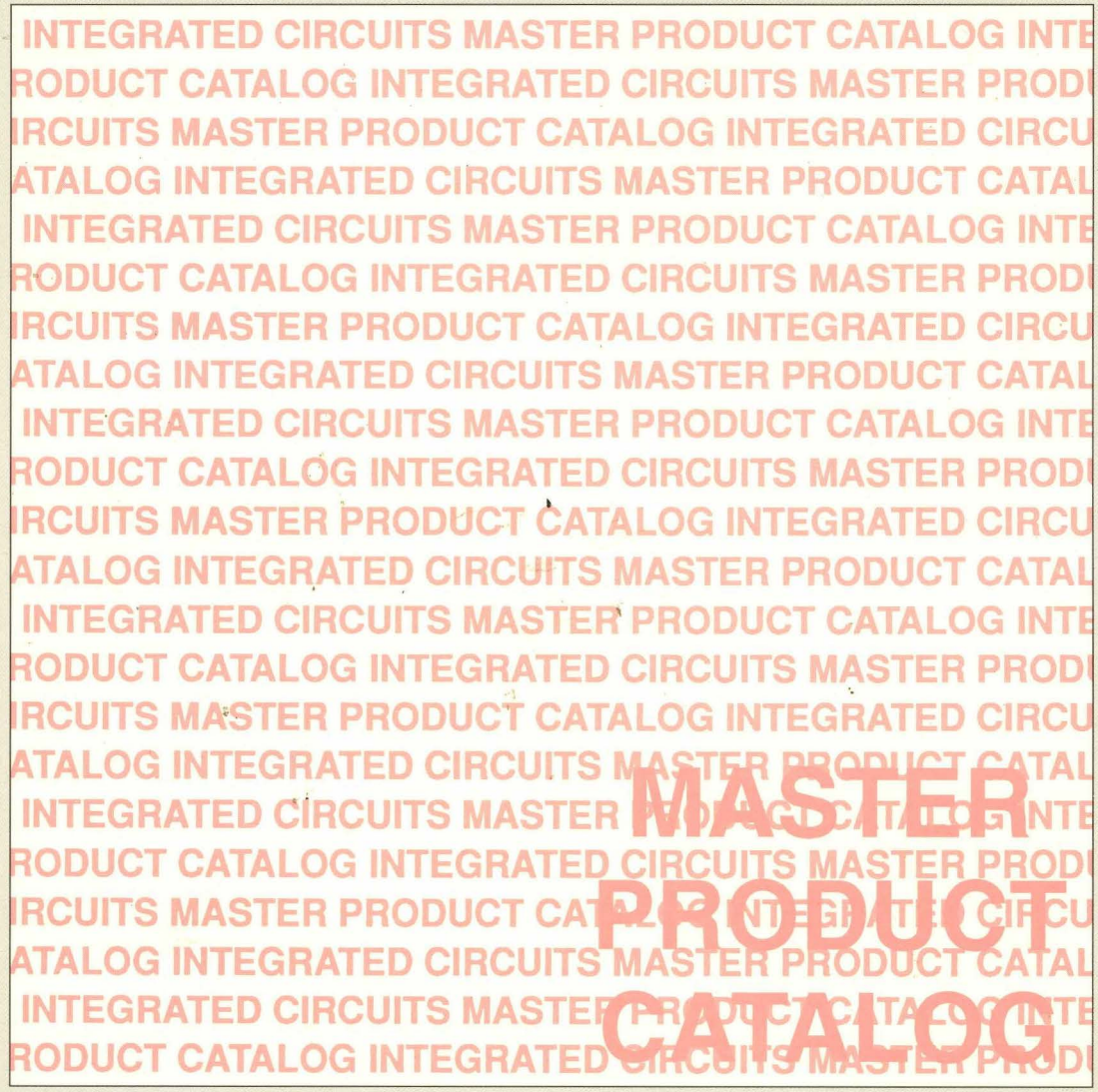

Philips Semiconductors

PHILIPS

Philips Semiconductors Master Product Catalog

May 1993

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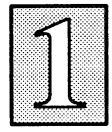
General Information



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Philips Semiconductors – A Company Profile

Signetics is now Philips Semiconductors. Our identity shift reflects a new alignment in the organization: we focus the strength of a global semiconductor supplier, with a world-class product portfolio, into the North American market.

Philips Semiconductors designs, manufactures and markets a wide range of advanced integrated circuits that support a variety of applications in the computing, communications, consumer, and automotive markets. In the computing arena, we provide innovative circuits for bus interface, disk drives, peripheral control, and multimedia applications. In communications, we offer cost-effective solutions for compact, battery-powered systems. Philips is a leader in advanced RF circuits for high-performance, very-high-frequency systems. In the consumer area, Philips offers advanced digital video and audio products and innovative circuits that integrate computer and video data. In automotive, our products are used in entertainment systems and for a variety of specialized control functions.

Philips Semiconductors is poised to meet the needs of an increasingly competitive environment in North America. We can help customers in growing markets meet the next generation of technical challenges through our expertise in digital, analog and mixed-signal technology. And, we can support customers' requirements anywhere around the world through our global manufacturing and customer support network.

Key Products

DIGITAL VIDEO and AUDIO
- Audio
- Video

MICROCONTROLLERS
- 80C51 Family
- Low Voltage/Power
- I^2C Serial bus and ACCESS.bus™
- OTP/EPROM versions

FIXED-FUNCTION LOGIC
- ABT and MULTIBYTE™
- BiCMOS Bus Interfaces
- Futurebus+
- FAST
- 3.3 Volt Logic

PROGRAMMABLE LOGIC
- General Purpose PAL® Devices
- Address Decoders
- Sequencers
- Design Tools

DATA COMMUNICATIONS
- Serial Data Comm
- Protocol Converters
- Network Controllers
- I/O Processors

RF/TELECOMM
- Telecomm
- Audio Compandors
- Telephony
- Wireless/RF

CUSTOM
- VLSI Tool Set
- CMOS System Cell
- Hi-IQ Cell Based Arrays

FOUNDRY
- BiCMOS/QUBiC
- CMOS
- Bipolar

MILITARY
- Millitary Drawings 883C 1.2.1
- Added Value Services

SURFACE MOUNT PACKAGING
- SO/SSOP
- CLCC
- PLCC
- Quad Flat Packs

ACCESS.bus is a trademark of Digital Equipment Corporation
MULTIBYTE is a trademark of North American Philips Corporation
PAL is a registered trademark of Advanced Micro Devices

Ordering Information

4000 CMOS PRODUCTS

Example: H E F 4 X X X X X X

- X — Philips North America Package Code
  - D = Plastic SO
  - N = Plastic Dual In-Line
- X — Philips Package Code on part
  - P = Plastic Dual In-Line
  - T = Plastic SO
- X — B = JEDEC "B" series CMOS specification
- 4XXX = Device number up to 5 digits
- F = Limited
- Family Identification

ABT PRODUCTS

Example: 74 ABT XXX X

- X — Package Code
  - D = Plastic SO
  - DB = Shrink Small Outline (SSOP)
  - N = Plastic Dual In-Line
- XXX — 3 Character Device Number
- ABT — Designates Advanced BiCMOS TTL Process
- 74 = Commercial Operating Temperature Range –40°C to +85°C

DATA COMMUNICATIONS CONTROLLERS

Example: S C N X X X X X C 6 N 4 8

- SC – Philips North America Designator
- Process/Power Variation
  - N = N – Channel
  - C = C – MOS
  - B = Bipolar
- Basic Part Number — See individual data sheets
- Temperature
  - C = 0°C to 70°C (Commercial)
  - A = -40°C to +80°C (Automotive)
  - M = -55°C to +125°C (Military)
  - P = -20°C to +70°C (Philips)
- Timing Variation

Spd	Sym	Spd	Sym	Spd	Sym
01	1	21	1	41	1
02	2	22	2	42	2
03	3	23	3	43	3
04	4	24	4	44	4
05	5	25	5	45	5
06	6	26	6	46	6
07	7	27	7	47	7
08	8	28	8	48	8
09	9	29	9	49	9
10	A	30	0	50	0
11	B	31	1	51	1
12	C	32	2	52	2
13	D	33	3	53	3
14	E	34	4	54	4
15	F	35	5	55	5
16	6	36	6	56	6
17	7	37	7	57	7
18	8	38	8	58	8
19	9	39	9		.
20	0	40	0		.

Unless otherwise noted.

- Package Code
  - A = Plastic Leaded Chip Carrier (PLCC)
  - N = Plastic Dual In-Line
  - F = Ceramic Dual In-Line
  - I = Hermetic Ceramic Dual In-Line
- Pin count — 14, 16, 20, 24, 28, 40, 48, etc.

Ordering Information

ECL 100K PRODUCTS

Example: 100XXX F

- F — Package Code
- 100XXX — Device Number

TEMPERATURE RANGE	DEVICE NUMBER	PACKAGE CODE
T_{amb} = 0°C to +85°C	100XXX	A = Plastic Leaded Chip Carriers (PLCC) F = Ceramic Dual In-Line

EPROMS

Example: 27C XXX I N

- N — Package Code:
  - A = Plastic Leaded Chip Carrier (PLCC)
  - D = Plastic SO
  - N = Plastic Dual In-Line
- I — Temperature Range:
  - – = 0°C to +70°C (Commercial)
  - I = -40°C to +85°C (Industrial)
  - M = -55°C to +125°C (Military)
- XXX — Part Density
  - 64A = 8K × 8
  - 256 = 32K × 8
  - 512 = 64K × 8
  - 010 = 128K × 8
  - 210 = 64K × 16
- 27C — Family Designator

FUTUREBUS+ PRODUCTS

Example: FB XXXX B

- B — Package Code:
  - A = Plastic Leaded Chip Carrier (PLCC)
  - B = Quad Flat Pack (QFP)
- XXXX — Device Number
- FB — Designates Futurebus+ Product. Temperature Range: 0°C to +70°C

HIGH-SPEED CMOS PRODUCTS

Example: 74 HC XXXXX N

- N — Complete type number; standard temperature range
- N — Package Code:
  - D = Plastic SO
  - N = Plastic Dual In-Line
  - N3 = Plastic Dual In-Line (300 mil)
- XXXXX — Device number (up to 5 digits)
- HC — HC = CMOS input switching levels, supply voltage range 2V to 6V, fully buffered.
  HCT = TTL input switching levels, supply voltage range 4.5V to 5.5V, fully buffered.
- 74 = Standard temperature range: -40°C to +125°C

Ordering Information

LOGIC PRODUCTS

Example: N 74FXXX N

- N — Package Code
- 74FXXX — Device Number
- N — Temperature Range

TEMPERATURE RANGE	DEVICE NUMBER	PACKAGE CODE
N = Commercial Range 0°C to 70°C	74ALSXXX 74FXX	A = Plastic Leaded Chip Carrier (PLCC) D = Plastic SO F = Ceramic Dual In-Line N = Plastic Dual In-Line

LINEAR PRODUCTS

Example: NE XXXX N

Package Code:
- A = Plastic Leaded Chip Carriers (PLCC)
- D = Plastic SO
- DK = Shrink Small Outline Package (SSOP)
- F = Ceramic Dual In-Line
- FE = Hermetic Cerdip (8 Lead)
- N = Plastic Dual In-Line

Device Number

Device Family and Temperature Range Prefix
- AU = -40°C to +125°C
- NE = 0 to +70°C
- SE = -55°C to +125°C
- SA = -40°C to +80°C

MEDIA COMPONENTS PRODUCTS
PREFIXES PC, PN, SA, TD, TE, TS, UA, UB, UM

Example: TD A XXXX P N

Device Family
- PCx = CMOS Circuit
- PNx = NMOS Circuit
- SAx = Digital Circuit
- TDx = Linear Circuit
- TEx = Linear Circuit
- TSx = Analog Circuit
- UAx = Digital Circuit
- UBx = Digital Circuit
- UMx = Digital Circuit

Operating Temperatures:
- A = Temperature range not specified (see data sheet)
- B = 0 to +70°C
- C = -55°C to +125°C
- D = -25°C to +70°C
- E = -25°C to +85°C
- F = -40°C to +85°C

Package Code:
- A = Plastic Leaded Chip Carrier (PLCC)
- B = Quad Flat Pack (QFP)
- N = Plastic Dual In-Line
- D = Plastic SO
- F = Ceramic Dual In-Line
- U = Plastic Single In-Line

Package Code on Part:
- GP = Quad Flat Pack (QFP)
- P = Plastic Dual In-Line
- T = Plastic SO
- D = Ceramic Dual In-Line
- WP = Plastic Leaded Chip Carrier (PLCC)

Device Number

Ordering Information

LOW VOLTAGE – HCMOS PRODUCTS

Example: 74LVXXX N

- 74LVXXX — Device Number
- N — Package Code

TEMPERATURE RANGE	DEVICE NUMBER	PACKAGE CODE
-40°C to +85°C	74LVXXX	D = Plastic SO N = Plastic Dual In-Line

MICROCONTROLLER PRODUCTS

Example: P 8 X C X X X E B P N

- X — 0 = ROMLESS, 3 = ROM, 7 = EPROM/OTP
  - **Exceptions:** P80C32 = ROMless, P80C52 = ROM
- XXX — This can be 2 or 3 digits
- E — Speed: E = 16MHz, G = 20MHz
- B — Temperature: B = 0°C to +70°C, F = -40°C to +85°C
- P — Philips Package Code: A = Plastic Leaded Chip Carrier (PLCC), B = Quad Flat Pack (QFP), F = Hermetic Cerdip (window), L = Cerquad (window), P = Plastic Dual In-Line
- N — Philips North America Package Code: A = Plastic Leaded Chip Carrier (PLCC), B = Quad Flat Pack (QFP), FA = Hermetic Cerdip (window), KA = CerQuad (window), N = Plastic Dual In-Line

Example: SC 8 X C X X X B C C N 40

- X — 0 = ROMLESS, 3 = ROM, 7 = EPROM/OTP
  - **Exceptions:** SC80C31 = ROMless, SC80C51 = ROM
- XXX — This can be 2 or 3 digits
- B — Revision (optional)
- C — Temperature: C = Commercial 0°C to +70°C, A = Industrial -40°C to +85°C
- C — Speed: B = 0.5 to 12MHz, C = 12MHz, G = 16MHz, L = 20MHz, P = 24MHz, Y = 33MHz
- N — Package Code: A = Plastic Leaded Chip Carrier (PLCC), B = Quad Flat Pack (QFP), FA = Hermetic Cerdip (window), KA = CerQuad (window), N = Plastic Dual In-Line
- 40 — Pin Count

Ordering Information

MICROCONTROLLER PRODUCTS (continued)

Example: S 8 X C XXX –1 N 24

- Pin Count: 24
- Package Code: N
  - A = Plastic Leaded Chip Carrier (PLCC)
  - B = Quad Flat Pack (QFP)
  - F = Ceramic Dual In-Line
  - K = CerQuad
  - N = Plastic Dual In-Line
- Speed / Temperature Range: -1
  - -1 = 12MHz, 0°C to +70°C
  - -2 = 12MHz, -40°C to +85°C
  - -3 = 0.5 to 12MHz, 0°C to +70°C
  - -4 = 16MHz, 0°C to +70°C
  - -5 = 16MHz, -40°C to +85°C
  - -6 = 12 or 16MHz, -55°C to +85°C
- 0 = ROMLESS, 3 = ROM, 7 = EPROM/OTP: X

MULTIBYTE™ PRODUCTS

Example: MB 2 XXX B

- Package Code: B
  - B = Quad Flat Pack (QFP)
- Device Number: XXX
- Byte-width (2 or 4): 2
- Designates MULTIBYTE™ Product. Temperature Range: –40°C to +85°C: MB

MULTIBYTE is a trademark of Philips Semiconductors.

PLD PRODUCTS

Example: P(L) XX YYYY Q P

- Package Code: P
  - F = 20-, 24-, 28-Pin Ceramic Dual In-Line
  - N = 20-, 24-, 28-Pin Plastic Dual In-Line
  - A = 20-, 28-, 52-, 68-lead Plastic Leaded Chip Carrier (PLCC)
  - FA = 20-, 24-Pin Ceramic Dual In-Line with Quartz Window
  - KA = CerQuad (window)
- Performance indicator: Q
  - Z = Zero standby power devices
  - blank, A, B, D, -35, -7, etc. = propagation delay (ns)
  - -37, -45, -55, etc. = operating frequency (MHz)
- Basic Part Number: YYYY
  - (3 to 8 characters)
  - (e.g., 100, 105, 153, 168, 173, 18P8, 42VA12)
- Process/Architecture Indicator: XX
  - S = Bipolar Junction Isolated Schottky – Nichrome fuses
  - C = CMOS – EPROM cells
  - HS = High Speed Bipolar Oxide Isolated – Vertical Fuse
  - US = High Speed Bipolar Oxide Isolated – Lateral Fuse
  - HD = High Speed Decoder
  - ML = Macro Logic
  - (Blank for ECL devices)
- Indicator for Philips North America Programmable Logic: P(L)
  - (Can be either P, PL, or blank)
  - (P for PHD and PML and blank for ECL devices)

Operating temperature range = 0 to +70°C
EXCEPT: PLC18V8ZI = -40 to +85°C

GAL is a registered trademark of Lattice Corp.
PAL is a registered trademark of MMI, Corp., a wholly-owned subsidiary of Advanced Micro Devices (AMD), Inc.

Ordering Information

PROMS

Example: N82 XXX YYY Z P

Package Code
- A = Plastic Leaded Chip Carrier (PLCC)
- D = Plastic SO
- F = Ceramic Dual In-Line
- F3 = 24-pin Ceramic Dual In-Line (300-mil)
- N = Plastic Dual In-Line
- N3 = 24-pin Plastic Dual In-Line (300-mil)

Performance Indicator
(May be blank, A, B, C, etc., to designate speed variations in basic part.)

Basic Part Number
(2 or 3 characters)

Process Indicator
- HS = High Speed Bipolar Oxide Isolated — Vertical Fuse
- LS = High Speed Bipolar Oxide Isolated — Vertical Fuse
- S = Bipolar Junction Isolated Schottky — Nichrome Fuses

Operating temperature range = 0 to +70°C
EXCEPT: 10149 = -30 to +85°C

Packing Quantity Information

CERAMIC DUAL IN-LINE (CERDIP)

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TUBE	DEVICES PER BOX
F/FE, BPA, PA	8-pin (300-mil)	48	1920
F, BCA, CA	14-pin (300-mil)	25	1000
F, BEA, EA	16-pin (300-mil)	25	1000
F, BVA, MVA	18-pin (300-mil)	21	840
F/FA, BRA, RA	20-pin (300-mil)	20	800
F, BWA, WA	22-pin (400-mil)	17	544
F/FA/F6, BJA, JA	24-pin (600-mil)	15	360
F/FA/F3/F24, BLA, LA	24-pin (300-mil)	15	600
F, BXA, XA	24-pin (400-mil)	15	480
F/FA/F28, BXA, XA	28-pin (600-mil)	13	312
FA	32-pin (600-mil)	11	264
F/FA/F40, BQA, MQA, QA	40-pin (600-mil)	9	216

CERPAC

PACKAGE CODE	PIN COUNT	QUANTITIES
		DEVICES PER MAGAZINE
BDA/DA/W	14-pin	145
BFA/FA/W	16-pin	145
BXA/BYA/W	18-pin	100
BSA/SA/W/WB	20-pin	100
BKA/KA/W	24-pin	100
BYA/YA/W	28-pin	100

CERQUAD

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TRAY	DEVICES PER BOX
KA/K44	44-pin	6	6
KA/K68	68-pin	4	4
KA	84-pin	42	210

LEADLESS CHIP CARRIER

PACKAGE CODE	PIN COUNT	QUANTITIES
		DEVICES PER TUBE
B2A/2A/GA	20-pin	55
B3A/3A/GA/GC1	28-pin	43
YA/YA/GC2	32-pin	35
BUA/MXA/MUA/UA/XA/ GA/GC	44-pin	27
BZA/BUA/UA/ZA/GA/GC	68-pin	19

QUANTITIES SHOWN IN GRAY REQUIRE PURCHASE TO BE MADE IN EXACT MULTIPLES OF THAT QUANTITY.

Packing Quantity Information (Continued)

PLASTIC DUAL IN-LINE

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TUBE	DEVICES PER BOX
N/N8	8-pin (300-mil)	50	2000
N/N14/N16	14-/16-pin (300-mil)	25	1000
N	14-/16-pin (300-mil long tube)	28	1120
N	18-pin (300-mil)	20	800
N	18-pin (standard tube)	22	880
N	18-pin (long tube)	25	1000
N	20-pin (300-mil)	18	720
N	20-pin (long tube)	20	800
N	22-pin (400-mil)	17	544
N/N3/N24	24-pin (300-mil)	15	600
N/N24	24-pin (400-mil)	15	480
N	24-pin (600-mil)	15	360
N	24-pin (600-mil long tube)	17	510
N/N3	28-pin (300-mil)	13	520
N	28-pin (600-mil)	13	312
N	28-pin (600-mil long tube)	15	450
N	32-pin (600-mil)	11	264
N	32-pin (600-mil shrink)	19	760
N/N40	40-pin (600-mil)	9	216
NB (Shrink)	42-pin (600-mil)	12	288
N/N48	48-pin (600-mil)	7	168
N	50-pin (900-mil)	7	112
N/N64	64-pin (900-mil)	5	80

PLASTIC LEADED CHIP CARRIER (PLCC)

PACKAGE CODE	PIN COUNT	QUANTITIES		
		DEVICES PER TUBE	DEVICES PER BOX	DEVICES PER REEL
A	20-pin	46	3680	1000
A/A28	28-pin	37	2368	750
A	28-pin	34	2176	1000
A	32-pin	31	2232	750
A/A44	44-pin	26	1248	500
A/A44	44-pin	26	1300	500
A/A52	52-pin	23	1012	500
A/A68	68-pin	18	648	250
A/A84	84-pin	15	420	250

QUANTITIES SHOWN IN GRAY REQUIRE PURCHASE TO BE MADE IN EXACT MULTIPLES OF THAT QUANTITY.

Packing Quantity Information (Continued)

PLASTIC SMALL OUTLINE (SO)

PACKAGE CODE	PIN COUNT	QUANTITIES		
		DEVICES PER TUBE	DEVICES PER BOX	DEVICES PER REEL
D/D8	8-pin (150-mil)	100	2000	2500
D	8-pin (300-mil)	64	2560	1000 – 13" 700 – 7"
D/D14	14-pin (150-mil)	57	1140	2500
D	16-pin (150-mil)	50	1000	2500
D	16-pin (300-mil)	47	1880	1000
DK (SSOP)	20-pin (170-mil)	75	6750	2500
DB (SSOP)	20-pin (225-mil)	66	4620	1000
D	20-pin (300-mil)	38	1520	1000
DB (SSOP)	24-pin (225-mil)	59	4130	1000
D	24-pin (300-mil)	31	1240	1000
D/D24	24-pin (300-mil)	32	1280	1000
D	28-pin (300-mil)	27	1080	1000
D	32-pin (300-mil)	24	960	1000
D	40-pin (VSO-40)	31	1240	1000 – 13" 300 – 7"
D	56-pin (VSO-56)	22	616	1000

QUAD FLAT PACK*

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TRAY	DEVICES PER BOX
B/B44	44-pin	50	500
B	44-pin	72	720
B/B44	44-pin	96	480
B	52-pin	96	480
B	80-pin	66	330
B	100-pin	66	330
B	120-pin	24	120
B	120-pin	30	150
B	128-pin	24	120

* Quad Flat Pack parts require dry pack handling according to EIA Standard - 583.
These parts are identified in part list section with DRY PACK in the Cross Ref Part No field.

QUANTITIES SHOWN IN GRAY REQUIRE PURCHASE TO BE MADE IN EXACT MULTIPLES OF THAT QUANTITY.

Military Product Description

MILITARY STANDARD PRODUCTS

The Philips Semiconductors standard product line offering includes Standard Military and DESC Drawings, and Class B and C vendor standard products.

All Philips Semiconductors standard products are 100% screened to the requirements of the most current issue of MIL-STD-883, Method 5004, and periodically sampled to Quality Conformance Inspection (QCI), Method 5005. Philips Semiconductors utilizes alternate Group A and alternate Group B for all product lines. The details of these test methods, as well as additional related requirements of MIL-M-38510 and MIL-STD-883, are not repeated herein so as to not mislead our customers by errors or omission of requirements included in those specifications.

This product description supersedes all prior dated Military Product literature, including commercial data books containing Military Product electrical characteristics, flow descriptions, and package physical dimensions.

JAN Qualified Products

On January 15, 1992, Philips Semiconductors announced its decision to close its Orem, Utah plant where many of our mature bipolar products were produced. Because of this decision, Philips Semiconductors intends to discontinue all JAN product in our Mil-M-38510 QPL product line. Philips Semiconductors will formally resign all QPL products after "last time buy" orders have been completed. The Orem facility was closed December 15, 1992.

Part IV QPL 38510

Philips Semiconductors offers selected devices as compliant and qualified to QPL IV. Products listed in Part IV of the QPL are considered to be qualified products. Part IV was established to allow continued procurement of diminishing JAN sources (DJS) devices to the same part number for logistics support or completion of production. They are not intended for new design.

Standard Military Drawing (SMD)

DESC selected item drawings (mini-specs) were produced by DESC-ECS during the period of 1976-1986 to serve as an interim standard for use prior to the publication of a JAN detailed slash sheet.

Standard Military Drawings (SMD), introduced in 1986, fulfill the same needs as DESC Drawings, but are streamlined about the general requirements of compliant non-JAN device types as defined by MIL-STD-883, Paragraph 1.2.1.

The SMD serves as the Class B standard procurement preference as defined by MIL-STD-454, Requirement 64.

All Philips Semiconductors products offered as SMD's fully conform with MIL-STD-883, Paragraph 1.2.1 and to the detailed drawing. Final electrical, Group A, and end-point electrical tests are defined by the SMD.

Many SMD products are dual-marked with the Philips Semiconductors Class B standard product part number.

This category of product conforms to Quality Level B-1 of MIL-HDBK-217 ($\pi_Q = 2.0$)

Philips Semiconductors Class B Standard Products

Philips Semiconductors Class B Vendor Standard products are offered for use when JAN products are not qualified on the QPL, SMD products are not available, or when program requirements allow the use of vendor standard products.

All Class B standard products are compliant to MIL-STD-883, general provisions Paragraph 1.2.1 for non-JAN devices. No claims by Philips Semiconductors are otherwise made of equivalence to JAN products or to MIL-M-38510. Philips Semiconductors standard products are also compliant with JEDEC Publication 101.

Military Product Description

Electrical specifications are as published in the most current Philips Semiconductors Military Data Manual.

- 100% final electrical tests include all data manual parameter limits, test conditions, and temperatures applicable to Subgroups 1, 2, 3, 7, 8, and 9 of MIL-STD-883, Method 5004 for digital products, or to Subgroups 1, 2, 3, 4, and 9 for Linear products.
- Alternate Group A sample electrical inspection tests include applicable final electrical subgroups as well as all other Data Manual parameters with specified minimum or maximum limits.
- End-point electrical tests used for QCI inspection sampling (Groups C and D) are those Data Manual parameter limits, test conditions, and temperatures applicable to the Group A Subgroups specified in the most similar associated detail specification (slashsheet).

Electrical parameters which have no specified minimum or maximum limits (typical performance only) are not tested. Parameters which have limits specified at 25°C only, are tested only at that temperature. Detailed parameter assignment to Group A subgroups and other test details are contained in documented Philips Semiconductors internal Product Electrical specifications, and are available upon request. Actual test program symbolics are available for customer review at the factory, but are considered proprietary and will not be copied or otherwise distributed outside of Philips Semiconductors.

Waivers or deviations deemed necessary in contracts must be processed in accordance with MIL-STD-480.

Package types which do not have case outline letters assigned in MIL-M-38510, Appendix C, are assigned case outline letters per JEDEC Publication 101.

The Philips Semiconductors standard Product Assurance Plan documentation is available for customer review at the factory.

This category of product conforms to quality level B-1 of MIL-HDBK-217 (π_Q = 2.0).

General Information

- All Philips Semiconductors products are considered sensitive to electrostatic discharge (ESD), regardless of ESD class. In-process factory ESD controls are maintained from die attach through shipping. Devices are packed in protective tubes or magazines, enclosed in a Faraday shield container, and labeled in accordance with MIL-STD-129.

  WARNING: Devices may be degraded or destroyed if proper ESD handling techniques are not used when opening the shipping container. The Philips Semiconductors warranty is void if product is not properly protected.

ESD Information

- Philips Semiconductors products which have been classified for electrostatic discharge sensitivity (ESDS) according to MIL-STD-883, T/M3015, are described in the product listings herein. Class 1 devices are further described by the highest level that samples were found acceptable at 1kV, 500V, and 250V. For information regarding products not yet classified, please contact Military Marketing.
- All Philips Semiconductors production areas, critical support areas, subcontract test labs, and authorized distributor stocking locations are certified and periodically self-audited by Philips Semiconductors Quality Assurance.
- Customer Source Inspection (CSI) which is contractually required on standard products is restricted to final documentation review only (Philips Semiconductors does not identify work-in-process by customer). For custom or semi-custom products, CSI is permissible at any in-process operation.
- Source or Spec Control Drawings (SCD), Altered Item Drawings, and Selected Item Drawings (SID) are acceptable for review. The Philips Semiconductors review guidelines reflect the standard requirements of MIL-STD-883, Paragraph 1.2.1.

Military Product Description

- Philips Semiconductors is agreeable to customer imposed qualification, First Article, or MIL-M-38510 QCI requirements on non-JAN products. Contact the factory for price and delivery information.
- Purchase order directed standard data pack requirements are acceptable for screening or QCI attribute data for all products. Contact the factory for price and delivery information.
- Philips Semiconductors offers a one year limited warranty from the time of delivery to the customer on standard products for performance, workmanship, and conformance to the applicable product specifications. Products procured through Philips Semiconductors authorized distributors are similarly warranteed for one year from the time of delivery to the customer. This warranty is not transferable through multiple distributor transactions, and is invalid for any product which is delivered by or transferred through a non-authorized distributor, broker or test laboratory.
- The Philips Semiconductors warranty is invalid if the customer or his subcontractor subject the product to alteration (e.g., marking, lead cutting) or stresses beyond the capability of the product. Where environmental stress screening is contractually required, it is strongly recommended that Philips Semiconductors be consulted as to the ability of the devices to survive the stresses, and that the test laboratory be certified by the customer's QA organization.
- Philips Semiconductors recognizes that many government contracts require current lead finish solderability acceptance testing on every lot, and/or 100% solder coat rework. Because all Philips Semiconductors products are solder coated after burn-in and prior to shipment, we recommend that the rework of solder coat not be attempted by our customers or their subcontractors.

  WARNING: Device seal integrity may be downgraded or destroyed if proper controls to avoid extreme thermal shock are not employed during solder coat, the Philips Semiconductors warantee is void if product is damaged in solder coat rework.

  Solderability acceptance testing per MIL-STD-2000 and/or WS6536 can be performed by Philips Semiconductors as a line-item lot test charge, if required. See the SOW-2000 Testing Statement on the following page.
- All products are marked with a unique country of origin code identifying the assembly plant location. The code "THAI" signifies assembly in our Bangkok, Thailand facility.
- The Philips Semiconductors plant address information is as follows:

Company Headquarters
Philips Semiconductors
811 E. Arques Avenue
P.O. Box 3409
Sunnyvale, CA 94088-3409

Offshore Manufacturing
Philips Semiconductors Thailand Co. LTD.
303 Chaeng Wattana Road
Bangkhen
Bangkok, Thailand
Telephone: 66-2-521-0653

Alpha-Tec Electronics Co. LTD.
17/2 Moo 18, Tambon Bang-Num-Priow
Amphor Saladang, Cha-Cherng-Chao
Thailand

Product Spotlights

Contents

Contents

Fixed Function Logic

Contents

Fixed Function Logic (Continued)

Programmable Logic

RF/Wireless

Contents

Product Spotlights

DIGITAL AUDIO/VIDEO

Digital Video Chip Set

FEATURES

- Color video decoding
- 13.5MHz, 720 pixels/line
- 7 Bits Y:U:V 4:1:1
- PAL, NTSC

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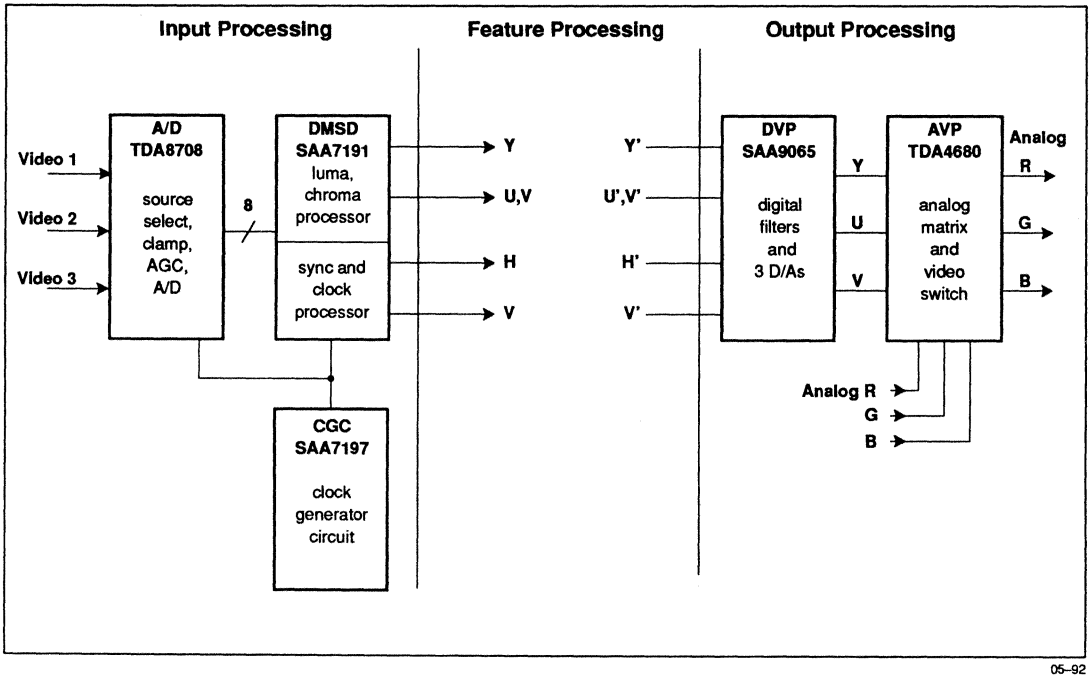

05–92

Product Spotlights

SAA7191 – Digital Multistandard Color Decoder, Square Pixel (DMSD-SQP)

GENERAL DESCRIPTION

The SAA7191 is a digital multistandard color decoder suitable for 8-bit CVBS input signals or for 8-bit luminance and 8-bit chrominance input signals (Y/C).

- Horizontal and vertical sync detection for all standards
- Controls via the I²C bus
- User programmable aperture correction (horizontal peaking)
- Compatible with memory-based features (line-locked clock)
- Cross-color reduction by chrominance comb-filtering (NTSC) or by special cross color cancellation (SECAM)
- 8-bit quantization of input signals
- 768/640 active samples per line equals 50/60Hz (SQP)
- The UYV bus supports data rates of 780 (f_H = 12.2727MHz for 60Hz, NTSC-M) and 944 (f_H = 14.75MHz for 50Hz, PAL-B/G, SECAM) in 4 : 1 : 1 or 4 : 2 : 2 formats (via the I²C bus)
- One crystal oscillator of 26.8MHz

SAA7199B – Gen-Locking Digital Encoder (DENC)

FEATURES

Inputs:
Computer Graphics

- 24-bit RGB
- 8-bit indexed or palletized color such as VGA Digital Video
- CCIR601 digital video standard a composite digital video standard for NTSC and PAL Outputs: o Composite
  - NTSC/PAL outputs
  - Components Y/C
  - NTSC/PAL analog outputs

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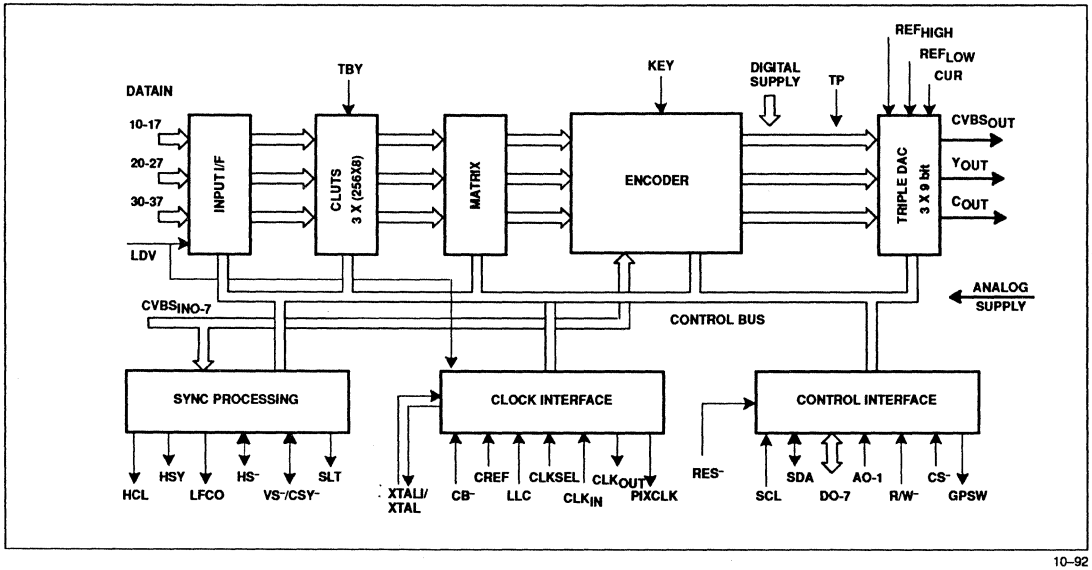

10–92

Product Spotlights

SAA7322/23 – Stereo Bitstream D/A Converter with Digital Filter

FEATURES

- Oversampling digital filter
- Bitstream 16-bit DAC
- Op amps for post filters
- De-emphasis network

TDA7050(T) – 150mW BTL or 2 x 75mW Low-Voltage Amplifier

DESCRIPTION

This low-voltage amplifier is for small mono (BTL) or stereo apparatus with headphones.

It's in an 8-pin plastic DIL package (TDA7050) or in an 8-pin small outline (SO) plastic package for surface mounting (TDA7050T).

Power output at d_{tot} = 10%		
POWER OUTPUT (W)	SUPPLY VOLTAGE (V)	LOAD IMPEDANCE (Ω)
Mono BTL		
0.15	4.5	64
0.14	3	32
Stereo		
2 x 0.075	4.5	32
2 x 0.035	3	32

FEATURES

- Requires no external components in BTL configuration
- Operates with battery supplies from 6V down to 1.6V
- Very low quiescent current (typically 3.2mA with 3V supply)
- Closed-loop voltage gain fixed at 26dB in the stereo configuration or 32dB in the BTL configuration (floating differential input, 3V supply and 32Ω load)

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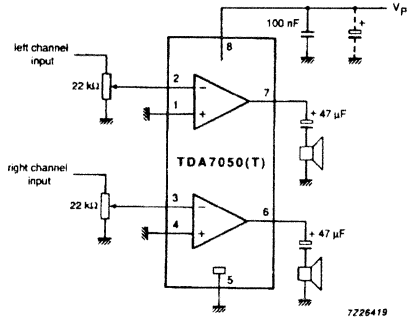
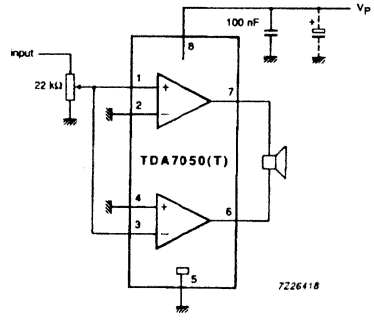


TDA7050(T) in single-ended stereo configuration



TDA7050(T) in single-ended stereo configuration

ARH/0792

Product Spotlights

TDA7052A/TDA7052AT – 1W/0.5W BTL Amplifier with DC Volume Control

DESCRIPTION

The proprietary circuit design of this amplifier makes use of the bridge-tied load (BTL) principle to achieve low-voltage operation without sacrifice of output power. They are therefore primarily intended for battery-powered radios, telephone sets, and portable equipment. Its wide supply voltage range (4.5V to 18V) makes it suitable for a broad range of applicatons.

The amplifier has a built-in DC volume control with a logarithmic characteristic providing control over a range of more than 80dB. When the DC control voltage drops below O.3V, the amplifier is muted. Except for pin 4 (DC volume control), the amplifier is pin-compatible with the TDA7052.

Power output at d_{tot} = 10%		
POWER OUTPUT (W)	SUPPLY VOLTAGE (V)	LOAD IMPEDANCE (Ω)
TDA7052A		
1	6	8
2	12	32
TDA7052AT		
0.5	6	16

FEATURES

- No external components required
- Excellent overall stability
- Output protected against short-circuit to V_{CC}, ground, or across load
- No external heatsink required
- Low power consumption
- No switch-on/switch-off clicks
- Supply voltage range 4.5V to 18V
- Incorporates DC volume control with a control range >80dB
- Mute facility

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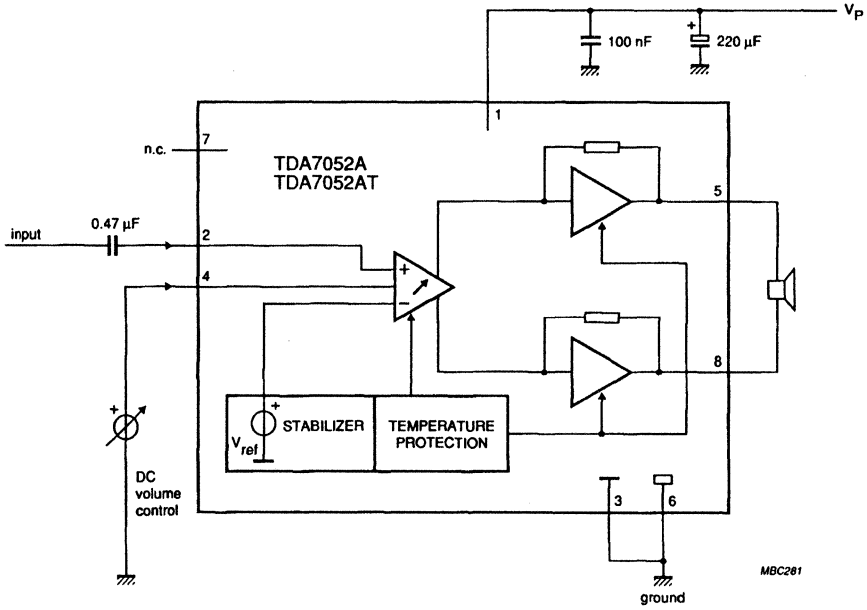

TDA7052A/TDA7052AT

ARH/0792

Product Spotlights

TDA7052/TDA7053 – 1W/2x1W BTL Amplifiers

DESCRIPTION

The proprietary circuit design of these amplifiers makes use of the bridge-tied load (BTL) principle to achieve low-voltage operation without sacrifice of output power. They are therefore primarily intended for battery-powered radios, telephone sets, and portable equipment. Its wide supply voltage range (3V to 18V) makes it suitable for a broad range of applicatons.

The TDA7052 is in an 8-plastic DIL package and is pin-compatible with half of the TDA7053 which is in a 16-pin plastic DIL package.

Power output at d_{tot} = 10%		
POWER OUTPUT (W)	SUPPLY VOLTAGE (V)	LOAD IMPEDANCE (Ω)
TDA7052		
1	6	8
2	11	25
TDA7053		
2 x 1	6	8
2 x 2	11	25

FEATURES

- No external components required
- Excellent overall stability
- No external heatsink required
- Low power consumption
- No switch-on or switch-off clicks
- Supply voltage range 3V to 18V
- Fixed closed-loop voltage gain of 39dB (6V supply, 8Ω lead)

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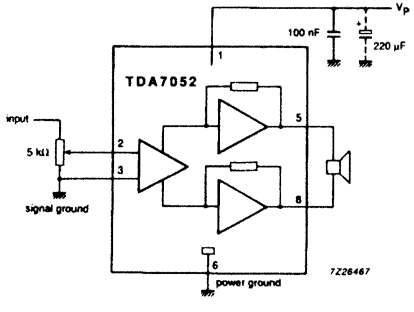
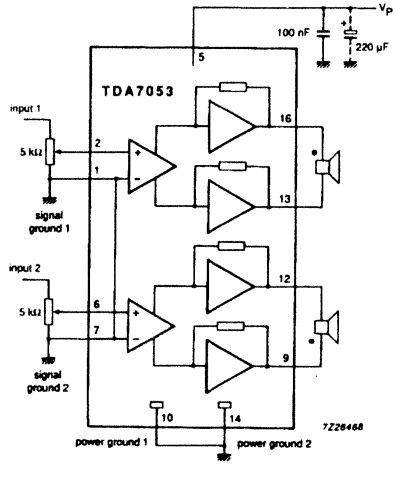


TDA7052 in BTL mono configuration



TDA7053 in BTL stero configuration

ARH/0792

Product Spotlights

TDA7056A – 3W BTL Amplifier with DC Volume Control

DESCRIPTION

This BTL amplifier is primarily intended for battery-powered portables. However their wide supply voltage range (4.5V to 18V) also makes them suitable for AC powered applications such as monitors and computers.

The amplifier has a built-in DC volume control with a logarithmic characteristic providing control over a range of more than 80dB. When the DC control voltage drops below O.3V, the amplifier is muted. Except for pin 5 (DC volume control), the amplifier is pin-compatible with the TDA7056.

The TDA7056A is in a 9-pin medium-power plastic SIL package.

Power output at d_{tot} = 10%		
POWER OUTPUT (W)	SUPPLY VOLTAGE (V)	LOAD IMPEDANCE (Ω)
3.4	12	16

FEATURES

- No external components required
- Excellent overall stability
- Output protected against short-circuit to V_{CC}, ground, across load
- Low power consumption
- No switch-on/switch-off clicks
- Supply voltage range 4.5V to 18V
- Incorporates DC volume control with a control range >80dB

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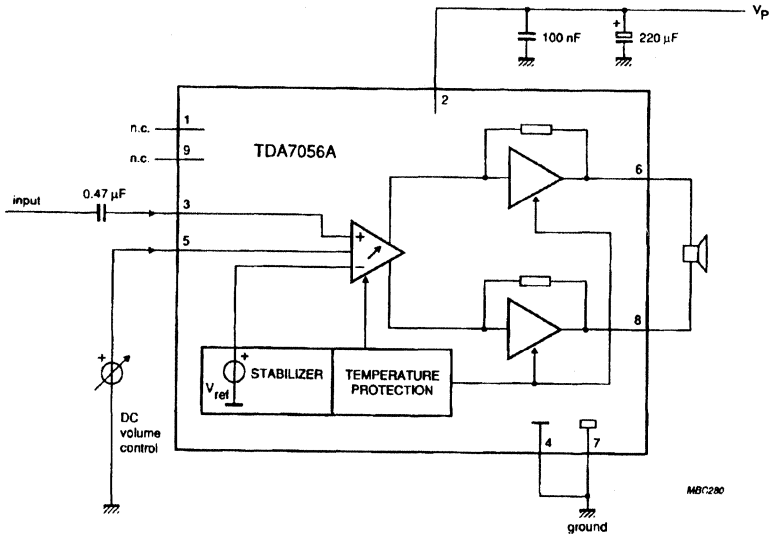

TDA7056A

ARH/0792

Product Spotlights

TDA7056/TDA7057Q – 3W/2x3 BTL Amplifiers

DESCRIPTION

These BTL amplifiers are primarily intended for battery-powered portables. However their wide supply voltage range (3V to 18V) also makes them suitable for AC powered applications such as monitors and computers.

The TDA7056 is in a 9-pin power plastic SIL package. The TDA7057Q is in a 13-pin plastic SIL package with the pins bent to DIL format.

Power output at d_{tot} = 10%		
POWER OUTPUT (W)	SUPPLY VOLTAGE (V)	LOAD IMPEDANCE (Ω)
TDA7056		
3	11	16
TDA7057Q		
2 x 3	11	16

FEATURES

- No external components required
- Excellent overall stability
- Low power consumption
- No switch-on/switch-off clicks
- Supply voltage range 3V to 18V
- Fixed closed-loop voltage gain of 39dB (11 V supply, 16Ω lead)

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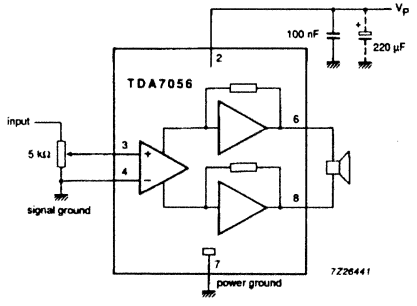
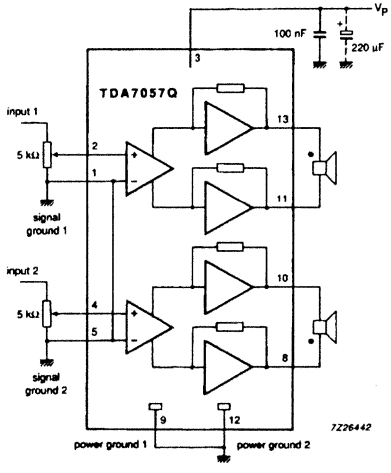


TDA7056 in BTL configuration



TDA7057Q in BTL stero configuration

ARH/0792

Product Spotlights

TDA7072A/T – Single BTL Power Driver

DESCRIPTION

The TDA7072A/AT are single power driver circuits in a BTL configuration, intended for use as a power driver for servo systems with a single supply. They are specially designed for compact disc players and are capable of driving focus, tracking sled functions and spindle motors.

TDA8425 – Hi–Fi Stereo Audio Processor; I²C-bus

DESCRIPTION

The TDA8425 is a monolithic bipolar integrated stereo sound circuit with a loudspeaker channel facility, digitally controlled via the I²C-bus for application in hi-fi audio and television sound.

DESCRIPTION

- Source and mode selector for two stereo channels
- Pseudo stereo, spatial stereo, linear stereo and forced mono switch
- Volume and balance control
- Base, treble and mute control
- Power supply with power-on reset

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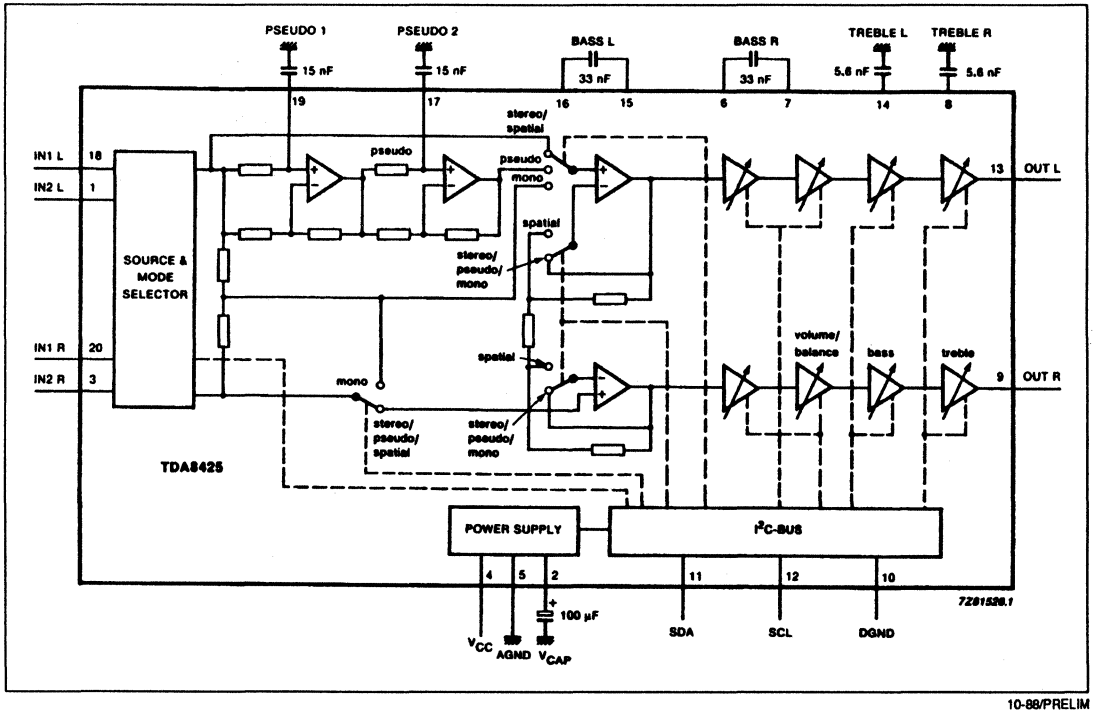


10-88/PRELIM

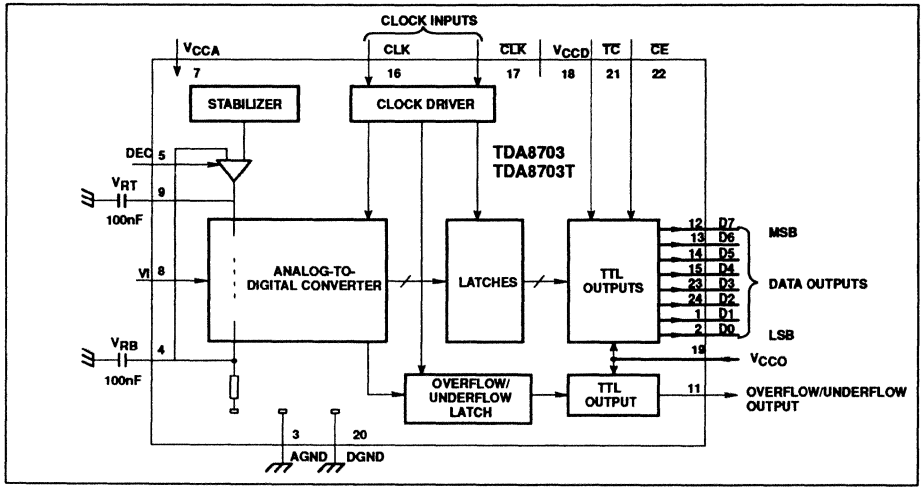
Product Spotlights

TDA8703/TDA8703T – 8-Bit High-Speed Analog-to-Digital Converter

FEATURES

- 8-bit resolution
- Sampling rate up to 40MHz
- High signal-to-noise ratio over a large analog input frequency range (7.1 effective bits at 4.43MHz full-scale input)
- Binary or two's complement 3-state TTL outputs
- Overflow/underflow 3-state TTL output
- TTL compatible digital inputs
- Low-level AC clock input signal allowed
- Internal reference voltage generator
- Power dissipation only 290mW (typical)
- Low analog input capacitance, no buffer amplifier required
- No sample and hold circuit required

TDA8703/T BLOCK DIAGRAM



03-92

TDA8708 – 8-Bit Analog-to-Digital Converter for Composite Video, Luminance

FEATURES

- Sampling rate up to 30MHz
- Binary or two's complement 3-State TTL outputs
- Clamp and automatic gain control for composite video, blanking, synchronization, and luminance
- Three selectable inputs

TDA8709 – 8-Bit Analog-to-Digital Converter for Chrominance

FEATURES

- Sampling rate up to 30MHz
- Clamp to "16" or "128"
- Three selectable inputs

FEATURES

- Separate 8-bit luminance (Y or CVBS) and 8-bit chrominance inputs (CVBS or C) from CVBS, Y/C, S-Video (S-VHS or Hi8) sources
- Luminance and chrominance signal processing for standards PAL-B/G, NTSC-M, SECAM

Joint Agreements Enhance Philips' Worldwide Leadership in Microcontrollers

This high level of integration enables a single device to replace up to 11 circuits in a system design.

Philips Semiconductors, the company that offers the most 80C51 derivatives in the world, has joined forces with two other industry leaders to further expand its product offering. Two separate alliances will result in even more Philips microcontroller solutions for more popular customer applications.

Such partnership arrangements allow both suppliers to mutually benefit through the process of better serving their customers. This spirit of cooperation between industry suppliers also reflects the maturity of an established industry.

The First Step

The first agreement brings Philips Semiconductors and Intel Corporation together to develop an extension of the 8-bit 80C51 microcontroller family. Intel and Philips Semiconductors supply over 50 percent of all the 80C51 microcontrollers sold worldwide, so this superpower partnership ensures the continued longevity and standardization of the architecture throughout this decade.

A new family of products is being developed as a result of the Intel/Philips Semiconductors agreement. This new family is based on an upgraded 80C51 core that is fully instruction-set compatible with existing 8051/80C51 devices.

The products will offer even higher performance, expanded supply voltage, extended address range, high-level language support, fully static design and reduced noise generation. With these new products, customers will be able to upgrade 8051/80C51-based systems while protecting their existing software investments.

The Results

Initial products resulting from the Intel/Philips Semiconductors agreement are expected to be available in early 1994. Sold by both companies, these products will

support emerging high-performance and low-power embedded applications.

Current 8051/80C51 architecture, an industry standard for high-performance 8-bit microcontrollers, is optimized for use in a wide range of embedded applications, including industrial control systems, medical instrumentation and automobile control systems.

And There is More. . .

In yet another agreement, Philips Semiconductors has become an alternate source for WSI's PSD3XX family of field-programmable microcontroller peripheral chips. The full line is available now from Philips sales offices and authorized distributors.

The PSD3XX products are the only commercially available circuits that integrate on a single chip all peripheral memory and logic functions required to support microcontrollers in embedded applications. This high level of integration enables a single device to replace up to 11 circuits in a system design.

The PSD3XX microcontroller peripheral family extends Philips Semiconductors' 80C51 derivative strategy by integrating numerous peripheral functions that can interface with any 80C51 derivative, as well as with any other 8-bit or 16-bit microcontroller.

Defining the PSD3XX Family

The PSD3XX microcontroller peripheral family includes system control logic, two programmable logic devices (PLDs), EPROM, SRAM and user-configurable logic. The on-chip PLDs also operate as programmable address decoders (PADs) with up to 18 inputs and 24 outputs. They can implement 40 product terms based on address inputs, control signals and/or chip-select inputs. The products include memory-paging logic that increases the memory addressing range to as many as 16 one-megabit pages. These circuits also incorporate 19 individually configurable input/output pins that provide port expansion for the target microcontroller.

The Significance

By adding the PSD3XX microcontroller peripheral line, Philips Semiconductors is able to significantly expand its already-substantial microcontroller product offering. The WSI peripheral circuits are popular with customers because they substantially reduce system chip-count, and they are very easy to configure.

For example, in some designs, the additional memory and logic available in a WSI circuit enable designers to replace an expensive 16-bit device by using an 8-bit microcontroller with a peripheral chip.

The Power Behind the Program

Philips Semiconductors is the world's tenth largest semiconductor supplier and the largest in Europe. The company's wafer fabs and assembly facilities located throughout the world product more than 25 million integrated circuits and discrete semiconductors each day. Key markets are consumer electronics, telecommunications, computers and automotive. Philips Semiconductors is supported by Philips Research Laboratories, one of the world's largest privately funded research organizations, with centers in five countries.

Product Spotlights

MICROCONTROLLERS

83C053/83C054/87C054 – Microcontroller for Television and Video (MTV)

FEATURES

- 8192 x 8 masked ROM (83C053)
  16384 x 8 masked ROM (83C054)
  16384 x 8 OTPROM (87C054)
- 192 x 8 RAM
- On Screen Display (OSD) Controller
- Three digital video outputs
- Multiplexer/mixer and background intensity controls
- Flexible formatting with OSD New Line Option
- 128 x 10 display RAM
- 60 x 18 x 14 character generator ROM
- Eight text-shadowing modes
- Text color selectable per character
- Background color selectable per word
- Background color vs. video selectable per character
- Eight 6-bit pulse width modulators for analog voltage integration
- One 14-bit PWM for high-precision voltage integration
- D/A converter and comparator with three-input multiplexer
- Nine dedicated I/Os plus 28 port bits
- 15 port bits have alternate uses
- Four high-current open-drain port outputs
- 12 high-voltage (+12V) open drain outputs
- Programmable video input and output polarities
- 80C51 instruction set
- No external memory capability
- 42-pin shrunk DIP (0.07-inch center pins)
- High-speed CMOS technology
- 5V ± 10% operation

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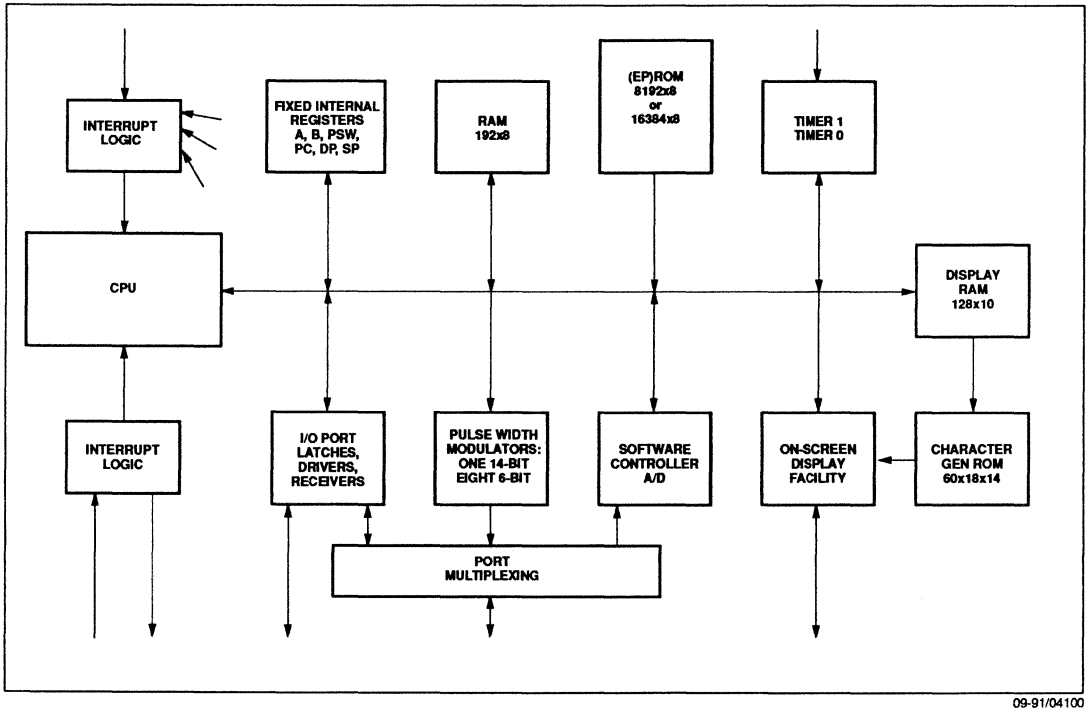

09-91/04100

Product Spotlights

80CL51 – 8-Bit Microcontroller with UART, 1.8V

FEATURES

- Supply voltage from 1.8 to 6.0V
- Operating frequency from 32kHz to 12MHz
- 80C51 based architecture
  - 4k x 8 ROM (64k external)
  - 128 x 8 RAM (64k external)
  - Four 8-bit I/O ports
  - Two 16-bit timer/counters
  - A thirteen-source, two-level, nested priority interrupt structure
  - 10 external interrupts
- Fully static 80C51 CPU
- Full duplex serial channel
- Two power control modes
  - Idle mode
  - Power-down mode – can be terminated by reset or external interrupt
- Wake-up via external interrupts at port 1
- On-chip oscillator (quartz crystal, ceramic resonator, RC, LC)
- Very low power consumption
- Operating temperature range: -40 to +85°C

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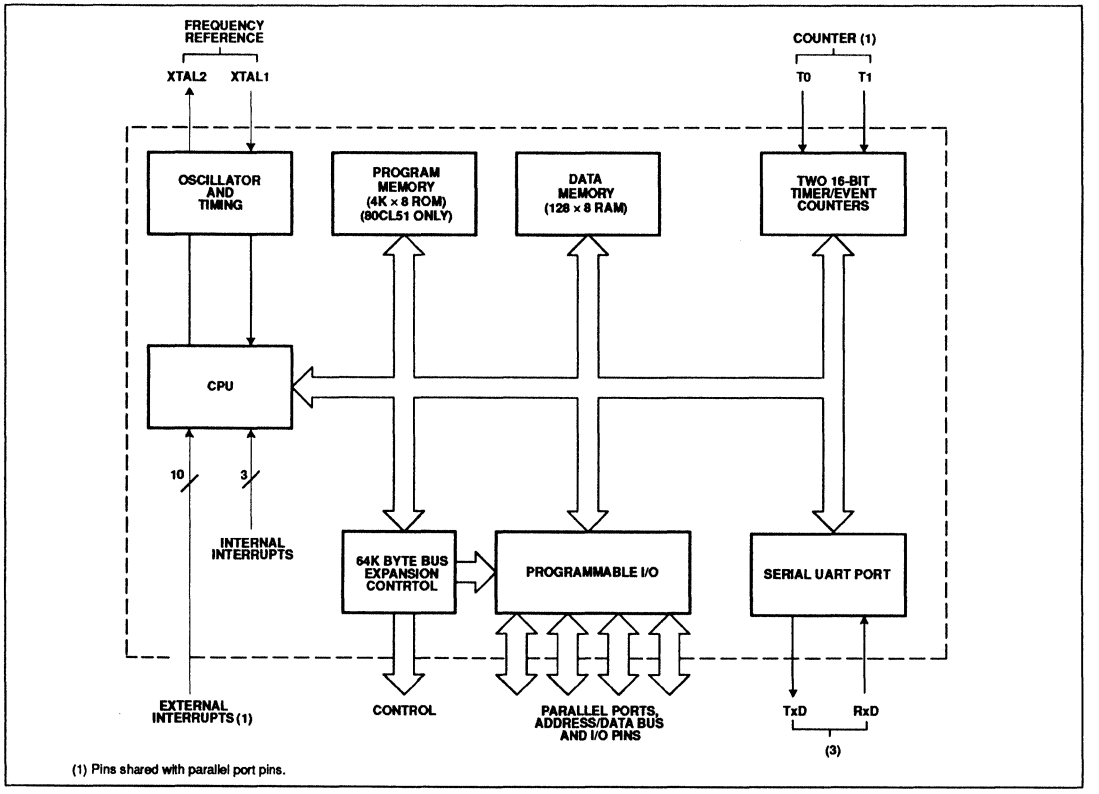


01-92/05277

Product Spotlights

87C51 – CMOS Single-Chip 8-Bit Microcontroller

DESCRIPTION

The Philips 87C51 is a high-performance microcontroller fabricated with Philips high-density CMOS technology. The CMOS 87C51 is functionally compatible with the NMOS 8031/8051 microcontrollers. The Philips CMOS technology combines the high speed and density characteristics of HMOS with the low power attributes of CMOS. Philips epitaxial substrate minimizes latch-up sensitivity.

The 87C51 contains a 4k x 8 EPROM, 32 I/O lines, two 16-bit counter/timers, a five-source, two-priority level nested interrupt structure, a serial I/O port for either multi-processor communications, I/O expansion or full duplex UART, and on-chip oscillator and clock circuits.

In addition, the device has two software selectable modes of power reduction — idle mode and power-down mode. The idle mode freezes the CPU while allowing the RAM, timers, serial port, and interrupt system to continue functioning. The power-down mode saves the RAM contents but freezes the oscillator, causing all other chip functions to be inoperative.

FEATURES

- 8031/8051 compatible
  - 4k x 8 EPROM (87C51)
  - Two 16-bit counter/timers
  - Full duplex serial channel
  - Boolean processor
- Power control modes:
  - Idle mode
  - Power-down mode
- CMOS and TTL compatible
- Four speed ranges at V_{CC} = 5V
  - 12MHz
  - 16MHz
  - 24MHz
  - 33MHz
- Five package styles
- Extended temperature ranges

01-93/08821

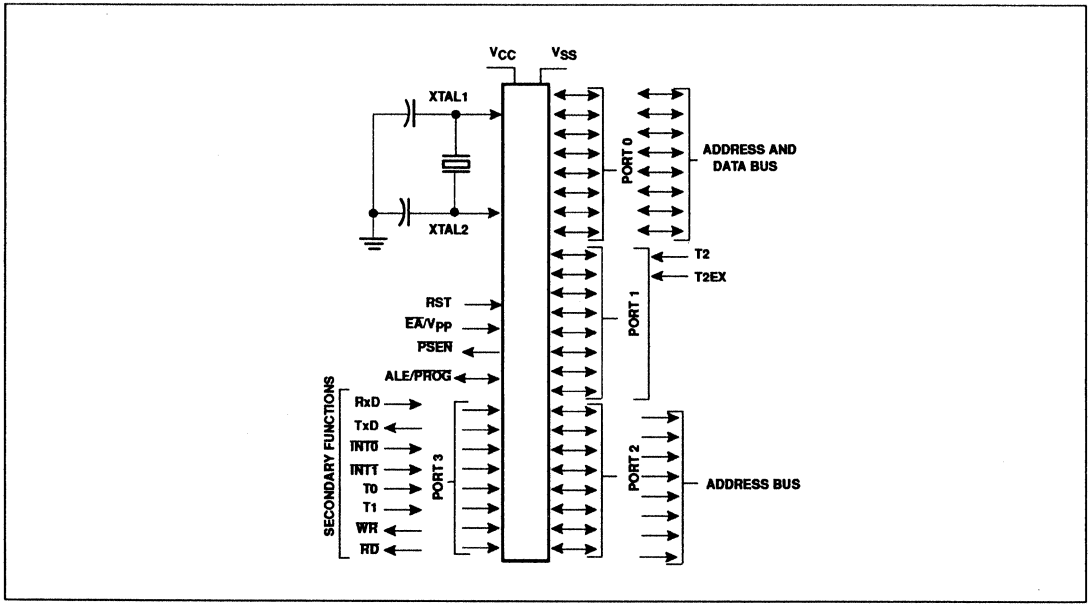
Product Spotlights

87C52 – 8-Bit Microcontroller, 8K OTP

FEATURES

- 80C51 based architecture
- 8032/8052 compatible
  - 8k × 8 ROM (80C52)
  - 8k × 8 EPROM (87C52)
  - ROMless (80C32)
  - 256 × 8 RAM
  - Three 16-bit counter/timers
  - Full duplex serial channel
  - Boolean processor
- Memory addressing capability
  - 64k ROM and 64k RAM
- Power control modes:
  - Idle mode
  - Power-down mode
- CMOS and TTL compatible
- Two speed ranges:
  - 3.5 to 16MHz
  - 3.5 to 24MHz
- Five package styles
- Extended temperature ranges
- OTP package available
- Military qualified

LOGIC SYMBOL



06-91/03087

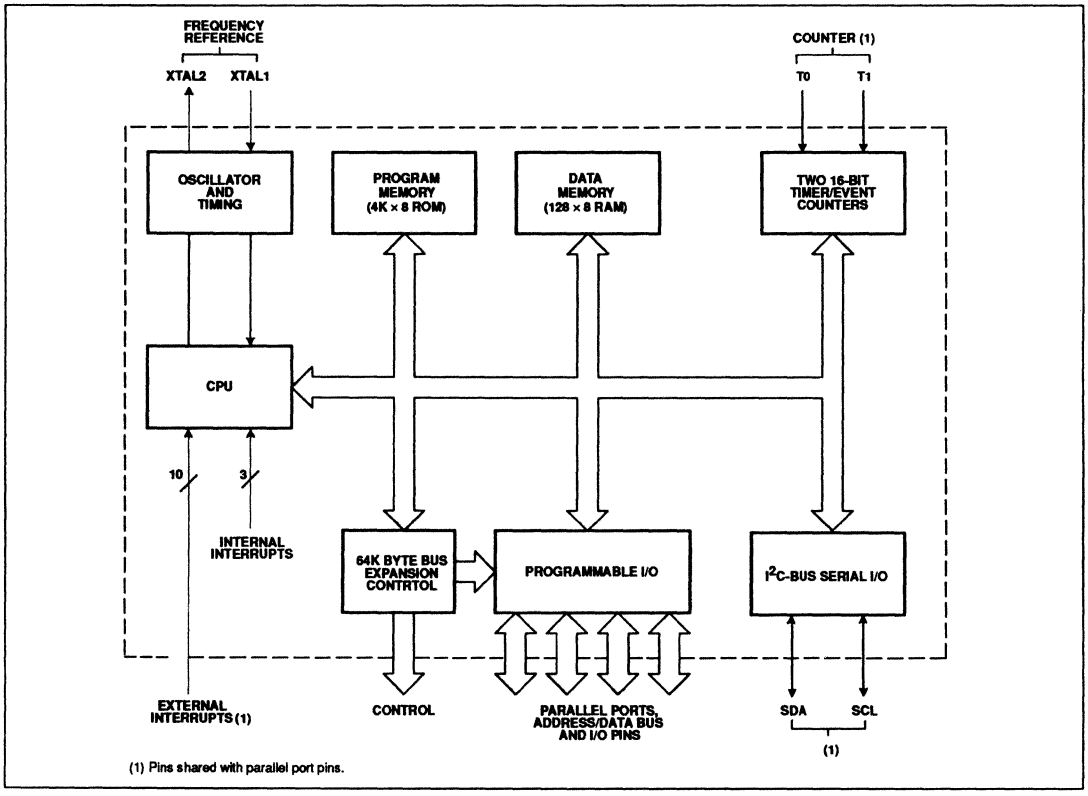
Product Spotlights

83CL410 – 8-Bit Microcontroller, 4K, I²C, 1.8V

FEATURES

- Supply voltage from 1.8 to 6.0V
- Operating frequency from 32kHz to 12MHz
- 80C51 based architecture
  - 4k x 8 ROM (64k external)
  - 128 x 8 RAM (64k external)
  - Four 8-bit I/O ports
  - Two 16-bit timer/counters
  - A thirteen-source, two-level, nested priority interrupt structure
  - 10 external interrupts
- Fully static 80C51 CPU
- I²C Serial Interface
- Two power control modes
  - Idle mode
  - Power-down mode – can be terminated by reset or external interrupt
- Wake-up via external interrupts at port 1
- On-chip oscillator (quartz crystal, ceramic resonator, RC, LC)
- Very low power consumption
- Operating temperature range: -40 to +85°C

BLOCK DIAGRAM



12-91/05002

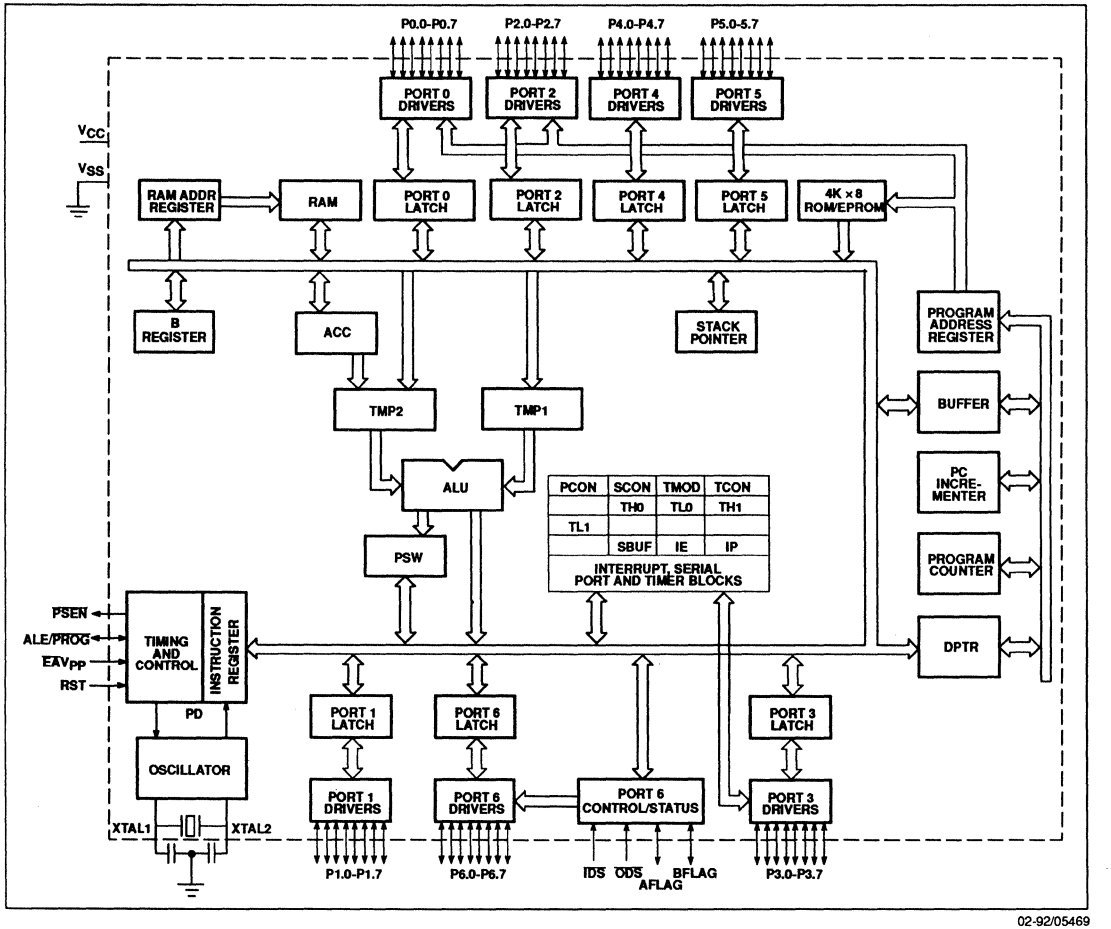
Product Spotlights

80/83/87C451 – CMOS Single-Chip, 8-Bit Microcontroller

FEATURES

- 80C51 based architecture
- 68-pin PLCC and 64-pin DIP packages:
  - Seven 8-bit I/O ports (PLCC version)
  - Six 8-bit ports and one 4-bit port (DIP version)
- Port 6 features:
  - 8 data pins
  - 4 control pins
  - Direct MPU bus interface
  - Parallel printer interface
- On the microcontroller:
  - 4K x 8 ROM (83C451)
    4K x 8 EPROM (87C451)
    ROMless version (80C451)
  - 128 x 8 RAM
  - Two 16-bit counter/timers
  - Two external interrupts
- External memory addressing capability
  - 64k ROM and 64k RAM
- Low power consumption:
  - Normal operation: less than 24mA at 5V, 12MHz
  - Idle mode
  - Power-down mode
- Military qualified

BLOCK DIAGRAM



02-92/05469

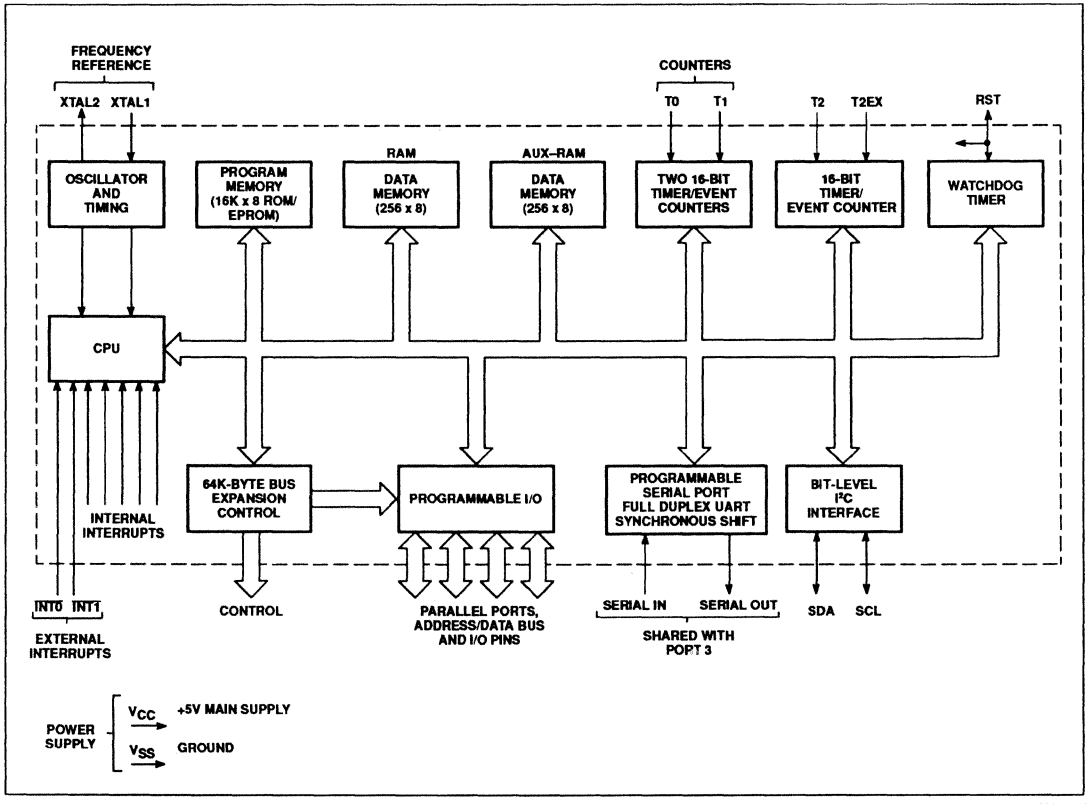
Product Spotlights

87C524 – 8-Bit Microcontroller, 16K

FEATURES

- 80C51 instruction set
  - 16k × 8 EPROM (87C524)
  - 512 × 8 RAM
  - Three 16-bit counter/timers
  - On-chip watchdog timer with oscillator
  - Full duplex UART
  - I^2C serial interface
- Power control modes:
  - Idle mode
  - Power-down mode
  - Warm start from power-down
- CMOS and TTL compatible
- Two speed ranges at V_{CC} = 5V ±10%
  - 3.5 to 16MHz
  - 3.5 to 20MHz
- Extended temperature ranges
- OTP package available
- ROM/EPROM code protection

BLOCK DIAGRAM



01-92/05202

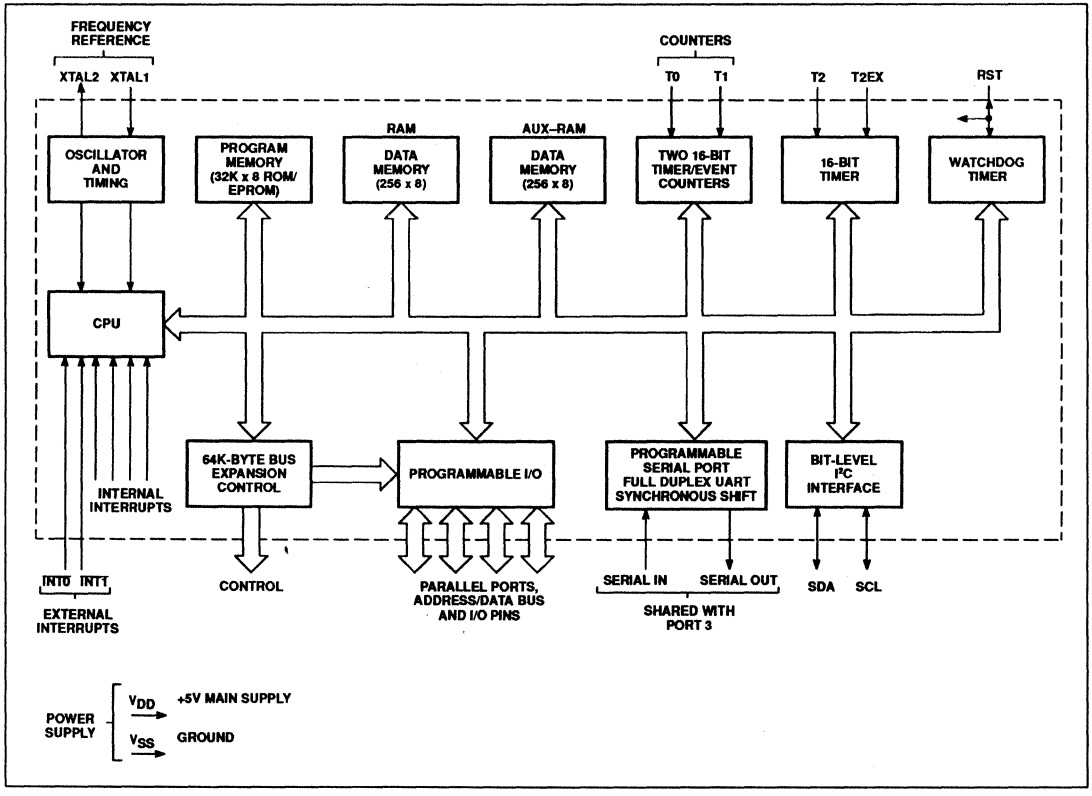
Product Spotlights

80/83/87C528 – CMOS Single-Chip 8-Bit Microcontroller

FEATURES

- 80C51 instruction set
  - 32K x 8 ROM (83C528)
  - 32K x 8 EPROM (87C528)
  - ROMless (80C528)
  - 512 x 8 RAM
  - Memory addressing capability
  - 64K ROM and 64K RAM
  - Three 16-bit counter/timers
  - On-chip watchdog timer
  - Full duplex UART
  - I^2C serial interface
- Power control modes:
  - Idle mode
  - Power-down mode
  - Warm start from power-down
- CMOS and TTL compatible
- Speed range at V_{DD} = 5V ±10%
  - 3.5 to 16MHz
- Extended temperature ranges
- OTP package available
- ROM/EPROM code protection
- Military qualified

BLOCK DIAGRAM



01-92/05201

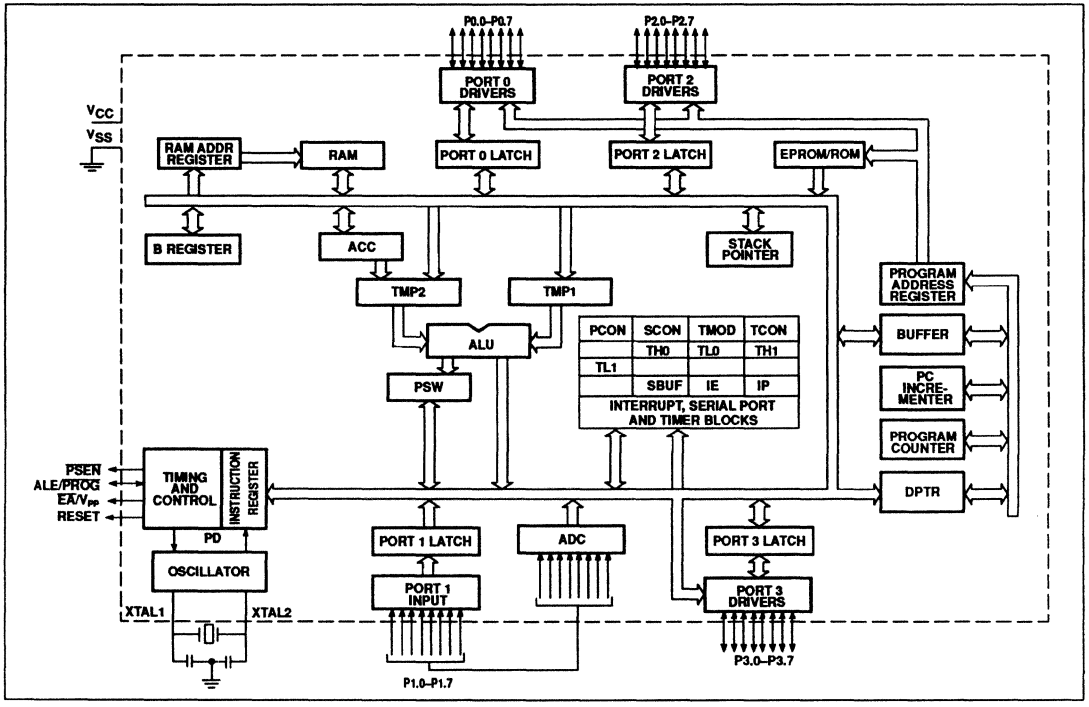
Product Spotlights

80/83/87C550 – CMOS Single-Chip 8-Bit Microcontroller with A/D and Watchdog Timer

FEATURES

- 80C51 based architecture
  - 4K × 8 EPROM (87C550)/ ROM (83C550)
  - 128 × 8 RAM
  - Eight channels of 8-bit A/D
  - Two 16-bit counter/timers
  - Watchdog timer
  - Full duplex serial channel
  - Boolean processor
- Memory addressing capability
  - 64K ROM and 64K RAM
- Power control modes:
  - Idle mode
  - Power-down mode
- CMOS and TTL compatible
- Speed range at V_{CC} = 5V ±10%
  - 3.5 to 16MHz
- Four package styles
- Extended temperature ranges
- OTP package available

BLOCK DIAGRAM



01-92/05427

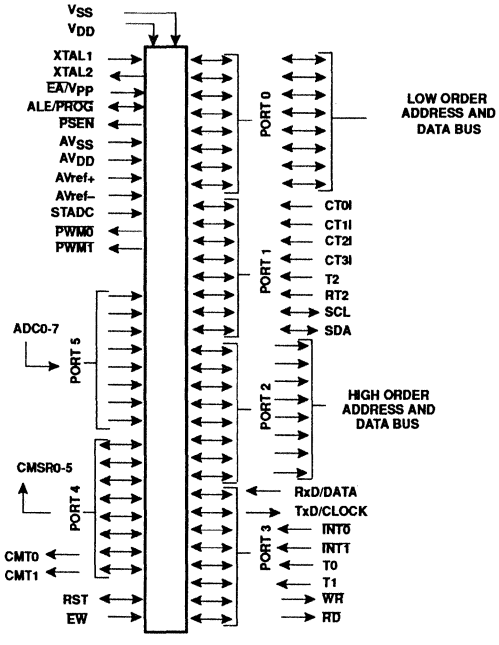
Product Spotlights

8XC552 – 8-Bit Microcontroller 8K ROM, A/D, I²C

FEATURES

- 80C51 central processing unit
- 8k × 8 ROM/EPROM expandable externally to 64k bytes
- An additional 16-bit timer/counter coupled to four capture registers and three compare registers
- Two standard 16-bit timer/counters
- 256 × 8 RAM, expandable externally to 64k bytes
- Capable of producing eight synchronized, timed outputs
- A 10-bit ADC with eight multiplexed analog inputs
- Two 8-bit resolution, pulse width modulation outputs
- Five 8-bit I/O ports plus one 8-bit input port shared with analog inputs
- I²C-bus serial I/O port with byte oriented master and slave functions
- Full-duplex UART compatible with the standard 80C51
- On-chip watchdog timer
- Three speed ranges:
  - 16MHz
  - 24MHz
  - 30MHz (in preparation)
- Extended temperature ranges
- OTP package available
- Military qualified

LOGIC SYMBOL



01-92/05126

Product Spotlights

80C575/83C575/87C575 – CMOS Single-Chip 8-Bit Microcontroller

DESCRIPTION

The Philips 80C575/83C575/87C575 is a high-performance microcontroller fabricated with Philips high-density CMOS technology. The Philips CMOS technology combines the high speed and density characteristics of HMOS with the low power attributes of CMOS. Philips epitaxial substrate minimizes latch-up sensitivity.

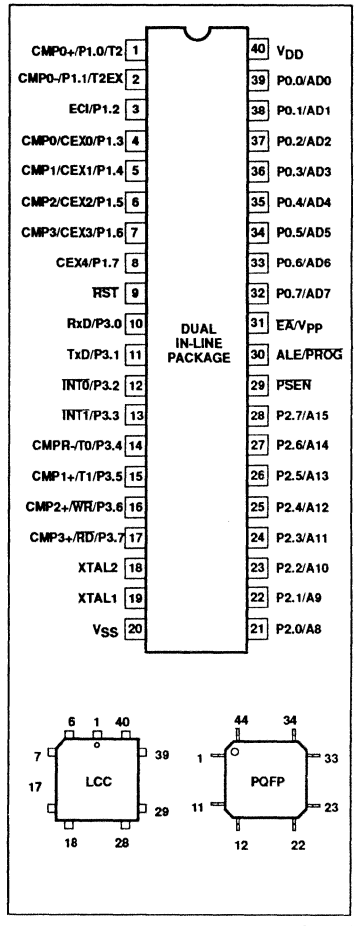
The 8XC575 contains an 8k × 8 ROM (83C575) EPROM (87C575), a 256 × 8 RAM, 32 I/O lines, three 16-bit counter/timers, a Programmable Counter Array (PCA), a seven-source, two-priority level nested interrupt structure, an enhanced UART, four analog comparators, power-fail detect and oscillator fail detect circuits, and on-chip oscillator and clock circuits.

In addition, the 8XC575 has a low active reset, and the port pins are reset to a low level. There is also a fully configurable watchdog timer, and internal power on clear circuit. The part includes idle mode and power-down mode states for reduced power consumption.

FEATURES

- 80C51 based architecture
  - 8k × 8 ROM (83C575)
  - 8k × 8 EPROM (87C575)
  - ROMless (80C575)
  - 256 × 8 RAM
  - Three 16-bit counter/timers
  - Programmable Counter Array
  - Enhanced UART
  - Boolean processor
  - Oscillator fail detect
  - Low active reset
  - Asynchronous low port reset
  - Schmitt trigger inputs
  - 4 analog comparators
  - Watchdog timer
  - Low V_{CC} detect
- Memory addressing capability
  - 64k ROM and 64k RAM
- Power control modes:
  - Idle mode
  - Power-down mode
- CMOS and TTL compatible
- 4.0 to 16MHz
- Extended temperature ranges
- OTP package available

PIN CONFIGURATIONS



12-92/08604

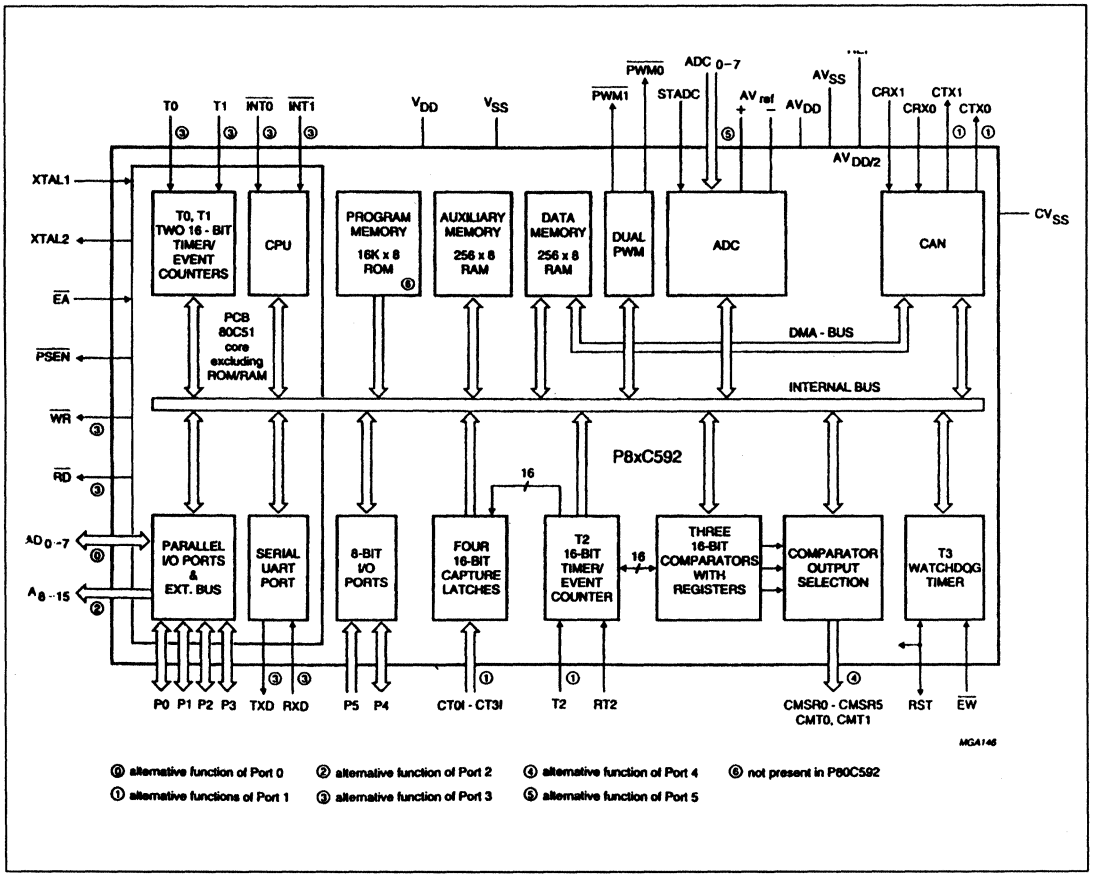
Product Spotlights

80C592/83C592/87C592 – Single-Chip 8-Bit Microcontoller with CAN Controller

FEATURES

- 80C51 core architecture
- 16k x 8 EPROM (87C592)
- 16k x 8 ROM (83C592)
- ROMless (80C592)
- 512 x 8 RAM expandable externally to 64k bytes
- Two standard 16-bit timer/counters
- An additional 16-bit timer/counter coupled to four capture registers and three compare registers
- A 10-bit ADC with eight multiplexed analog inputs
- Two 8-bit resolution pulse width modulation outputs
- 15 interrupt sources with 2 priority levels
- Five 8-bit I/O ports plus one 8-bit input port shared with analog inputs
- CAN controller with DMA transfer between internal data RAM and CAN registers
- 1 Mbit's CAN-controller with bus failure management facility
- $V_{DD}/2$ reference voltage
- Full-duplex UART compatible with the standard 80C51
- On-chip watchdog timer
- Extended temperature ranges (-40 to +125°C)
- OTP package available

BLOCK DIAGRAM



PRELIM/0892

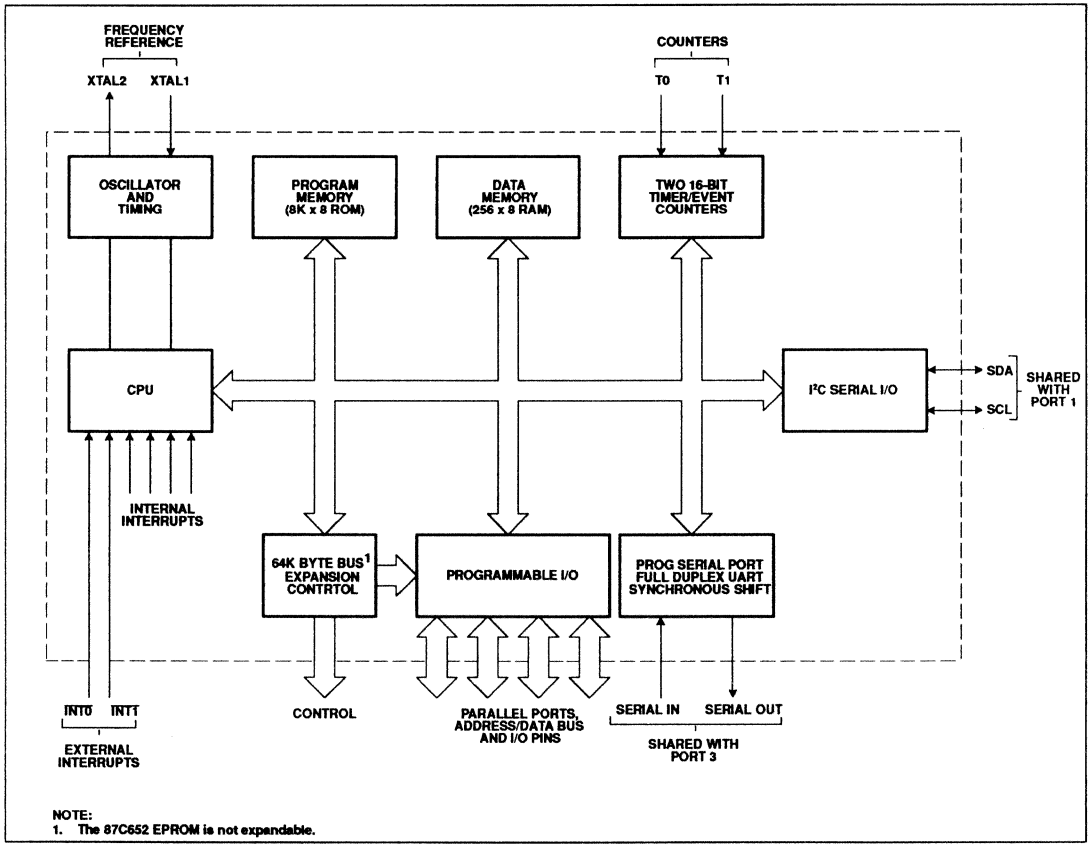
Product Spotlights

80/83/87C652 – CMOS Single-Chip, 8-Bit Microcontroller

FEATURES

- 80C51 central processing unit
- 8K x 8 ROM expandable externally to 64K bytes (87C652 EPROM is not expandable)
- 256 x 8 RAM, expandable externally to 64K bytes
- Two standard 16-bit timer/counters
- Four 8-bit I/O ports
- I²C-bus serial I/O port with byte oriented master and slave functions
- Full-duplex UART facilities
- Power control modes
  - Idle mode
  - Power-down mode
- Five package styles
- Extended temperature ranges
- OTP package available

BLOCK DIAGRAM



NOTE:
1. The 87C652 EPROM is not expandable.

02-92/05472

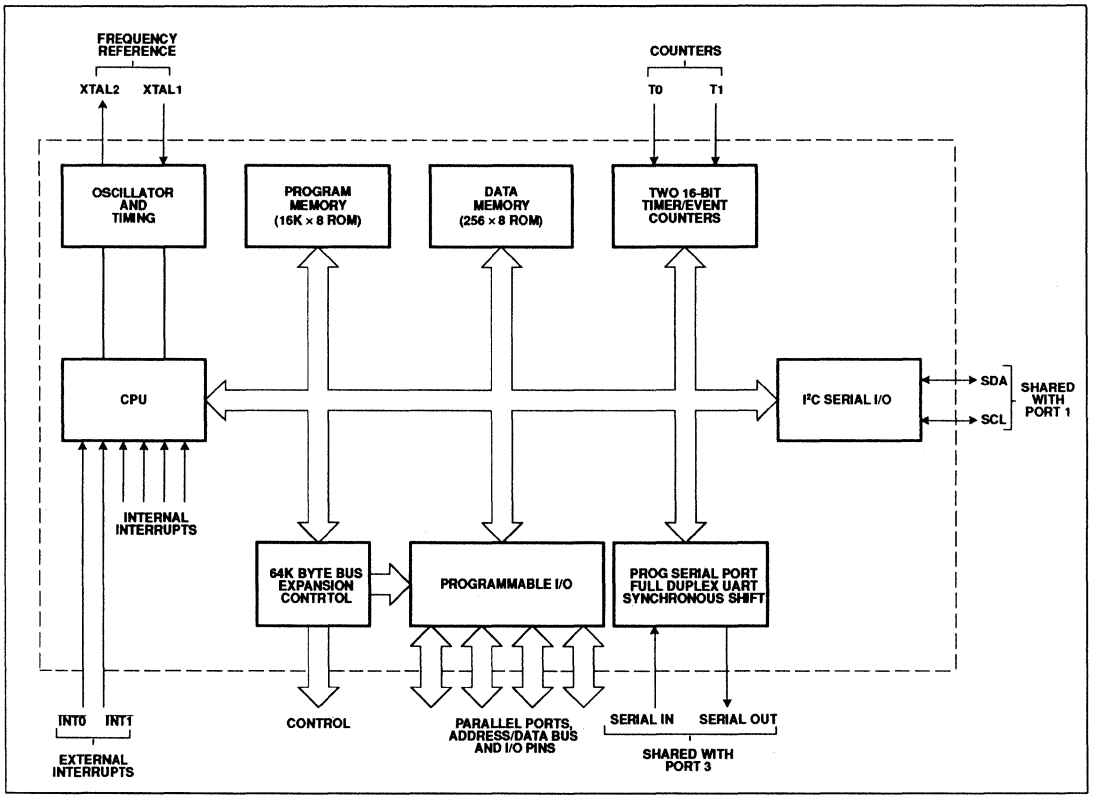
Product Spotlights

83C654/87C654 – CMOS Single-Chip, 8-Bit Microcontroller

FEATURES

- 80C51 central processing unit
- 16K x 8 ROM expandable externally to 64K bytes
- 256 x 8 RAM, expandable externally to 64K bytes
- Two standard 16-bit timer/counters
- Four 8-bit I/O ports
- I²C-bus serial I/O port with byte oriented master and slave functions
- Full-duplex UART facilities
- Power control modes
  - Idle mode
  - Power-down mode
- Five package styles
- Extended temperature ranges
- OTP package available
- Military qualified

BLOCK DIAGRAM



02-92/01465

Manufacturers Protect Revenues. Microcontroller Provides Configuration Control

... this unique combination of security, small size and economy - all coexisting on the same device - sets the 87C751 apart from the competition.

Use of the Philips Semiconductors' 87C751 one-time-programmable (OTP) microcontroller overcomes a typical design limitation and can significantly increase revenue dollars for equipment manufacturers.

Many manufacturers of printers, fax machines, copiers, test equipment and medical instrumentation use a base design to simplify manufacturing and inventory control. All possible feature options are programmed onto a single board design, which may be used for a variety of models within a specific product family. The specific features which differentiate one model from anther are then invoked through the use of jumpers or DIP switches.

The drawback to this base-design approach is that it provides little protection for the manufacturer. Technically sophisticated end-users can buy the most economical low-end model, then manipulate the board to enable the full range of feature options - including those they have not purchased.

By incorporating the 87C751 microcontroller into their equipment in a function such as a push-button, LCD display front panel, manufacturers can electronically control all the feature switches. They regain their ability to control and sell all the options on their equipment. And they still retain all the benefits of a common assembly for ease of manufacturing and inventory control.

Even if end-users buy one fully optioned machine and try to clone it, they will be unable to do so. The secure EPROM programmability of the 87C751 OTP microcontroller prevents anyone from copying the device to clone its option content.

Enhanced security is but one benefit of the 87C751. Relative to the competition, this handy device is also much smaller (24 pins versus 40 pins) and lower in cost. Many other OTP devices are larger in size, and many low-cost parts lack the necessary security. It is this unique

combination of security, small size and economy - all coexisting on the same device - that sets the 87C751 apart from the competition.

Also of benefit are the control and I/O capabilities of the part, which allow it to handle the front panel display functions.

Any end-use piece of equipment with numerous options which can all be implemented on a standard design can benefit greatly from use of the 87C751 OTP microcontroller from Philips Semiconductors. By incorporating the microcontroller into their designs, manufacturers can obtain configuration control at a negligible cost.

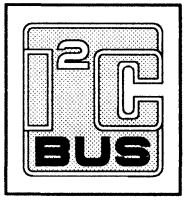
Product Spotlights

8XC751/752 – CMOS Single-Chip 8-Bit Microcontrollers

DESCRIPTION

These Philips microcontrollers offer many of the advantages of the 80C51 architecture in a small package and at low cost.

The microcontrollers contain a 2k x 8 ROM, EPROM, a 64 x 8 RAM, a 16-bit auto-reload counter/timer, a fixed-priority level interrupt structure, a bidirectional inter-integrated circuit (I^2C) serial bus interface, an on-chip oscillator. The 8XC752 also has a five channel multiplexed 8-bit A/D converter and an 8-bit PWM output.



The onboard inter-integrated circuit (I^2C) bus interface allows the microcontroller to operate as a master or slave device on the I^2C small area network. This capability facilitates I/O and RAM expansion, access to EEPROM, processor-to-processor communication, and efficient interface to a wide variety of dedicated I^2C peripherals.

FEATURES

- Available in erasable quartz lid or One-Time Programmable plastic packages
- 80C51 based architecture
- Inter-integrated Circuit (I^2C) serial bus interface
- Small package sizes
- Wide oscillator frequency range
- Low power consumption:
  - Normal operation: less than 11mA @ 5V, 12MHz
  - Idle mode
  - Power-down mode
- 2k x 8 ROM (83C75X) EPROM (87C75X)
- 64 x 8 RAM
- 16-bit auto reloadable counter/timer
- Fixed-rate timer
- Boolean processor
- CMOS and TTL compatible
- Well suited for logic replacement, consumer and industrial applications

12-92/08601

Microcontroller Arrests Fraudulent Gambling

The 83C751 microcontroller actually monitors the direction of travel as the final step prior accepting a token as valid.

The 83C751 microcontroller from Philips Semiconductors has become a lucky chip for the gambling industry. Casino owners must continuously find new ways of protecting their interests from habitual gamblers whose luck and money may run out before their inventiveness does.

It is not uncommon for people to attach strings to gambling tokens in order to manipulate those tokens inside the slot machines. With a little patience, they can become quite adept at bouncing and pulling the tokens backwards in order to trigger false credits inside the machines.

To prevent this form of cheating, slot machines can be equipped with infrared sensors and receivers to detect the direction of travel of the token. The Philips Semiconductors' 83C751 microcontroller is the key device which actually monitors the direction of travel as the final step prior to accepting a token as valid.

The 83C751 microcontroller monitors the status of the infrared LEDs to determine the direction of the token's travel. The token must continue to travel forward and must pass the infrared window within a short, specified period of time. If the token stops or moves backwards, the microcontroller triggers a tilt indication to notify casino management of illegal activity.

One reason the Philips Semiconductors' 83C751 was selected for this application is its small size. The microcontroller comes in a 24-pin skinny DIP package and is also available in a 28-pin PLCC package for customers desiring surface mount.

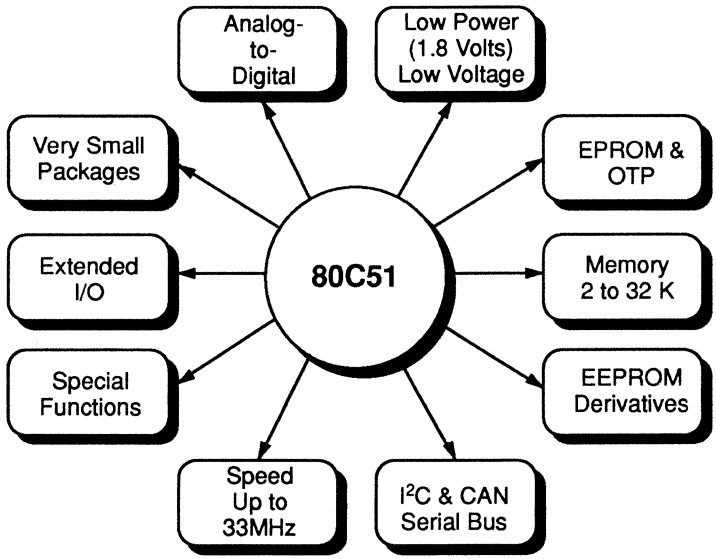
Economy was another important consideration. Not a lot of I/O is required in this application, so the low priced 83C751 is ideal. This ROM-coded device is less expensive than a customized part and the lead-time is much shorter. Plus, the 83C751 microcontroller is compatible with a ceramic resonator, which is half the price of a crystal.

Being an 80C51 derivative, the 83C751 can easily be upgraded, if customers want to take advantage of the expanded features available on other members of the 80C51 family. With 22 devices, Philips Semiconductors offers the most extensive line of 80C51 derivatives of any supplier in the world.

The 80C51 product family utilizes inherently low-power CMOS technology. Philips Semiconductors' leadership position in CMOS technology gives these products lower current consumption than similar Intel devices.

Through the use of advanced 80C51 parts, more of the token acceptance capabilities of the system will continue to be integrated into the microcontroller. This will further reduce manufacturing costs and enhance reliability and manufacturability. Of course, development is always easy with the 80C51 family, due to the abundance of third-part software and development support tools available in the industry.

Spin the Big Philips Wheel to Obtain the most 80C51 Derivatives in the WORLD.



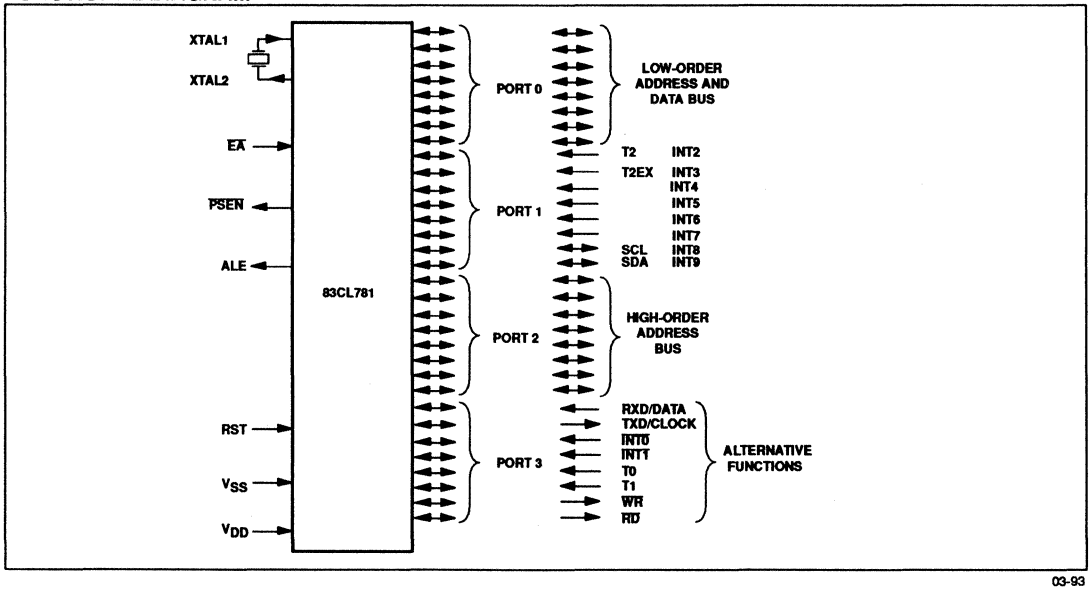
Product Spotlights

8XCL781 – 8-Bit Microcontroller, 16K, I²C, UART

FEATURES

- Full static 80C51 CPU
- 8-bit CPU, ROM, RAM, I/O in a single package
- 16K x 8 ROM, expandable externally to 64K bytes
- 256 bytes RAM, expandable externally to 64K bytes
- Four 8-bit ports, 32 I/O lines
- Three 16-bit timer/event counters
- External memory expandable up to 128K, external ROM up to 64K and/or RAM up to 64K
- On-chip oscillator suitable for RC, LC, quartz crystal or ceramic resonator
- Fifteen source, fifteen vector interrupt structure with two priority levels
- Full duplex serial UART
- I²C bus interface for serial transfer on two lines.
- Enhanced architecture with:
  - Non-page oriented instructions
  - Direct addressing
  - Four eight-byte RAM register banks
  - Stack depth limited only by available internal RAM (max. 256 bytes)
  - Multiply, divide, subtract and compare instructions
- STOP and IDLE instructions
- Wake-up via external interrupts at Port 1
- Single supply voltage of 1.8V to 6.0V
- Frequency range of 32kHz to 12MHz
- Very low current consumption
- Operating temperature range: –40 to +85°C

FUNCTIONAL DIAGRAM



03-93

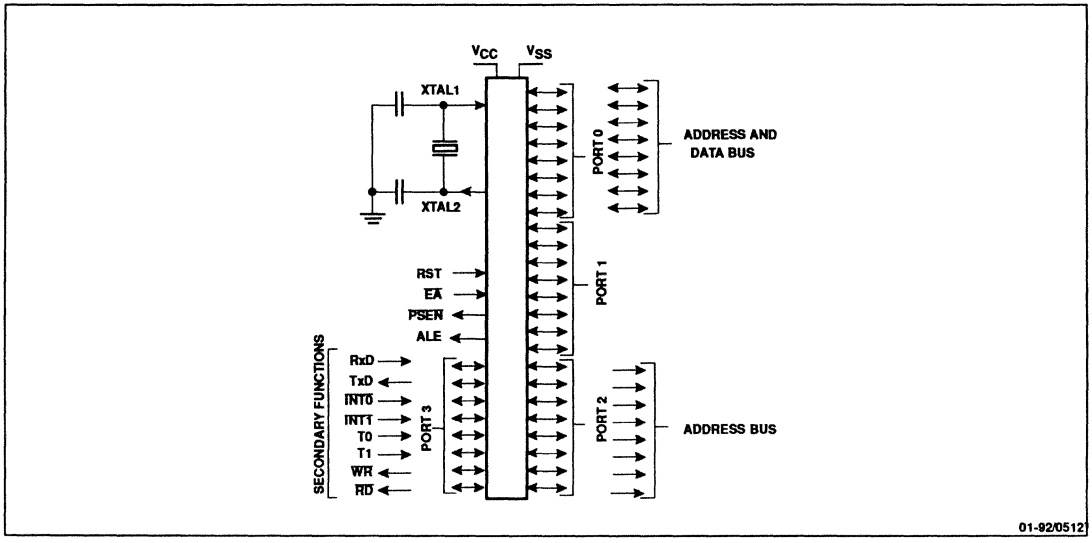
Product Spotlights

83C851 – 8-Bit Microcontroller, EEPROM

FEATURES

- 80C51 based architecture
  - 4k x 8 ROM
  - 128 x 8 RAM
  - Two 16-bit counter/timers
  - Full duplex serial channel
  - Boolean processor
- Non-volatile 256 x 8-bit EEPROM (electrically erasable programmable read only memory)
  - On-chip voltage multiplier for erase/write
  - 50,000 erase/write cycles per byte
  - 10 years non-volatile data retention
  - Infinite number of read cycles
  - User selectable security mode
  - Block erase capability
- Mask-programmable ROM code protection
- Memory addressing capability
  - 64k ROM and 64k RAM
- Power control modes:
  - Idle mode
  - Power-down mode
- CMOS and TTL compatible
- 1.2 to 16MHz
- Three package styles
- Three temperature ranges

LOGIC SYMBOL



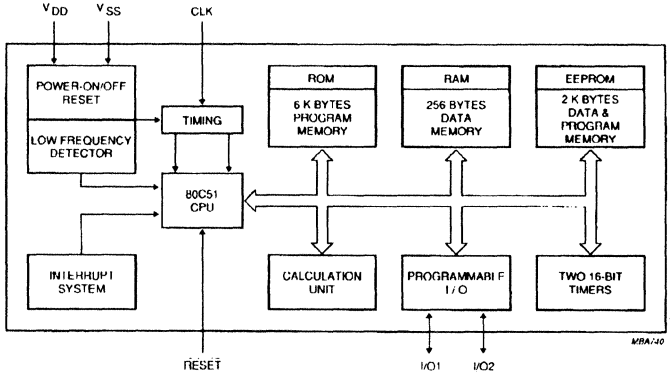
Product Spotlights

83C852 – Secured 8-Bit Microcontroller with Cryptographic Calculation Unit

FEATURES

- 8-bit CPU
- 6K bytes of user program memory (ROM), no external extension
- 256 bytes of RAM data memory (RAM), no external extension.
- 2K bytes EEPROM
  - EEPROM stores data or program
  - on-chip voltage multiplier for EEPROM ERASE/WRITE
  - ERASE/WRITE cycle time independent of the clock frequency
  - 10000 ERASE/WRITE cycles per bytes
  - 10 years non-volatile data retention
  - infinite number of READ cycles
  - error code correction
- Calculation unit for cryptographic calculations
- Security features
- Power-ON/OFF reset circuit
- Low frequency detector
- Two 16-bit timers
- Clock frequency range 1 MHz to 6 MHz; 1µs cycle time with 6 MHz clock frequency
- Two I/O lines; only one I/O line is used in half-duplex, according to the ISO standards for the Smart Card applications; full-duplex communication can be performed with both I/O lines.
- 5 interrupt sources from: I/O lines; Timer 0; Timer 1; EEPROM; Calculation unit
- Power-down and idle mode
- Two operating modes; test mode and user mode
- Single 5 volts power supply
- 6 pins: V_{DD}, V_{SS}, I/01, I/02, $\overline{RESET}$, CLK

BLOCK DIAGRAM



PRELIM/11-91

Product Spotlights

PCA84C422/822 – Remote Controller

GENERAL DESCRIPTION

The PCA84C422 is a member of the PCA84Cxxx CMOS microcontroller family used in standard infrared remote control commander applications. It includes a PCF84C processor core, 4K bytes of ROM, 32 bytes of RAM and a derivative functional part that consists of a simple "Hardware Modulator" for pulse generation and a modified interrupt architecture.

FEATURES

- 8-bit CPU
- 4K bytes of ROM
- 32 bytes of RAM
- 12 (PCA84C422B) or 16 (PCA84C422A) quasi-bidirectional I/O lines (standard port option)
- Two test inputs, T0 and T1
- Three single level vectored interrupt sources: external (T0/INTN and Port 1, for keypad press wake-up function), timer/counter (T1) and hardware modulator interrupt
- 8-bit programmable timer with 5-bit prescaler
- On-board oscillator 1MHz to 6MHz
- Single supply voltage from 2V to 5.5V
- Operating temperature range: –20°C to 70°C
- "Hardware Modulator" that provides pulse bursts of which the 'on' time and 'off' time of each pulse (i.e., duty cycle) and the number of pulses are programmable
- One output line from the "Hardware Modulator" to control the driver transistor for IR-LED. Capable of sink 30mA at V_{DD} = 2.0V, V_{Lout} = 1.0V (i.e., V_{DD} = 1.0V)
- Watchdog timer to keep the transmitter away from being locked or malfunctioning
- Package: SO-24 or SDIL-24 (PCA84C422A); SO-20 or DIL-20 (PCA84C422B)

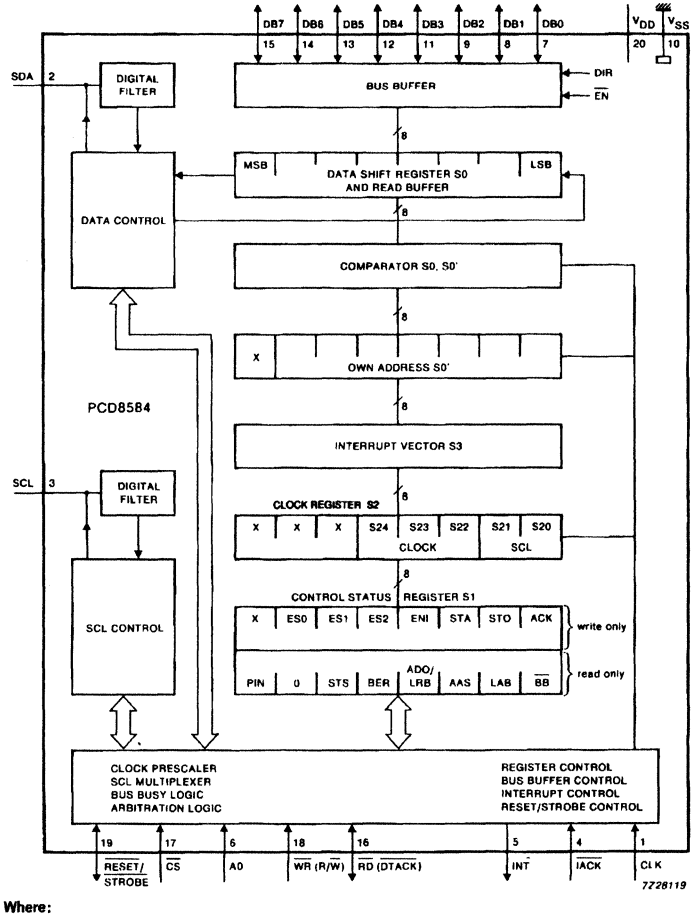
Product Spotlights

PCD8584 – I²C-Bus Controller

FEATURES

- Parallel-bus/I²C-bus protocol converter
- Compatible with most parallel-bus processors including MAB8049, MAB8051, SCN68000 and Z80
- Automatic selection of bus interface
- Programmable interrupt vector
- Multi-master capability
- I²C-bus monitor mode
- Long-distance mode
- Operating supply voltage 4.5 to 5.5V
- Operating temperature range -20 to 70°C

BLOCK DIAGRAM



Where:

( ) indicate the SCN68000 pin name designations.
X = don't care.

03-92/PRELIM

Product Spotlights

PCF84C430 – CMOS 8-Bit Microcontroller with On-Chip LCD Driver

DESCRIPTION

The PCF84C430 is a derivative of the PCF84CXX family of microcontrollers and is manufactured using CMOS technology. On-chip it includes and LCD driver supporting most Liquid Crystal Displays with up to 95 segments. The display driver can handle up to 12 numeric characters, or 6 alphanumeric characters. The supply voltage ranges from 2.5 to 5.5 volts and is designed for battery-powered applications.

The PCF84C430 provides hand-held battery-powered products with an LCD display.

FEATURES

- On-chip LCD driver with 24 outputs
- 4K ROM bytes/128 RAM bytes
- I^2C-bus hardware interface for serial data transfer on two separate lines
- 8-bit programmable timer/event counter
- Clock frequency 100kHz to 10MHz
- Single supply voltage from 2.5V to 5.5V

Product Spotlights

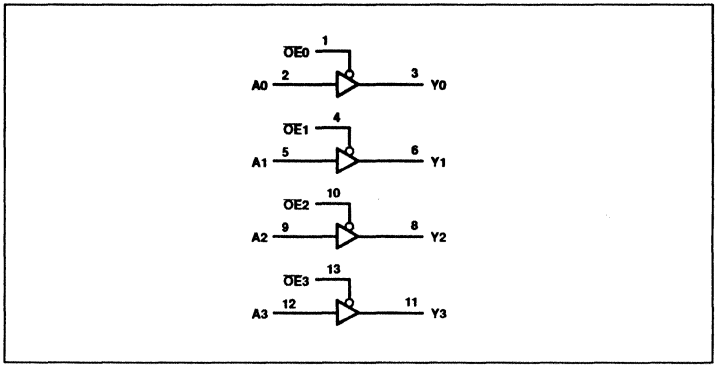
FIXED FUNCTION LOGIC

54/74ABT125 – Quad Buffer (3-State)

FEATURES

- Quad bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



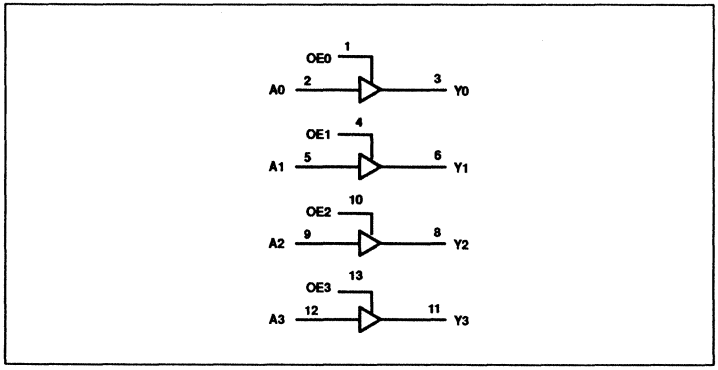
03-92/06267

54/74ABT126 – Quad Buffer (3-State)

FEATURES

- Quad bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



03-92/06267

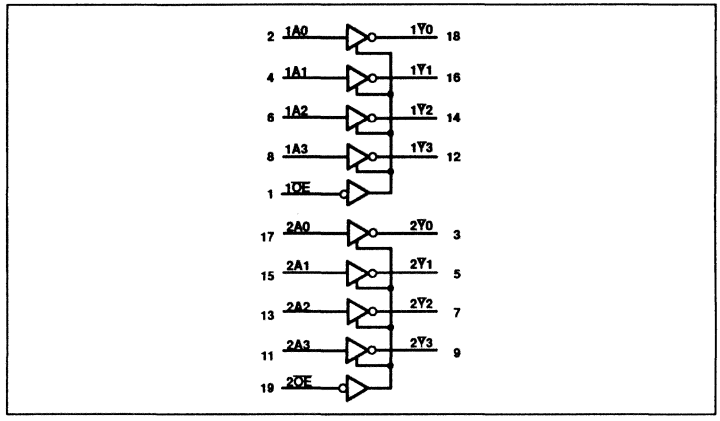
Product Spotlights

54/74ABT240 – Octal Inverting Buffer (3-State)

FEATURES

- Octal bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



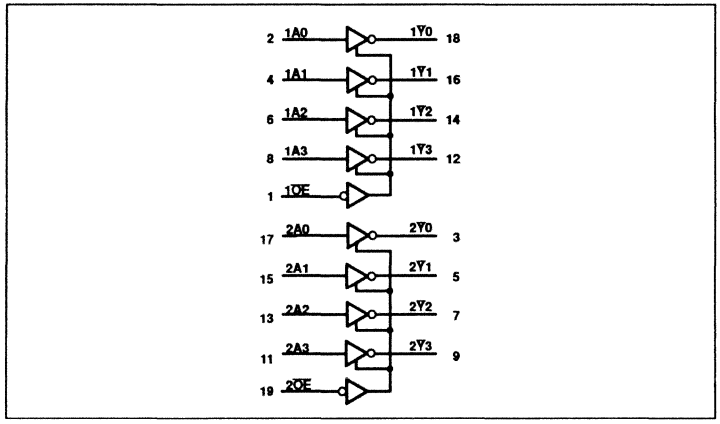
03-92/06267

74ABT240-1 – Octal Inverting Buffer with 30Ω Series Termination Resistors (3-State)

FEATURES

- Octal bus interface
- 3-State buffers
- Outputs include series resistance of 30Ω, making external termination resistors unnecessary
- Output capability: +5mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



04-92/06297

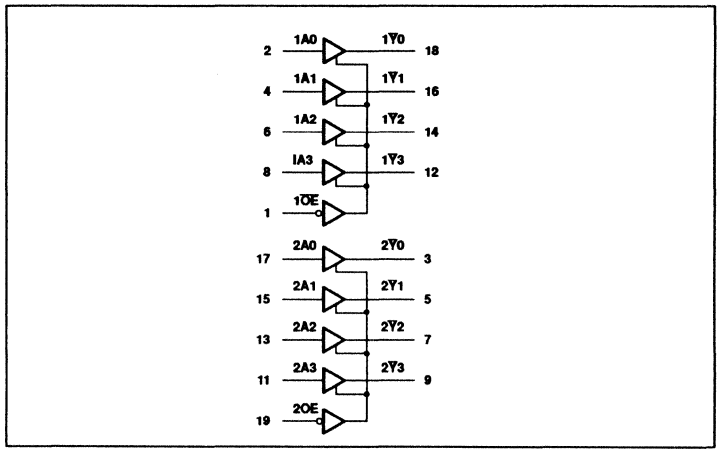
Product Spotlights

54/54ABT241 – Octal Buffer/Line Driver (3-State)

FEATURES

- Octal bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 4.6ns worst case propagation delay
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



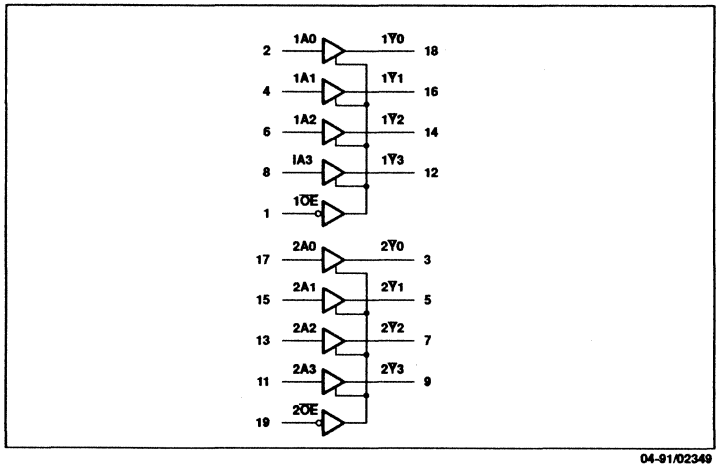
04-91/02349

74/54ABT244 – Octal Buffer/Line Driver (3-State)

FEATURES

- Octal bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 4.6ns worst case propagation delay
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

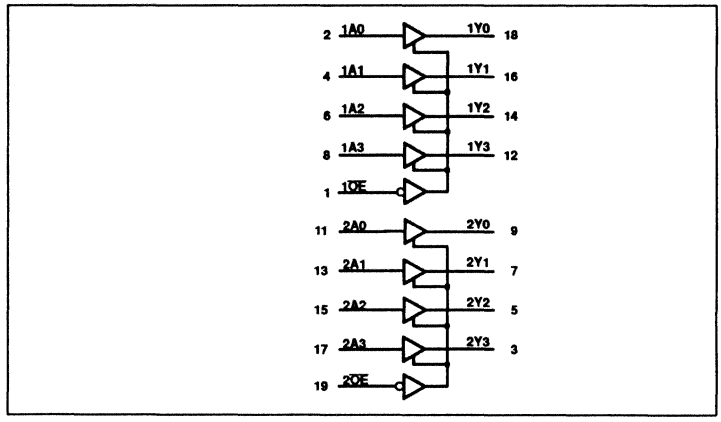
Product Spotlights

74ABT244-1 – Octal Buffer/Line Driver with 30Ω Series Termination Resistors (3-State)

FEATURES

- Octal bus interface
- 3-State buffers
- Outputs include series resistance of 30Ω, making external termination resistors unnecessary
- Output capability: +5mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



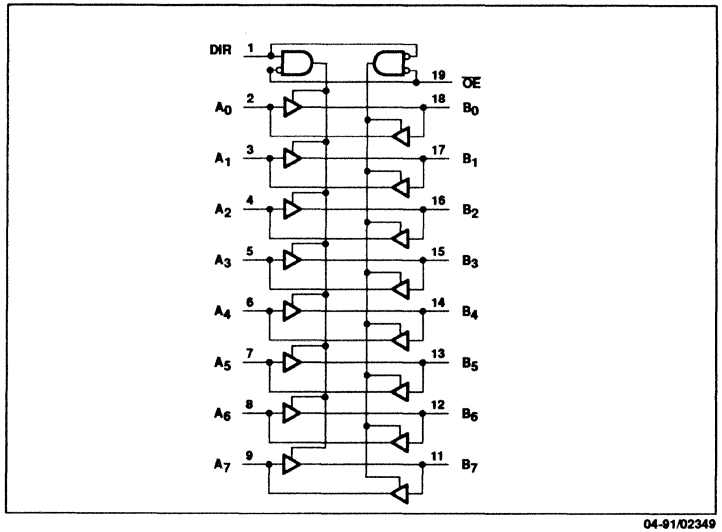
04-92/06297

54/74ABT245 – Octal Transceiver with Directional Pin (3-State)

FEATURES

- Octal bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 4.6ns worst case propagation delay
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

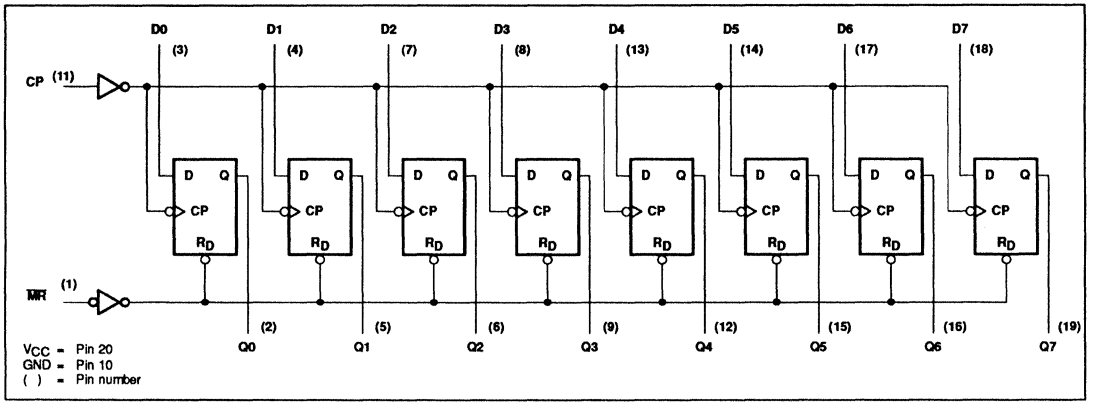
Product Spotlights

74ABT273 – Octal Transceiver with Directional Pin (3-State)

FEATURES

- Eight edge-triggered D-type flip-flops
- Buffered common clock
- Buffered asynchronous Master Reset
- See 74ABT377 for clock enable version
- See 74ABT373 for transparent latch version
- See 74ABT374 for 3-State version
- 150MHz worst case f_{MAX}
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



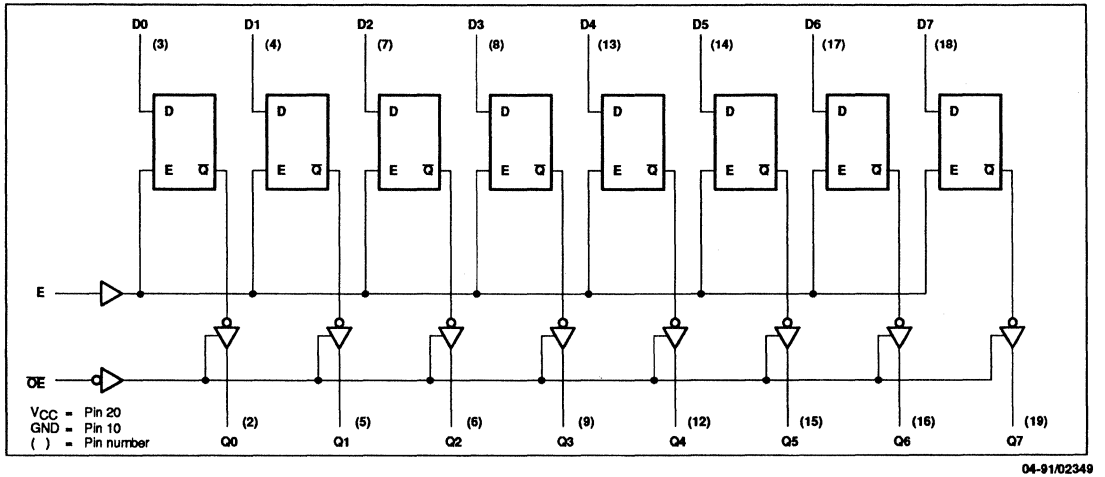
04-91/02349

54/74ABT373 – Octal D-Type Transparent Latch (3-State)

FEATURES

- 8-bit transparent latch
- 3-State output buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 6.2ns worst case propagation delay
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

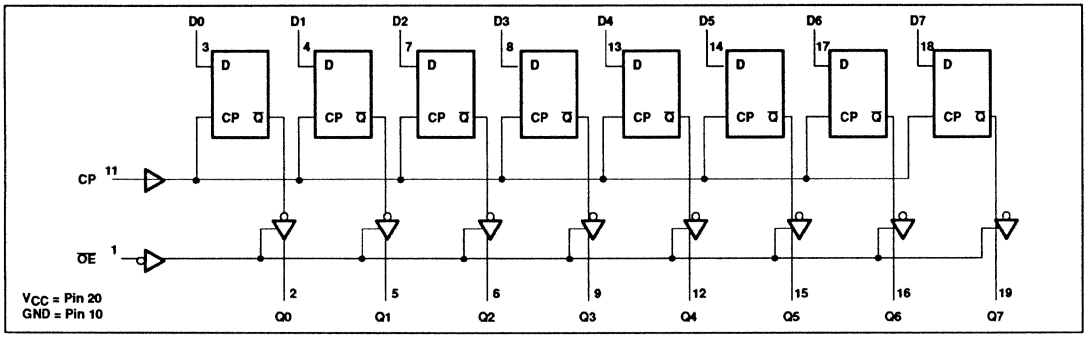
Product Spotlights

54/74ABT374 – Octal D-Type Flip-Flop; Positive-Edge Trigger (3-State)

FEATURES

- 8-bit positive edge triggered register
- 3-State output buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 150MHz worst case f_{MAX}
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



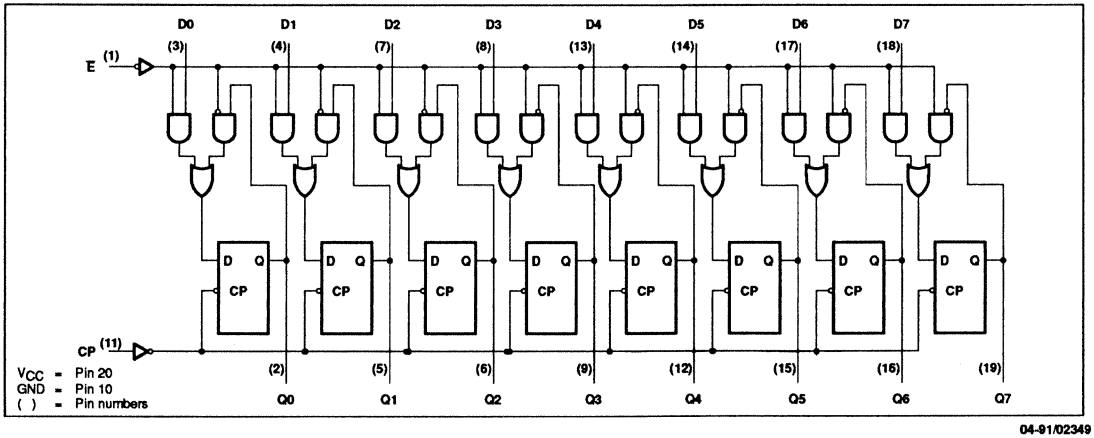
04-91/02349

54/74ABT377 – Octal D-Type Flip-Flop with Enable

FEATURES

- Ideal for addressable register applications
- 8-bit positive edge triggered register
- Enable for address and data synchronization applications
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 150MHz worst case f_{MAX}
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

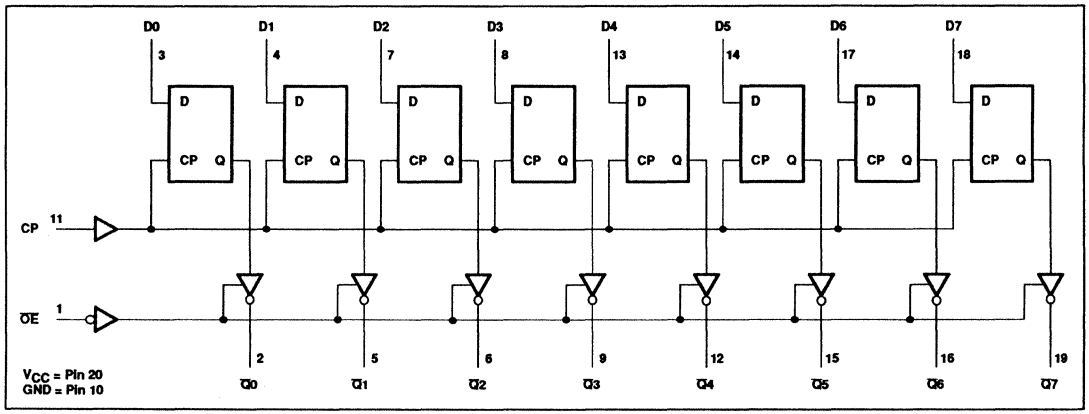
Product Spotlights

54/74ABT534 – Octal D-Type Flip-Flop, Inverting (3-State)

FEATURES

- 8-bit positive edge triggered register
- 3-State output buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 125MHz worst case f_{MAX}
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

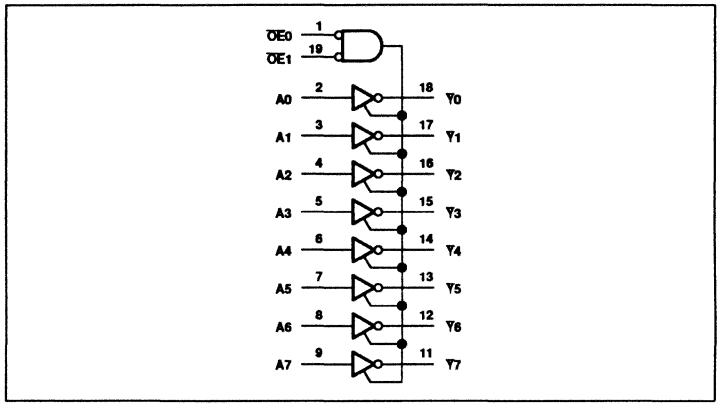
Product Spotlights

74ABT540 – Octal Buffer, Inverting (3-State)

FEATURES

- Octal bus interface
- 3-State buffers
- Efficient pinout to facilitate PC board layout
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



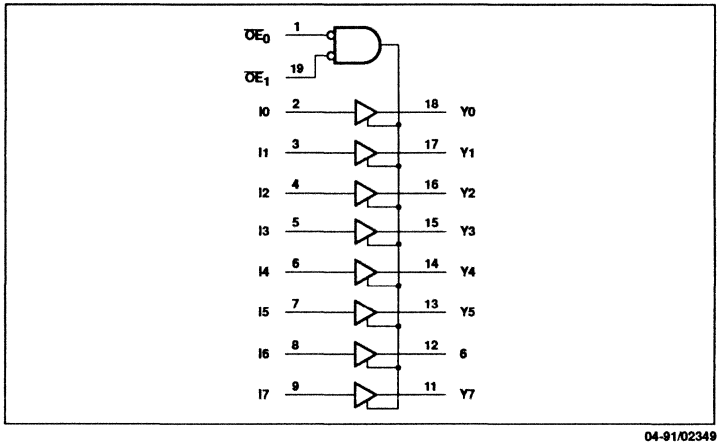
03-92/06267

74ABT541 – Octal Buffer/Line Driver (3-State)

FEATURES

- Octal bus interface
- Functions similar to the 74ABT241
- Provides ideal interface and increases fan-out of MOS Microprocessors
- Efficient pinout to facilitate PC board layout
- 3-State buffer outputs sink 64mA and source 32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 125MHz worst case f_{MAX}
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

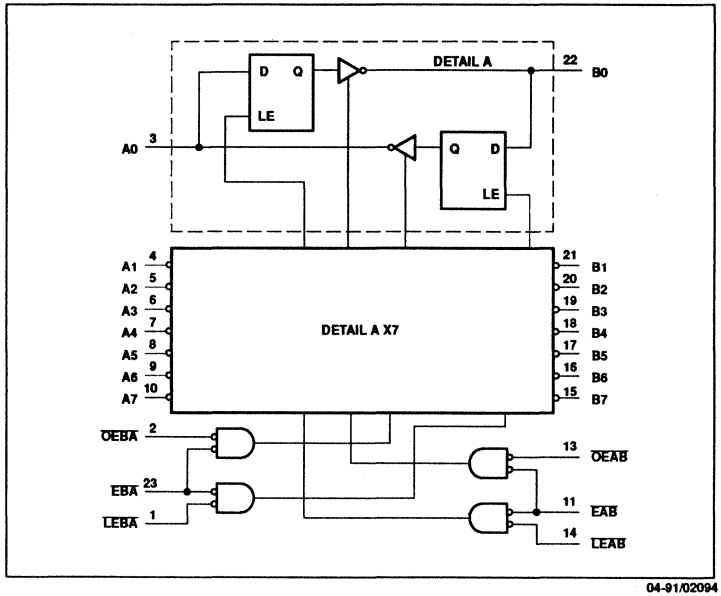
Product Spotlights

54/74ABT543 – Octal Buffer/Line Driver (3-State)

FEATURES

- Combines 74ABT245 and 74ABT373 type functions in one device
- Octal transceiver with D-type latch
- Back-to-back registers for storage
- Separate controls for data flow in each direction
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- Worst case propagation delay is 6.9ns
- Worst case I_{CCZ} is 50μA

LOGIC DIAGRAM



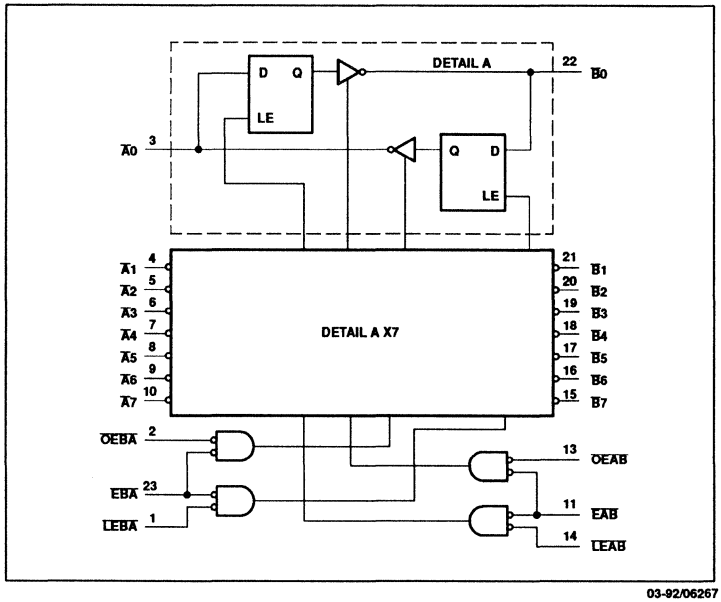
04-91/02094

74ABT544 – Octal Latched Transceiver with Dual Enable, Inverting

FEATURES

- Combines 74ABT245 and 74ABT373 type functions in one device
- Octal transceiver with D-type latch
- Back-to-back registers for storage
- Separate controls for data flow in each direction
- 3-State buffer outputs sink 64mA and source 32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- Worst case propagation delay is 6.4ns
- Worst case I_{CCZ} is 50μA

LOGIC DIAGRAM



03-92/06267

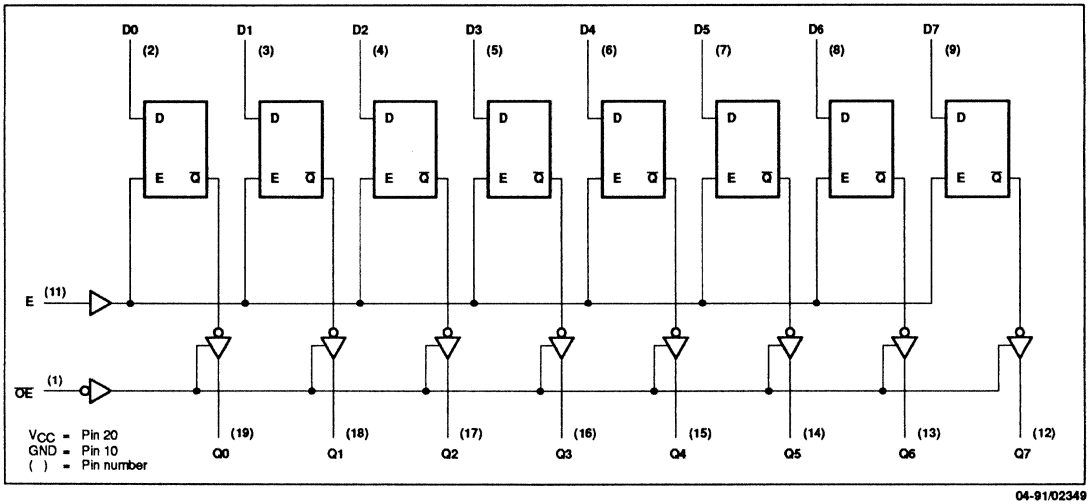
Product Spotlights

54/74ABT573 – Octal D-Type Transparent Latch (3-State)

FEATURES

- 74ABT573 is a broadside pinout version of 74ABT373
- Inputs and outputs on opposite side of package allow easy interface to microprocessors
- 3-State outputs for bus interfacing common output enable
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 6.2ns worst case propagation delay
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

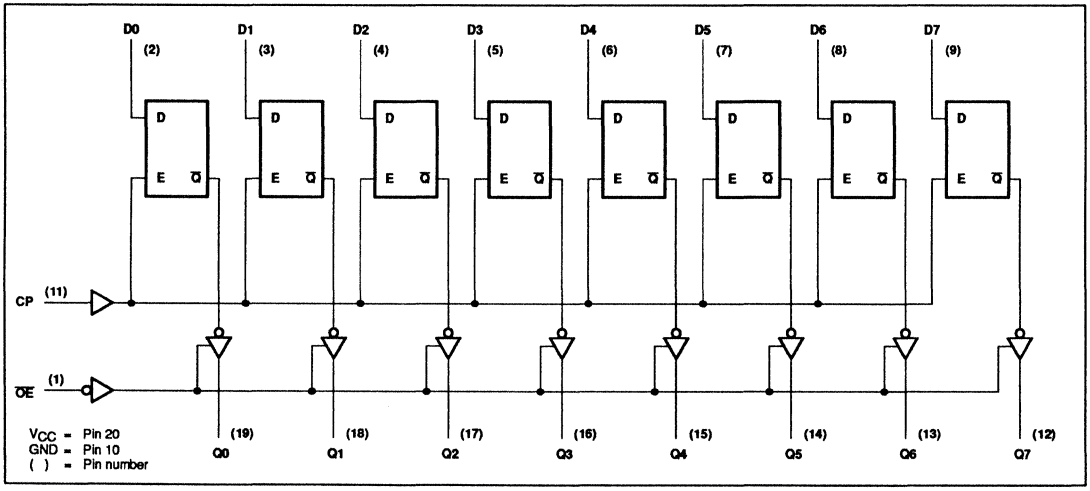
Product Spotlights

54/74ABT574 – Octal D Flip-Flop (3-State)

FEATURES

- 74ABT574 is a broadside pinout version of 74ABT374
- Inputs and outputs on opposite side of package allow easy interface to microprocessors
- Useful as an input or output port for microprocessors
- 3-State outputs for bus interfacing common output enable
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 150MHz worst case f_{MAX}
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

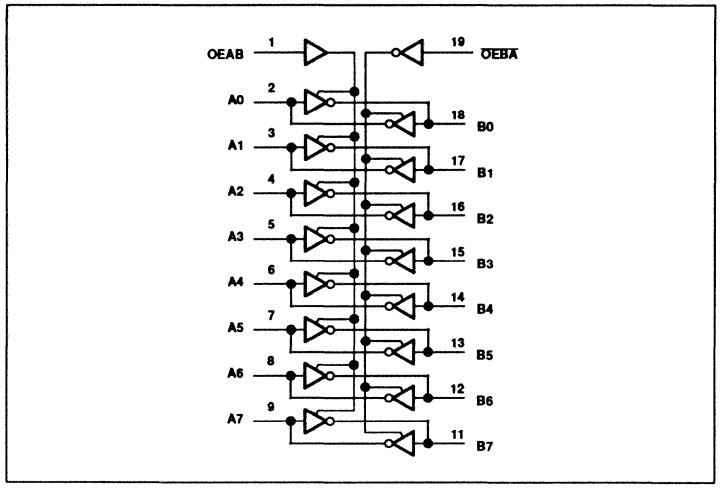
Product Spotlights

54/74ABT620 – Octal Transceiver with Dual Enable, Inverting (3-State)

FEATURES

- Octal bidirectional bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



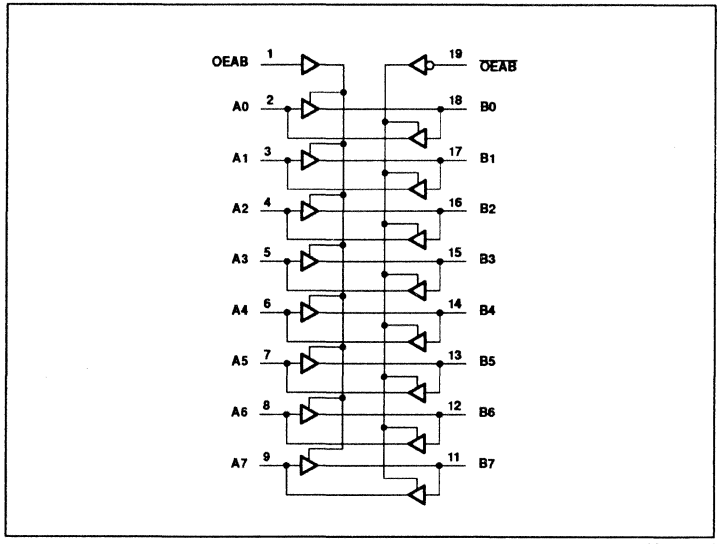
03-92/06267

54/74ABT623 – Octal Transceiver with Dual Enable, Non-Inverting (3-State)

FEATURES

- Octal bidirectional bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 4.6ns worst case propagation
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02349

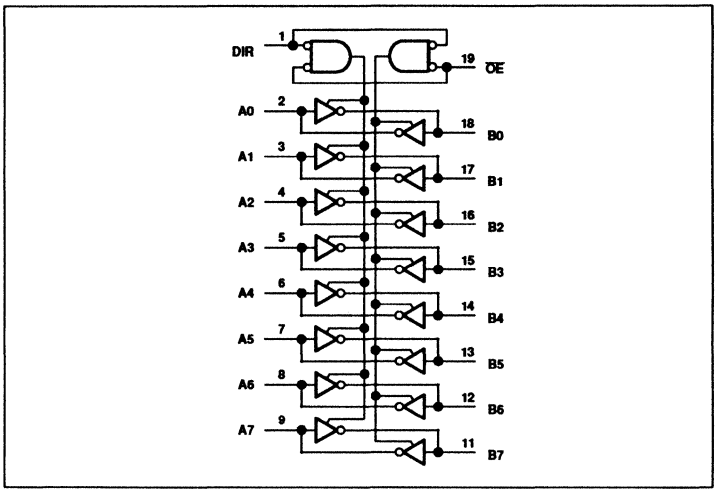
Product Spotlights

54/74ABT640 – Octal Transceiver with Direction Pin, Inverting (3-State)

FEATURES

- Octal bidirectional bus interface
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



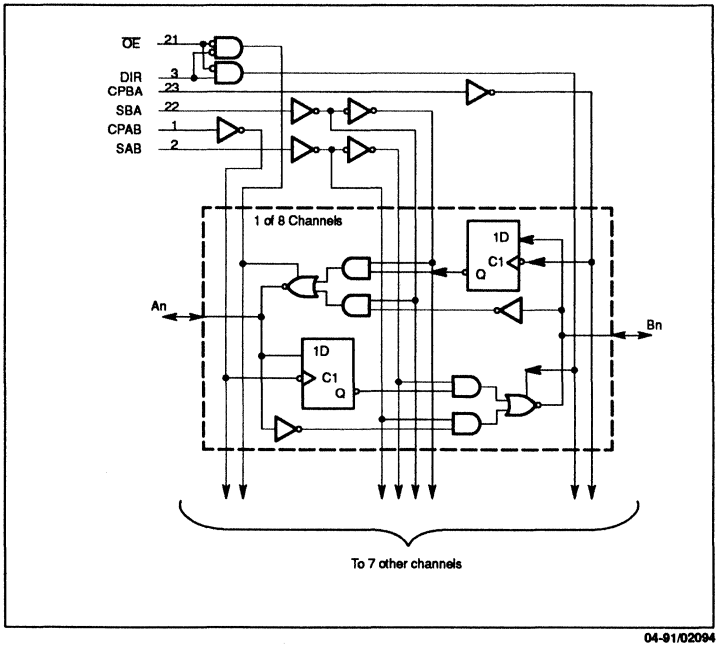
03-92/06267

54/74ABT646 – Octal Bus Transceiver/Register (3-State)

FEATURES

- Combines 74ABT245 and 74ABT374 type functions in one device
- Independent registers for A and B buses
- Multiplexed real-time and stored data
- Output sink 64mA and source 32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 6.9ns worst case propagation
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02094

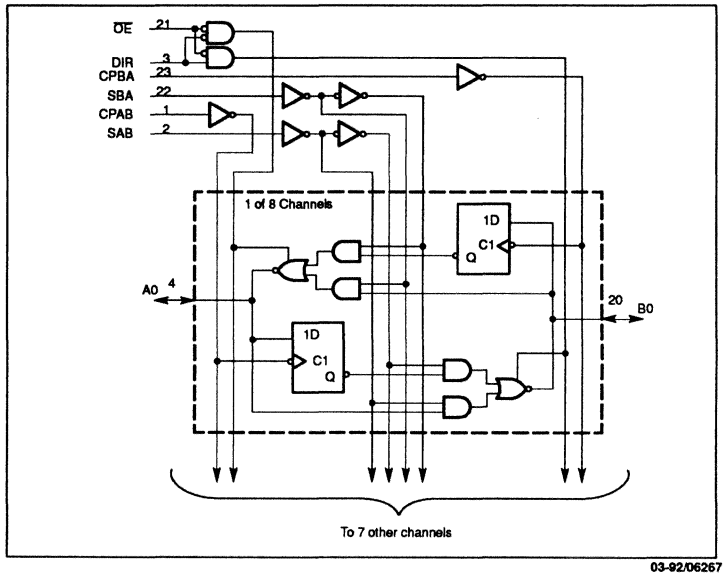
Product Spotlights

54/74ABT648 – Octal Bus Transceiver/Register, Inverting (3-State)

FEATURES

- Combines 74ABT245 and 74ABT374 type functions in one device
- Independent registers for A and B buses
- Multiplexed real-time and stored data
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 6.2ns worst case propagation
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



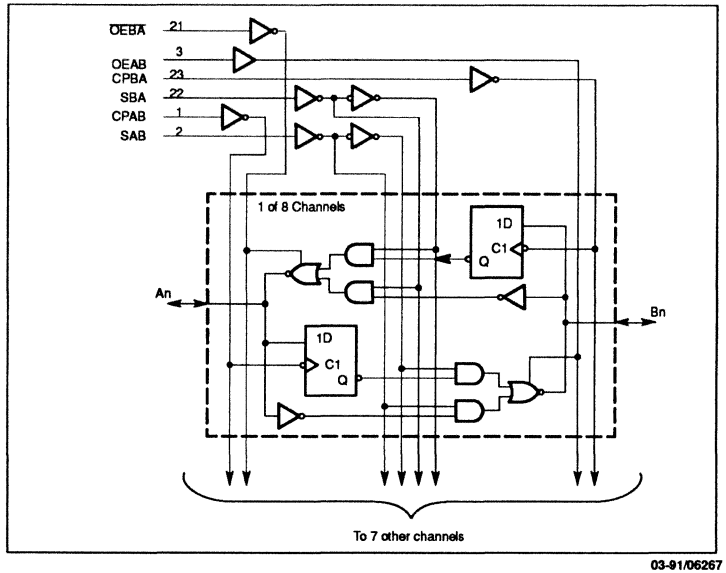
03-92/06267

54/74ABT652 – Transceiver/Register, Non-Inverting (3-State)

FEATURES

- Independent registers for A and B buses
- Multiplexed real-time and stored data
- 3-State outputs
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 6.7ns worst case propagation
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



03-91/06267

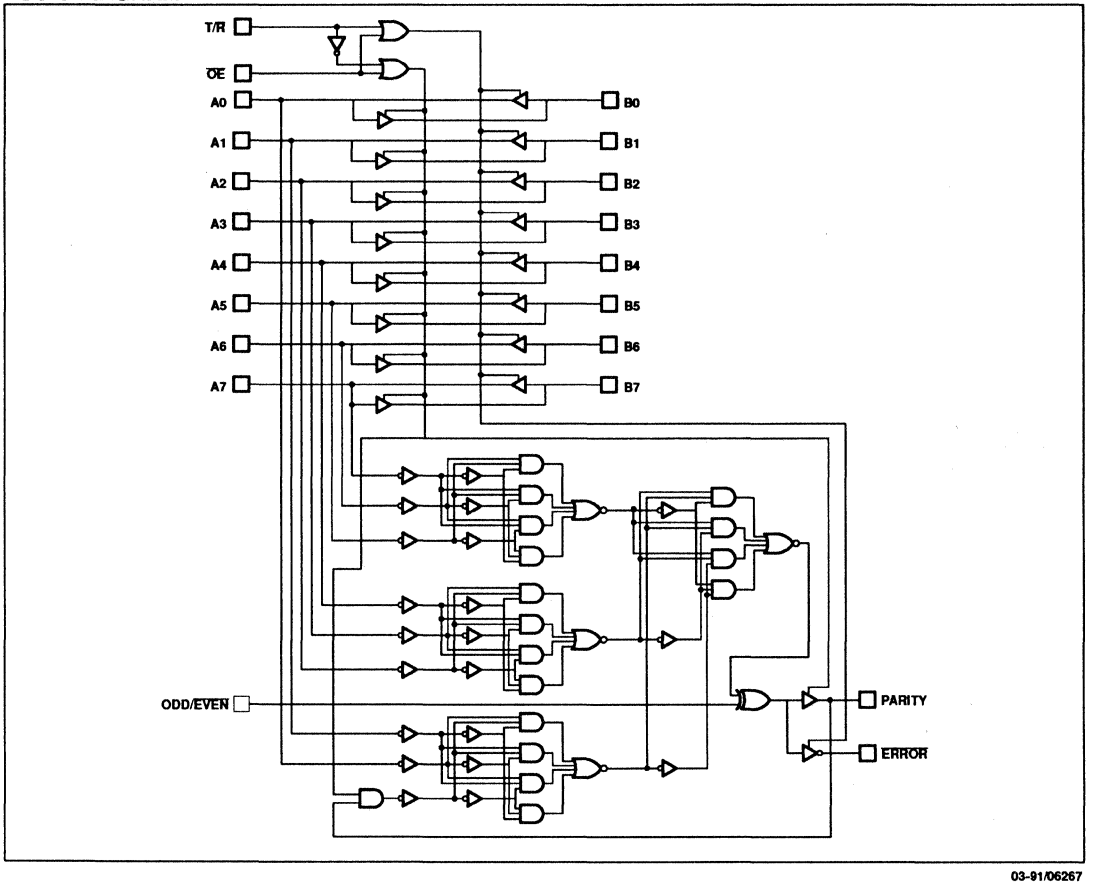
Product Spotlights

54/74ABT657 – Octal Transceiver with Parity Generator/Checker (3-State)

FEATURES

- Combines 74ABT280 and 74ABT245 functions in one package
- Low static and dynamic power dissipation with high speed and high output drive
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 5.5ns worst case propagation
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



03-91/06267

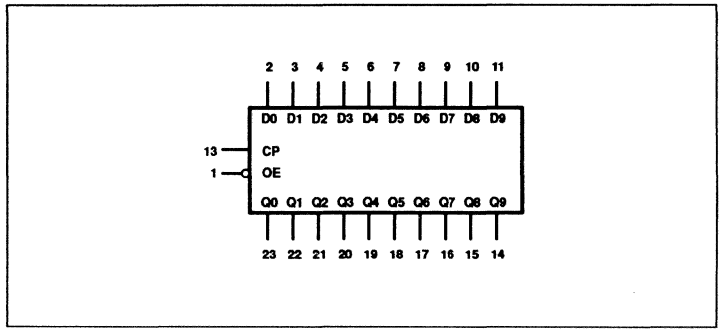
Product Spotlights

54/74ABT821 – 10-Bit D-Type Flip-Flop; Positive-Edge Trigger (3-State)

FEATURES

- High speed parallel registers with positive edge-triggered D-type flip-flops
- Ideal where high speed, light loading, or increased fan-in are required with MOS microprocessors
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



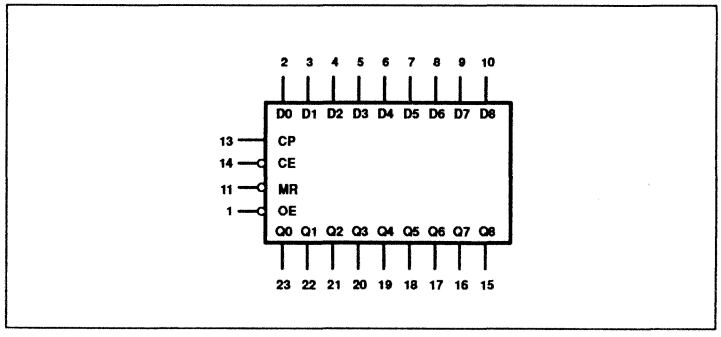
03-92/06267

54/74ABT823 – 9-Bit D-Type Flip-Flop with Reset and Enable (3-State)

FEATURES

- High speed parallel registers with positive edge-triggered D-type flip-flops
- Ideal where high speed, light loading, or increased fan-in are required with MOS microprocessors
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



03-92/06267

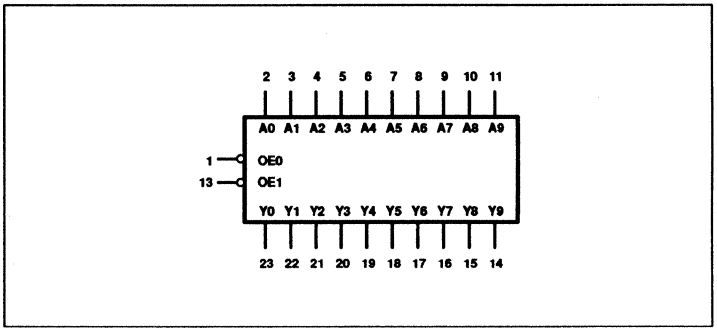
Product Spotlights

54/74ABT827 – 10-Bit Buffer/Line Driver, Non-Inverting (3-State)

FEATURES

- Ideal where high speed, light loading, or increased fan-in are required
- Flow through pinout architecture for microprocessor oriented applications
- Output capability: +64mA/-32mA
- Slim 300 mil-wide plastic 24-pin package
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



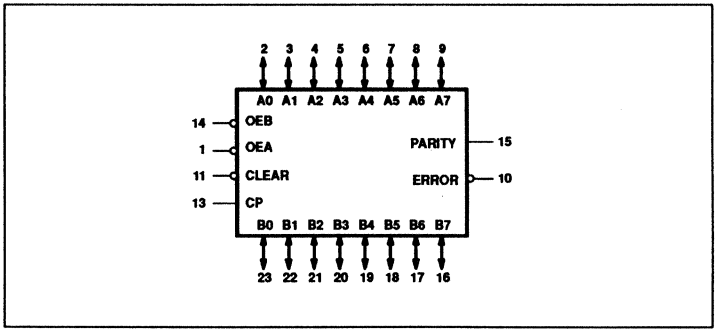
03-92/06267

74ABT833 – Octal Transceiver with Parity Generator/Checker (3-State)

FEATURES

- Low static and dynamic power dissipation with high speed and high output drive
- Open–collector $\overline{\text{ERROR}}$ output
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- Power up/down 3-State
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



03-92/06267

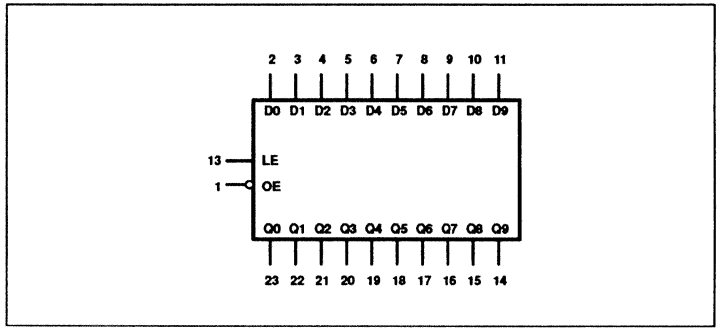
Product Spotlights

54/74ABT841 – 10-Bit Bus Interface Latch (3-State)

FEATURES

- High speed parallel latches
- Extra data width for wide address/data paths or buses carrying parity
- Ideal where high speed, light loading, or increased fan-in are required with MOS microprocessors
- Slim DIP 300 mil package
- Broadside pinout
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



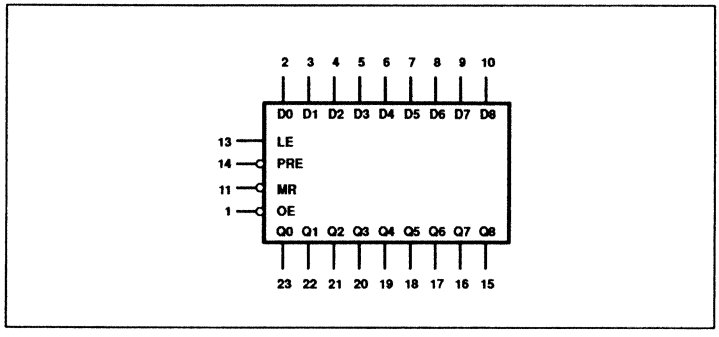
04-92/06335

74ABT843 – 9-Bit Bus Interface Latch with Set and Reset (3-State)

FEATURES

- High speed parallel latches
- Extra data width for wide address/data paths or buses carrying parity
- Ideal where high speed, light loading, or increased fan-in are required with MOS microprocessors
- Slim DIP 300 mil package
- Broadside pinout
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



03-92/06267

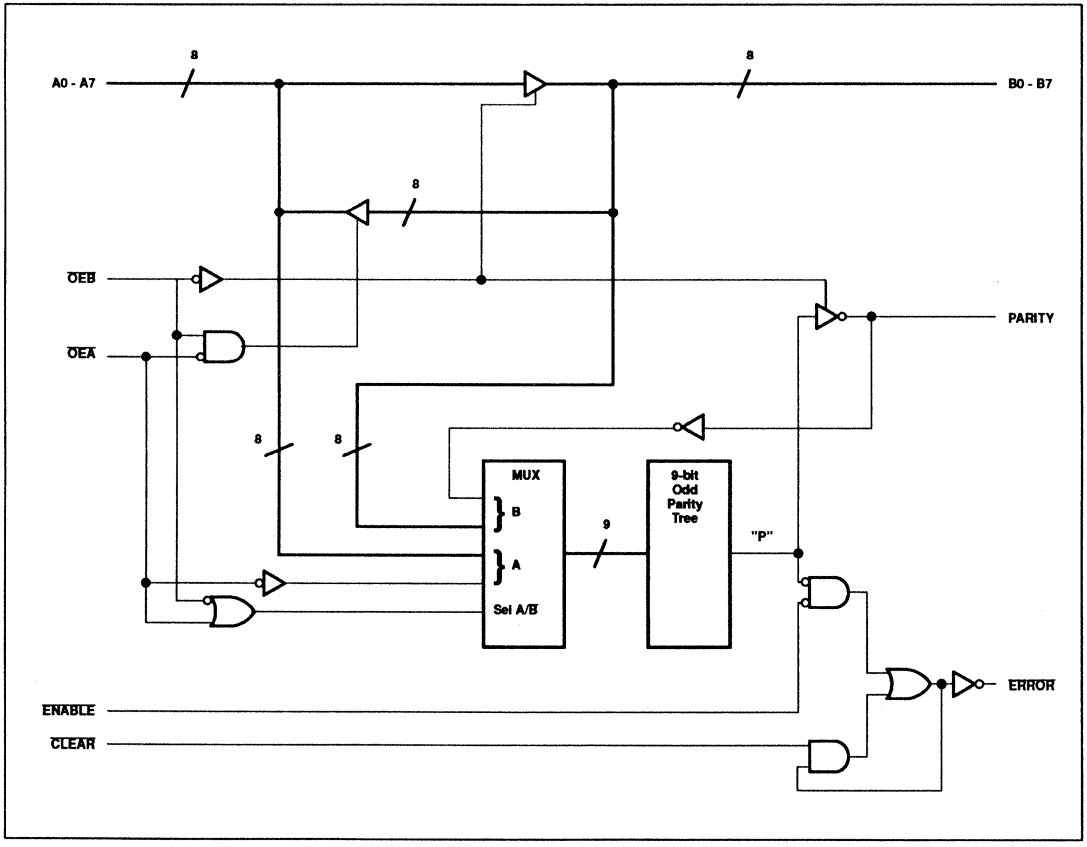
Product Spotlights

74ABT853 – 8-Bit Transceiver with 9-Bit Parity Checker/Generator and Flag Latch (3-State)

FEATURES

- Low static and dynamic power dissipation with high speed and high output drive
- Open-collector $\overline{\text{ERROR}}$ output
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17
- ESD protection exceeds 2000 V per MIL STD 883C Method 3015.6 and 200 V per Machine Model

LOGIC DIAGRAM



10-92/08032

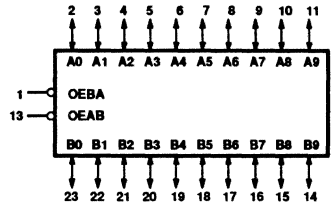
Product Spotlights

54/74ABT861 – 10-Bit Bus Transceiver (3-State)

FEATURES

- Provides high performance bus interface buffering for wide data/address paths or buses carrying parity
- Buffered control inputs for light loading, or increased fan-in as required with MOS microprocessors
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000 V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



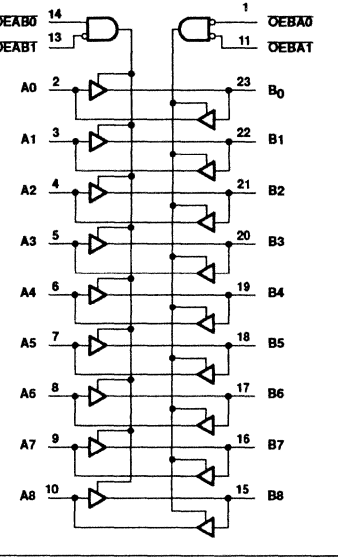
03-92/06267

54/74ABT863 – 9-Bit Bus Transceiver (3-State)

FEATURES

- Provides high performance bus interface buffering for wide data/address paths or buses carrying parity
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 6.3ns worst case propagation delay
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



03-92/06267

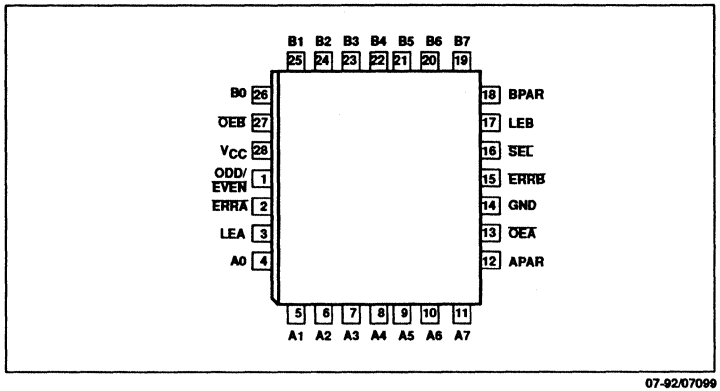
Product Spotlights

74ABT899 – 9-Bit Dual Latch Transceiver with 8-Bit Parity Generator/Checker (3-State)

FEATURES

- Symmetrical (A and B bus functions are identical)
- Selectable generate parity or "feed-through" parity for A-to-B and B-to-A directions
- Independent transparent latches for A-to-B and B-to-A directions
- Selectable ODD/$\overline{\text{EVEN}}$ parity
- Continuously checks parity of both A bus and B bus latches as $\overline{\text{ERRA}}$ and $\overline{\text{ERRB}}$
- Ability to simultaneously generate and check parity
- Can simultaneously read/latch A and B bus data
- Output capability: +64 mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- Power up/down 3-State
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



07-92/07099

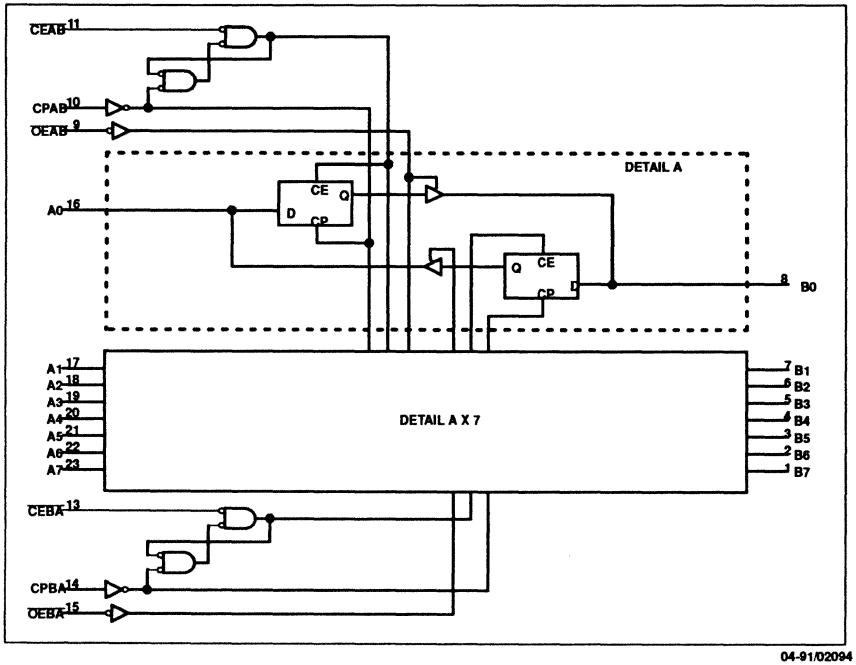
Product Spotlights

54/74ABT2952 – Octal Registered Transceiver (3-State)

FEATURES

- 8-bit registered transceiver
- Independent registers for A and B buses
- Outputs sink 64mA and source 32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 8.2ns worst case propagation
- 50µA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02094

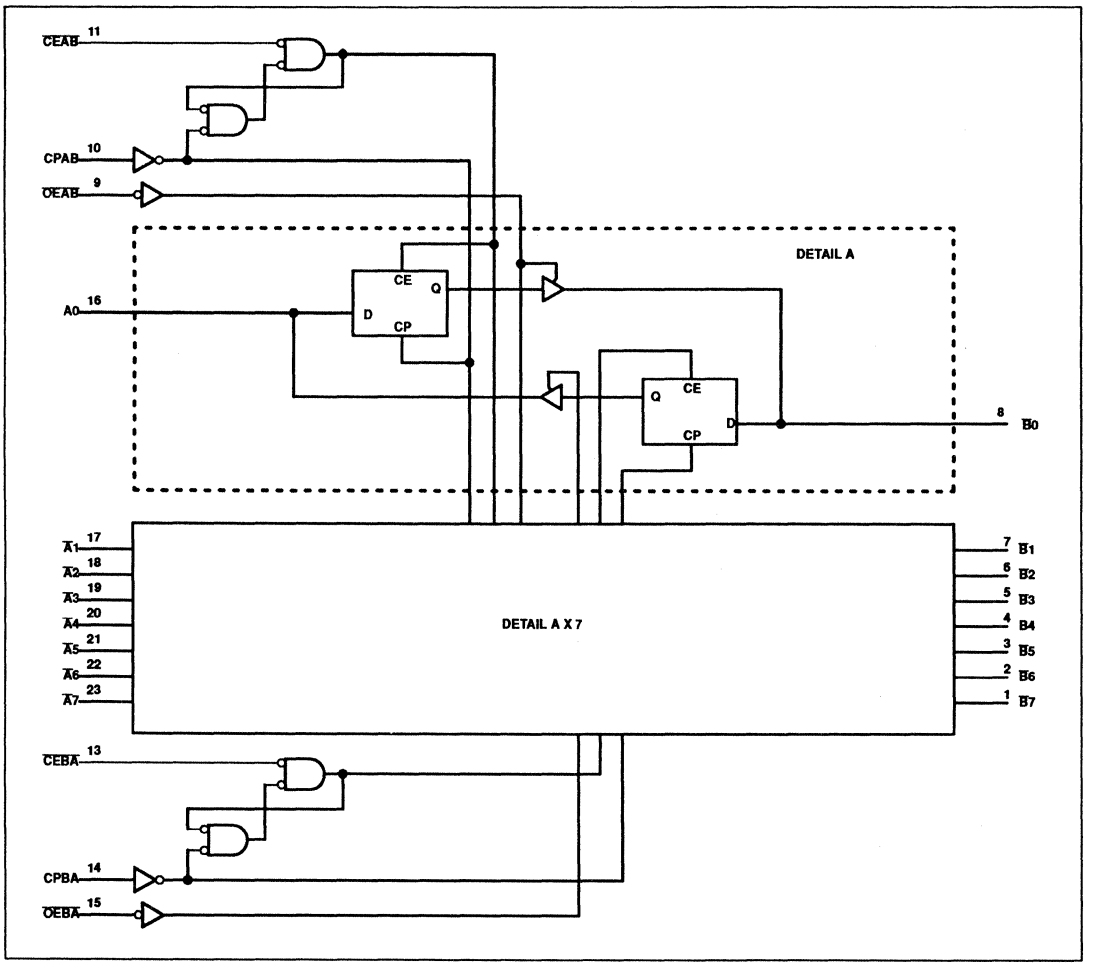
Product Spotlights

74ABT2953 – Octal Registered Transceiver, Inverting (3-State)

FEATURES

- 8-bit registered inverting transceiver
- Separate clock, clock enable and 3-State enable provided for each register
- Outputs sink 64mA and source 32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model
- 8.2ns worst case propagation
- 50μA worst case I_{CCZ}

LOGIC DIAGRAM



04-91/02094

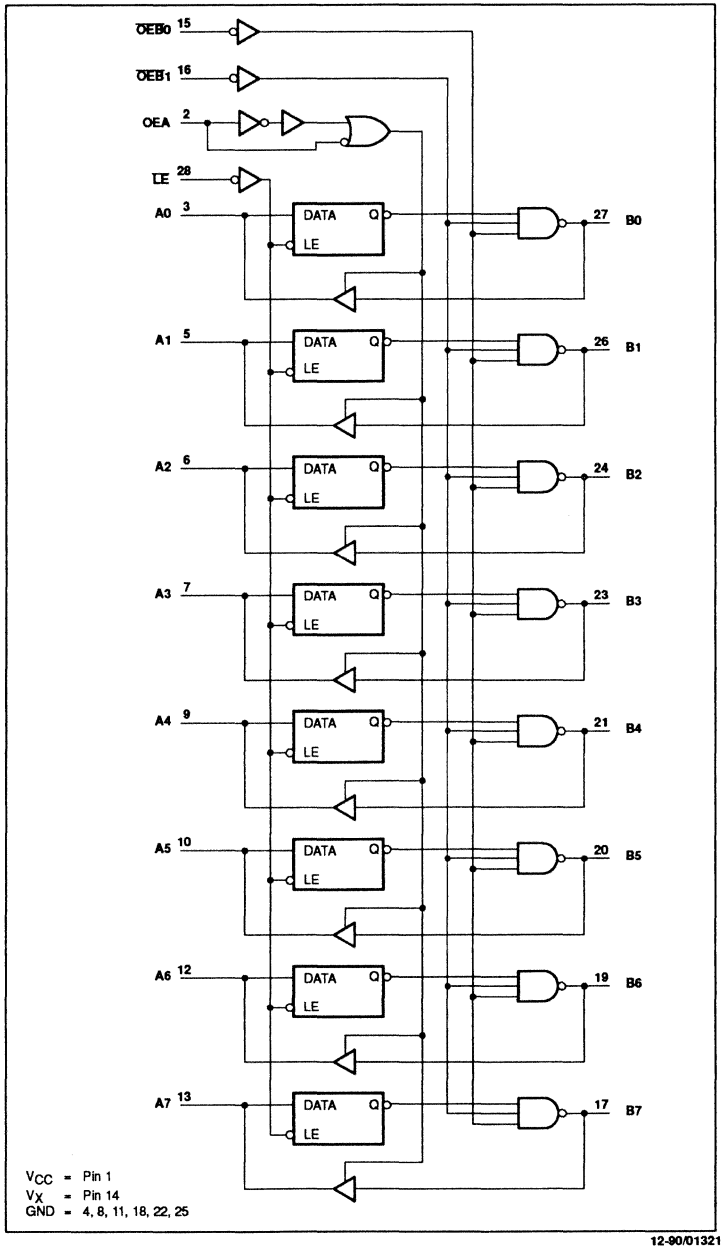
Product Spotlights

54/74F776 – Pi-Bus Transceiver

FEATURES

- Octal latched transceiver
- Drives heavily loaded backplanes with equivalent load impedances down to 10Ω
- High drive (100mA) open collector drivers on B-port
- Reduced voltage swing (1 volt) produces less noise and reduces power consumption
- High speed operation enhances performance of backplane buses and facilitates incident wave switching
- Compatible with Pi-Bus and IEEE 896 Futurebus Standards
- Built-in precision band-gap reference provides accurate receiver thresholds and improved noise immunity
- Controlled output ramp and multiple GND pins minimize ground bounce
- Glitch-free power up/power down operation
- Multiple package options
- Industrial temperature range available (-40°C to +80°C)

LOGIC DIAGRAM



12-90/01321

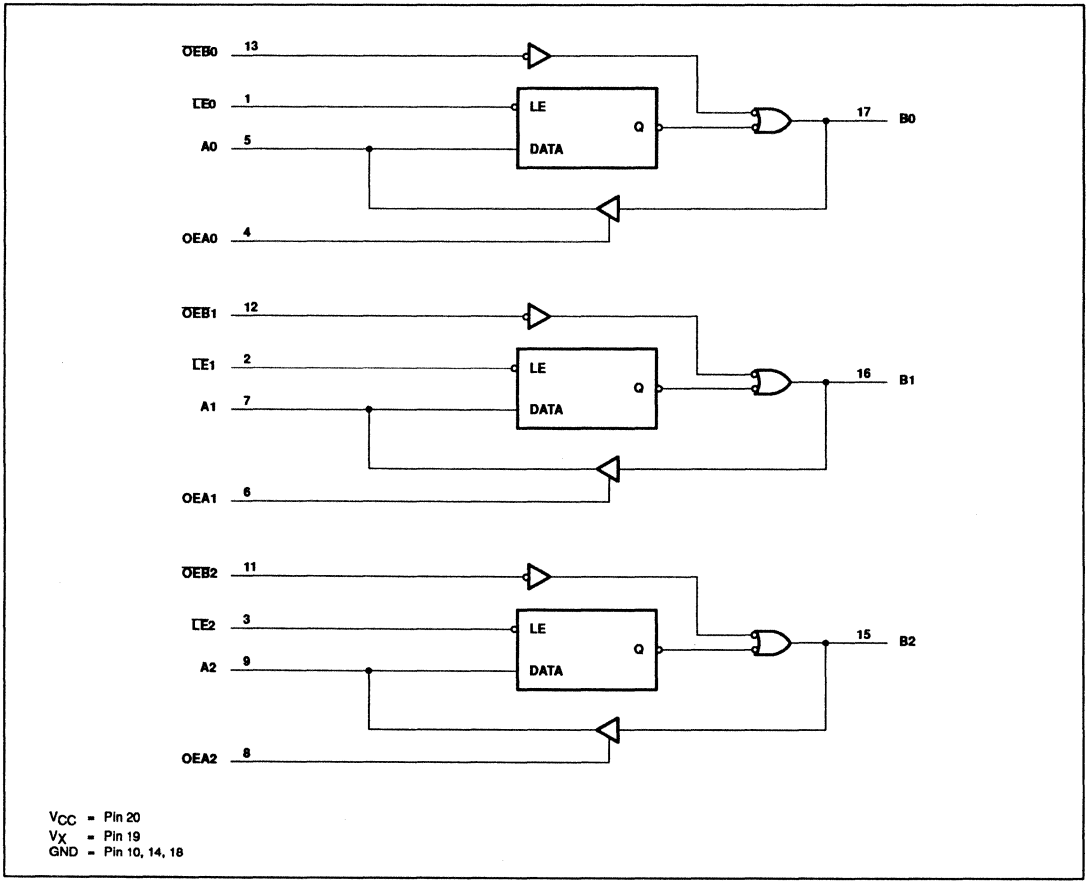
Product Spotlights

54F777 –Triple Bidirectional Latched Bus Transceiver (3-State + Open Collector)

FEATURES

- Latching transceiver
- High drive open collector output current with minimum output swing
- Compatible with Test Mode (TM) Bus specification
- Controlled output ramp
- Multiple package options

LOGIC DIAGRAM



07-90/99964

Product Spotlights

74F711A/711-1, 74F712A/712-1 – Multiplexers

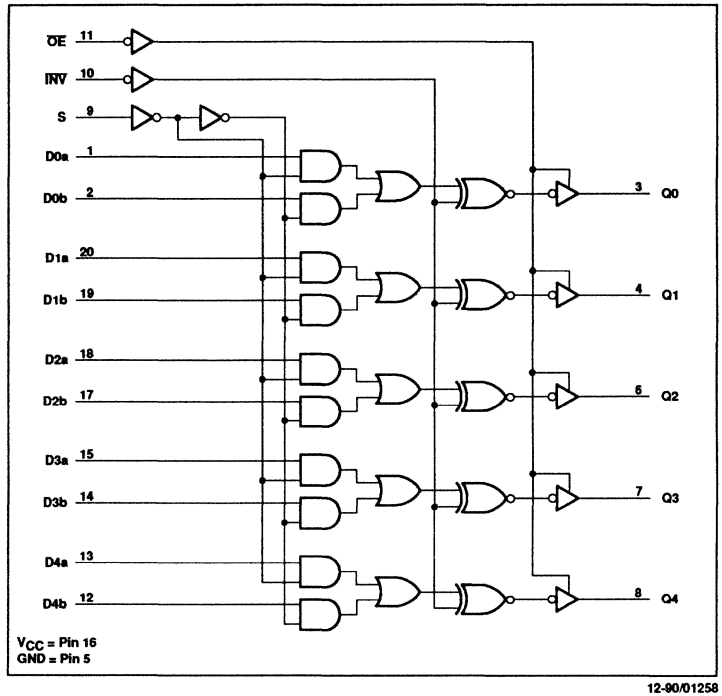
FEATURES FOR 74F711A/711-1

- Consists of five 2-to-1 multiplexers
- High impedance PNP base inputs for reduced loading (20μA in High and Low states)
- Designed for address multiplexing of dynamic RAM and other applications
- Output inverting/non-inverting option
- 74F711-1 offers 30Ω output impedance characteristics
- Outputs sink 64mA ('F711A only)

FEATURES FOR 74F712A/712-1

- Consists of five 3-to-1 multiplexers
- High impedance PNP base inputs for reduced loading (20μA in High and Low states)
- Designed for address multiplexing of dynamic RAM and other applications
- 74F712-1 offers 30Ω output impedance characteristics
- Outputs sink 64mA ('F712A only)

74F711A, 74F712A LOGIC DIAGRAM



12-90/01258

Product Spotlights

54/74F723A/723-1, 74F725A/725-1 – Multiplexers

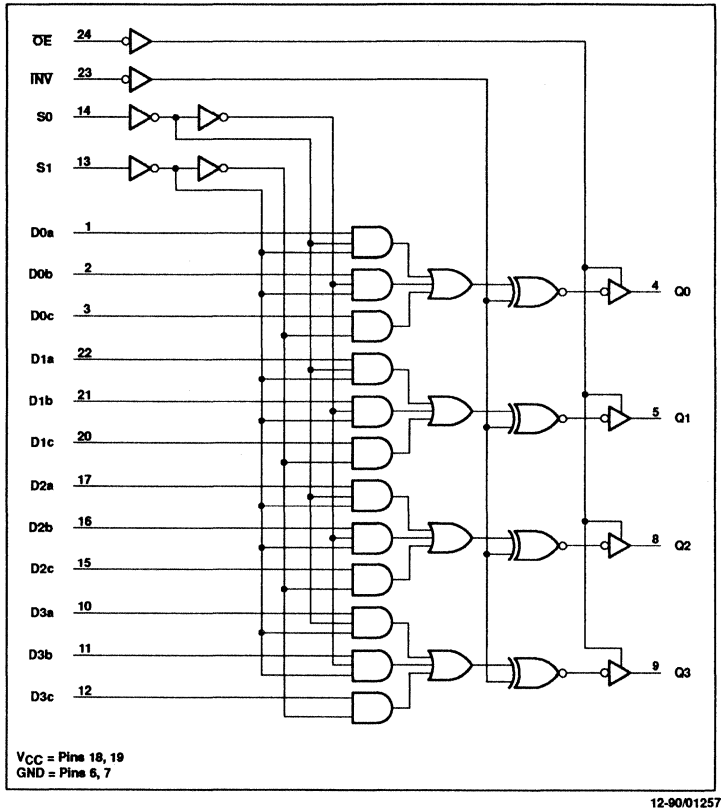
FEATURES FOR 74F723A/723-1

- Consists of four 3-to-1 multiplexers
- High impedance PNP base inputs for reduced loading (20μA in High and Low states
- Inverting or non-inverting data path capability by an invertint ($\overline{INV}$) input
- Designed for address multiplexing of dynamic RAM and other applications
- Multiple side pins for V_{CC} and GND to reduce lead inductance (improves speed and noise immunity)
- 3-State outputs sink 64mA ('F723 only)
- 74F723-1 offers 30Ω output impedance characteristics

FEATURES FOR 74F725A/725-1

- Consists of four 4-to-1 multiplexers
- High impedance PNP base inputs for reduced loading (20μA in High and Low states
- Equivalent to two 'F253s without 3-State
- Outputs sink 48mA ('F725A only)
- 74F725-1 offers 30Ω output impedance characteristics

74F723A, 74F725A LOGIC DIAGRAM



12-90/01257

Product Spotlights

54/74F5074 – Flip-Flop/Clock Driver

FEATURES

- Metastable immune characteristics
- Propagation delay skew and output to output skew guaranteed less than 1.5ns
- High source current (I_{OH} = 15mA) ideal for clock driver applications
- Pinout compatible with 74F74
- See 74F50728 for Synchronizing Cascaded D-Type Flip-Flop
- See 74F50729 for Synchronizing Dual D-Type Flip-Flop with Edge-Triggered Set and Reset
- See 74F50109 for Synchronizing Dual J-$\overline{K}$ Positive Edge-Triggered Flip-Flops

74F50109 – Flip-Flop/Clock Driver

FEATURES

- Metastable immune characteristics
- Propagation delay skew and output to output skew guaranteed less than 1.5ns
- High source current (I_{OH} = 15mA) ideal for clock driver applications
- Pinout compatible with 74F109
- See 74F5074 for Synchronizing Dual D-Type Flip-Flop
- See 74F50728 for Synchronizing Cascaded D-Type Flip-Flop
- See 74F50729 for Synchronizing Dual D-Type Flip-Flop with Edge-Triggered Set and Reset

09-90/004 22

74F50728 – Flip-Flop

FEATURES

- Metastable immune characteristics
- Propagation delay skew and output to output skew less than 1.5ns
- See 74F5074 for Synchronizing Dual D-Type Flip-Flop
- See 74F50109 for Synchronizing Dual J-$\overline{K}$ Positive Edge-Triggered Flip-Flops
- See 74F50729 for Synchronizing Dual D-Type Flip-Flop with Edge-Triggered Set and Reset
- Industrial temperature range available (-40°C to +85°C)

74F50729 – Flip-Flop/Clock Driver

FEATURES

- Metastable immune characteristics
- Propagation delay skew and output to output skew less than 1.5ns
- High source current (I_{OH} = 15mA) ideal for clock driver applications
- See 74F5074 for Synchronizing Dual D-Type Flip-Flop
- See 74F50109 for Synchronizing Dual J-$\overline{K}$ Positive Edge-Triggered Flip-Flops
- See 74F50728 for Synchronizing Cascaded Dual D-Type Flip-Flop
- Very low power consumption in triggered start mode
- 3 oscillator operation modes:
  RC oscillator
  Crystal oscillator
  External oscillator
- Device is unaffected by variations in temperature and V_{CC}, when using an external oscillator
- Automatic power-on reset
- Schmitt trigger action on both trigger inputs
- Direct drive for power transistor
- Output capability: 20mA
- I_{CC} category: MSI

Product Spotlights

MB2240 – 16-Bit Inverting Buffer/Line Driver (3-State)

DESCRIPTION

The MB2240 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

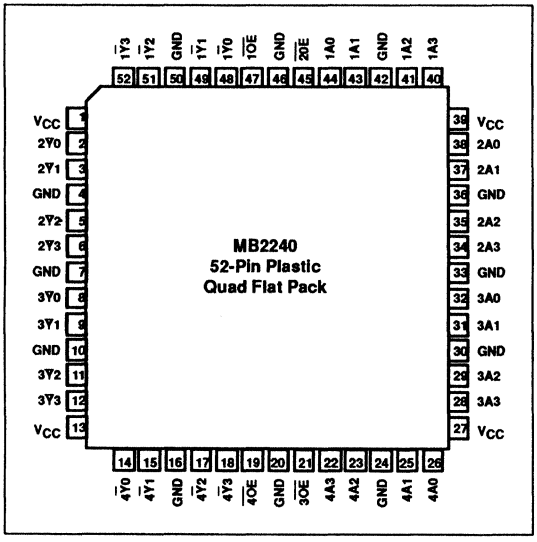
FEATURES

- 16-bit bus interface
- Multiple V_{CC} and GND pins minimize switching noise
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

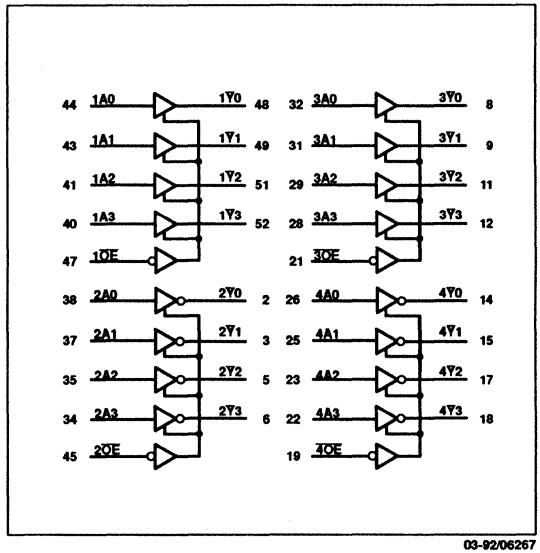
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2240B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



03-92/06267

Product Spotlights

MB2241 – 16-Bit Inverting Buffer/Line Driver (3-State)

DESCRIPTION

The MB2241 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2240 device is an inverting 16-bit buffer that is ideal for driving bus lines. The device features four Output Enables ($1\overline{OE}$, 2OE, $3\overline{OE}$, 4OE), each controlling four of the 3-State outputs.

The MB2241 device is a 16-bit buffer that is ideal for driving bus lines. The device features four Output Enables ($1\overline{OE}$, 2OE, $3\overline{OE}$, 4OE), each controlling four of the 3-State outputs.

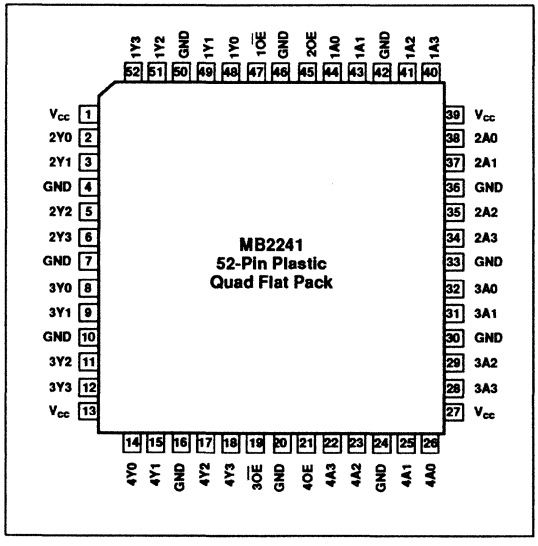
FEATURES

- 16-bit bus interface
- Multiple V_{CC} and GND pins minimize switching noise
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

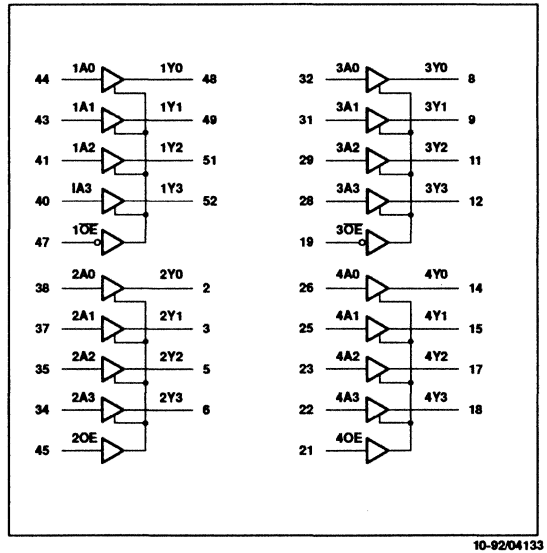
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2241B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



10-92/04133

Product Spotlights

MB2244 – 16-Bit Buffer/Line Driver (3-State)

DESCRIPTION

The MB2244 high-performance Advanced BiCMOS device combines high speed, high output drive and low static and dynamic power dissipation.

The MB2244 device is a 16-bit buffer which operates identical to two industry standard '244 functions. It is ideal for driving bus lines or buffering memory address registers. The device contains four Output Enables ($1\overline{OE}$, $2\overline{OE}$, $3\overline{OE}$, $4\overline{OE}$), each controlling four of the 3-State outputs.

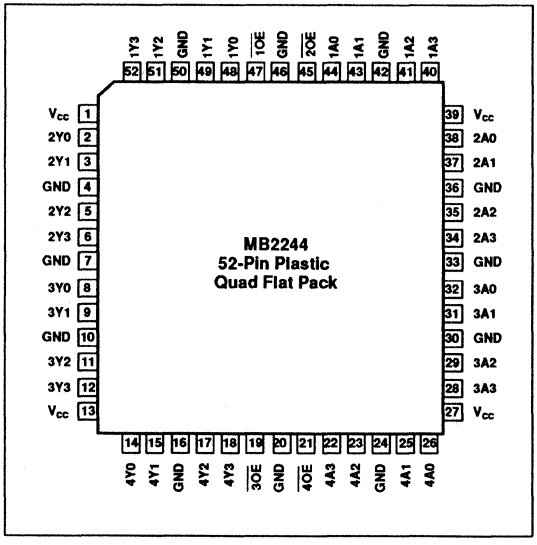
FEATURES

- Double byte functionality
- 3-State outputs
- Output capability: +64mA/-32mA
- High signal integrity/low ground bounce
- Low simultaneous switching propagation delay degradation
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

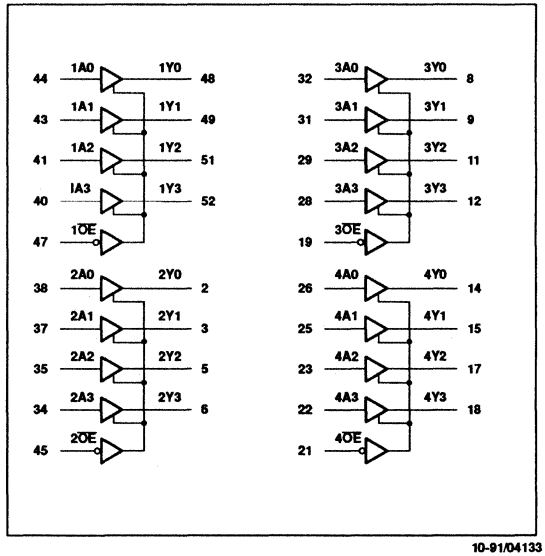
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2244B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



10-91/04133

Product Spotlights

MB2245 – Dual Octal Transceivers with Direction Pins (3-State)

DESCRIPTION

The MB224 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2245 device is a dual octal transceiver featuring non-inverting 3-State bus compatible outputs in both send and receive directions. The control function implementation minimizes external timing requirements. The device features two Output Enable ($1\overline{OE}$, $2\overline{OE}$) inputs for easy cascading and two Direction (1DIR, 2DIR) inputs for direction control.

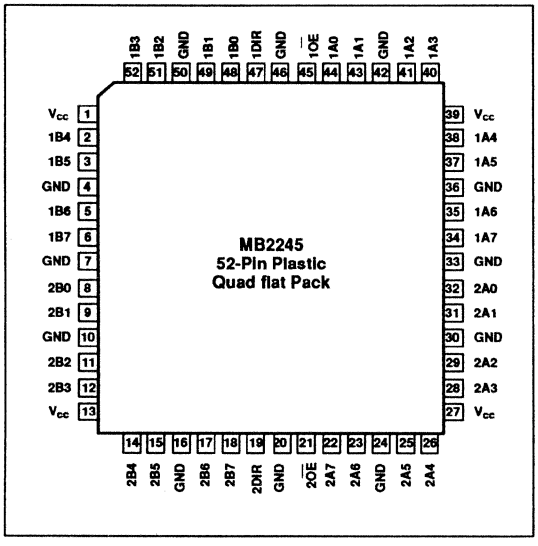
FEATURES

- 16-bit bidirectional bus interface
- Multiple V_{CC} and GND pins minimize switching noise
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

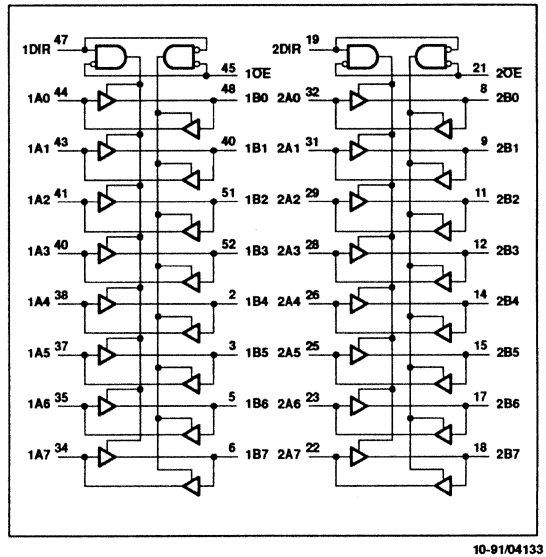
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2245B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



10-91/04133

Product Spotlights

MB2373 – Dual Octal Transparent Latch (3-State)

DESCRIPTION

The MB2373 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2373 device is a dual octal transparent latch coupled to two sets of eight 3-State output buffers. The two sections of the device are controlled independently by Enable (nE) and Output Enable ($n\overline{OE}$) control gates.

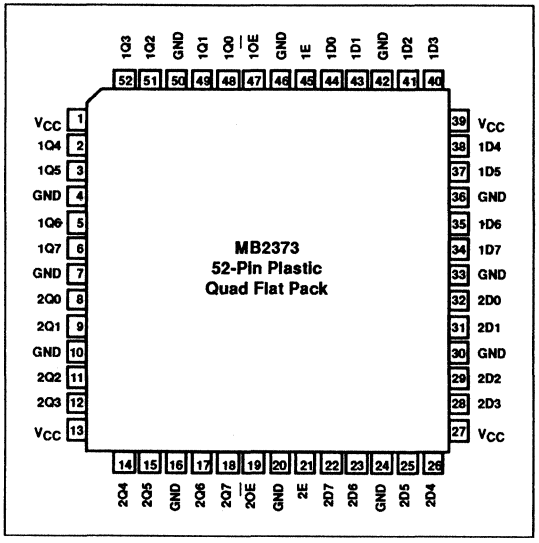
FEATURES

- 16-bit bus interface
- Multiple V_{CC} and GND pins minimize switching noise
- Power-up reset
- 3-State buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

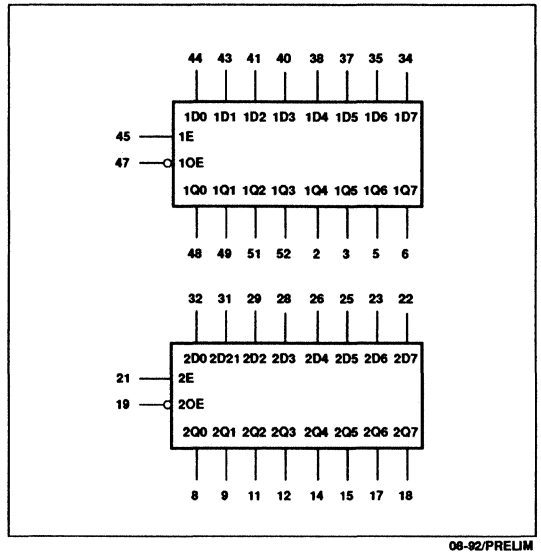
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2373B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



08-92/PRELIM

Product Spotlights

MB2374 – Dual Octal D-Type Flip-Flop; Positive-Edge Trigger (3-State)

DESCRIPTION

The MB2374 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2374 has two 8-bit, edge triggered registers, with each register coupled to eight 3-State output buffers. The two sections of each register are controlled independently by the clock (nCP) and Output Enable ($n\overline{OE}$) control gates.

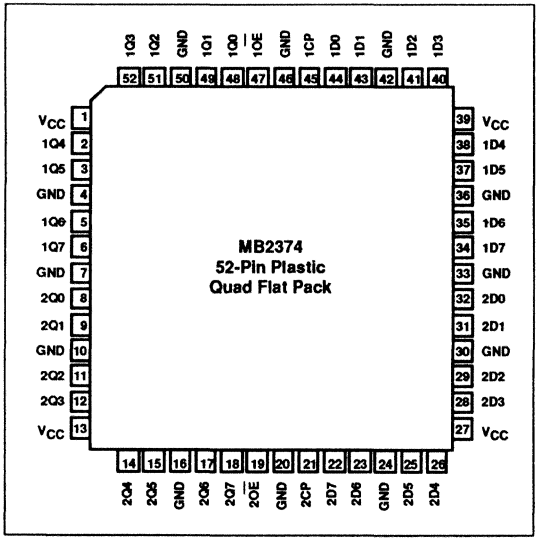
FEATURES

- 16-bit bus interface
- Two 8-bit positive edge triggered registers
- Power-up 3-State
- Power-up reset
- Multiple V_{CC} and GND pins minimize switching noise
- 3-State output buffers
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

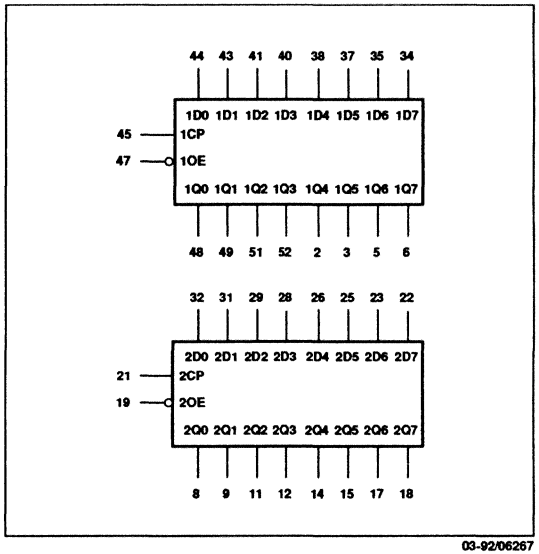
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2374B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



03-92/06267

Product Spotlights

MB2377 – Dual Octal D-Type Flip-Flop with Enable

DESCRIPTION

The MB2377 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.
The MB2377 has two 8-bit, edge triggered registers, with individual D inputs and Q outputs. The common buffered clock (1CP or 2CP) input will load a set of eight flip-flops simultaneously when the corresponding Enable (1$\overline{E}$ or 2$\overline{E}$) input is Low.

The registers are fully edge triggered. The state of each D input, one set-up time before the Low-to-High clock transition, is transferred to the corresponding flip-flop's Q output.

The n$\overline{E}$ inputs must be stable one setup time prior to the Low-to-High clock transition for predictable operation.

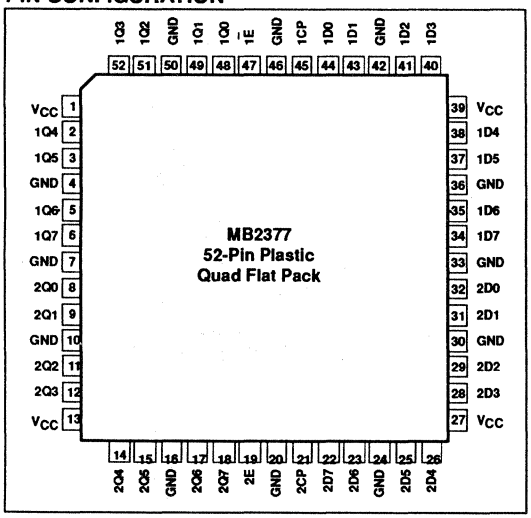
FEATURES

- Ideal for addressable register applications
- Two 8-bit positive edge-triggered registers
- Two Enable inputs for address and data synchronization applications
- Power-up reset
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17
- ESD protection exceeds 2000 V per MIL STD 883C Method 3015.6 and 200 V per Machine Model

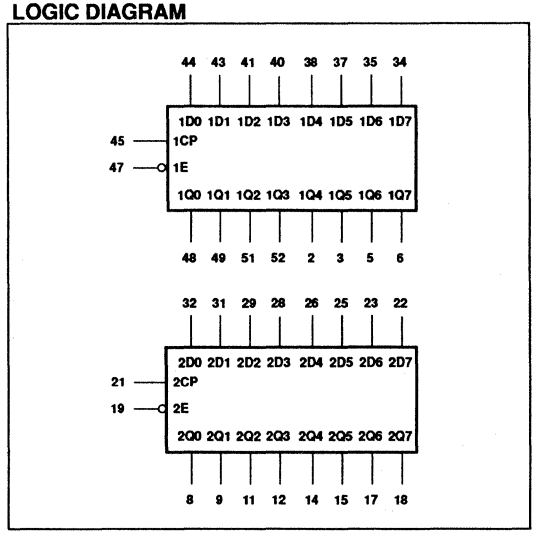
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2377B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



10-92/08028

Product Spotlights

MB2541 – Dual Octal Buffer/Line Drivers (3-State)

DESCRIPTION

The MB2541 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2541 has two octal buffers that are ideal for driving bus lines. The outputs are all capable of sinking 64mA and sourcing 32mA.

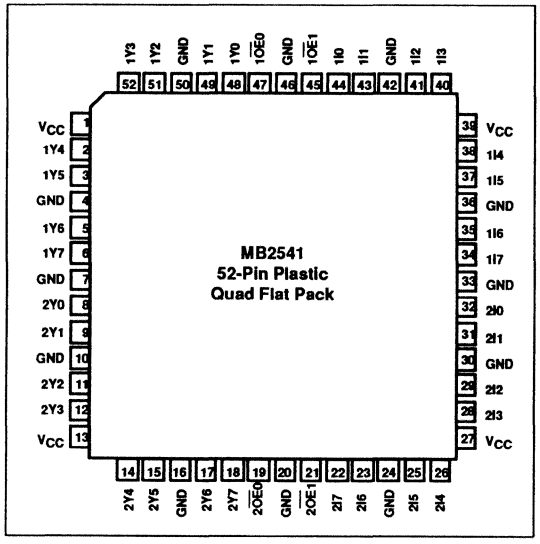
FEATURES

- Two 8-bit bus interface
- Multiple V_{CC} and GND pins minimize switching noise
- Provides ideal interface and increases fan-out of MOS Microprocessors
- 3-State buffers sink 64mA and source 32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

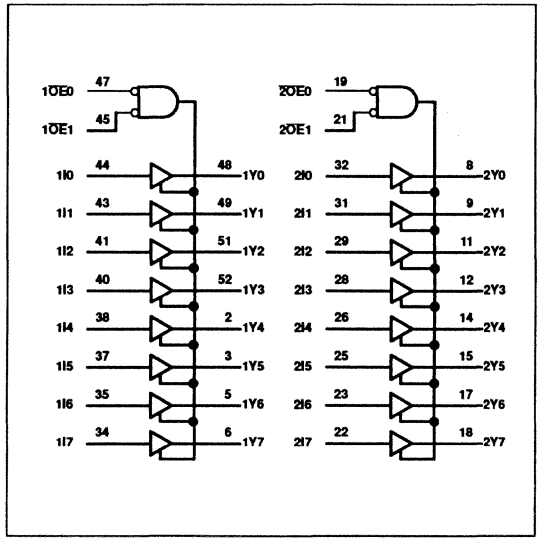
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2541B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



10-91/04133

Product Spotlights

MB2543 – Dual Octal Latched Transceivers with Dual Enable (3-State)

DESCRIPTION

The MB2543 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2543 dual octal registered transceiver contains two sets of D-type latches for temporary storage of data flowing in either direction. Separate Latch Enable (n$\overline{\text{LEAB}}$, n$\overline{\text{LEBA}}$) and Output Enable (n$\overline{\text{OEAB}}$, n$\overline{\text{OEBA}}$) inputs are provided for each register to permit independent control of data transfer in either direction. The outputs are guaranteed to sink 64mA.

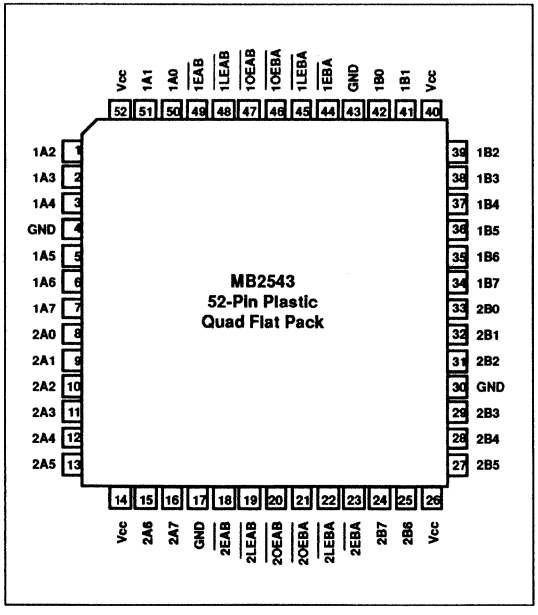
FEATURES

- Two 8-bit octal transceivers with D-type latch
- Power-up 3-State
- Power-up reset
- Multiple V_{CC} and GND pins minimize switching noise
- Back-to-back registers for storage
- Separate controls for data flow in each direction
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

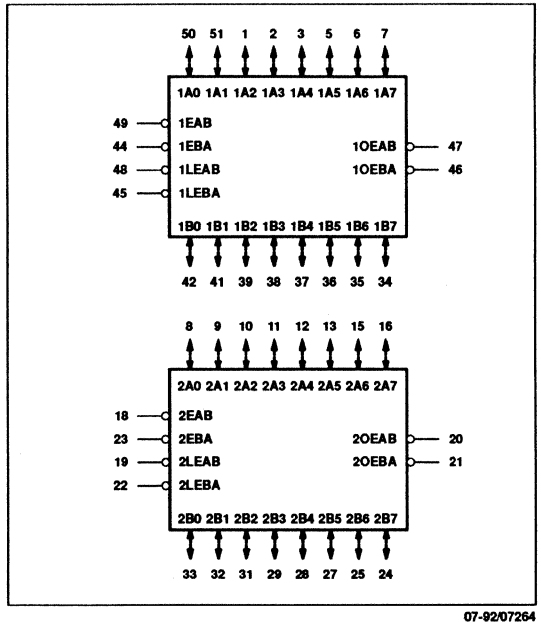
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2543B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



07-92/07264

Product Spotlights

MB2623 – Dual Octal Transceiver with Dual Enable, Non-Inverting (3-State)

DESCRIPTION

The MB2623 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2623 device is a dual octal transceiver featuring non-inverting 3-State bus compatible outputs in both send and receive directions. The MB2623 is designed for asynchronous two-way communication between data buses.

The control function implementation allows for maximum flexibility in timing. This device allows data transmission from the A bus to the B bus or from the B bus to the A bus, depending upon the logic levels at the Enable Inputs ($n\overline{OEB}$ and nOEAB). The Enable inputs can be used to disable the device so that the buses are effectively isolated.

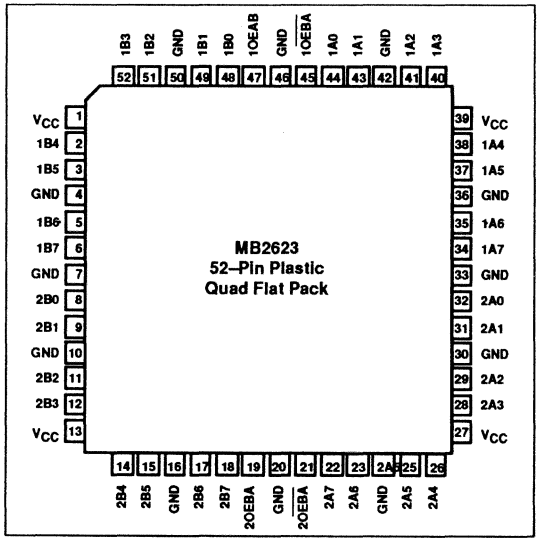
FEATURES

- Two 8-bit bidirectional bus interface
- 3-State buffers
- Multiple V_{CC} and GND pins minimize switching noise
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

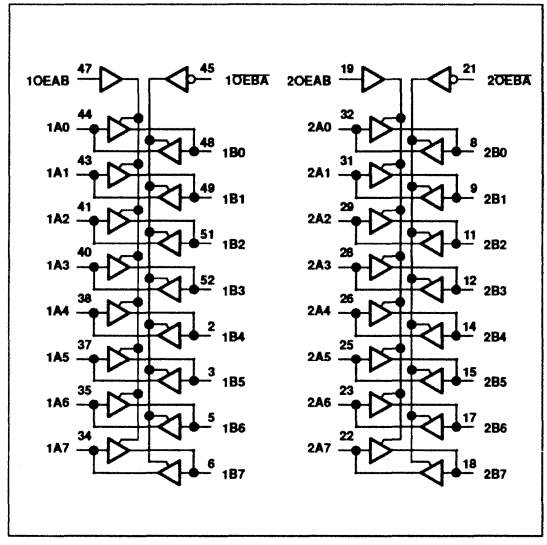
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2623B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



10-91/04133

Product Spotlights

MB2646 – Dual Octal Bus Transceivers/Registers (3-State)

DESCRIPTION

The MB2646 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2646 dual transceiver/register consists of two sets of bus transceiver circuits with 3-State outputs, D-type flip-flops, and control circuitry arranged for multiplexed transmission of data directly from the input bus or from the internal registers. Data on the A or B bus will be clocked into the registers as the appropriate clock pin goes High. Output Enable ($n\overline{OE}$) and Direction (nDIR) pins are provided to control the transceiver function. In the transceiver mode, data present at the high impedance port may be stored in either the A or B register or both.

The select (nSAB, nSBA) pins determine whether data is stored or transferred through the device in real–time. The nDIR determines which bus will receive data when the $n\overline{OE}$ is active Low. In the isolation mode ($n\overline{OE}$ = High), data from Bus A may be stored in the B register and/or data from Bus B may be stored in the A register. When an output function is disabled, the input function is still enabled and may be used to store and transmit data. Only one of the two buses, A or B may be driven at a time.

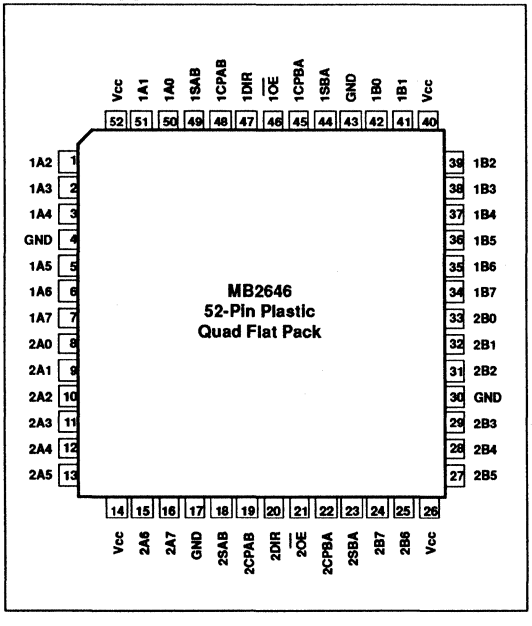
FEATURES

- Independent registers for A and B buses
- Multiple Vcc and GND pins minimize switching noise
- Power-up 3-state
- Power-up reset
- Multiplexed real-time and stored data
- Outputs sink 64mA and source 32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17

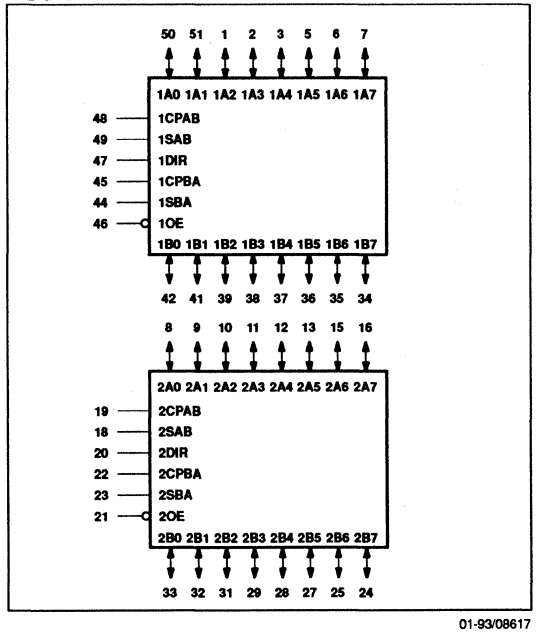
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2646B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



01-93/08617

Product Spotlights

MB2652 – Dual Octal Transceivers/Registers, Non-Inverting (3-state)

DESCRIPTION

The MB2652 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2652 transceiver/register consists of two sets of bus transceiver circuits with 3-State outputs, D-type flip-flops, and control circuitry arranged for multiplexed transmission of data directly from the input bus or the internal registers. Data on the A or B bus will be clocked into the registers as the appropriate clock pin goes High. Output Enable (nOEAB, (n$\overline{\text{OEBA}}$) and Select (n$\overline{\text{SAB}}$, n$\overline{\text{SBA}}$) pins are provided for bus management.

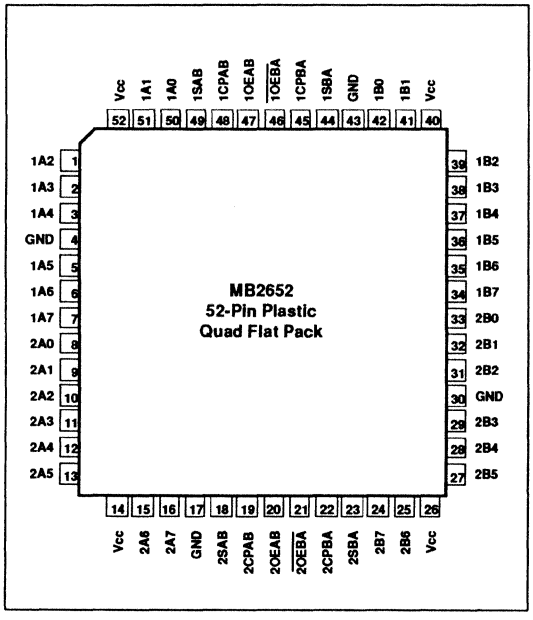
FEATURES

- Independent registers for A and B buses
- Multiple V_{CC} and GND pins minimize switching noise
- Power-up 3-state
- Power-up reset
- Multiplexed real-time and stored data
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015 and 200V per Machine Model

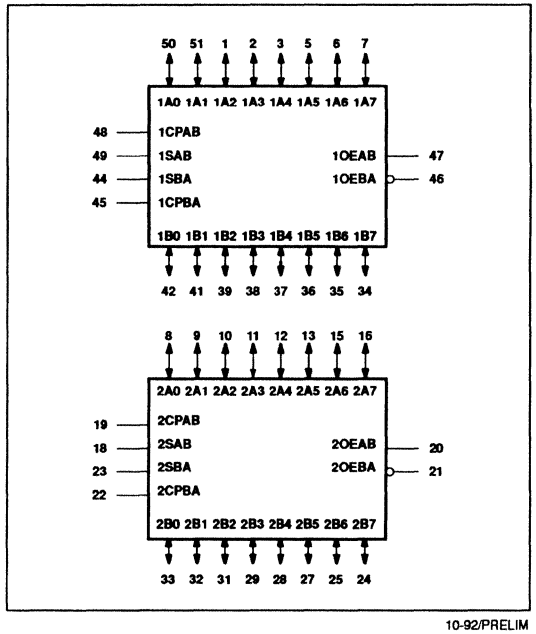
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2652B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



10-92/PRELIM

Product Spotlights

MB2821 – Dual 10-Bit D-Type Flip-Flop; Positive-Edge Trigger (3-State)

DESCRIPTION

The MB2821 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2821 has two 10-bit, edge triggered registers, with each register coupled to ten 3-State output buffers. The two sections of each register are controlled independently by the clock (nCP) and Output Enable ($n\overline{OE}$) control gates.

Each register is fully edge triggered. The state of each D input, one set-up time before the Low-to-High clock transition, is transferred to the corresponding flip-flop's Q output.

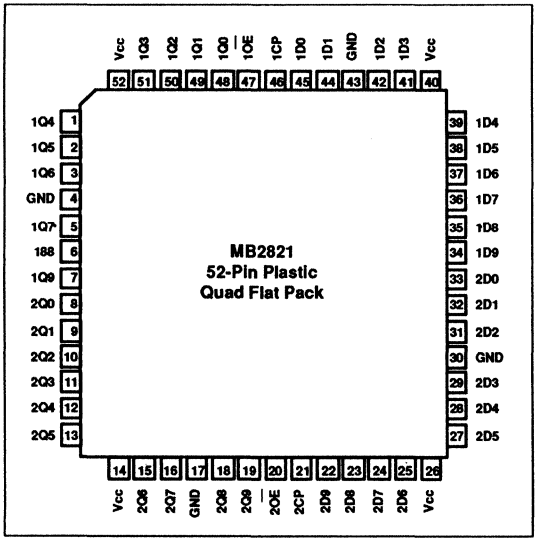
FEATURES

- 20-bit positive-edge triggered register
- Multiple V_{CC} and GND pins minimize switching noise
- Power-up reset
- Power-up 3-State
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

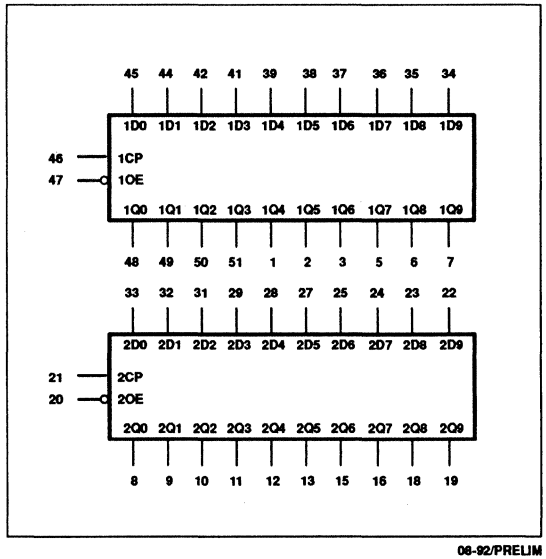
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2821B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



08-92/PRELIM

Product Spotlights

MB2823 – Dual 9-Bit D-type Flip-Flop with Reset and Enable (3-State)

DESCRIPTION

The MB2823 dual bus interface register is designed to eliminate the extra packages required to buffer existing registers and provide extra data width for wider data/address paths of buses carrying parity.

The MB2823 has two 9-bit wide buffered registers with Clock Enable (n$\overline{CE}$) and Master Reset (n$\overline{MR}$) which are ideal for parity bus interfacing in high microprogrammed systems.

The registers are fully edge-triggered. The state of each D input, one set-up time before the Low-to-High clock transition is transferred to the corresponding flip-flop's Q output.

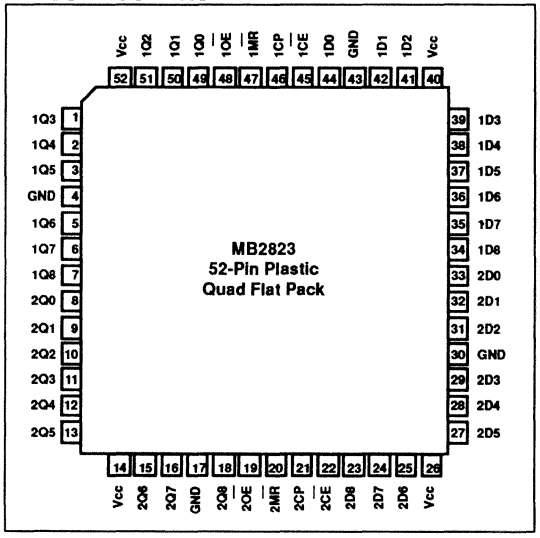
FEATURES

- Two sets of high speed parallel registers with positive edge-triggered D-type flip-flops
- Ideal where high speed, light loading, or increased fan-in are required with MOS microprocessors
- Power-up 3-State
- Power-up Reset
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17
- ESD protection exceeds 2000 V per MIL STD 883C Method 3015.6 and 200 V per Machine Model

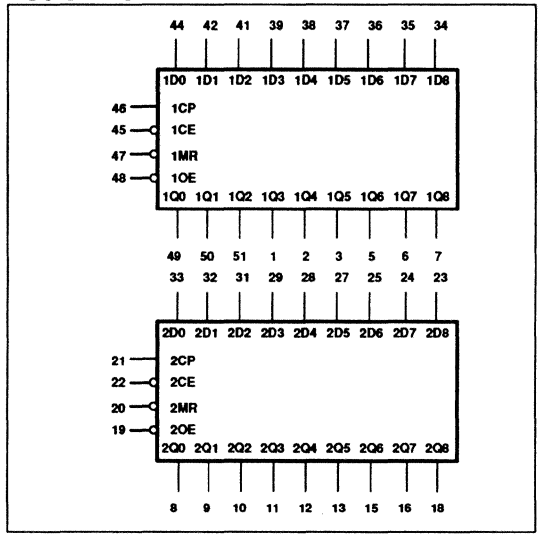
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	–40°C to +85°C	MB2823B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



02-92/OBJ

Product Spotlights

MB2827 – Dual 10-Bit Buffer/Line Driver Non-Inverting (3-State)

DESCRIPTION

The MB2827 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The MB2827 20-bit buffers provide high performance bus interface buffering for wide data/address paths or buses carrying parity. They have NOR Output Enables ($n\overline{OE}1$, $n\overline{OE}2$) for maximum control flexibility.

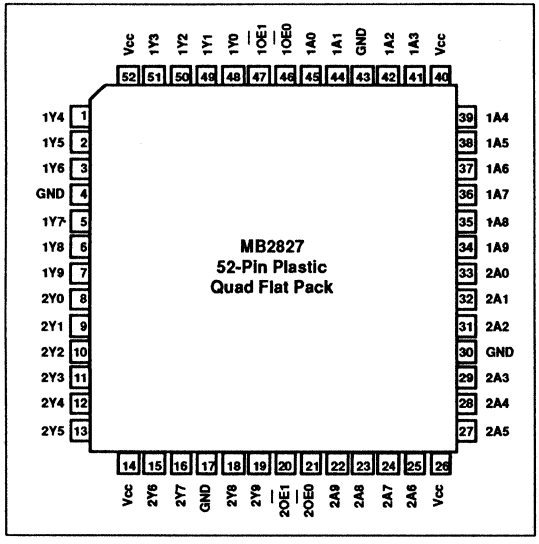
FEATURES

- Multiple V_{CC} and GND pins minimize switching noise
- 3-State output buffers
- Power-up 3-State
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6 and 200V per Machine Model

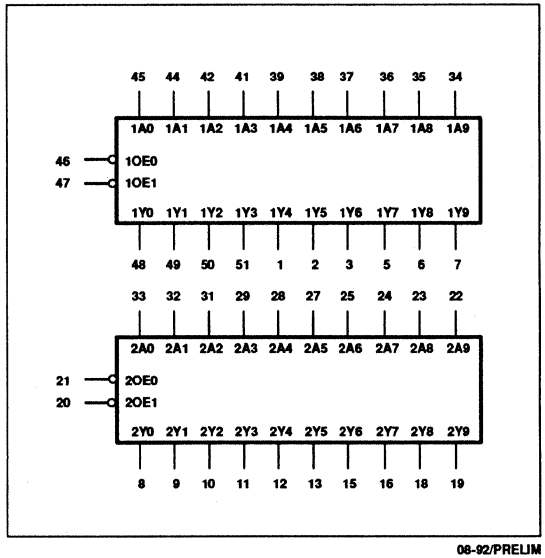
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2827B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



08-92/PRELIM

Product Spotlights

MB2841 – Dual 10-Bit Bus Interface Latch (3-State)

DESCRIPTION

The MB2841 Bus interface register is designed to provide extra data width for wider data/address paths of buses carrying parity.

The MB2841 consists of two sets of ten D-type latches with 3-State outputs. The flip-flops appear transparent to the data when Latch Enable (nLE) is High. This allows asynchronous operation, as the output transition follows the data in transition. On the nLE High-to-Low transition, the data that meets the setup and hold time is latched.

Data appears on the bus when the Output Enable ($n\overline{OE}$) is Low. When $n\overline{OE}$ is High the output is in the High-impedance state.

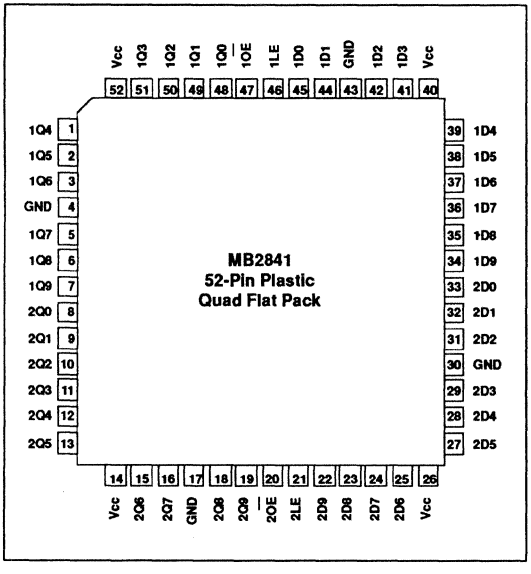
FEATURES

- High speed parallel latches
- Extra data width for wide address/data paths or buses carrying parity
- Power-up 3-State
- Power-up reset
- Ideal where high speed, light loading, or increased fan-in are required with MOS microprocessors
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per Jedec JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015 and 200V per Machine Model

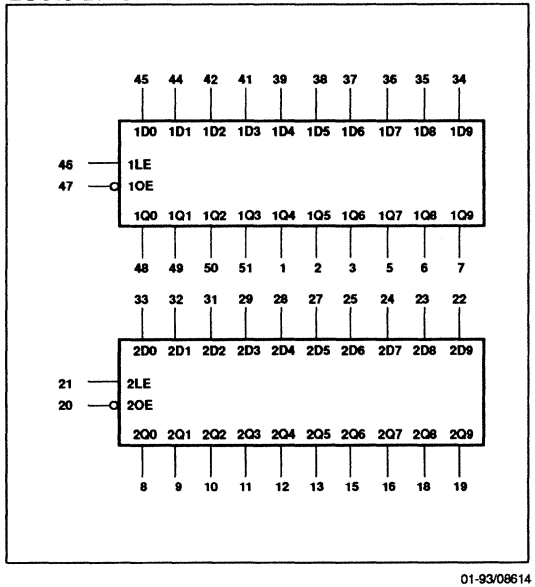
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
52-Pin Plastic Quad Flat Pack	-40°C to +85°C	MB2841B	1418B

PIN CONFIGURATION



LOGIC DIAGRAM



01-93/08614

Product Spotlights

PROGRAMMABLE LOGIC

100/10H20EV8-4 – 4.5ns ECL PAL Devices

DESCRIPTION

The 10H20EV8/10020EV8 is an ultra high-speed universal ECL PAL® device. Combining versatile output macrocells with a standard AND/OR single programmable array, this device is ideal in implementing a user's custom logic. The use of Philips state-of-the-art bipolar oxide isolation process enables the 10H20EV8/10020EV8 to achieve optimum speed in any design. The SNAP design software package from Philips simplifies design entry based upon Boolean or state equations.

The 10H20EV8/10020EV8 is a two-level logic element comprised of 11 fixed inputs, an input pin that can either be used as a clock or 12th input, 90 AND gates, and 8 Output Logic Macrocells. Each Output Macrocell can be individually configured as a dedicated input, dedicated output with polarity control, a bidirectional I/O, or as a registered output that has both output polarity control and feedback to the AND array. This gives the part the capability of having up to 20 inputs and eight outputs.

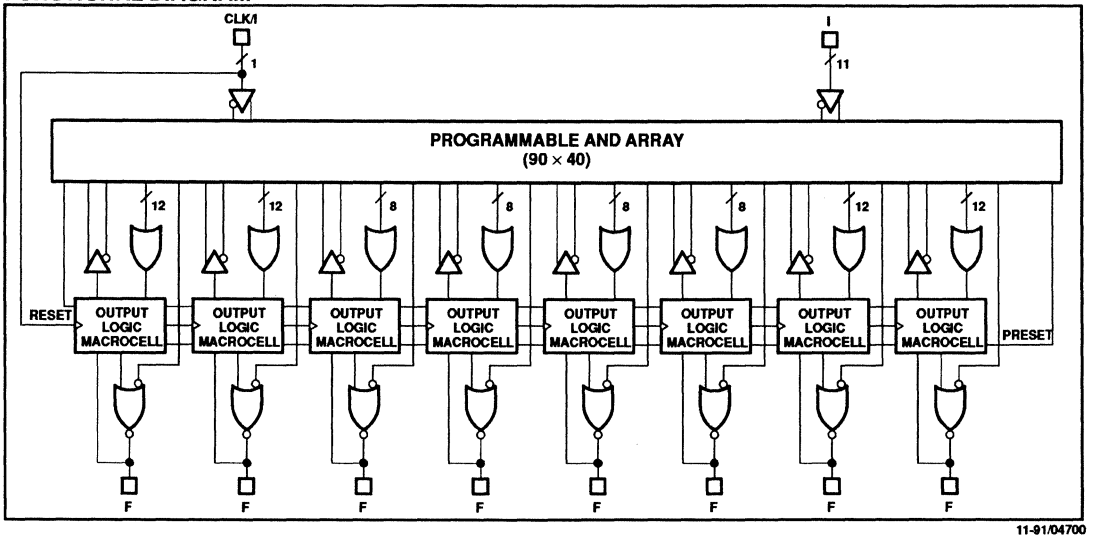
The 10H20EV8/10020EV8 has a variable number of product terms that can be OR'd per output. Four of the outputs have 12 AND terms available and the other four have 8 terms per output. This allows the designer the extra flexibility to implement those functions that he couldn't in a standard PAL device. Asynchronous Preset and Reset product terms are also included for system design ease. Each output has a separate output enable product term. Another feature added for the system designer is a power-up Reset on all registered outputs.

The 10H20EV8/10020EV8 also features the ability to Preload the registers to any desired state during testing. The Preload is not affected by the pattern within the device, so can be performed at any step in the testing sequence. This permits full logical verification even after the device has been patterned.

FEATURES

- Ultra high speed ECL device
  - t_{PD} = 4.5ns (max)
  - t_{IS} = 2.6ns (max)
  - t_{CKO} = 2.3ns (max)
  - f_{MAX} = 208MHz
- Universal ECL Programmable Array Logic
  - 8 user programmable output macrocells
  - Up to 20 inputs and 8 outputs
  - Individual user programmable output polarity
- Asynchronous Preset and Reset capability
- 10KH and 100K options
- Power-up Reset and Preload function to enhance state machine design and testing
- Design support provided via SNAP and other CAD tools
- Security fuse for preventing design duplication

FUNCTIONAL DIAGRAM



11-91/04700

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Product Spotlights

PHD16N8-5 – Programmable High-Speed Decoder Logic (16 × 16 × 8)

DESCRIPTION

The PHD16N8-5 is an ultra fast Programmable High-speed Decoder featuring a 5ns maximum propagation delay. The architecture has been optimized using Philips Components-Philips state-of-the-art bipolar oxide isolation process coupled with titanium-tungsten fuses to achieve superior speed in any design.

The PHD16N8-5 is a single level logic element comprised of 10 fixed inputs, 8 AND gates, and 8 outputs of which 6 are bidirectional. This gives the device the ability to have as many as 16 inputs. Individual 3-State control of all outputs is also provided.

The device is field-programmable, enabling the user to quickly generate custom patterns using standard programming equipment. Proprietary designs can be protected by programming the security fuse.

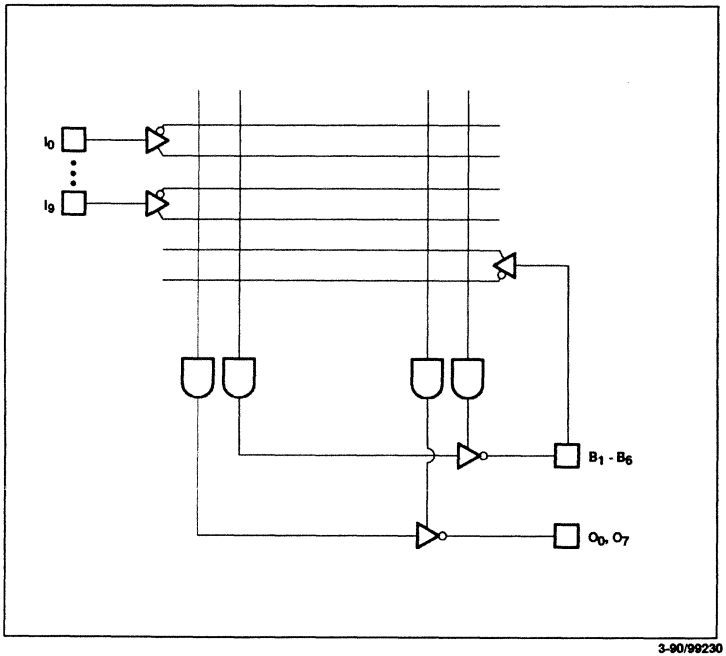
FEATURES

- Ideal for high speed system decoding
- Super high speed at 5ns t_{PD}
- 10 dedicated inputs
- 8 outputs
  - 6 bidirectional I/O
  - 2 dedicated outputs
- Security fuse to prevent duplication of proprietary designs.
- Individual 3-State control of all outputs
- Field-programmable on industry standard programmers
- Available in 20-pin Plastic DIP and 20-Pin PLCC

APPLICATIONS

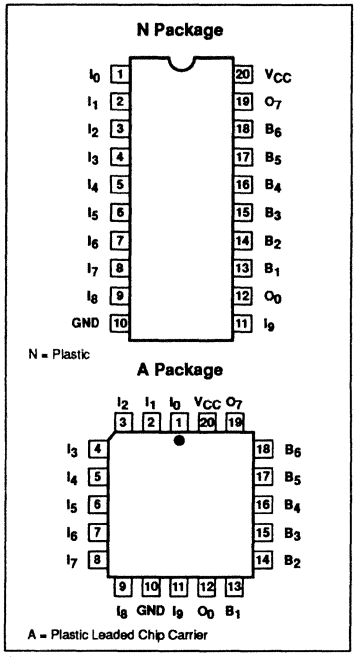
- High speed memory decoders
- High speed code detectors
- Random logic
- Peripheral selectors
- Machine state decoders
- Footprint compatible to 16L8
- Fuse/Footprint compatible to TIBPAD

FUNCTIONAL DIAGRAM



3-90/99230

PIN CONFIGURATION



The PHD48N22 Programmable High-Speed Decoder: Light Years Ahead of the Competition

The system-level performance of even 5ns PALs cannot match the speed of one PHD48N22

Philips Semiconductors' PHD48N22 is the industry's only programmable high-speed decoder with enough inputs and outputs to support the complete system decoder needs of a 32-bit or 64-bit microprocessor system. This device offers a unique combination of capabilities which makes it ideal for use in workstations utilizing high-speed RISC and CISC processors, some personal computers, and other memory– and I/O-intensive applications requiring numerous address lines.

The very fast 7.5 nanosecond speed of the PHD48N22, coupled with an extra-wide gate structure, offers customers two distinct advantages: they can use the part to increase the overall speed of their system; or they can economize by buying slower, less expensive memory without negatively impacting system performance.

Although conventional PAL®s and PAL-type devices are small and fast, they lack the power and flexibility of the PHD48N22. At least two PALs are required to decode 36 inputs and up to four are needed to handle up to 20 outputs. Plus, the connection of multiple PAL devices generates an undesirable delay while information travels from input to output. This means that the system-level performance of even 5ns PALs cannot match the speed of one PHD48N22.

Having all address lines routed into one part rather than multiple devices provides design efficiency. Today's popular microprocessors have 32 address lines, as well as several control lines. Decoding may require 36 or more inputs to address a byte within a 4 gigabyte range (or 232). In just 7.5 nanoseconds, a single PHD48N22 device can select any byte within that 4 gigabyte range.

This capability of the PHD48N22 provides a distinct advantage. The more complicated multiple-PAL design approach may require that addresses be grouped within certain locations, which wastes memory locations and

prevents them from being used for other purposes. With the PHD48N22 chip, however, designers can memory map while still fully utilizing all surrounding address space.

Plus, the bidirectional I/O structure of the PHD48N22 enables up to 48 inputs or 22 high-drive outputs – a capability PALs cannot match. Such flexibility is critical in applications which require the decoding of many lines.

Multiple-chip designs also require more board space and consume more power. The high level of integration of the PHD48N22 decoder simplifies the layout of the PC board and reduces assembly cost.

The PHD48N22 decoder is available in production quantities and has full programmer support. Customers can use industry-standard programming tools, including ABEL and CUPL. Two additional software packages, SLICE (offered free of charge) and SNAP, are also available now from Philips Semiconductors.

PAL is a registered trademark of AMD/MMI.

Product Spotlights

PHD48N22-7 – 7.5ns High Speed Decoder

DESCRIPTION

The PHD48N22–7 is an ultra fast Programmable High-speed Decoder featuring a 7.5ns maximum propagation delay. The architecture has been optimized using Philips state-of-the-art bipolar oxide isolation process coupled with titanium-tungsten fuses to achieve superior speed in any design.

The PHD48N22–7 is a two level logic element comprised of 36 fixed inputs, 73 AND gates, 10 outputs, and 12 bidirectional I/Os. This gives the device the ability to have as many as 48 inputs. Individual 3-State control of all outputs is also provided.

The device is field-programmable, enabling the user to quickly generate custom patterns using standard programming equipment. Proprietary designs can be protected by programming the security fuse.

The SLICE and SNAP software packages from Philips Components–Philips support easy design entry for the PHD48N22–7 as well as other PLD devices.

Order codes are listed below.

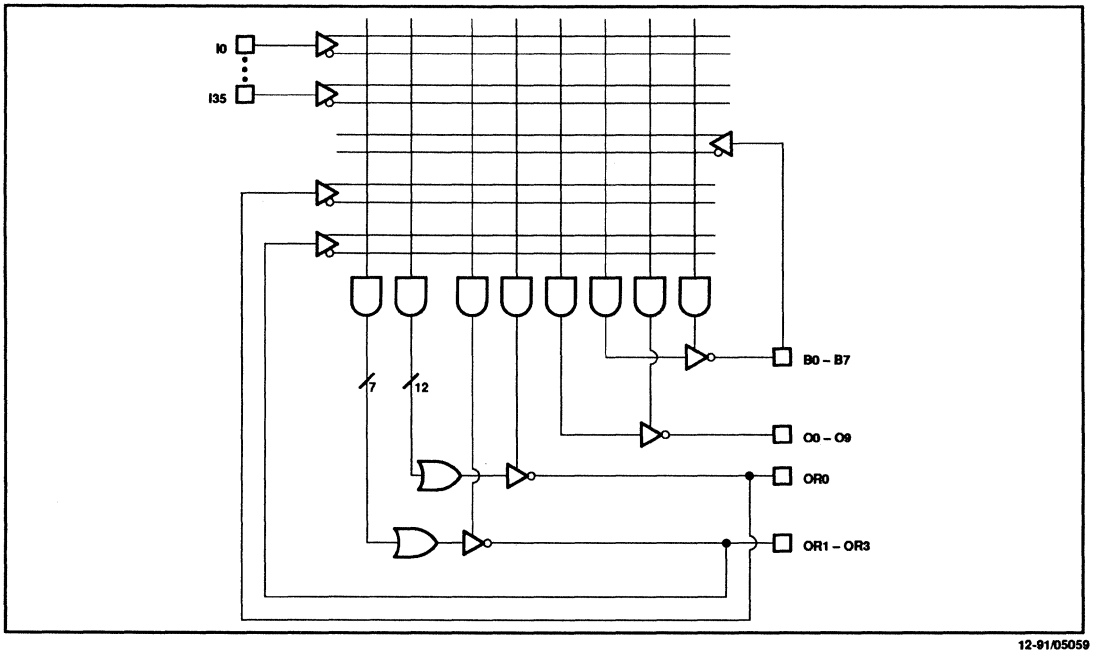
FEATURES

- Ideal for high speed system decoding
- Super high speed at 7.5ns t_{PD}
- 36 dedicated inputs
- 22 outputs
  - 12 bidirectional I/O
  - 10 dedicated outputs
- Security fuse to prevent duplication of proprietary designs.
- Individual 3-State control of all outputs
- Field-programmable on industry standard programmers
- Available in 68-Pin Plastic Leaded Chip Carrier (PLCC)

APPLICATIONS

- High speed memory decoders
- High speed code detectors
- Random logic
- Peripheral selectors
- Machine state decoders

FUNCTIONAL DIAGRAM



12-91/05059

Product Spotlights

PL22V10-10/-12/-15, PL22V10I15 – CMOS Programmable Electrically Erasable Logic Device

DESCRIPTION

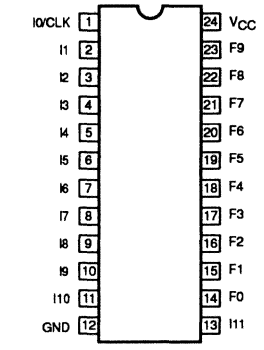
The Philips Semiconductors PL22V10-10, PL22V10-12 and PL22V10-15 are CMOS programmable electrically erasable logic devices that provide a high-performance, low-power, reprogrammable, and architecturally enhanced alternative to early generation programmable logic devices (PLDs). Designed in advanced CMOS EEPROM technology, the PL22V10 rivals speed parameters of comparable bipolar PLDs while providing a dramatic improvement in active power consumption. The EE reprogrammability of the PL22V10 allows cost effective plastic packaging, low risk inventory, reduced development and retrofit costs, and enhanced testability to ensure 100% field programmability and function. The PL22V10's flexible architecture offers complete function and JEDEC-file compatibility with the bipolar AmPAL22V10 and the CMOS PALC22V10. Applications for the PL22V10 include: replacement of random SSI/MSI logic circuitry and user customized sequential and combinatorial functions such as counters, shift registers, state machines, address decoders, multiplexers, etc. Development and programming support for the PL22V10 is provided by Philips Semiconductors and third-party manufacturers.

FEATURES

- Advanced CMOS EEPROM technology
- Ultra high performance
  - 10ns, 12ns, 15ns (t_{PD}) commercial versions
  - 15ns (t_{PD}) industrial version
  - f_{MAX} as fast as 83.3MHz
- Available in Dual In-Line, Small Outline Large, and Plastic Leaded Chip Carrier packages
- Low power consumption
  - 110mA + 0.5mA/MHz max
- EE reprogrammability
  - Low-risk reprogrammable inventory
  - Superior programming and functional yield
  - 100% testable
  - Erases and programs in seconds
  - 100 guaranteed erase cycles
- Development and programming support
  - Third-party software and programmers
  - SLICE development software
- Architectural flexibility
  - 132 product term x 44 input AND array
  - Up to 22 inputs and 10 outputs
  - Variable product term distribution (8 to 16 per output) for greater logic flexibility
  - Independently programmable 4-configuration I/O macrocells
  - Synchronous preset, asynchronous clear
  - Independently programmable output enables
- Application versatility
  - Pin-for-pin and JEDEC-file compatible with the bipolar AmPAL22V10, CMOS PALC22V10 and PEEL22CV10A

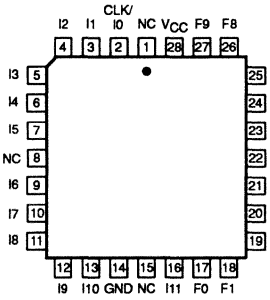
PIN CONFIGURATIONS

D and N Packages



N = Plastic Dual In-Line Package (300mil-wide)
D = Plastic Small Outline Large (300mil-wide) Package

A Package



A = Plastic Leaded Chip Carrier

09-92/07707

Product Spotlights

PLC18V8Z25/35/18V8ZI – Zero Standby Power Universal PAL® Devices

DESCRIPTION

The PLC18V8Z35 and PLC18V8ZI are universal PAL-type devices featuring high performance and virtually zero-standby power for power sensitive applications. They are reliable, user-configurable substitutes for discrete TTL/CMOS logic. While compatible with TTL and HCT logic, the PLC18V8ZI can also replace HC logic over the V_{CC} range of 4.5 to 5.5V.

The PLC18V8Z is a two-level logic element comprised of 10 inputs, 74 AND gates (product terms) and 8 output Macro cells.

Each output features an "Output Macro Cell" which can be individually configured as a dedicated input, a combinatorial output, or a registered output with internal feedback. As a result, the PLC18V8Z is capable of emulating all common 20-pin PAL devices to reduce documentation, inventory, and manufacturing costs.

A power-up reset function and a Register Preload function have been incorporated in the PLC18V8Z architecture to facilitate state machine design and testing.

With a standby current of less than 100µA and active power consumption of 1.5mA/MHz, the PLC18V8Z is ideally suited for power sensitive applications in battery operated/backed portable instruments and computers.

The PLC18V8Z is also processed to industrial requirements for operation over an extended temperature range of -40°C to +85°C and supply voltage of 4.5V to 5.5V.

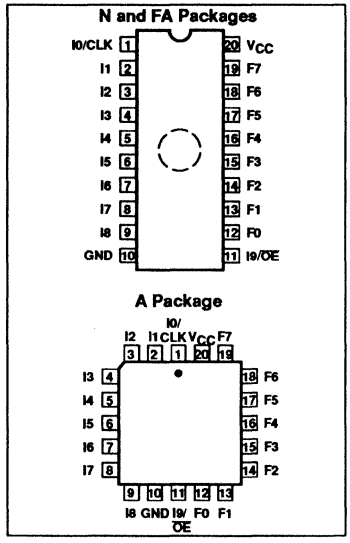
FEATURES

- 20-pin Universal Programmable Array Logic
- Virtually zero standby power
- Functional replacement for Series 20 PAL devices
  - I_{OL} = 24mA
- High-performance CMOS EPROM cell technology
  - Erasable
  - Reconfigurable
  - 100% testable
- 25/35ns propagation delay (comm)
- 25/40ns propagation delay (Industrial)
- Up to 18 inputs and 8 input/output macro cells
- Programmable output polarity
- Power-up reset on all registers
- Register preload capability
- Synchronous Preset/Asynchronous Reset
- Security fuse to prevent duplication of proprietary designs
- Design support provided using Philips SLICE or SIMPALII software development packages and other CAD tools for PLDS
- Available in 300mil-wide DIP with quartz window, plastic DIP (OTP) or PLCC (OTP)
- Available Military qualified

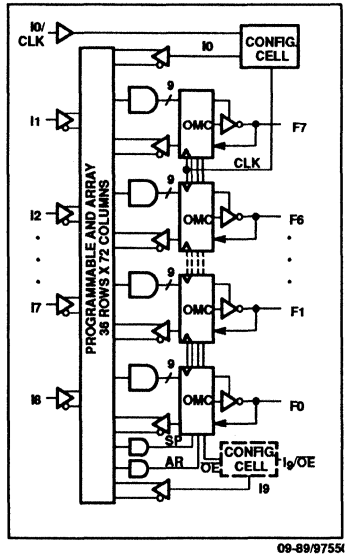
APPLICATIONS

- Battery powered instruments
- Laptop and pocket computers
- Industrial control
- Medical Instruments
- Portable communications equipment

PIN CONFIGURATIONS



FUNCTIONAL DIAGRAM



09-89/9755

Break from Tradition with the Most Versatile PLD on the Market

A single PLC42VA12 can easily replace a number of traditional PLDs without sacrificing speed or performance.

Designers seeking a programmable logic device (PLD) with intelligence, flexibility and power need look no further. Philips Semiconductors' unique Output Macro Cell (OMC) architecture and improved user-programmable options have given the PLC42VA12 far greater flexibility than traditional PLDs.

The PLC42VA12 can be programmed to perform whatever functions may be needed, including synchronous and asynchronous clocking functions on the same device. Thus, a single PLC42VA12 can easily replace a number of traditional PLDs without sacrificing speed or performance.

This device has become the popular choice of many designers due to its extreme flexibility and functionality. It is particularly well suited to applications requiring registers and combinatorial logic within the same part, and applications involving independent, random clocking. Furthermore, the PLC42VA12 can function as a double-density 22V10, often replacing two 22V10s with one 24-pin package. Or it can serve as a 20RA10 with 64 input-wide OR functions and product term sharing – capable of handling the most complex asynchronous timing/control or decode functions. And by improving upon and combining the architectures of both the 22V10 and 20RA10, Philips Semiconductors doubled the density of either device.

The PLC42VA12 has 10 registers which can be either J-K, D, or T (toggle), so designers can easily build a wide variety of state machines. The OMC architecture increases logic flexibility by providing the ability to create a fully functional buried register which operates independently from the combinatorial I/O. Each has its own separate input and feedback paths from the AND array, giving them total autonomy.

With multiple programmable clock sources, the PLC42VA12 offers one external clock source in addition to

10 array-driven clocks. Each OMC can be individually programmed to enable its product term clock. This disables the external clock and provides each individual register with event-driven clocking capability.
Designers can use this feature to support multiple state machines, clocked at different rates, all on a single chip. It also enables the collection of large amounts of random logic, including 10 separately clocked flip-flops.

In additional to its wide range of functionality, the hidden beauty of this part is that it does not require any additional investment in new programming equipment or training. It uses the same industry-standard software tools designers are already using with their traditional PLDs, as well as programming instructions that they are already familiar with. Philips Semiconductors also supplies two powerful software packages, SLICE (available at no cost) and SNAP.

Regardless of the application – from instrumentation and computers to industrial control and telecommunications, the PLC42VA12 is the perfect building block for designers who need power, intelligence and flexibility.

Product Spotlights

PLC42VA12 – CMOS Programmable Logic Sequencer (42 × 105 × 12)

DESCRIPTION

The new PLC42VA12 CMOS PLD from Philips exhibits a unique combination of the two architectural concepts that revolutionized the PLD marketplace.

The Philips unique Output Macro Cell (OMC) embodies all the advantages and none of the disadvantages associated with the "V" type Output Macro Cell devices. This new design, combined with added functionality of two programmable arrays, represents a significant advancement in the configurability and efficiency of multi-function PLDs.

The most significant improvement in the Output Macro Cell structure is the implementation of the register bypass function. Any of the 10 J-K/D registers can be individually bypassed, thus creating a combinatorial I/O path from the AND array to the output pin. Unlike other "V" type devices, the register in the PLC42VA12 Macro Cell remains fully functional as a buried register. Both the combinatorial I/O and buried register have separate input paths (from the AND array). In most V-type architectures, the register is lost as a resource when the cell is configured as a combinatorial I/O. This feature provides the capability to operate the buried register independently from the combinatorial I/O.

The PLC42VA12 is an EPROM-based CMOS device. Designs can be generated using Philips SNAP 16 design software or one of several other commercially available JEDEC standard PLD design software packages.

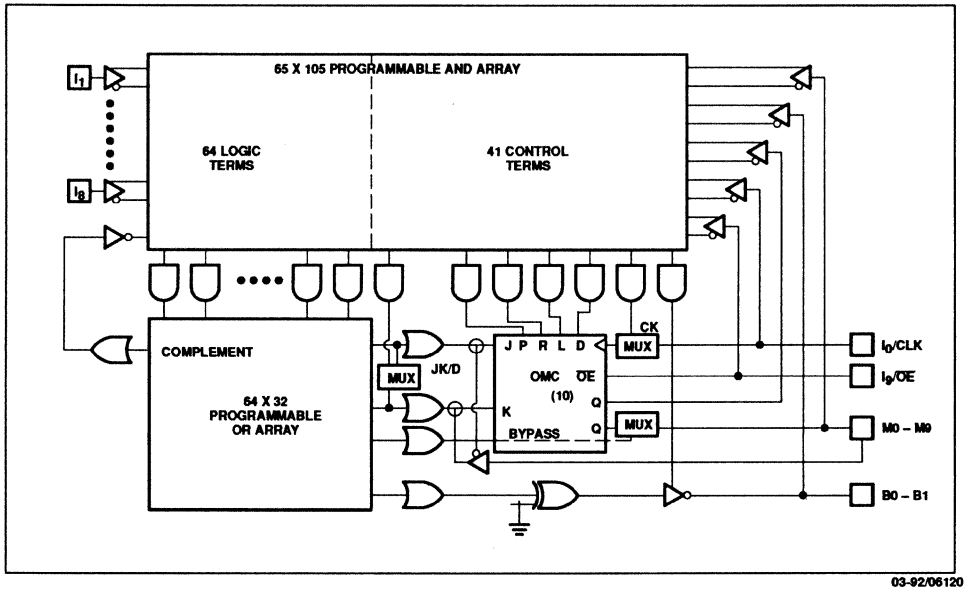
FEATURES

- High-speed EPROM-based CMOS Multi-Function PLD
  - Super set of 22V10, 32VX10 and 20RA10 PAL® ICs
- Two fully programmable arrays eliminate "P-term Depletion"
  - Up to 64 P-terms per OR function
- Improved output macro cell structure
  - Individually programmable as:
    - * Registered output with feedback
    - * Registered input
    - * Combinatorial I/O with buried register
  - Bypassed registers are 100% functional with separate input and feedback paths
  - Individual Output Enable control functions
    - * From pin or AND array
- Eleven clock sources
- Register preload and diagnostic test mode features
- Security fuse

APPLICATIONS

- Mealy or Moore State Machines
  - Synchronous
  - Asynchronous
- Multiple, independent State Machines
- 10-bit ripple cascade
- Sequence recognition
- Bus protocol generation
- Industrial control
- A/D scanning

BLOCK DIAGRAM



03-92/06120

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Product Spotlights

PLUS105-55 – 55MHz Programmable State Machine

DESCRIPTION

The PLUS105-55 is a bipolar programmable state machine of the Mealy type. Both the AND and the OR array are user- programmable. All 48 AND gates are connected to the 16 external dedicated inputs (I0 - I15) and to the feedback paths of the 6 buried State Registers (Q_{P0}-Q_{P5}). Because the OR array is programmable, any one or all of the 48 transition terms can be connected to any or all of the State and Output Registers.

All state transition terms can include True, False and Don't Care states of the controlling state variables. A Complement Transition Array supports complex IF-THEN-ELSE state transitions with a single product term.

The PLUS105-55 device features edge-triggered, J-K flip-flops, which provide the added flexibility of the toggle function which is indeterminate on S-R flip-flops. Because the J-K function is a superset of the S-R flip-flop function, the PLUS105-55 is backward compatible with all 105-type devices that have S-R flip-flops. Asynchronous Preset/Output Enable functions are available.

The PLUS105-55 is pin-for-pin and software compatible with Philips PLS105 and PLS105A Logic Sequencers, as well as other commercially available 105-type programmable logic devices.

To facilitate testing of state machine designs, diagnostic mode features for register preset and buried state register observability have been incorporated into the PLUS105-55 device architecture.

Ordering codes are listed in the Ordering Information Table.

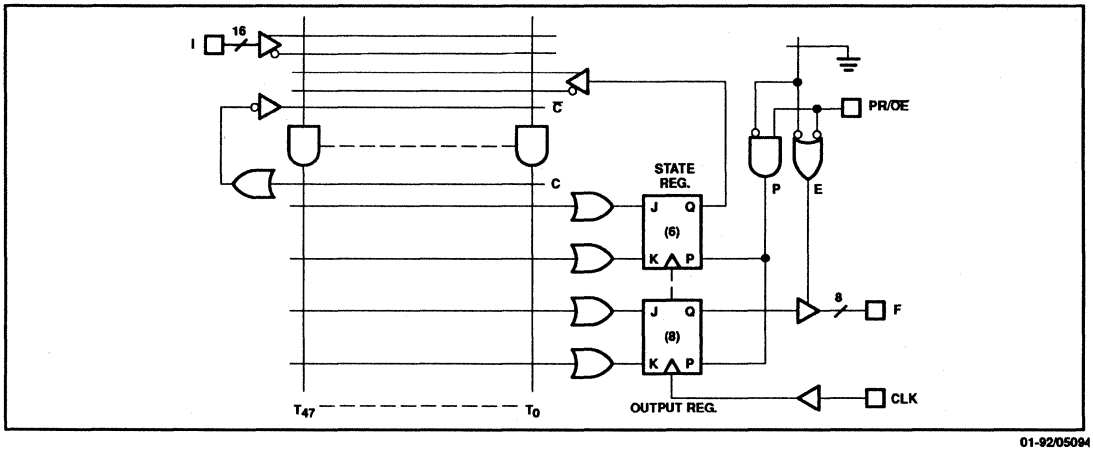
FEATURES

- 55MHz operating frequency
  - 71.4MHz clock rate
  - No OR term loading restrictions
- Available in 300mil skinny DIP, 600mil-wide DIP, and PLCC packages
- Pin and software compatible with other commerically available 105 sequencers
- 16 input variables
- 8 output functions
- 48 transition terms
- 6-bit State Register
- 8-bit Output Register
- Transition complement array
- Positive edge-triggered clocked J-K (or S-R) flip-flops
- Security fuse
- Programmable Asynchronous Preset or Output Enable
- Power-on preset to (all "1"s) of internal registers
- Power dissipation: 800mW (typ.)
- TTL compatible
- Single +5V supply
- 3-State outputs

APPLICATIONS

- Interface protocols
- Sequence detectors
- Peripheral controllers
- Timing generators
- Sequential circuits
- Elevator controllers
- Security Locking systems
- Counters
- Shift registers

FUNCTIONAL DIAGRAM



01-92/05094

Product Spotlights

PLUS153/173-10 – 10ns Programmable Logic Arrays

DESCRIPTION

The PLUS153-10 and PLUS173–10 PLDs are high speed, combinatorial Programmable Logic Arrays. The Philips state-of-the-art Oxide Isolated Bipolar fabrication process is employed to produce maximum propagation delays of 10ns or less.

The 24-pin PLUS173 and the 20-pin PLUS153 devices have a programmable AND array and a programmable OR array. Unlike PAL® devices, 100% product term sharing is supported. Any of the 32 logic product terms can be connected to any or all of the 10 output OR gates. Most PAL ICs are limited to 7 AND terms per OR function; the PLUS153/173 devices can support up to 32 input wide OR functions.

The polarity of each output is user-programmable as either Active-High or Active-Low, thus allowing AND-OR or AND-NOR logic implementation. This feature adds an element of design flexibility, particularly when implementing complex decoding functions.

The PLUS153/173 devices are user-programmable using one of several commercially available, industry standard PLD programmers.

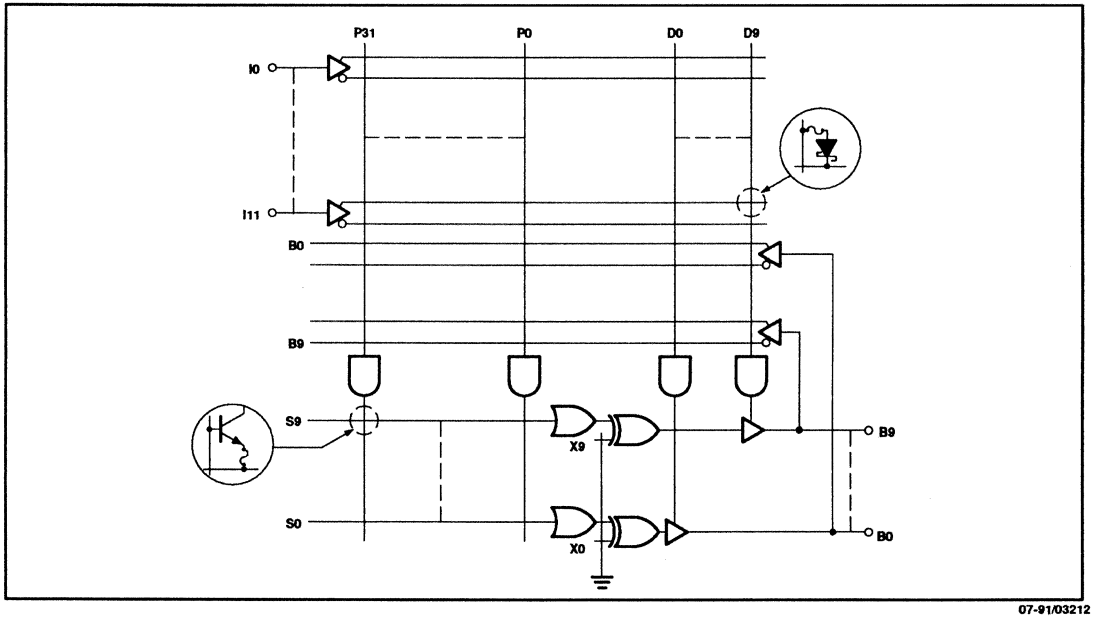
FEATURES

- I/O propagation delays
  - 10ns (worst case)
- Functional superset of 16L8, 20L10 and most other 20-/24-pin combinatorial PAL devices
- Two programmable arrays
  - Supports 32 input wide OR functions
- 8 or 12 inputs
- 10 bi-directional I/O
- 42 AND gates
  - 32 logic product terms
  - 10 direction control terms
- Programmable output polarity
  - Active-High or Active-Low
- Security fuse
- 3-State outputs
- Power dissipation: 850mW (typ.)
- TTL Compatible

APPLICATIONS

- Random logic
- Code converters
- Fault detectors
- Function generators
- Address mapping
- Multiplexing

FUNCTIONAL DIAGRAM



07-91/03212

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Product Spotlights

PLUS173-10 – Programmable Logic Array (22 X 42 X 10)

DESCRIPTION

The PLUS173-10 PLD is a high speed, combinatorial Programmable Logic Array. The Philips state-of-the-art Oxide Isolated Bipolar fabrication process is employed to produce maximum propagation delays of 10ns or less.

The 24-pin PLUS173-10 device has a programmable AND array and a programmable OR array. Unlike PAL® devices, 100% product term sharing is supported. Any of the 32 logic product terms can be connected to any or all of the 10 output OR gates. Most PAL ICs are limited to 7 AND terms per OR function; the PLUS173-10 device can support up to 32 input wide OR functions.

The polarity of each output is user-programmable as either Active-High or Active-Low, thus allowing AND-OR or AND-NOR logic implementation. This feature adds an element of design flexibility, particularly when implementing complex decoding functions.

The PLUS173-10 device is user-programmable using one of several commercially available, industry standard PLD programmers.

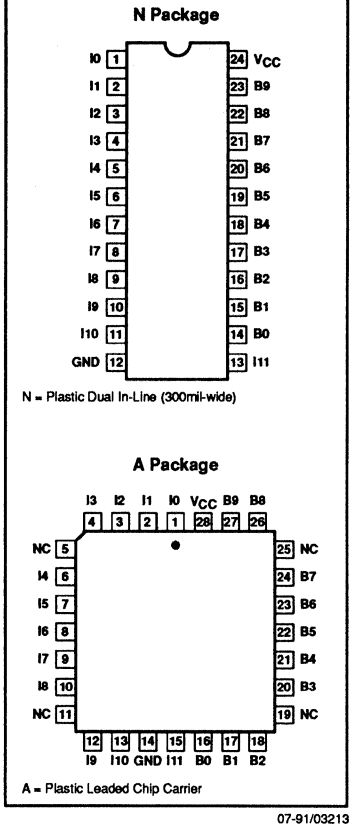
FEATURES

- I/O propagation delays
  - 10ns (worst case)
- Functional superset of 20L10 and most other 24-pin combinatorial PAL devices
- Two programmable arrays
  - Supports 32 input wide OR functions
- 12 inputs
- 10 bi-directional I/O
- 42 AND gates
  - 32 logic product terms
  - 10 direction control terms
- Programmable output polarity
  - Active-High or Active-Low
- Security fuse
- 3-State outputs
- Power dissipation: 850mW (typ.)
- TTL Compatible

APPLICATIONS

- Random logic
- Code converters
- Fault detectors
- Function generators
- Address mapping
- Multiplexing

PIN CONFIGURATIONS



07-91/03213

ORDERING INFORMATION

DESCRIPTION	t_{PD} (MAX)	ORDER CODE
24-Pin Plastic Dual In-Line 300mil-wide	10ns	PLUS173–10N
28-Pin Plastic Leaded Chip Carrier	10ns	PLUS173–10A

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Product Spotlights

PLUS405-37/-45/-55 – Field-Programmable Logic Sequencers (16 × 64 × 8)

DESCRIPTION

The PLUS405 devices are bipolar, programmable state machines of the Mealy type. Both the AND and the OR array are user-programmable. All 64 AND gates are connected to the 16 external dedicated inputs (I_0 - I_{15}) and to the feedback paths of the 8 on-chip State Registers (Q_{P0} - Q_{P7}). Two complement arrays support complex IF-THEN-ELSE state transitions with a single product term (input variables C_0, $C_{1)}$.

All state transition terms can include True, False and Don't Care states of the controlling state variables. All AND gates are merged into the programmable OR array to issue the next-state and next-output commands to their respective registers. Because the OR array is programmable, any one or all of the 64 transition terms can be connected to any or all of the State and Output Registers.

All state (Q_{P0} - Q_{P7}) and output (Q_{F0} - Q_{F7}) registers are edge-triggered, clocked J-K flip-flops, with Asynchronous Preset and Reset options. The PLUS405 architecture provides the added flexibility of the J-K toggle function which is indeterminate on S-R flip-flops. Each register may be individually programmed such that a specific Preset- Reset pattern is initialized when the initialization pin is raised to a logic level "1". This feature allows the state machine to be asynchronously initialized to known internal state and output conditions prior to proceeding through a sequence of state transitions. Upon power-up, all registers are unconditionally preset to "1". If desired, the initialization input pin (INIT) can be converted to an $\overline{\text{Output Enable}}$ ($\overline{\text{OE}}$) function as an additional user-programmable feature.

Availability of two user-programmable clocks allows the user to design two independently clocked state machine functions consisting of four state and four output bits each.

FEATURES

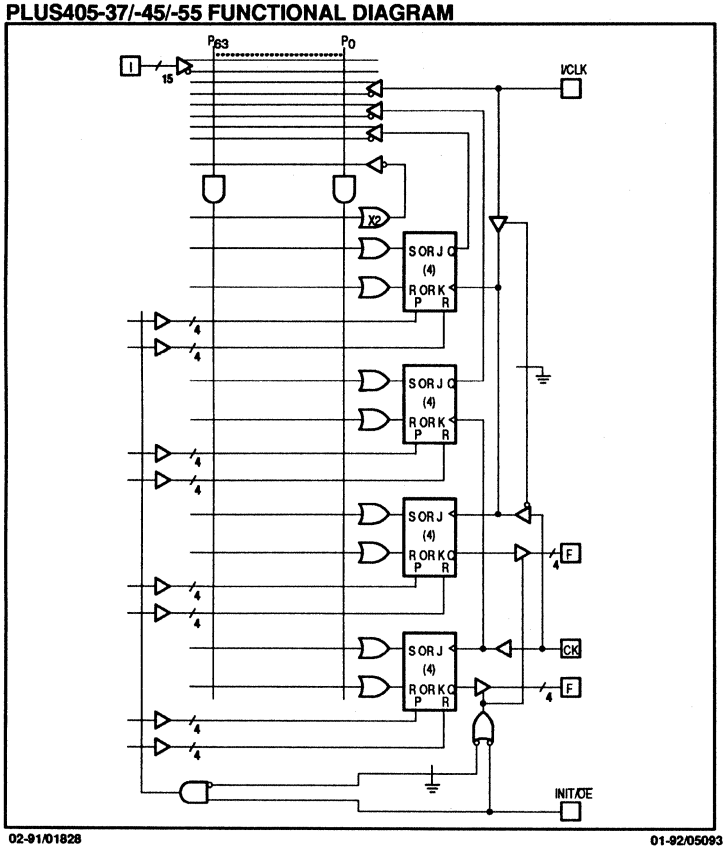
- 50, 58 and 62.5MHz minimum guaranteed clock rates
- 37, 45 and 55MHz minimum guaranteed operating frequencies ($1/(t_{IS1} + t_{CKO1})$)
- Functional superset of PLS105/105A
- Field-programmable (Ti-W fusible link)
- 16 input variables
- 8 output functions
- 64 transition terms
- 8-bit State Register
- 8-bit Output Register
- 2 transition Complement Arrays
- Multiple clocks
- Programmable Asynchronous Initialization or $\overline{\text{Output Enable}}$
- Power-on preset of all registers to "1"
- "On-chip" diagnostic test mode features for access to state and output registers
- 950mW power dissipation (typ.)
- TTL compatible
- J-K or S-R flip-flop functions
- Automatic "Hold" states
- 3-State outputs

APPLICATIONS

- Interface protocols
- Sequence detectors
- Peripheral controllers
- Timing generators
- Sequential circuits
- Elevator contollers
- Security locking systems
- Counters
- Shift registers

Product Spotlights

PLUS405-37/-45/-55 FUNCTIONAL DIAGRAM



02-91/01828 01-92/05093

Product Spotlights

PML2552 – Programmable Macro Logic

FEATURES

- Full connectivity
- Scan test
- Power down mode
- Power on reset
- 100% testable
- High-Speed and Standard versions
- SNAP development system
  - Supports third-party schematic entry formats
  - Macro library
  - Versatile netlist format for design portability
  - Logic, timing, and fault simulation
- TTL compatible
- Power dissipation (TTL) = 630mW
- Power dissipation (CMOS) = 525mW
- Security fuse
- Reprogrammable

STRUCTURE

- 112 possible foldback NAND gates:
  - 96 internal NAND
  - 16 from the I/O macros
- 114 additional logic terms
- 53 possible inputs (with programmable polarity)
  - 29 dedicated inputs
  - 24 bidirectional I/Os
- 24 bidirectional pins
- 52 flip-flops
- 24 possible outputs with individual Output Enable control (8 with programmable polarity)
- Multiple independent clocks
- 20 Buried JK-type flip-flops with foldback (JKFFs):
  - 10 JKFFs with one shared preset signal and one shared clocked signal originating from the clock array.
  - 10 JKFFs with 10 independent clock signals originating from the clock array and 10 independent clear signals
- 258 inputs per NAND gate
- Bypassable Input D-type flip-flop (DFFs)/Combinatorial Inputs:
  - 16 DFFs/combinatorial inputs
  - DFFs clocked in two groups of eight
  - DFFs not bypassed in unprogrammed state
  - Independent bypass fuse on each DFF
- Inputs/bypassable D-type flip-flop outputs/foldback NAND gates:
  - 16 output DFFs/combinatorial inputs/outputs with individual Output Enable control
  - DFFs clocked in two groups of eight
  - DFFs not bypassed in unprogrammed state
  - Independent bypass fuse on each DFF
  - The DFF can be used as an internal DFF or an internal foldback NAND gate.
- Combinatorial inputs:
  - 9 dedicated inputs to the NAND array
  - 3 inputs optional to NAND array and/or clock array
  - 1 input optional to NAND array and/or clock array, and/or clock of Input D Flip-Flops (Group B)
- Separate clock array:
  - Separate clock array for JKFFs clock inputs
  - 4 inputs to clock array originate from NAND array
  - 4 inputs (with programmable polarity) directly from input pins
  - 10 inputs from Q outputs of JKFFs with clear
- Dedicated clocks:
  - One dedicated clock for input DFFs (Group A)
  - Two dedicated clocks for output DFFs
- Scan test feature:
  - Scan chain is implemented through the 20 buried JKFFs and 16 output DFFs
  - Pins SCI, SCM, and CKE1 are used to operate the scan test
- Power down mode
  - Dedicated pin (PD) freezes the circuit when brought to logic "1". The circuit remains in the same state prior to the logic "0" to logic "1" transition of the "PD" pin.
  - When in the power down mode, the SCI pin acts as the 3-State pin for the 24 outputs.
- Power on reset:
  - All flip-flops (16 input DFFs, 20 buried JKFFs, and 16 output DFFs) are reset to logic "0" after V_{CC} power on.

PROPAGATION DELAYS

- Delay per internal NAND gate = 15ns (typ)

04-91/02219

PML is a trademark of North American Philips Corporation.

Product Spotlights

PML2852 – Programmable Macro Logic

DESCRIPTION

The Philips family of Programmable Macro Logic is optimized for handling wide buses, wide datapaths, and multiple-port applications with the highest throughputs among high density PLDs and FPGAs. The PML2852 now expands Philips CMOS PML product offering into the 32-bit arena. Fabricated with a high-performance EPROM process, the PML2852 is ideal in today's bus interface control, microprocessor peripheral control, memory interface, communications, instrumentation, and industrial control. It is capable of replacing large amounts of TTL SSI and MSI logic, and literally integrates a complete custom microcontroller.

The PML2852 incorporates the folded NAND array architecture, which provides 100% connectivity to eliminate the routing restrictions associated with other high density PLD/FPGA architectures. The array of wide-input NAND gates enables the designer to implement any wide-gate logic function, from decoders to multiplexers, with no more than two gate-level delays. It also allows implementation of multiple levels of logic within the chip, without wasting I/O pins. Its flexible and potent flip-flop building blocks provide for high throughput data storage, high speed state machines, and fast counters.

The PML2852 also incorporates two unique features: scan test and power down. With user-controlled scan test, the PML2852 significantly reduces system functional test time by providing access to all of its internal registers. In the user-controlled power down mode, the PML2852 power dissipation is reduced to a mere 52mW, making it ideal for laptop or pocket computers and handheld instruments.

Thanks to its high density and its flexible architecture, the PML2852 provides **instant gate array** capabilities for all general purpose logic integration. As such, the PML2852 eliminates the NRE costs, risks, inventory problems, and hard to use design tools associated with semicustom and full custom approaches. It allows the designer to quickly bring concepts to silicon for faster learning cycles and a much shorter time to market. Functional prototypes are available within minutes.

The SNAP development software is designed to fully exploit the flexibility and density of the PML2852. It accepts a variety of design entry formats, including schematic, logic equations, and state equations in any combination for maximum flexibility. Its powerful features, but ease of use, allows literally push-button operation.

Together, the PML2852 and SNAP constitute the designer's personal **desktop silicon foundry.**

FEATURES

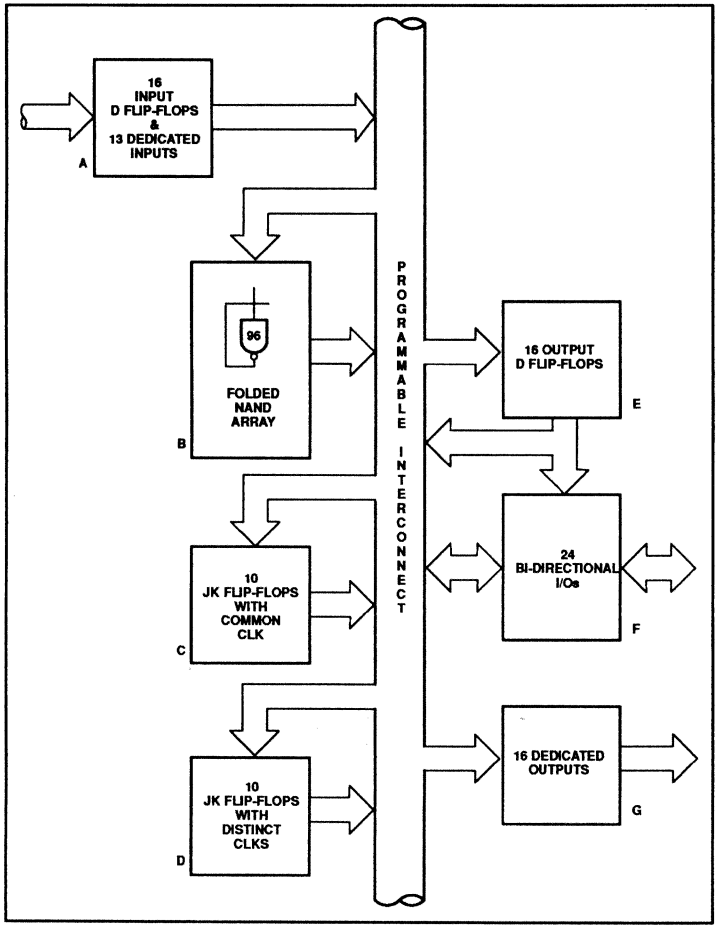
- Wide gates for efficient product term use
- Multiple I/O pins for 16–32 bit buses or up to 32-bit data flow
- Multiple I/O pins for multiple-port data handling
- Multiple clocks for independent state machines and storage banks
- 100% connectible, no place and route restrictions
- Erasable and one time programmable versions available
- Scan test
- Low CMOS power dissipation = 525mW max.
- Power down mode (52mW max.)
- Power on reset
- Security fuse for copy protection
- Supported by advanced SNAP and SLICE development systems

PERFORMANCE

- 35ns max. pin-to-pin for 32-bit decoders
- 40ns max. internal, 55ns max. pin-to-pin for 16-bit multiplexers
- 33MHz max. throughput for 16-bit latches
- 18–50MHz max. for 10-bit counters
- 31MHz max. for 10-bit shift registers
- 15ns (typ.) delay for internal NANDs
- 50MHz max. flip-flop toggle rate

Product Spotlights

PML2852 FUNCTIONAL DIAGRAM



11-91/04548

Product Spotlights

RF/WIRELESS

Cellular Radio Chip Set

NE5750/5751, PCF8282/8XC552, UMA1000/1014, NE605 or 606 family,

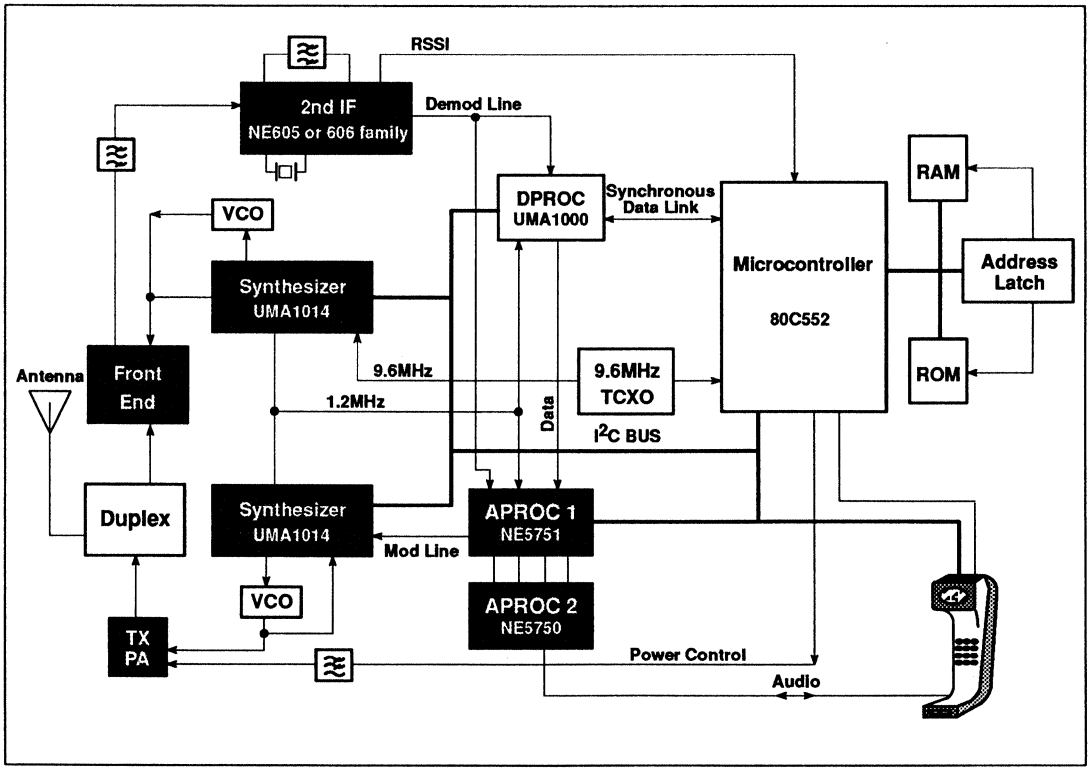
COMPONENTS

- NE605 or 606 Family – Low Power Single Chip FM Systems
- NE5750 – Audio Processor - Companding and Amplifier
- NE5751 – Audio Processor - Filter and Control Section
- UMA1000 – Data Processor for Cellular Radio
- UMA1014 – Low-Power Universal Synthesizer for Radio Communication
- S80C552 – Single Chip 8-Bit Microcontroller with A/D, Capture/Compare Timer, with High-Speed Outputs, PWM

FEATURES

- 6 key ICs for maximum integration
- Integrated filters, amplifiers, and compandors to reduce off-chip components
- Designed for minimum current consumption, i.e., maximum use of standby modes, low current IC design
- I^2C serial control bus

CELLULAR RADIO CHIP SET SCHEMATIC



Product Spotlights

NE/SA568A – Phase-Locked Loop

DESCRIPTION

The NE/SA568A is a monolithic phase-locked loop (PLL) which operates from 1Hz to frequencies in excess of 150MHz and features an extended supply voltage range and a lower temperature coefficient of the V_{CO} center frequency in comparison with its predecessor, the NE 568. The NE568A is function and pin-compatible with the NE568, requiring only minor changes in peripheral circuitry (see Figure 1). Temperature compensation network is different, no resistor on Pin 2, needs to be grounded and Pin 13 has a 3.9kΩ resistor to ground. Timing cap is different and for 70MHz operation with temperature compensation network should be 16pF, not 34pF as was used in the NE568. The NE568A has the following improvements: ESD protected; extended V_{CC} range from 4.5V to 5.5V; operating temperature range -55 to 125°C (see Philips Semiconductors Military 568A data sheet); less layout sensitivity; and lower T_C of VCO (center frequency). The integrated circuit consists of a limiting amplifier, a current-controlled oscillator (ICO), a phase detector, a level shift circuit, V/I and I/V converters, an output buffer, and bias circuitry with temperature and frequency compensating characteristics. The design of the NE568A is particularly well-suited for demodulation of FM signals with extremely large deviation in systems which require a highly linear output. In satellite receiver applications with a 70MHz IF, the NE568A will demodulate ±20% deviations with less than 1.0% typical non-linearity. In addition to high linearity, the circuit has a loop filter which can be configured with series or shunt elements to optimize loop dynamic performance. The NE568A is available in 20-pin dual in-line and 20-pin SO (surface mounted) plastic packages.

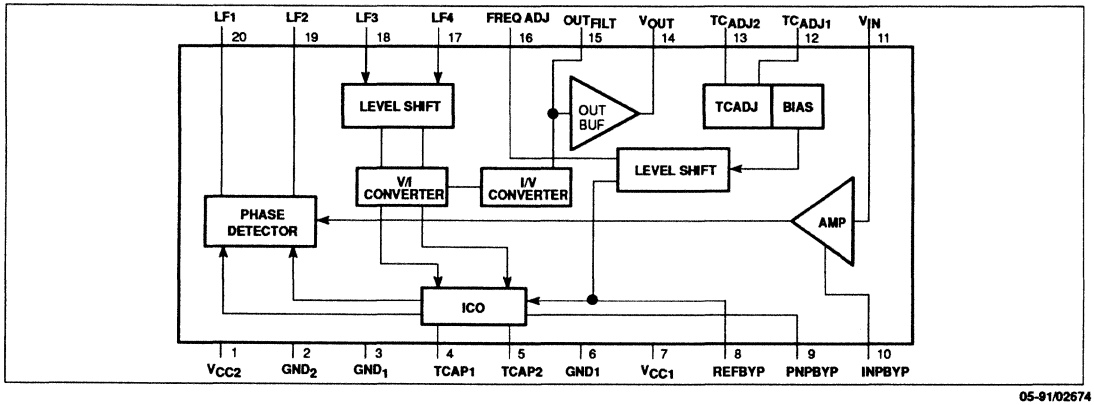
FEATURES

- Operation to 150MHz
- High linearity buffered output
- Series or shunt loop filter component capability
- External loop gain control
- Temperature compensated
- ESD protected[1]
- Military qualified

APPLICATIONS

- Satellite receivers
- Fiber optic video links
- VHF FSK demodulators
- Clock Recovery

BLOCK DIAGRAM



05-91/02674

Product Spotlights

NE/SA600 – 1GHz LNA and Mixer

DESCRIPTION

The NE/SA600 is a combined low noise amplifier (LNA) and mixer designed for high-performance low-power communication systems from 800-1200MHz. The low-noise preamplifier has a 2dB noise figure at 900MHz with 16dB gain and an IM_3 intercept of -10dBm at the input. Input and output impedances are 50Ω and the gain is stabilized by on-chip compensation to vary less than ±0.5dB over the -40 to +85°C temperature range. The wide-dynamic-range mixer has a 14dB noise figure and IM_3 intercept of +6dBm at the input at 900MHz. Mixer input impedance is 50Ω with an open-collector output. The chip incorporates an option so the LNA can be disabled and replaced by a through connection. The amplifier IM_3 intercept increases to +26dBm in this mode; thus, large signals can be handled. The nominal current drawn from a single 5V supply is 13mA and 4.2mA in the LNA thru mode.

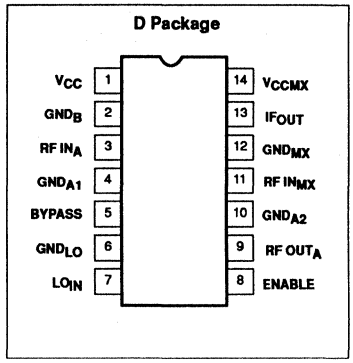
FEATURES

- Low current consumption: 13mA nominal, 4.2mA in the LNA thru mode
- Excellent noise figure: 2dB for the amplifier and 14dB for the mixer at 900MHz
- Excellent gain stability versus temperature
- Switchable overload capability
- Amplifier matched to 50Ω
- Mixer input matched to 50Ω
- Oscillator input matched to 50Ω

APPLICATIONS

- 900MHz front end for GSM/AMPS/TACS/ hand-held units
- RF data links
- UHF frequency conversion
- Portable radio
- Spread spectrum receivers
- 900MHz cordless phones

PIN CONFIGURATION



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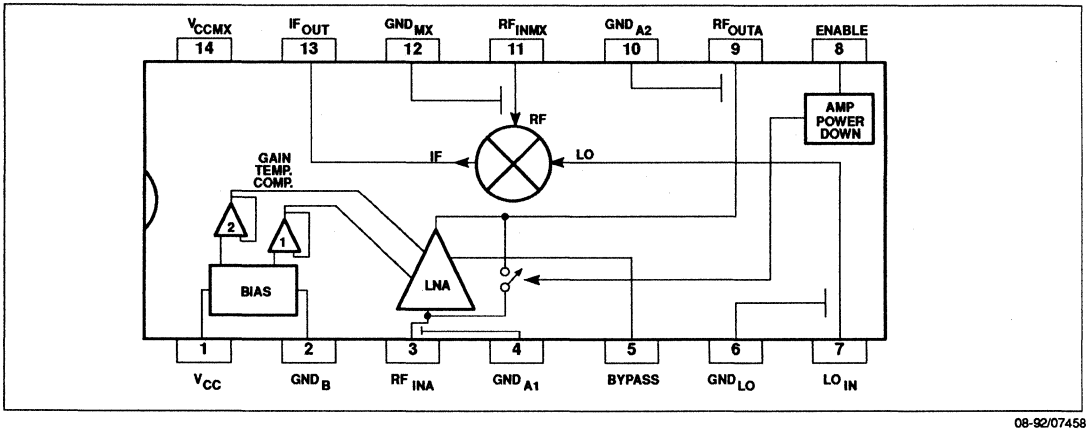

08-92/07458

Product Spotlights

NE/SA602A/612A – Double-Balanced Mixers and Oscillators

DESCRIPTION

The NE/SA602A/612A are low-power VHF monolithic double-balanced mixers with input amplifier, on-board oscillator, and voltage regulator. They are intended for high performance and low cost, low power communication systems. The guaranteed parameters of the SA602A make this device particularly well suited for cellular radio applications. The mixer is a "Gilbert cell" multiplier configuration which typically provides 14dB to18dB gains at 45MHz. The oscillator will operate to 200MHz. It can be configured as a crystal oscillator, a tuned tank oscillator, or a buffer for an external LO. For higher frequencies the LO input may be externally driven. The noise figure at 45MHz is typically below 5dB. The gain, intercept performance, low-power and noise characteristics make the NE/SA602A/612A superior choices for high-performance battery operated equipment. They are available in 8-lead dual in-line plastic packages and 8-lead SOs (surface-mount miniature package).

FEATURES

- Low current consumption
- Excellent noise figure: <4.7dB typical at 45MHz
- Operation to 500MHz
- Low radiated energy
- Excellent gain, intercept and sensitivity
- Low external parts count; suitable for crystal/ceramic filters
- SA602A meets cellular radio specifications
- 602A is Military qualified

APPLICATIONS

- Cordless telephone
- Portable radio
- VHF transceivers
- RF data links
- Sonabouys
- Communications receivers
- Broadband LANs
- HF/VHF frequency conversion
- Cellular radio mixer/oscillator

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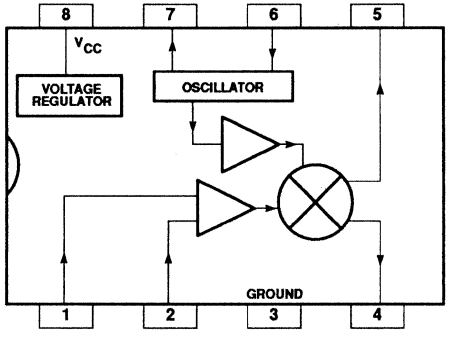


04-90/99374

Product Spotlights

SA620 – RF Gain Stage, VCO and Mixer–1GHz

DESCRIPTION

The SA620 is a combined RF amplifier, VCO and mixer designed for high-performance low-power communication systems from 800-1200MHz. The low-noise preamplifier has a 1.6dB noise figure at 900MHz with 12dB gain and an IM_3 intercept of -2dBm at the input. The gain is stabilized by on-chip compensation to vary less than ±0.2dB over -40 to +85°C temperature range. The wide-dynamic-range mixer has an 8dB noise figure and IM_3 intercept of –2dBm at the input at 900MHz. The mixer has two open-collector outputs. The chip incorporates a differential thru-mode option so the RF amplifier can be disabled and replaced by a through connection. The nominal current drawn from a single 3V supply is 8.2mA and 5.2mA in the thru-mode.

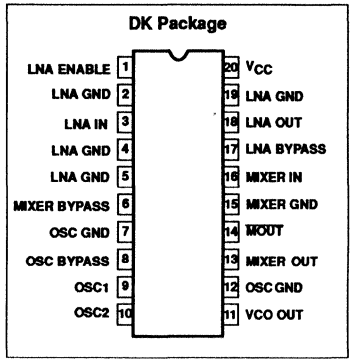
FEATURES

- Low current consumption: 8.2mA nominal, 5.2mA with thru-mode activated
- Outstanding noise figure: 1.6dB for the amplifier and 8dB for the mixer at 900MHz
- Excellent gain stability versus temperature and supply voltage
- Switchable overload capability
- Independent LNA and mixer power down capability
- Internal VCO automatic leveling loop
- Monotonic VCO frequency vs control voltage
- Buffered VCO output

APPLICATIONS

- 900MHz front end
- RF data links
- UHF frequency conversion
- Portable radio
- Spread spectrum receivers
- 900MHz cordless phones

PIN CONFIGURATION



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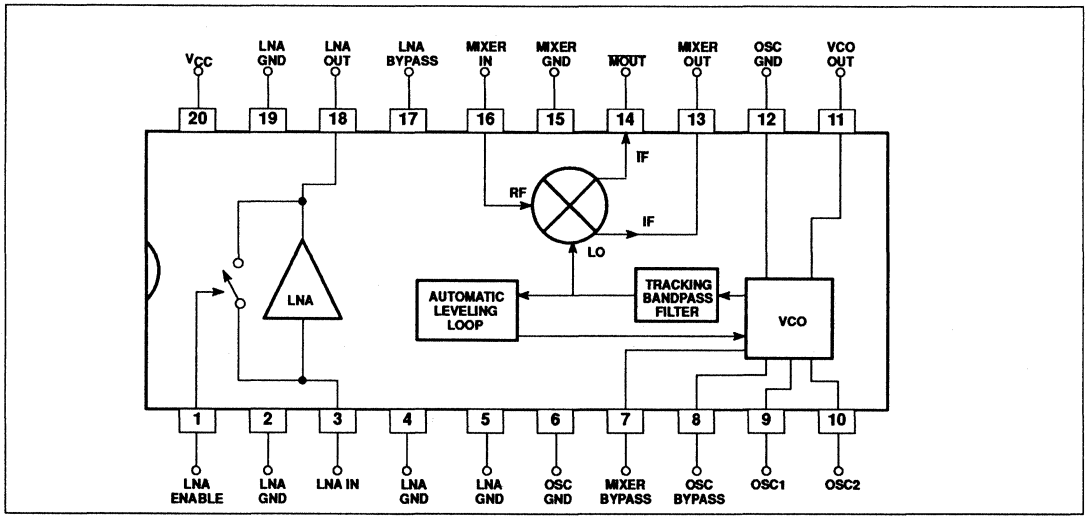


Product Spotlights

NE/SA604A/614A – High Performance Low Power FM IF Systems

DESCRIPTION

The NE/SA604A/614A are improved monolithic low-power FM IF systems incorporating two limiting intermediate frequency amplifiers, quadrature detector, muting, logarithmic received signal strength indicator, and voltage regulator. These products feature higher IF bandwidth (25MHz) and temperature compensated RSSI and limiters permitting higher performance application compared with the NE/SA604. They are available in 16-lead dual-in-line plastic and 16-lead SO (surface-mounted miniature) packages.

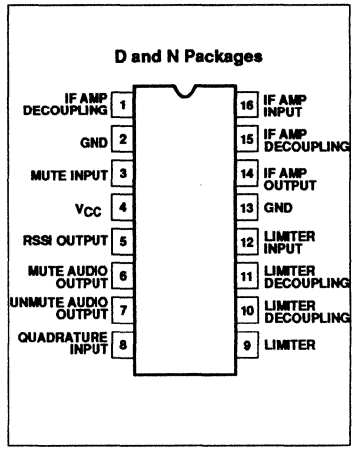
FEATURES

- Low power consumption: 3.3mA typical
- Temperature compensated logarithmic Received Signal Strength Indicator (RSSI) with a dynamic range in excess of 90dB
- Two audio outputs - muted and unmuted
- Low external component count; suitable for crystal/ceramic filters
- Excellent sensitivity: 1.5μV across input pins (0.22μV into 50Ω matching network) for 12dB SINAD (Signal to Noise and Distortion ratio) at 455kHz
- Meet cellular radio specifications
- 602A is Military qualified

APPLICATIONS

- Cellular radio FM IF
- High performance communications receivers
- Intermediate frequency amplification and detection up to 25MHz
- RF level meter
- Spectrum analyzer
- Instrumentation
- FSK and ASK data receivers

PIN CONFIGURATION



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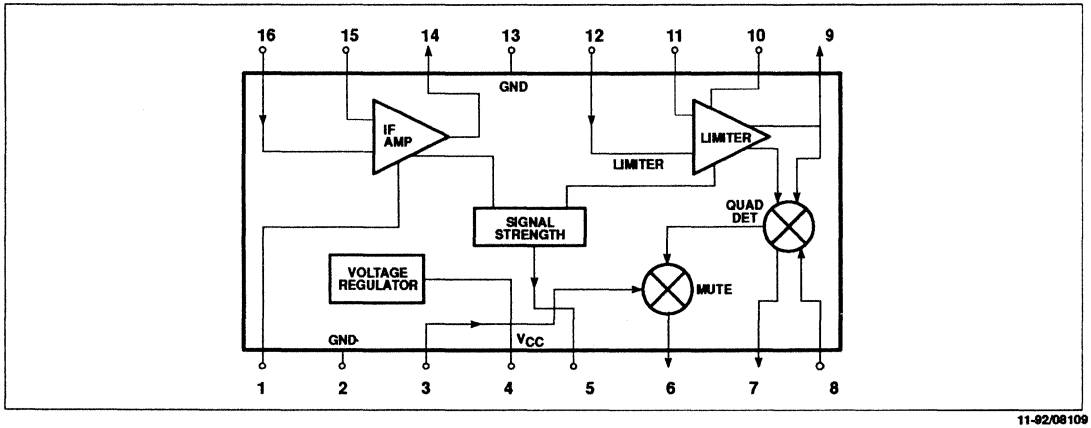

11-92/08109

Product Spotlights

NE/SA605/615 – High Performance Low Power Mixer FM IF Systems

DESCRIPTION

The NE/SA605/615 are high performance monolithic low-power FM IF systems incorporating a mixer/oscillator, two limiting intermediate frequency amplifiers, quadrature detector, muting, logarithmic received signal strength indicator (RSSI), and voltage regulator. These products are available in 20-lead dual-in-line plastic; 20-lead SOL (surface-mounted miniature) packages and 20-lead SSOP (Shrink Small Outline Packages).

The NE/SA605 and NE/SA615 are functionally the same device types. The difference between the two devices lies in the guaranteed specifications. The NE/SA615 has a higher I_{CC}, lower input third order intercept point, lower conversion mixer gain, lower limiter gain, lower AM rejection, lower SINAD, higher THD, and higher RSSI error than the NE/SA605. Both the NE/SA605 and NE/SA615 devices will meet the EIA specifications for AMPS and TACS cellular radio applications.

FEATURES

- Low power consumption: 5.7mA typical at 6V
- Mixer input to >500MHz
- Mixer conversion power gain of 13dB at 45MHz
- Mixer noise figure of 4.6dB at 45MHz
- XTAL oscillator effective to 150MHz (L.C. oscillator to 1GHz local oscillator can be injected)
- 102dB of IF Amp/Limiter gain
- 25MHz limiter small signal bandwidth
- Temperature compensated logarithmic Received Signal Strength Indicator (RSSI) with a dynamic range in excess of 90dB
- Two audio outputs - muted and unmuted
- Low external component count; suitable for crystal/ceramic/LC filters
- Excellent sensitivity: 0.22μV into 50Ω matching network for 12dB SINAD (Signal to Noise and Distortion ratio) for 1kHz tone with RF at 45MHz and IF at 455kHz
- Meet cellular radio specifications
- ESD hardened
- 605 is Military qualified

APPLICATIONS

- Consumer cellular radio FM IF
- High performance communications receivers
- Single conversion VHF/UHF receivers
- SCA receivers
- RF level meter
- Spectrum analyzer
- Instrumentation
- FSK and ASK data receivers
- Log amps
- Wideband low current amplification

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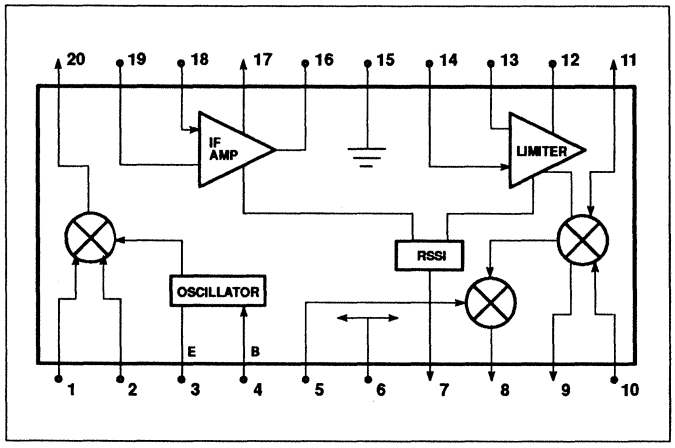
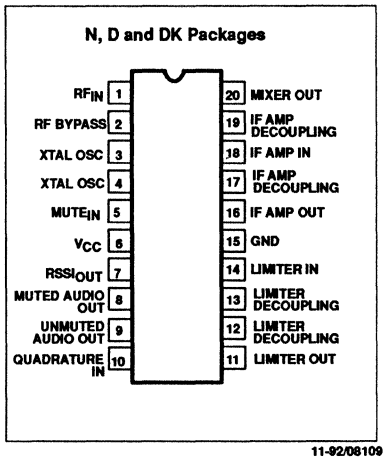


PIN CONFIGURATION



11-92/08109

Product Spotlights

NE/SA606/616 – Low-Voltage High Performance Mixer FM IF Systems

DESCRIPTION

The NE/SA606/616 are low-voltage high performance monolithic FM IF systems incorporating a mixer/oscillator, two limiting intermediate frequency amplifiers, quadrature detector, logarithmic received signal strength indicator (RSSI), voltage regulator and audio and RSSI op amps. The products are available in 20-lead dual-in-line plastic, 20-lead SOL (surface-mounted small outline large) and 20-lead SSOP (shrink small outline) packages.

These devices were designed for portable communication applications and will function down to 2.7V. The RF section is similar to the famous NE605. The audio and RSSI outputs have amplifiers with access to the feedback path. This enables the designer to level adjust the outputs or add filtering.

FEATURES

- Low power consumption: 3.5mA typical at 3V
- Mixer input to >150MHz
- Mixer conversion power gain of 17dB at 45MHz
- XTAL oscillator effective to 150MHz (L.C. oscillator or external oscillator can be used at higher frequencies)
- 102dB of IF Amp/Limiter gain
- 2MHz limiter small signal bandwidth
- Temperature compensated logarithmic Received Signal Strength Indicator (RSSI) with a 80dB to 90dB dynamic range
- Low external component count; suitable for crystal/ceramic/LC filters
- Excellent sensitivity: 0.31μV into 50Ω matching network for 12dB SINAD (Signal to Noise and Distortion ratio) for 1kHz tone with RF at 45MHz and IF at 455kHz
- Meets cellular radio specifications
- Audio output internal op amp
- RSSI output internal op amp
- Internal op amps with rail-to-rail outputs
- ESD protection: Human Body Model 2kV
  Robot Model 200V

APPLICATIONS

- Portable cellular radio FM IF
- Cordless phones
- Wireless systems
- RF level meter
- Spectrum analyzer
- Instrumentation
- FSK and ASK data receivers
- Log amps
- Portable high performance communication receiver
- Single conversion VHF receivers

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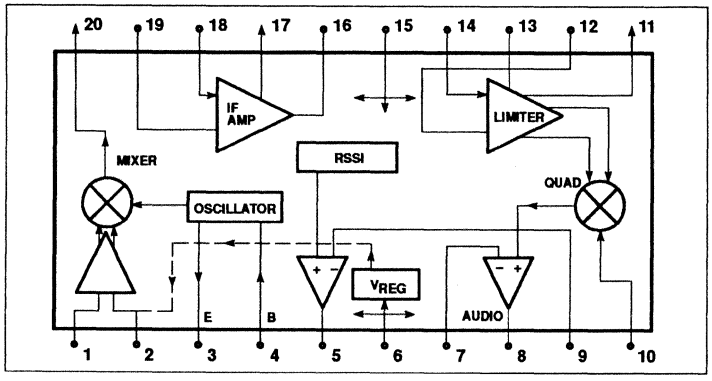
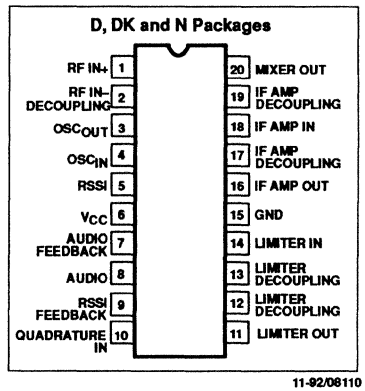


PIN CONFIGURATION



11-92/08110

Product Spotlights

SA607/617 – Low Voltage High Performance Mixer FM IF Systems

DESCRIPTION

The SA607/617 are low voltage high performance monolithic FM IF systems incorporating a mixer/oscillator, two limiting intermediate frequency amplifiers, quadrature detector, logarithmic received signal strength indicator (RSSI), voltage regulator and audio and RSSI op amps. Both are available in 20-lead dual-in-line plastic, 20-lead SOL (surface-mounted miniature package) and 20-lead SSOP package.

The products were designed for portable communication applications and will function down to 2.7V. The RF section is similar to the famous NE605. The audio output has an internal amplifier with the feedback pin accessible. The RSSI output is buffered. They also have an extra limiter output. This signal is buffered from the output of the limiter and can be used to perform frequency check. This is accomplished by comparing a reference frequency with the frequency check signal using a comparator to a varactor or PLL at the oscillator inputs.

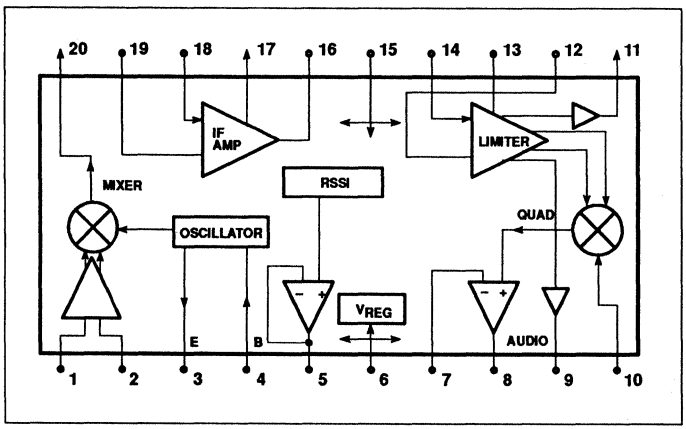
FEATURES

- Low power consumption: 3.5mA typical at 3V
- Mixer input to >150MHz
- Mixer conversion power gain of 17dB at 45MHz
- XTAL oscillator effective to 150MHz (L.C. oscillator or external oscillator can be used at higher frequencies)
- 102dB of IF Amp/Limiter gain
- 2MHz limiter small signal bandwidth
- Temperature compensated logarithmic Received Signal Strength Indicator (RSSI) with a 90dB dynamic range
- Low external component count; suitable for crystal/ceramic/LC filters
- Excellent sensitivity: 0.31μV into 50Ω matching network for 12dB SINAD (Signal to Noise and Distortion ratio) for 1kHz tone, 8kHz deviation with RF at 45MHz and IF at 455kHz
- Meet cellular radio specifications
- Audio output internal op amp
- RSSI output internal op amp
- Buffered frequency check output
- Internal op amps with rail-to-rail outputs
- ESD protection: Human Body Model 2kV, Robot Model 200V

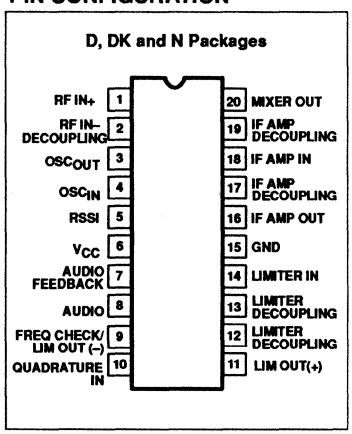
APPLICATIONS

- Portable cellular radio FM IF
- Cordless phones
- Narrow band cellular applications (NAMPS/NTACS)
- RF level meter
- Spectrum analyzer
- Instrumentation
- FSK and ASK data receivers
- Log amps
- Portable high performance communication receivers
- Single conversion VHF receivers
- Wireless systems

BLOCK DIAGRAM



PIN CONFIGURATION



11-92/08108

Product Spotlights

NE/SA624 – FM IF System with RSSI

DESCRIPTION

The NE/SA624 is pin-to-pin compatible with the NE/SA604A, but has faster RSSI rise and fall time. The NE/SA624 is an improved monolithic low-power FM IF system incorporating two limiting intermediate frequency amplifiers, quadrature detector, muting, logarithmic received signal strength indicator, and voltage regulator. The NE/SA624 features higher IF bandwidth (25MHz) and temperature compensated RSSI and limiters permitting higher performance application compared with the NE/SA604. The NE/SA624 is available in a 16-lead dual-in-line plastic and 16-lead SO (surface-mounted miniature) package.

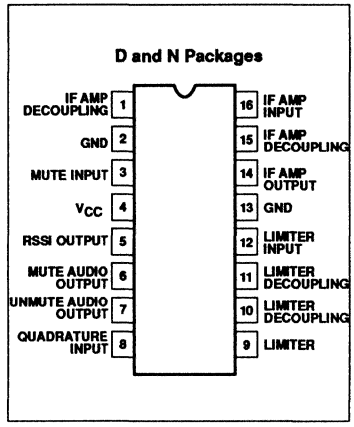
FEATURES

- Low power consumption: 3.4mA typical
- Temperature compensated logarithmic Received Signal Strength Indicator (RSSI) with a dynamic range in excess of 90dB
- Fast RSSI rise and fall time
- Two audio outputs - muted and unmuted
- Low external component count; suitable for crystal/ceramic filters
- Excellent sensitivity: 1.5μV across input pins (0.22μV into 50Ω matching network) for 12dB SINAD (Signal to Noise and Distortion ratio) at 455kHz
- SA624 meets cellular radio specifications

APPLICATIONS

- Digital cellular base station
- Cellular radio FM IF
- High performance communications receivers
- Intermediate frequency amplification and detection up to 25MHz
- RF level meter
- Spectrum analyzer
- Instrumentation
- FSK and ASK data receivers

PIN CONFIGURATION



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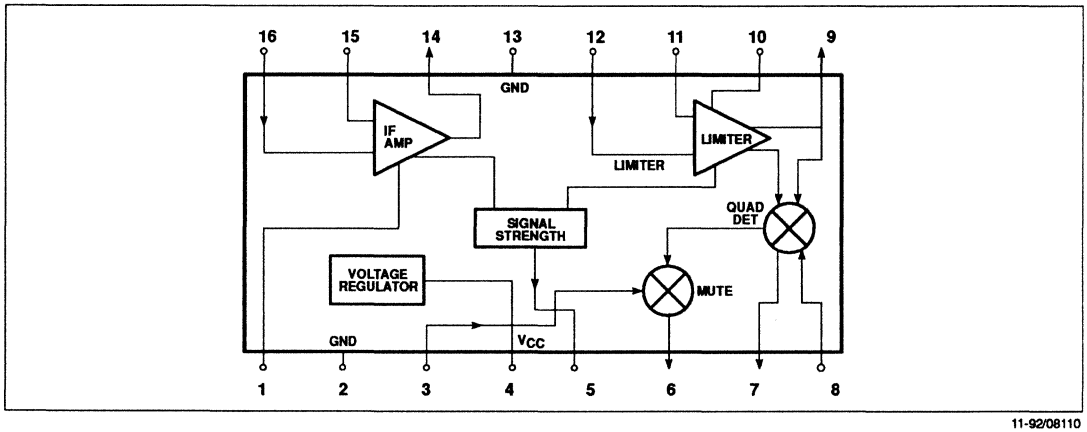


11-92/08110

Product Spotlights

NE/SA625 – FM IF System with High-Speed RSSI

DESCRIPTION

The NE/SA625 is pin-to-pin compatible with the NE/SA605, but has faster RSSI rise and fall times. The NE/SA625 is a high performance monolithic low-power FM IF system incorporating a mixer/oscillator, two limiting intermediate frequency amplifiers, quadrature detector, muting, logarithmic received signal strength indicator (RSSI) with fast rise and fall time, and voltage regulator. The NE/SA625 combines the functions of Philips Semiconductors' NE602A and NE624. The NE/SA625 is available in 20-lead dual-in-line plastic and 20-lead SOL (surface-mounted miniature package) and 20-lead SSOP (shrink small outline package).

FEATURES

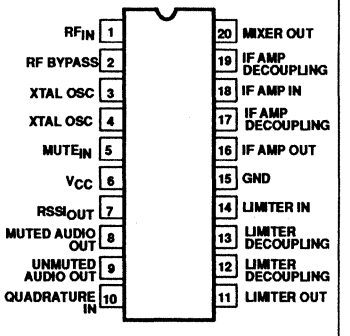
- Fast RSSI rise and fall times
- Low power consumption: 5.8mA typical at 6V
- Mixer input to >500MHz
- Mixer conversion power gain of 13dB at 45MHz
- Mixer noise figure of 4.6dB at 45MHz
- XTAL oscillator effective to 150MHz (L.C. oscillator to 1GHz local oscillator can be injected)
- 102dB of IF Amp/Limiter gain
- 25MHz limiter small signal bandwidth
- Temperature compensated logarithmic Received Signal Strength Indicator (RSSI) with a dynamic range in excess of 90dB
- Two audio outputs - muted and unmuted
- Low external component count; suitable for crystal/ceramic/LC filters
- Excellent sensitivity: 0.22μV into 50Ω matching network for 12dB SINAD (Signal to Noise and Distortion ratio) for 1kHz tone with RF at 45MHz and IF at 455kHz
- SA625 meets cellular radio specifications
- ESD hardened

APPLICATIONS

- Digital cellular base stations
- High performance communications receivers
- Single conversion VHF/UHF receivers
- SCA receivers
- RF level meter
- Spectrum analyzer
- Instrumentation
- FSK and ASK data receivers
- Log amps
- Wideband low current amplification
- Digital cordless telephones

PIN CONFIGURATION

D, DK and N Packages



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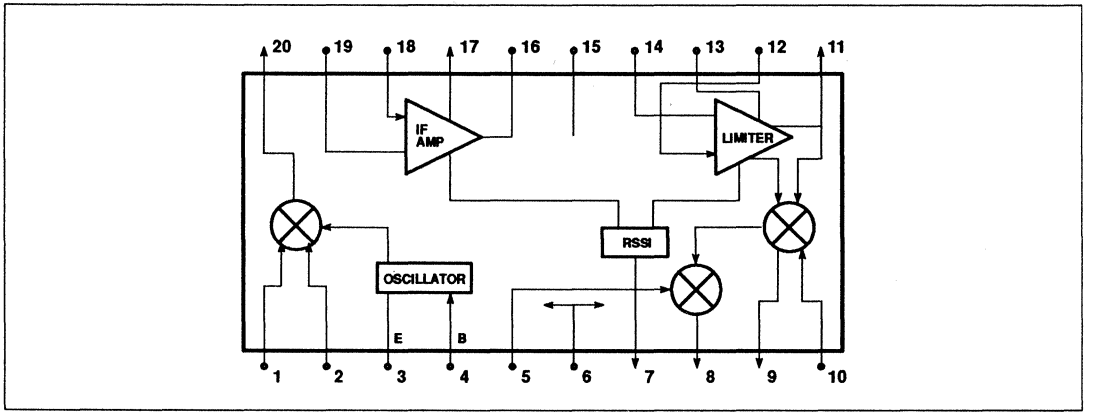


11-92/08110

Product Spotlights

NE/SA627 – FM IF System with High-Speed RSSI

DESCRIPTION

The NE/SA627 has faster RSSI rise and fall times. The NE/SA627 is a high performance monolithic low-power FM IF system incorporating a mixer/oscillator, two limiting intermediate frequency amplifiers, quadrature detector, muting, logarithmic received signal strength indicator (RSSI) with fast rise and fall time, voltage regulator and frequency check/limiter out (–). The NE/SA627 also has an extra limiter output. This signal is buffered from the output of the limiter and provides a negative (–) limiter output. This can be used to provide a frequency check function. The NE/SA627 is available in 20-lead dual-in-line plastic and 20-lead SOL (surface-mounted miniature package) and 20-lead SSOP (shrink small outline package).

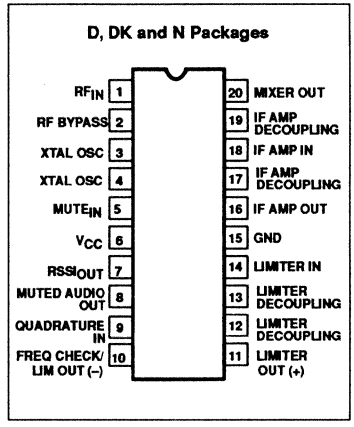
FEATURES

- Fast RSSI rise and fall times
- Low power consumption: 5.8mA typical at 6V
- Mixer input to >500MHz
- Mixer conversion power gain of 13dB at 45MHz
- Mixer noise figure of 4.6dB at 45MHz
- XTAL oscillator effective to 150MHz (L.C. oscillator to 1GHz local oscillator can be injected)
- 102dB of IF Amp/Limiter gain
- 25MHz limiter small signal bandwidth
- Temperature compensated logarithmic Received Signal Strength Indicator (RSSI) with a dynamic range in excess of 90dB
- Audio output - mutable
- Low external component count; suitable for crystal/ceramic/LC filters
- Excellent sensitivity: 0.22μV into 50Ω matching network for 12dB SINAD (Signal to Noise and Distortion ratio) for 1kHz tone, 8kHz deviation with RF at 45MHz and IF at 455kHz
- SA627 meets cellular radio specifications
- ESD hardened

APPLICATIONS

- Digital cellular base stations
- High performance communications receivers
- Single conversion VHF/UHF receivers
- SCA receivers
- RF level meter
- Spectrum analyzer
- Instrumentation
- FSK and ASK data receivers
- Log amps
- Wideband low current amplification
- Digital cordless telephones

PIN CONFIGURATION



06-92/06881

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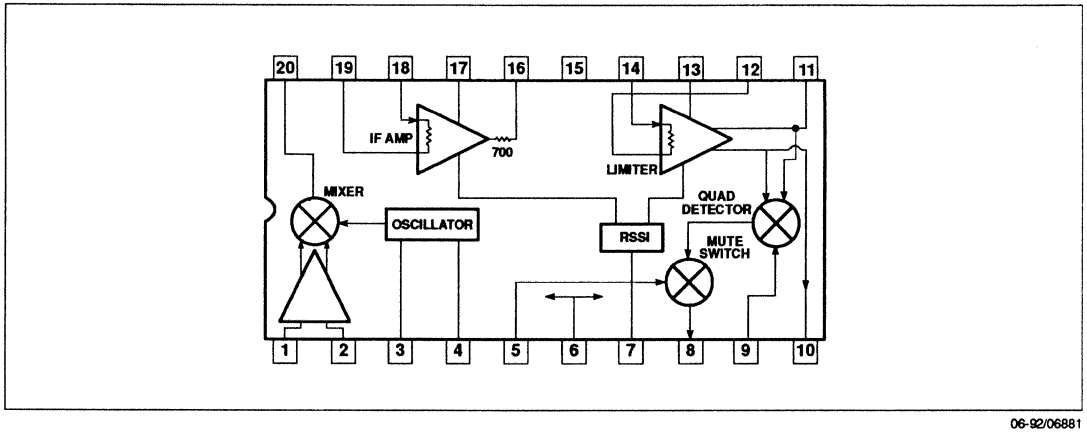

06-92/06881

Product Spotlights

NE/SA630 – Single Pole Double Throw (SPDT) Switch

DESCRIPTION

The NE630 is a wideband RF switch fabricated in BiCMOS technology and incorporating on-chip CMOS/TTL compatible drivers. Its primary function is to switch signals in the frequency range DC - 1GHz from one 50Ω channel to another. The switch is activated by a CMOS/TTL compatible signal applied to the enable channel 1 pin (ENCH1).

The extremely low current consumption makes the NE/SA630 ideal for portable applications. The excellent isolation and low loss makes this a suitable replacement for PIN diodes.

The NE/SA630 is available in an 8-pin dual in-line plastic package and an 8-pin SO (surface mounted miniature) package.

FEATURES

- Wideband (DC - 1GHz)
- Low through loss (1dB typical at 200MHz)
- Unused input is terminated internally in 50Ω
- Excellent overload capability (1dB gain compression point +18dBm at 300MHz)
- Low DC power (170μA from 5V supply)
- Fast switching (20ns typical)
- Good isolation (off channel isolation 60dB at 100MHz)
- Low distortion (IP_3 intercept +33dBm)
- Good 50Ω match (return loss 18dB at 400MHz)
- Full ESD protection
- Bidirectional operation

APPLICATIONS

- Digital transceiver front-end switch
- Antenna switch
- Filter selection
- Video switch
- FSK transmitter

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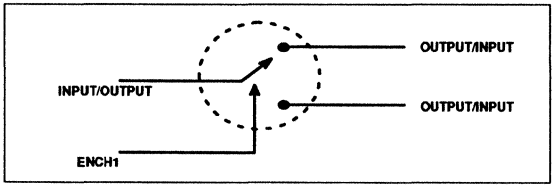
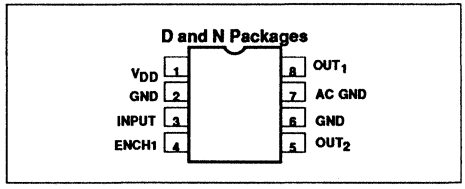


PIN CONFIGURATION



10–91/04269

Product Spotlights

NE/SA701 – Low Power ECL Prescaler

DESCRIPTION

The NE701 is an advanced dual modulus (Divide By 128/129 or 64/65) low power ECL prescaler. The minimum supply voltage is 2.7V and is compatible with the new CMOS UMF1005 and UMF1009 synthesizers from Philips and other logic circuits. The low supply current allows application in battery operated low-power equipment. Maximum input signal frequency is 1.2GHz for cellular and other land mobile applications. There is no lower frequency limit due to a fully static design. The circuit is implemented in ECL technology on the QUBiC process. The circuit will be available in an 8-pin SO package with 150 mil package width and in 8-pin dual-in-line plastic package, and is pin compatible with Fujitsu MB501, Plessey SP8704 and Motorola MC12022.

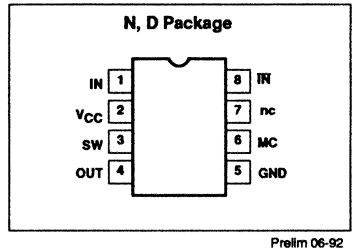
FEATURES

- Low voltage operation
- Low current consumption
- Operation up to 1.2GHz
- ESD hardened

APPLICATIONS

- Cellular phones
- Cordless phones
- RF LANs
- Test and measurement
- Military radio
- VHF/UHF mobile radio
- VHF/UHF hand-held radio

PIN CONFIGURATION



Prelim 06-92

Product Spotlights

SA5752 – Audio Processor – Companding, VOX and Amplifier Section

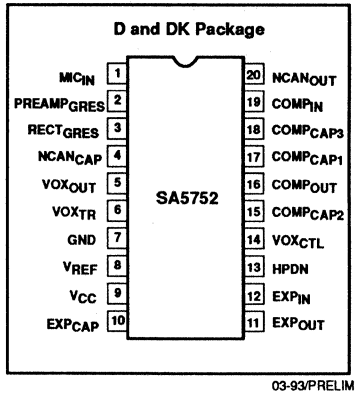
DESCRIPTION

The SA5752 is a high performance low power audio signal processing system especially designed to meet the requirements for small size and low voltage operation of hand-held equipment. The SA5752 subsystem includes a low noise microphone preamplifier with adustable gain, a noise cancellation switching amplifier with adjustable threshold, a voice operated transmitter (VOX) switch, VOX control, an audio compressor with buffered input, audio expandor, and an internal bandgap voltage regulator with power down capability. When used with Philips Semiconductors' SA5753, the complete audio processing function of an AMPS or TACS cellular telephone is easily implemented. The system also meets the requirements of the proposed NAMPS or NTACS specifications. The SA5752 can also be used without the SA5753 in a wide variety of radio communications applications.

FEATURES

- Operating voltage range: 2V to 5.5V
- Adjustable VOX and noise cancellation threshold
- Adjustable gain preamplifier
- Audio companding
- ESD protected
- Open collector VOX output
- Logic inputs CMOS compatible
- Power down mode
- Few external components
- Meets AMPS/TACS/NAMPS/NTACS requirements

PIN CONFIGURATION



03-93/PRELIM

NE/SA5753 – Audio Processor – Filter and Control Section

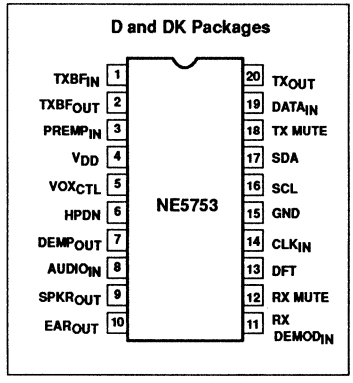
DESCRIPTION

The NE/SA5753 is a high performance low power CMOS audio signal processing system especially designed to meet the requirements for small size and low voltage operation of hand-held equipment. The NE/SA5753 subsystem includes complementary transmit/receive voice band (300-3000Hz), switched capacitor bandpass filters with pre-emphasis and de-emphasis respectively, a transmit low pass filter, peak deviation limiter for transmit, digitally controlled attenuators for signal level and volume control, audio path mute switches, a programmable DTMF generator, power-down circuitry for low current standby, power-on reset capability, and an I^2C interface. When the NE/SA5753 is used with an NE/SA5752 (companding function), the complete audio processing system of an AMPS or TACS cellular telephone is easily implemented.

FEATURES

- Low 3V supply
- Low power
- Built-in programmable DTMF generator
- Built-in digitally controlled attenuators for modulation and volume control
- Built-in peak-deviation limiter
- I^2C Bus controlled
- Power-on reset
- Power down capability
- Programmable mute control
- Meets AMPS/TACS/NAMPS/NTACS requirements

PIN CONFIGURATION



10-92/OBJ

Product Spotlights

NE570/571/SA571 – Compandor

FEATURES

- Compressor and expandor on one chip.
- Temperature compensated
- Greater than 110dB dynamic range
- Operates down to 6VDC
- System levels adjustable with external components
- Dynamic noise reduction systems
- Voltage-controlled amplifier
- Available in 16-pin SOL, Ceramic and Plastic Dual In-Line packages.

APPLICATIONS

- Cellular radio
- Telephone trunk compandor—570
- Telephone subscriber compandor—571
- High level limiter
- Low level expandor—noise gate
- Dynamic filters

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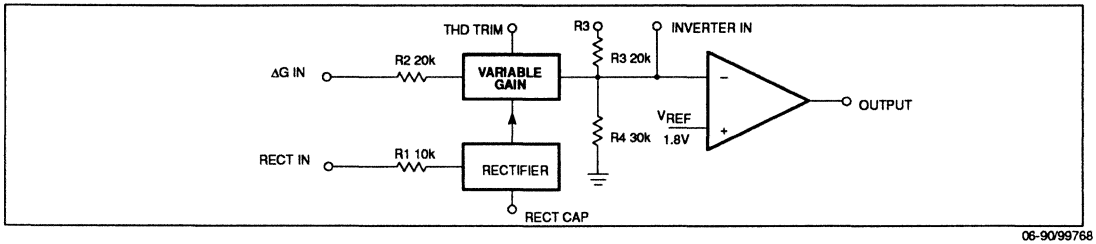

06-90/99768

NE/SA575A – Low Voltage Compandor

FEATURES

- Operating voltage range from 2V to 7V
- Reference voltage of 100mV$_{RMS}$ = 0dB
- One dedicated summing op amp per channel and two extra uncommitted op amps
- 600Ω drive capability
- Single or split operation
- Wide input/output swing capability

APPLICATIONS

- Portable communications
- Cellular radio
- Cordless telephone
- Portable broadcast mixers
- Modems
- Hearing aids

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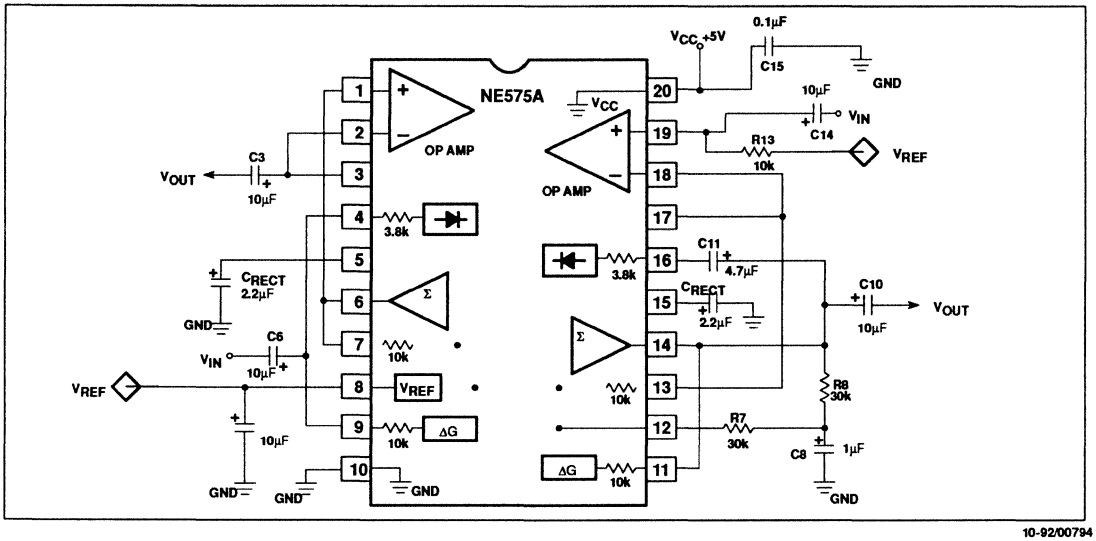


10-92/00794

Product Spotlights

NE576 – Compandor

DESCRIPTION

The NE/SA576 is a unity gain level programmable compandor designed for low power applications. The NE576 is internally configured as an expandor and a compressor to minimize external component count.

The NE576 can operate at 1.8V. During normal operations, the NE576 can operate from at least a 2V battery. If the battery voltage drops to 1.8V, this part will still continue to function, however, turning on the part at a V_{CC} of 1.8V requires two external resistors to bring V_{REF} to half V_{CC}. One resistor connects between V_{CC} and V_{REF}; the other connects from V_{REF} to ground. A typical value for these external resistors is approximately 20k. A lower value can be used, but the power consumption will go up.

The NE576 is available in a 14-pin plastic DIP and SO packages.

FEATURES

- Operating voltage range: 1.8V to 7V
- Low power consumption (1.4mA @ 3.6V)
- Over 80dB of dynamic range
- Wide input/output swing capability (rail-to-rail)
- Low external component count
- ESD hardened

APPLICATIONS

- Cordless telephone
- Consumer audio
- Wireless microphones
- Modems
- Electric organs
- Hearing aids
- Automatic level control

11-92/08109

Product Spotlights

NE/SA577 – Unity Gain Level Programmable Low Power Compandor

DESCRIPTION

The NE/SA577 is a unity gain level programmable compandor designed for low power applications. The NE577 is internally configured as an expandor and a compressor to minimize external component count.

The NE577 is available in a 14-pin plastic DIP and SO packages.

FEATURES

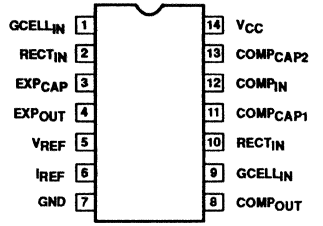
- Operating voltage range: 1.8V to 7V
- Low power consumption (1.4mA @ 3.6V)
- 0dB level programmable(10mV_{RMS} to 1.0V_{RMS})
- Over 90dB of dynamic range
- Wide input/output swing capability (rail-to-rail)
- Low external component count
- SA577 meets cellular radio specifications
- ESD hardened

APPLICATIONS

- High performance portable communications
- Cellular radio
- Cordless telephone
- Consumer audio
- Wireless microphones
- Modems
- Electric organs
- Hearing aids
- Automatic level control (ALC)

PIN CONFIGURATION

D and N Packages



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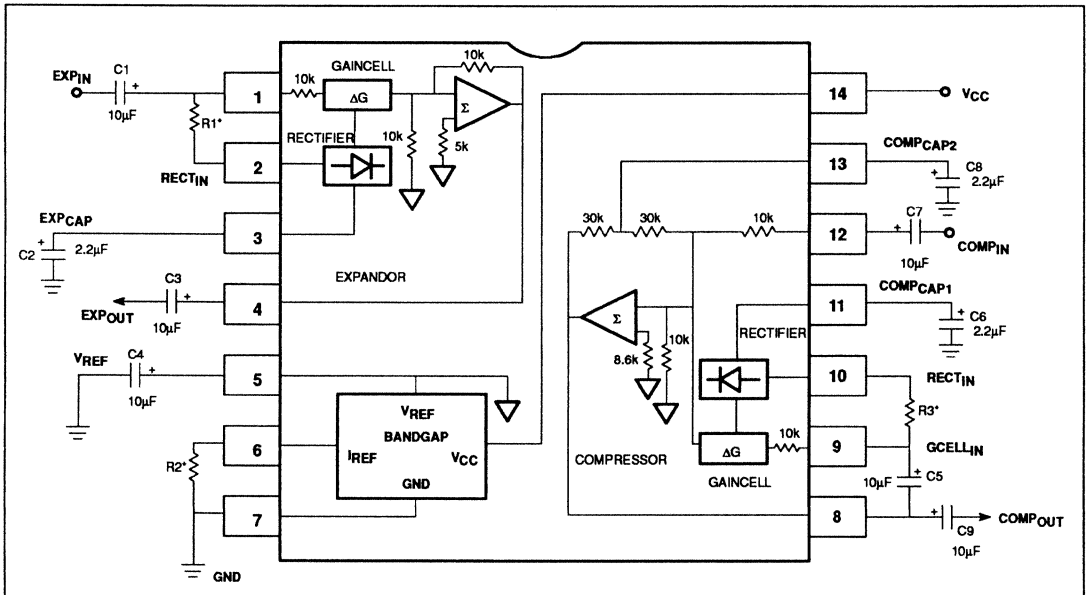


*R1, R2 and R3 are 1% resistors.

11-92/08109

Product Spotlights

NE/SA578 – Unity Gain Level Programmable Low Power Compandor

DESCRIPTION

The NE/SA578 is a unity gain level programmable compandor designed for low power applications. The NE578 is internally configured as an expandor and a compressor to minimize external component count.

The summing amplifiers of the NE578 have 600Ω drive capability and the inverting input of the compressor amplifier is accessible through Pin 9 for summing multiple external signals. Power Down/Mute function is active low and requires an open collector output logic configuration at Pin 8. If Power Down/Mute is not needed, Pin 8 should be left open. When the part is muted, supply current drops to 170µA at 3.6V. The NE578 is available in a 16-pin plastic DIP and an SO package.

FEATURES

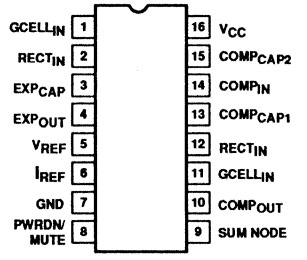
- Operating voltage range: 1.8V to 7V
- Low power consumption (1.4mA @ 3.6V)
- 0dB level programmable(10mV$_{RMS}$ to 1.0V$_{RMS}$)
- Over 90dB of dynamic range
- Wide input/output swing capability
- Low external component count
- SA578 meets cellular radio specifications
- ESD hardened
- Power Down mode (I_{CC} = 170mA @ 3.6V)
- Mute function
- Multiple external summing capability
- 600Ω drive capability

APPLICATIONS

- High performance portable communications
- Cellular radio
- Cordless telephone
- Consumer audio
- Wireless microphones
- Modems
- Electric organs
- Hearing aids
- Automatic level control (ALC)

PIN CONFIGURATION

D and N Packages



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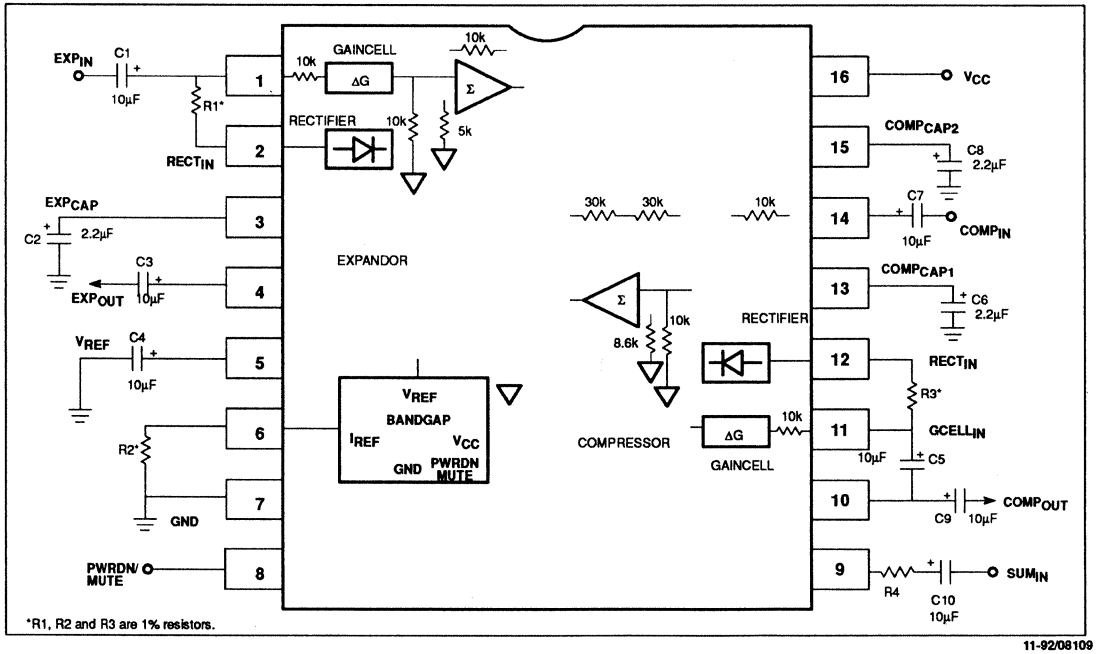


*R1, R2 and R3 are 1% resistors.

11-92/08109

Product Spotlights

NE/SA5200 – RF Dual Gain-Stage

DESCRIPTION

The NE/SA5200 is a dual amplifier with DC to 1200MHz response. Low noise (NF = 3.6dB) makes this part ideal for RF front-ends, and a simple power-down mode saves current for battery operated equipment. Inputs and outputs are matched to 50Ω.

The enable pin allows the designer the ability to turn the amplifiers on or off, allowing the part to act as an amplifier as well as an attenuator. This is very useful for front-end buffering in receiver applications.

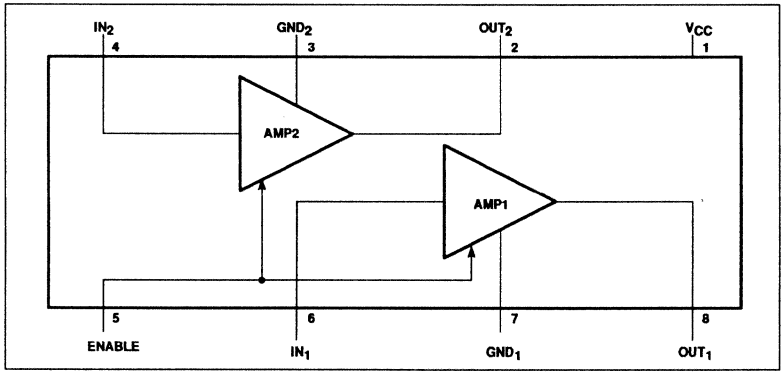
FEATURES

- Dual amplifiers
- DC - 1200MHz operation
- Low DC power consumption (4.2mA per amplifier @ V_{CC} = 5V)
- Power-Down Mode (I_{CC} = 95μA typical)
- 3.6dB noise figure at 900MHz
- Unconditionally stable
- Fully ESD protected
- Low cost
- Supply voltage 4-9V
- Gain S_{21} = 7dB at f = 1GHz
- Input and output match S_{11}, S_{22} typically <–14dB

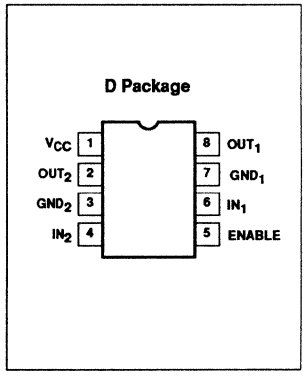
APPLICATIONS

- Cellular radios
- RF IF strips
- Portable equipment

BLOCK DIAGRAM



PIN CONFIGURATION



10-91/04270

Product Spotlights

NE/SA5204A/5205A – Wideband High-Frequency Amplifiers

DESCRIPTION

The NE/SA5204A/5205A family of wideband amplifiers replaces the NE/SA5204/5205 family. The 'A' parts are fabricated on a rugged 2µm bipolar process featuring excellent statistical process control. Electrical performance is identical to the original parts.

The NE/SA5205A is a high-frequency amplifier with a fixed insertion gain of 20dB. The gain is flat to ±0.5dB from DC to 450MHz respectively. The -3dB bandwidth is greater than 600MHz. This performance makes the amplifier ideal for cable TV applications. The NE/SA5205A operates with a single supply of 6V, and only draws 25mA of supply current, which is much less than comparable hybrid parts. The noise figure is 4.8dB in a 75Ω system and 6dB in a 50Ω system.

The NE/SA5204A is a relaxed version of the NE5205A. Minimum guaranteed bandwidth is relaxed to 350MHz and the "S" parameter Min/Max limits are specified as typicals only.

Until now, most RF or high-frequency designers had to settle for discrete or hybrid solutions to their amplification problems. Most of these solutions required trade-offs that the designer had to accept in order to use high-frequency gain stages. These include high power consumption, large component count, transformers, large packages with heat sinks, and high part cost. The NE/SA5204A/5205A solve these problems by incorporating a wideband amplifier on a single monolithic chip.

The part is well matched to 50 or 75Ω input and output impedances. The standing wave ratios in 50 and 75Ω systems do not exceed 1.5 on either the input or output over the entire DC to 600MHz operating range.

Since the part is a small, monolithic IC die, problems such as stray capacitance are minimized. The die size is small enough to fit into a very cost-effective 8-pin small-outline (SO) package to further reduce parasitic effects.

No external components are needed other than AC-coupling capacitors because the circuit is internally compensated and matched to 50 and 75Ω. The amplifier has very good distortion specifications, with second and third-order intermodulation intercepts of +24dBm and +17dBm, respectively, at 100MHz.

The part is well matched for 50Ω test equipment such as signal generators, oscilloscopes, frequency counters, and all kinds of signal analyzers. Other applications at 50Ω include mobile radio, CB radio, and data/video transmission in fiber optics, as well as broadband LANs and telecom systems. A gain greater than 20dB can be achieved by cascading additional NE/SA5204A/5205As in series as required, without any degradation in amplifier stability.

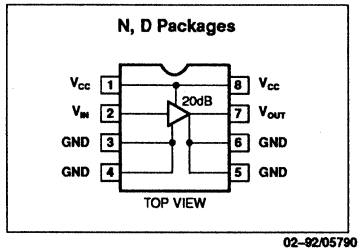
FEATURES

- 300MHz Bandwidth for NE/SA5204A
  600MHz Bandwidth for NE/SA5205A
- 20dB insertion gain
- 4.8dB (6dB) noise figure ZO=75Ω (ZO=50Ω)
- No external components required
- Input and output impedances matched to 50/75Ω systems
- Surface-mount package available
- Cascadable
- 2000V ESD protection
- 5205A is Military qualified

APPLICATIONS

- Antenna amplifiers
- Amplified splitters
- Signal generators
- Frequency counters
- Oscilloscopes
- Signal analyzers
- Broadband LANs
- Networks
- Modems
- Mobile radio
- Security systems
- Telecommunications

PIN CONFIGURATION



02-92/05790

Product Spotlights

NE/SA5209/5219 – Wideband Variable Vain Amplifiers

DESCRIPTION

The NE5209/5219 products represent a breakthrough in monolithic amplifier design featuring several innovations. This unique design has combined the advantages of a high speed bipolar process with the proven Gilbert architecture.

The NE5209/5219 are linear broadband RF amplifiers whose gain is controlled by a single DC voltage. The amplifier runs off a single 5 volt supply and consumes only 40mA. The amplifier has high impedance (1kΩ) differential inputs. The output is 50Ω differential. Therefore, the products can simultaneously perform AGC, impedance transformation, and the balun functions.

The dynamic range is excellent over a wide range of gain setting. Furthermore, the noise performance degrades at a comparatively slow rate as the gain is reduced. This is an important feature when building linear AGC systems.

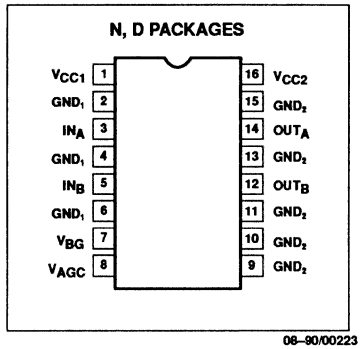
FEATURES

- Gain to 1.5GHz
- 850MHz bandwidth for NE/SA5209; 700MHz bandwidth for NE/SA5219
- High impedance differential input
- 50Ω differential output
- Single 5V power supply
- 0 - 1V gain control pin
- >60dB gain control range at 200MHz
- 26dB maximum gain differential
- Exceptional $V_{CONTROL}$ / V_{GAIN} linearity
- 7dB noise figure minimum
- Full ESD protection
- Easily cascadable

APPLICATIONS

- Linear AGC systems
- Very linear AM modulator
- RF balun
- Cable TV multi-purpose amplifier
- Fiber optic AGC
- RADAR
- User programmable fixed gain block
- Video
- Satellite receivers
- Cellular communications

PIN CONFIGURATION



08-90/00223

Product Spotlights

PCD4420 – DTMF Dialer with Redial

GENERAL DESCRIPTION

The PCD4420 is a single-chip silicon gate CMOS integrated circuit with a dual on-chip oscillator for use wih a 3.58 MHz or a 447 kHz quartz or ceramic resonator. It is a standard dialing circuit for dual tome multi frequency (DTMF). Input data is derived from a standard matrix 4x4 keyboard for dialing. Numbers of up to 23 digits can be stored in RAM for redial facilities. The last number can be redialed using the '#" key. DTMF bursts as well as pauses are timed to a minimum, in manual dialing the maximum depends on the key depression time.

FEATURES

- DTMF dialing
- Redial 23-digit
- Redial selected using the '#' key
- At redial after the first digit an access pause can be inserted
- Timing:
  - Manual dialing
  - Minimum duration for tone bursts and pauses
  - Redial
  - Calibrated timing
- On-chip voltage reference for supply and temperature independent tone-level output
- On-chip filtering for low harmonic distortion (CEPT CS 203 compatible)
- Pin selectable on-chip oscillator uses 3.58 MHz quartz or 447 kHz ceramic resonator
- Single-contact or double-contact (common left open) keyboard
- Keyboard entries fully debounced

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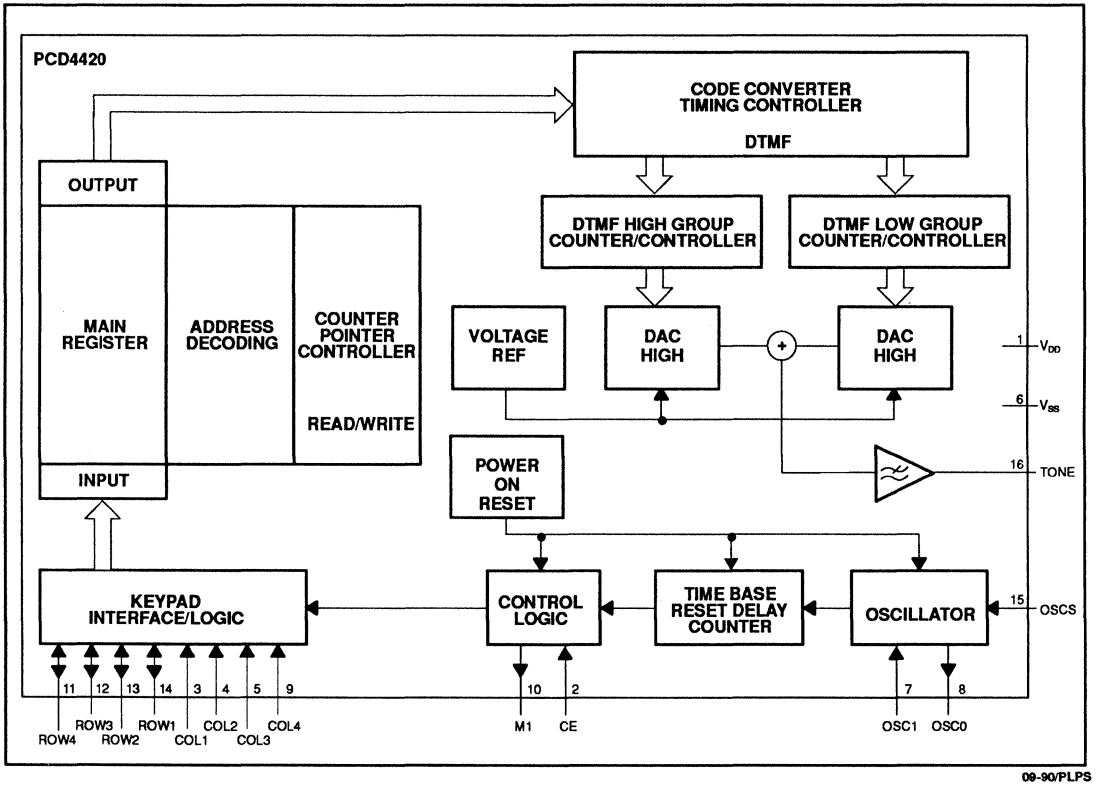


Product Spotlights

UAA2080T – Advanced Pager Receiver

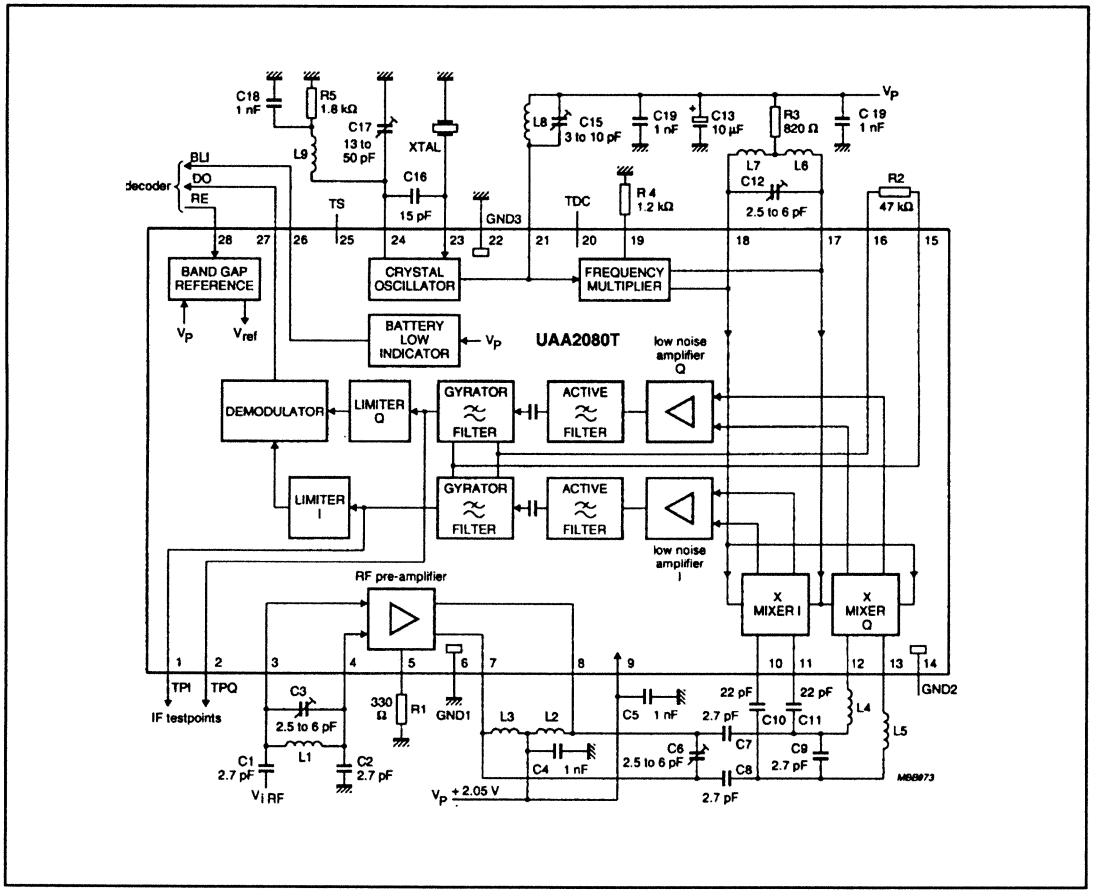
DESCRIPTION

The UAA2080T is a high performance low power radio receiver circuit primarily intended for VHF and UHF (25 to 512 MHz) pager receivers for wide area digital paging systems, employing direct FM non-return-to-zero (NRZ) frequency shift keying (FSK). The receiver design is based on the "direct conversion" principle where the input signal is mixed directly down to the base band by a local oscillator on the signal frequency. Two complete signal paths with signals of 90° phase difference are required to demodulate the signal. The circuit makes extensive use of on-chip capacitors to minimize the number of external components.

FEATURES

- Wide frequency range up to 512MHz
- High sensitivity
- High dynamic range
- Electronically adjustable filters on chip
- Wide frequency offset range and wide deviation range
- Fully POCSAG compatible
- Power on/off mode selectable by the chip enable input
- Low supply voltage; low power consumption
- High integration level

BLOCK DIAGRAM



08-92/PROD

Product Spotlights

UMA1005T – Dual Low-Power Frequency Synthesizer

DESCRIPTION

The UMA1005 is a low power, high performance dual frequency synthesizer fabricated in CMOS technology. Fractional-N division with selectable modulo 5 or 8 is implemented in the Main synthesizer. The detectors and charge pumps are designed to achieve 10 to 50000 kHz channel spacing and using fractional-N decreases the channel spacing by a factor of 5 or 8. Together with an external standard 2, 3 or 4 ratio prescaler the Main synthesizer can operate in the GHz frequency range. Channel selection and programming is realized by a high speed 3-wire serial interface.

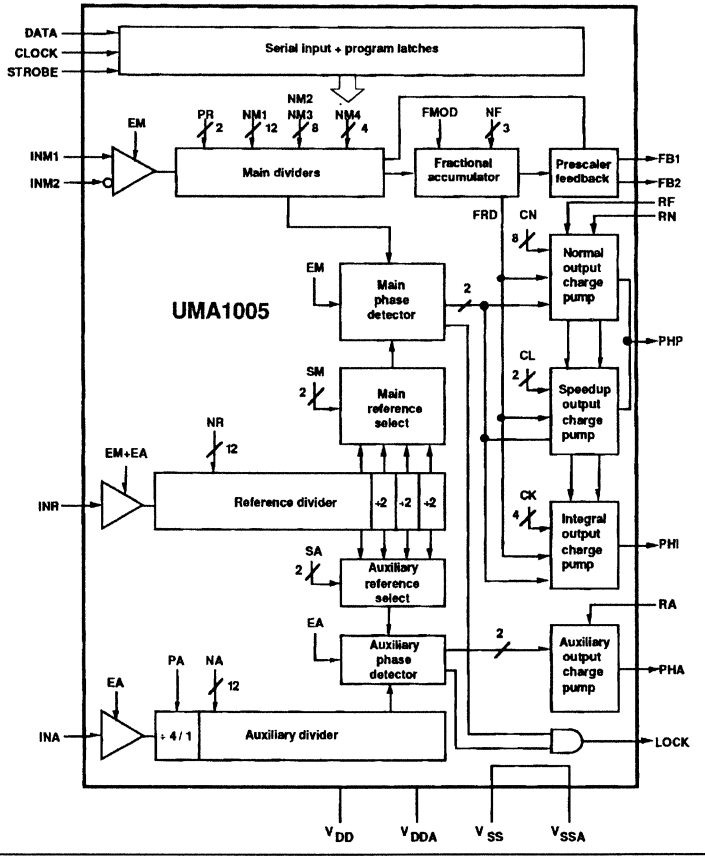
FEATURES

- Fast locking by "Fractional-N" divider
- Auxiliary synthesizer
- Digital phase comparator with proportional and integral charge pump output
- High speed serial input
- Low power consumption
- Programmable charge pump currents
- Supply voltage range 2.9 to 5.5 V

APPLICATIONS

- Mobile telephony
- Portable battery-powered radio equipment

BLOCK DIAGRAM



10-91/OBJ

Product Spotlights

UMA1016xT – Frequency Synthesizer for Radio Communication Equipment

DESCRIPTION

The UMA1016xT is a low power synthesizer for radio communications. Manufactured in bipolar technology, it is designed for a 70 to 1000kHz channel spacing in the 500 to 1000MHz band. The device includes a prescaler, a reference oscillator and dividers, a 3-state phase and frequency comparator, charge pump, and control circuits for the data bus to transfer serial data into the two internal registers. The internal dual register architecture allows a single synthesizer to be used in Fast Frequency Hopping systems without increasing microcontroller overhead. Fast switching between transmit and receive frequencies is achieved without the need for bus overhead. A power-down mode enables the circuit to be idled. The part uses a 3-wire serial bus for programming channels.

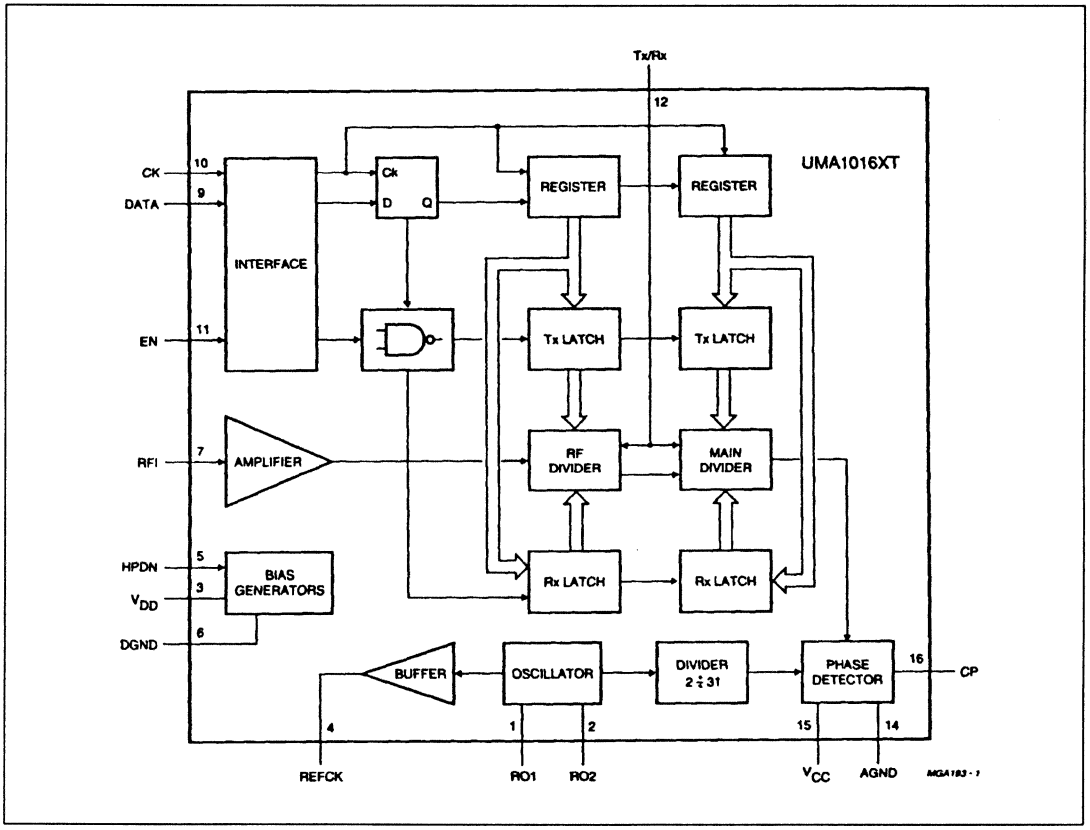
FEATURES

- RF input frequencies to 1 GHz
- Fully programmable RF divider
- Three-line serial bus interface
- On-chip 3 to MHz crystal oscillator
- Mask programmable +2 to +31
- Up to 1 MHz channel spacing
- Crystal frequency buffered output
- Dual register architecture for fast Tx/Rx switching TDD single synthesizer systems
- Phase detector compensated for supply and temperature variations
- Power-down mode

APPLICATIONS

- 900 MHz cordless telephones
- Portable battery-powered radio equipment

BLOCK DIAGRAM



PRELIM/1092

DATA COMMUNICATIONS

NE/SA/SE5212A – Transimpedance Amplifier (140MHz)

DESCRIPTION

The NE/SA/SE5212A is a 14kΩ transimpedance, wideband, low noise amplifier particularly suitable for signal recovery in fiber optic receivers and in any other applications where very low signal levels obtained from high-impedance sources need to be amplified.

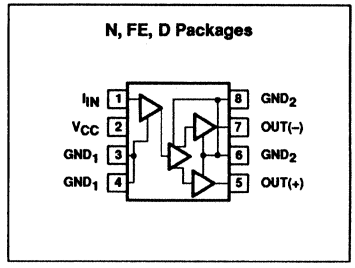
FEATURES

- Extremely low noise: 2.5pA/√Hz
- Single 5V supply
- Large bandwidth: 140MHz
- Differential outputs
- Low inupt/output impedances
- 14kΩ differential transresistance
- ESD hardened

APPLICATIONS

- Fiber optic receivers, analog and digital
- Current-to-voltage converters
- Wideband gain block
- Medical and scientific instrumentation
- Sensor preamplifiers
- Single-ended to differential conversion
- Low noise RF amplifiers
- RF signal processing

PIN CONFIGURATION



7-92/07284

NE5222 – Low-power FDDI Transimpedance Amplifier

DESCRIPTION

The NE/SA5222 is a low-power, wide-band, low noise transimpedance amplifier with differential outputs, optimized for signal recovery in FDDI fiber optic receivers. The part is also suited for many other RF and fiber optic applications as a general purpose gain block.

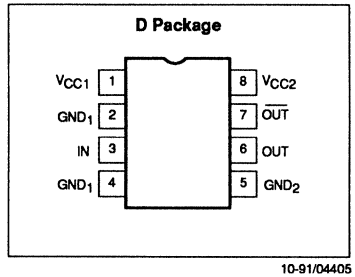
FEATURES

- Extremely low noise: $2.0pA/\sqrt{Hz}$
- Single 5V supply
- Low supply current: 9mA
- Large bandwidth: 165MHz
- Differential outputs
- Low output offset
- Low input/output impedances
- High power-supply-rejection ratio: 55dB
- Tight transresistance control
- High input overload: 115μA
- ESD protected

APPLICATIONS

- FDDI preamp
- Current-to-voltage converters
- Wide-band gain block
- Medical and scientific instrumentation
- Sensor preamplifiers
- Single-ended to differential conversion
- Low noise RF amplifiers
- RF signal processing

PIN DESCRIPTION



10-91/04405

Product Spotlights

NE/SA5224 NE/SA5225 – Fibre Optic Postamplifiers

DESCRIPTION

The NE/SA5224 and NE/SA5225 are high-gain limiting amplifiers that are designed to process signals from fiber optic preamplifiers. Capable of operating at 125Mb/s, the 5224 chip is FDDI compatible and has input signal level-detection with a user-adjustable threshold. The DATA and LEVEL-DETECT outputs are differential for optimum noise margin and ease of use. The NE/SA5225 is an ECL 10K version of the NE/SA5224.

FEATURES

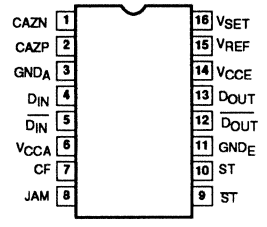
- Wideband operation: 1.0kHz to 120MHz typical
- Operation with single +5V or –5.2V supply
- Differential ECL outputs
  - 5224 = 100k
  - 5225 = 10k
- Programmable input signal level-detection
- Fully differential for excellent PSRR to 1GHz

GENERAL APPLICATIONS

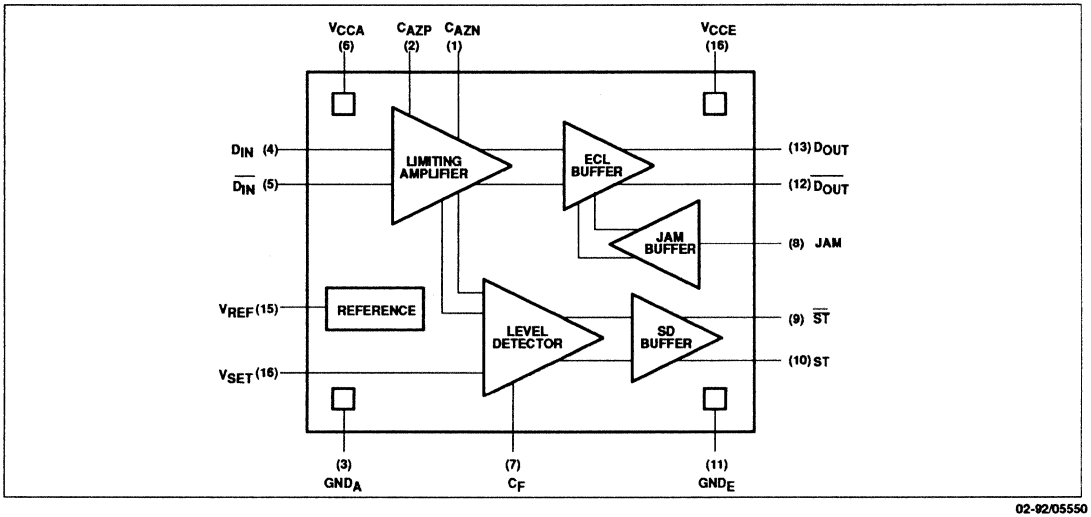
- Data communication in noisy industrial environments
- LANs

PIN DESCRIPTION

D Package



BLOCK DIAGRAM



02-92/05550

Product Spotlights

NE8392A, NE86C92 – Ethernet Transceivers

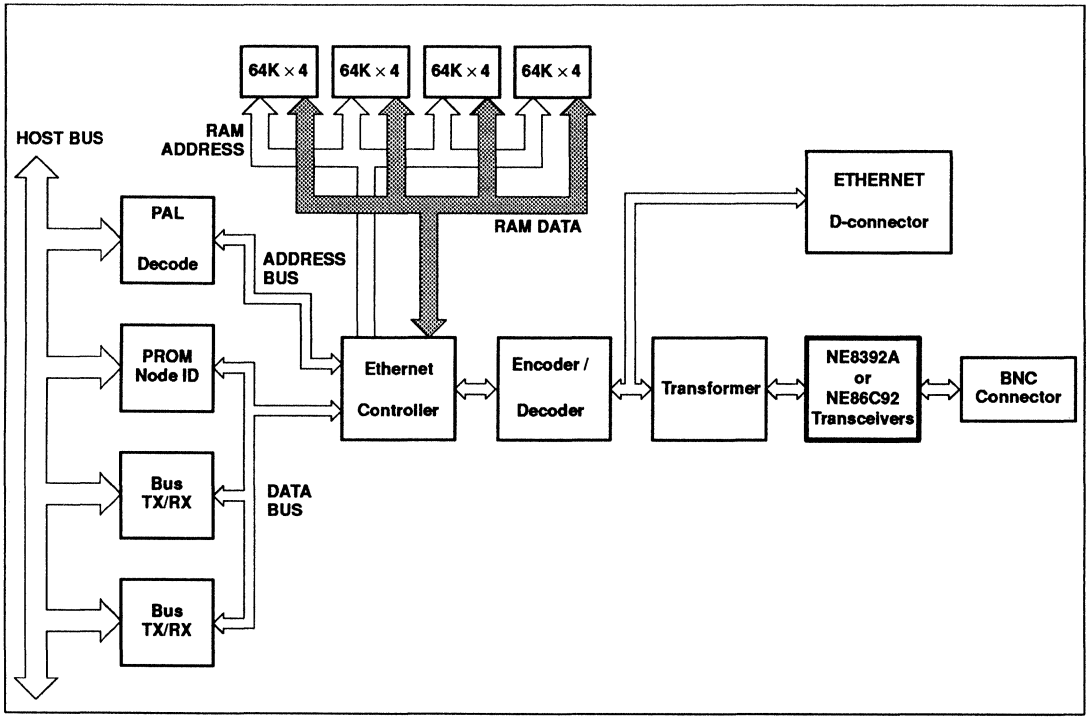
NE8392A – COAXIAL TRANSCEIVER INTERFACE

- Compatible with Ethernet II, IEEE 802.3 10base5 and 10base2, and ISO 8802/3 interface specifications
- Integrates all transceiver electronics except signal and power isolation
- Heartbeat generator can be externally disabled for operation as IEEE 802.3 compatible repeaters
- Full ESD protection
- Power-on reset prevents glitches on coaxial cable during power up.

NE86C92 – TWISTED-PAIR TRANSCEIVER INTERFACE

- Compatible with IEEE 802.3 10BASE-T specifications
- Integrates all transceiver functions, with selectable heartbeat and link test generators
- Twisted-pair polarity detection and automatic correction
- Smart squelch on all data inputs
- Internal transmitter pre-distortion generator
- Supports automatic selection between AUI and RJ-45 connections
- Five LED status signals with on-chip drivers for transmit, receive and link integrity, collision, jabber status and twisted pair polarity reversal
- Advanced CMOS process uses single 5V supply
- Extremely low power operation: 24mA typical idle current

TYPICAL BOARD COMPONENTS FOR ETHERNET CARD



Product Spotlights

SC26C92 – CMOS DUART

DESCRIPTION

The SC26C92 is a pin and function replacement for the SCC2692 with added features and deeper FIFOs. Its configuration on power up is that of the 2692. Its differences from the 2692 are: 8 character receiver, 8 character transmit FIFOs, receiver watch dog timer, mode register 0 is added, extended baud rate and overall faster speeds, programmable receiver and transmitter interrupts. (The SCC2692 is not being discontinued.)

The Philips SC26C92 Dual Universal Asynchronous Receiver/Transmitter (DUART) is a single-chip CMOS-LSI communications device that provides two full-duplex asynchronous receiver/transmitter channels in a single package. It interfaces directly with microprocessors and may be used in a polled or interrupt driven system.

The operating mode and data format of each channel can be programmed independently. Additionally, each receiver and transmitter can select its operating speed as one of eighteen fixed baud rates, a 16X clock derived from a programmable counter/timer, or an external 1X or 16X clock. The baud rate generator and counter/timer can operate directly from a crystal or from external clock inputs. The ability to independently program the operating speed of the receiver and transmitter make the DUART particularly attractive for dual-speed channel applications such as clustered terminal systems.

Each receiver is buffered by eight character FIFOs to minimize the potential of receiver over-run or to reduce interrupt overhead in interrupt driven systems. In addition, a flow control capability is provided to disable a remote transmitter when the receiver buffer is full.

Also provided on the SC26C92 are a multipurpose 7-bit input port and a multipurpose 8-bit output port. These can be used as general purpose I/O ports or can be assigned specific functions (such as clock inputs or status/interrupt outputs) under program control.

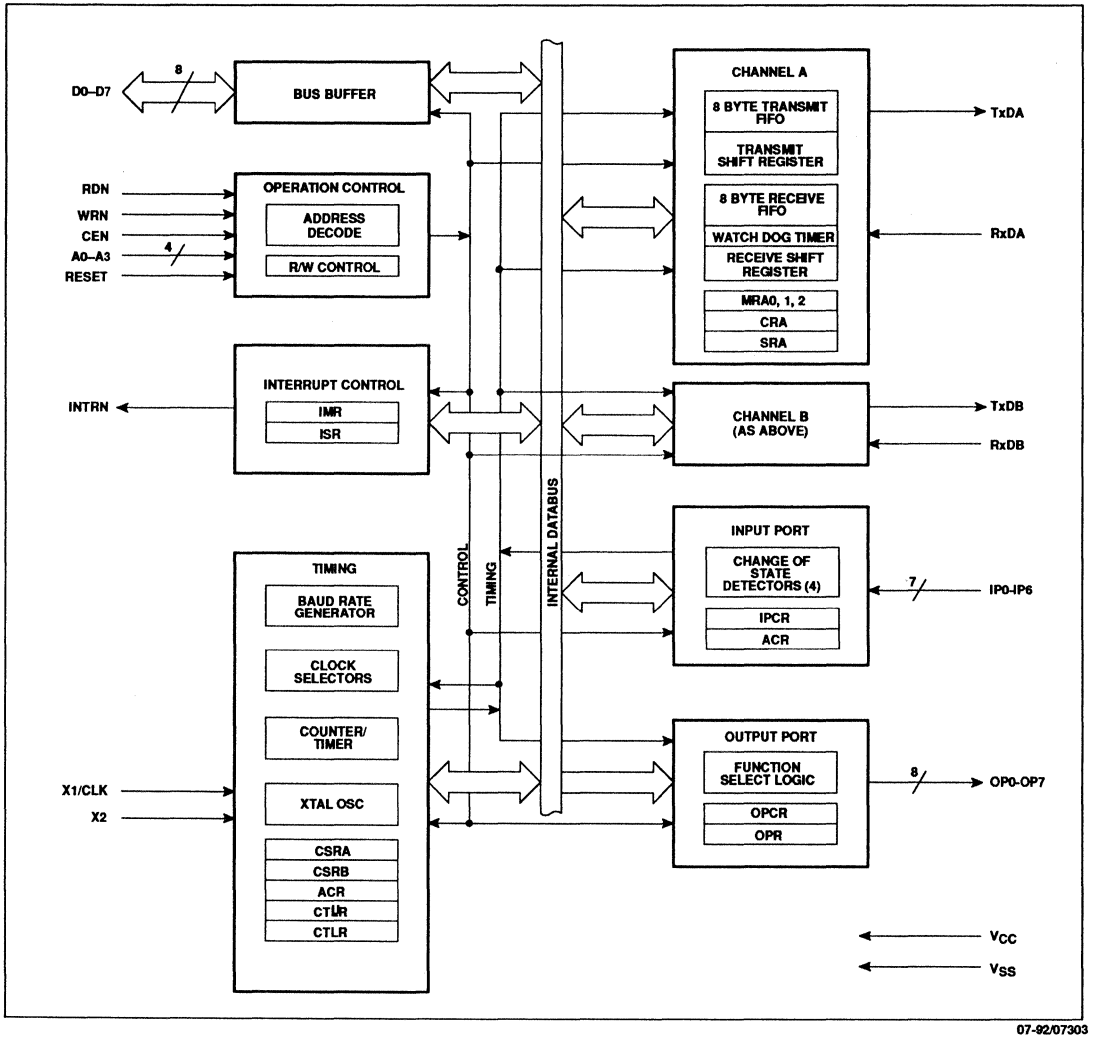
The SC26C92 is available in two package versions: 40-pin 0.6" wide DIP and a 44-pin PLCC.

FEATURES

- Dual full-duplex independent asynchronous receiver/transmitters
- 8 character FIFOs for each receiver and transmitter
- Programmable data format
  - 5 to 8 data bits plus parity
  - Odd, even, no parity or force parity
  - 1, 1.5 or 2 stop bits programmable in 1/16-bit increments
- Programmable baud rate for each receiver and transmitter selectable from:
  - 18 fixed rates: 50 to 38.4k baud
  - Other baud rates to 230.4k baud at 16X
  - Programmable user-defined rates derived from a programmable counter/timer
  - External 1X or 16X clock
- Parity, framing, and overrun error detection
- False start bit detection
- Line break detection and generation
- Programmable channel mode
  - Normal (full-duplex)
  - Automatic echo
  - Local loopback
  - Remote loopback
- Multi-function 7-bit input port
  - Can serve as clock or control inputs
  - Change of state detection on four inputs
- Multi-function 8-bit output port
  - Individual bit set/reset capability
  - Outputs can be programmed to be status/interrupt signals
- Versatile interrupt system
  - Single interrupt output with eight maskable interrupting conditions
  - Output port can be configured to provide a total of up to six separate wire-ORable interrupt outputs
  - Each FIFO can be programmed for four different interrupt levels
  - Watch dog timer for each receiver
- Maximum data transfer rates: 1X – 1MB/sec, 16X – 1Mb/sec
- Automatic wake-up mode for multidrop applications
- Start-end break interrupt/status
- Detects break which originates in the middle of a character
- On-chip crystal oscillator
- Power down mode
- Receiver timeout mode
- Single +5V power supply

Product Spotlights

BLOCK DIAGRAM



07-92/07303

Product Spotlights

SC26C94/68C94 – Quad Universal Asynchronous Receivers/Transmitters (QUART)

DESCRIPTION

The 26C94/68C94 quad universal asynchronous receivers/transmitters (QUART) combine four enhanced Philips Semiconductors industry-standard UARTs with an innovative interrupt scheme that can vastly minimize host processor overhead. They are implemented using Philips Semiconductors' high-speed CMOS process that combines small die size and cost with low power consumption.

The operating speed of each receiver and transmitter can be selected independently at one of eighteen fixed baud rates, a 16X clock derived from a programmable counter/timer, or an external 1X or 16X clock. The baud rate generator and counter/timer can operate directly from a crystal or from external clock inputs. The ability to independently program the operating speed of the receiver and transmitter make the QUART particularly attractive for dual-speed channel applications such as clustered terminal systems.

Each receiver is buffered with eight character FIFOs (first-in-first-out memories) and one shift register to minimize the potential for receiver overrun and to reduce interrupt overhead in interrupt driven systems. In addition, a handshaking capability is provided to disable a remote UART transmitter when the receiver buffer is full. (RTS control)

The circuits provide a power-down mode in which the oscillator is stopped and the register contents are stored. This results in reduced power consumption on the order of several magnitudes. The QUART is fully TTL compatible and operates from a single +5V power supply.

FEATURES

- New low overhead interrupt control
- Four Philips Semiconductors industry-standard UARTs
- Eight byte receive FIFO and eight byte transmit FIFO for each UART
- Programmable data format:
  - 5 to 8 data bits plus parity
  - Odd, even, no parity or force parity
  - 1, 1.5 or 2 stop bits programmable in 1/16-bit increments
- Baud rate for the receiver and transmitter selectable from:
  - 18 fixed rates: 50 to 38.4K baud Non-standard rates to 1.0M baud
  - User-defined rates from the programmable counter/timer associated with each of two blocks
  - External 1x or 16x clock
- Parity, framing, and overrun error detection
- False start bit detection
- Line break detection and generation
- Programmable channel mode
  - Normal (full-duplex), automatic echo, local loop back, remote loopback
- Programmable interrupt priorities
- Identification of highest priority interrupt
- Global interrupt register set provides data from interrupting channel
- Vectored interrupts with programmable vector format
- IACKN and DTACKN signals
- Built-in baud rate generator with choice of 18 rates
- Four I/O pins per UART for modem controls, clocks, etc.
- Power down mode
- High-speed CMOS technology
- 52-pin PLCC and 48-pin DIP
- Commercial and industrial temperature ranges available
- On-chip crystal oscillator
- TTL compatible
- Single +5V power supply with low power mode
- Two multifunction programmable 16-bit counter/timers
- 1MHz 16x mode operation
- 30ns data bus release time
- "Watch Dog" timer for each receiver

07-92/07309

Product Spotlights

SC26C460/SC68C460 – Input/output Processor (IOP)

DESCRIPTION

The Philips SC26C460 I/O Processor (IOP) is a co-processor that greatly reduces the CPU overhead required to service a large number of I/O devices. It can inspect, modify or delete the data it transfers. Each channel can have its own channel program, which can branch depending on device status or a data test.

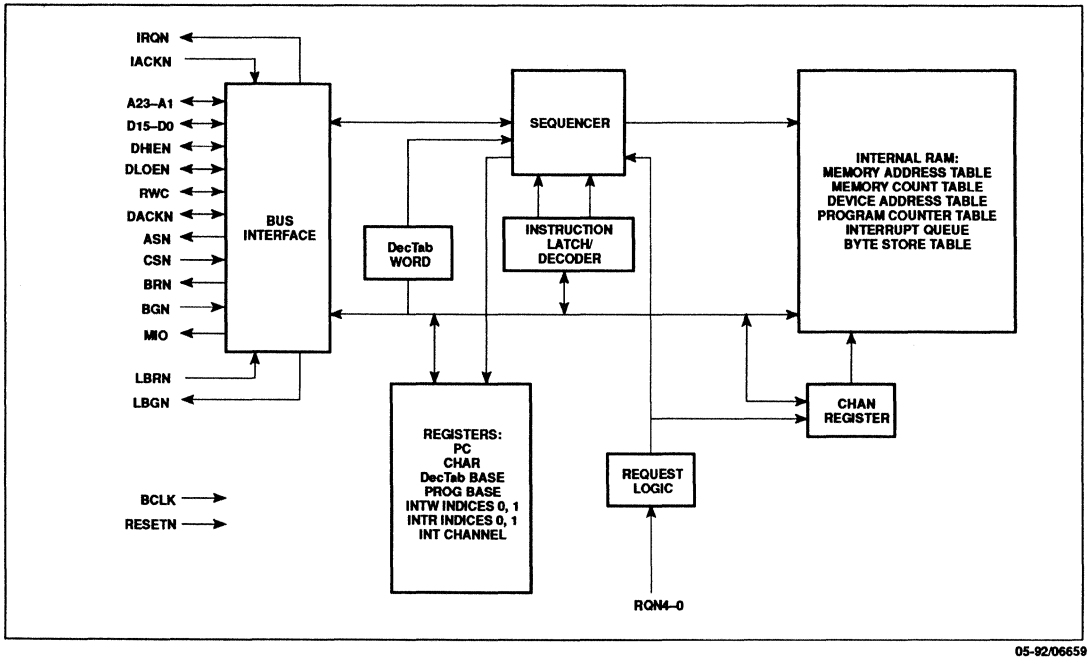
The IOP includes the features of a 32-channel Direct Memory Access (DMA) controller. This helps in handling multi-channel devices such as the Philips 2698 OCT-ART. It can create a data buffer chain in memory to transfer sequential blocks, greatly reducing the number of times the CPU needs to be interrupted.

The IOP can be attached directly to the system bus, or for higher performance, can support an additional local I/O bus.

FEATURES

- 32 channel DMA processor
- Separate memory address and length for each channel
- Separate I/O device address for each channel
- Separate channel program entry point for each channel
- Programmable to handle virtually all types of peripherals
- Custom instruction set
- Can interpret peripheral status for channel selection, error checking
- Can interpret data characters for buffer termination checking, control sequence transformation
- 8- or 16-bit data transfers
- 24-bit memory addresses: 16Mbyte address space
- 2-level interrupt queue minimizes host microprocessor overhead
- Stores and fetches data similar to Intel processors
- Can transfer multiple blocks without interrupting the CPU
- High-speed CMOS technology
- 68-pin PLCC

BLOCK DIAGRAM



05-92/06659

Product Spotlights

SC26C562/SC68562 – CMOS Dual Universal Serial Communications Controllers (CDUSCC)

DESCRIPTION

The Philips Semiconductors SC26C562 and SC68C562 Dual Universal Serial Communications Controllers (CDUSCC) are single-chip CMOS-LSI communications devices that provide two independent, multi-protocol, full-duplex receiver/transmitter channels in a single package. They support bit-oriented and character-oriented (byte count and byte control) synchronous data link controls as well as asynchronous protocols. The SC26C562 interfaces to synchronous bus MPUs and is capable of program-polled, interrupt driven, block-move or DMA data transfers. The SC68C562 interfaces to the 68000 MPUs via asynchronous bus control signals and is capable of program-polled, interrupt driven, block-move or DMA data transfers.

The SC26C562 (CDUSCC) is (pin) hardware and (register) software compatible with the existing SCN26562 (DUSCC). CDUSCC will automatically configure to the NMOS DUSCC register map (default mode) on power up.

The SC68C562 is hardware (pin) and software (register) compatible with SCN68562 (NMOS version). It will automatically configure to NMOS DUSCC register map on power-up or reset.

The operating mode and data format of each channel can be programmed independently. Each channel consists of a receiver, a transmitter, a 16-bit multifunction counter/timer, a digital phase-locked loop (DPLL), a parity/CRC generator and checker, and associated control circuits. The two channels share a common bit rate generator (BRG), operating directly from a crystal or an external clock, which provides 16 common bit rates simultaneously. The operating rate for the receiver and transmitter of each channel can be independently selected from the BRG, the DPLL, the counter/timer, or from an external 1X or 16X clock, making the CDUSCC well-suited for dual-speed channel applications. Data rates up to 10Mbits per second are supported.

The transmitter and receiver each contain a sixteen-deep FIFO with appended transmitter command and receiver status bits and a shift register. This permits reading and writing of up to sixteen characters at a time, minimizing the potential of receiver overrun or transmitter underrun, and reducing interrupt or DMA overhead. In addition, a flow control capability is provided to disable a remote transmitter when the FIFO of the local receiving device is full.

Two modem control inputs (DCD and CTS) and three modem control outputs (RTS and two general purpose) are provided. Because the modem control inputs and outputs are general purpose in nature, they can be optionally programmed for other functions.

FEATURES

General Features

- Multi-protocol operation
  - BOP: HDLC/ADCCP, SDLC, SDLC loop, X.25 or X.75 link level, etc.
  - COP: Single SYNC, dual SYNC, BiSYNC, DDCMP
  - ASYNC: 5-8 bits plus optional parity
- FIFO'ed status bits
- Watchdog timer
- 0 to 10 Mbit/sec data rate
- Programmable bit rate for each receiver and transmitter selectable from:
  - 19 fixed rates: 50 to 64K baud
  - One user-defined rate derived from programmable counter/timer
- Parity and FCS (frame check sequence LRC or CRC) generation and checking
- Programmable data encoding/decoding: NRZ, NRZI, FM0, FM1, Manchester
- Programmable channel mode: full- or half-duplex, auto-echo, or local loopback
- Programmable data transfer mode: polled, interrupt, DMA, wait
- Transmit path clear status
- Interrupt capabilities
  - Vector output (fixed or modified by status)
  - Programmable internal priorities
  - Maskable interrupt conditions
- Multi-function programmable 16-bit counter/timer
  - Bit rate generator
  - Event counter
  - Count received or transmitted characters
  - Delay generator
  - Automatic bit length measurement
- Modem controls
  - RTS, CTS, DCD, and up to four general purpose I/O pins per channel
  - CTS and DCD programmable auto-enables for Tx and Rx
  - Programmable interrupt on change of CTS or DCD
- On-chip oscillator for crystal
- TTL compatible
- Single +5V power supply

Asynchronous Mode Features

- Character length: 5 to 8 bits
- Odd or even parity, no parity, or force parity
- Up to two stop bits programmable in 1/16-bit increments
- Parity, overrun and framing error detection
- False start bit detection
- Break generation with handshake for counting break characters
- Transmit and receive up to 10Mb/s at 1x or 1Mb/s at 16x data rates

12-92/08563

Product Spotlights

SCC2698B – Enhanced Octal Universal Asynchronous Receiver/Transmitter (DUART)

DESCRIPTION

The SCC2698B Enhanced Octal Universal Asynchronous Receiver/ Transmitter (Octal UART) is a single chip MOS-LSI communications device that provides eight full-duplex asynchronous receiver/transmitter channels in a single package. It is fabricated with CMOS technology which combines the benefits of high density and low power consumption.

The operating speed of each receiver and transmitter can be selected independently as one of eighteen fixed baud rates, a 16X clock derived from a programmable counter/timer, or an external 1X or 16X clock. The baud rate generator and counter/timer can operate directly from a crystal or from external clock inputs. The ability to independently program the operating speed of the receiver and transmitter make the Octal UART particularly attractive for dual-speed channel applications such as clustered terminal systems.

The receiver is quadruple buffered to minimize the potential of receiver overrun or to reduce interrupt overhead in interrupt driven systems. In addition, a handshaking capability is provided to disable a remote UART transmitter when the receiver buffer is full.

The UART provides a power-down mode in which the oscillator is frozen but the register contents are stored. This results in reduced power consumption on the order of several magnitudes. The Octal UART is fully TTL compatible and operates from a single +5V power supply.

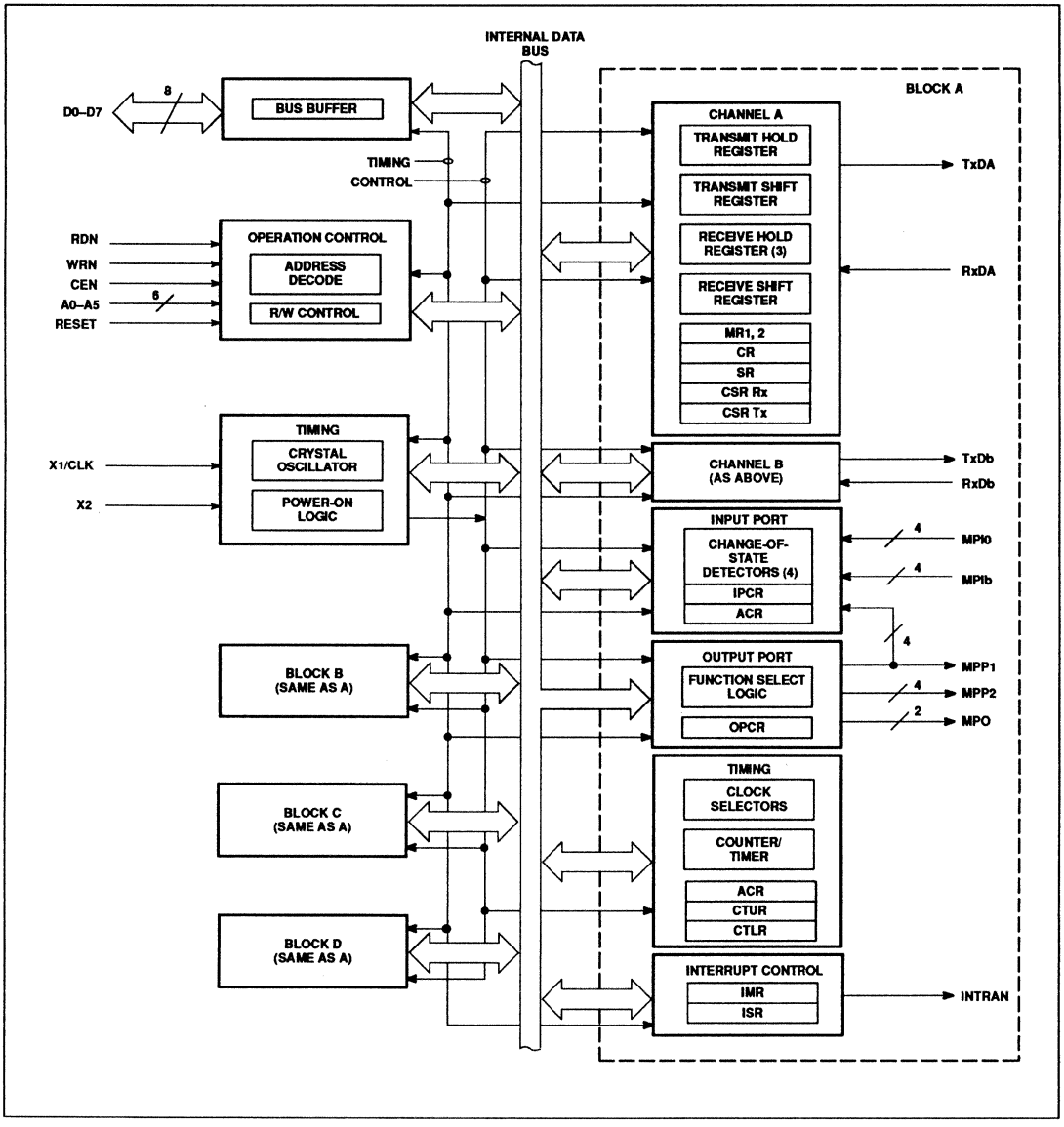
The SCC2698B is an upwardly compatible version of the 2698A Octal UART. In PLCC packaging, it is enhanced by the addition of receiver ready or FIFO full status outputs, and transmitter empty status outputs for each channel on 16 multipurpose I/O pins. The multipurpose I/O pins of the SCC2698B were inputs only on the SCC2698A.

FEATURES

- Eight full-duplex asynchronous receiver/transmitters
- Quadruple buffered receiver data register
- Programmable data format:
  - 5 to 8 data bits plus parity
  - Odd, even, no parity or force parity
  - 1, 1.5 or 2 stop bits programmable in 1/16-bit increments
- Baud rate for the receiver and transmitter selectable from:
  - 18 fixed rates: 50 to 38.4K baud Non-standard rates to 115.2K baud
  - User-defined rates from the programmable counter/timer associated with each of four blocks
  - External 1X or 16X clock
- Parity, framing, and overrun error detection
- False start bit detection
- Line break detection and generation
- Programmable channel mode
  - Normal (full-duplex), automatic echo, local loop back, remote loopback
- Four multi-function programmable 16-bit counter/timers
- Four interrupt outputs with eight maskable interrupting conditions for each output
- Receiver ready/FIFO full and transmitter ready status available on 16 multi-function pins in PLCC package
- On-chip crystal oscillator
- TTL compatible
- Single +5V power supply with low power mode

Product Spotlights

BLOCK DIAGRAM



Product Spotlights

PIN DESCRIPTION

MNEMONIC	PIN NO.	TYPE	NAME AND FUNCTION
D15–D0	60–64, 1–11	I/O	**Bidirectional Data Bus:** 16-bit data bus for the IOP, memory, peripherals, and the host MPU.
M/IO	28	O	**Memory/Input-Output Control:** When the IOP is a bus master, this tri-state output is driven high to indicate an access to memory, and low to indicate an access to a peripheral device. MIO has the same timing as A23–A1. When the IOP is a bus slave, this output is tri-stated.
ASN	32	O	**Address Strobe:** When the IOP is bus master, this is an output indicating that a transfer cycle is in progress on the bus, and, in particular, that a valid address has been placed on A23–A1. This signal is not driven at other times.
DHIEN, DLOEN	30, 31	I/O	**Data High/Low Enable:** When the IOP is a bus master, these pins are outputs. DHIEN low in a master read cycle indicates that the memory or peripheral selected by A23–A1 should read a byte and place its contents on D15–D8, while DLOEN low has the same meaning for the D7–D0 lines. In a master write cycle, DHIEN (DLOEN) low indicates that the IOP has placed valid data on D15–D8 (D7–D0), and that the memory or peripheral selected by A23–A1 should write the data into the appropriate byte(s). When both signals are low in a master cycle, a 16-bit word should be transferred. When the IOP is not a bus master, these lines are inputs from the host MPU. These two signals are internally ANDed. Either signal goes active, along with CSN active, will cause the IOP to be accessed.
RWC	29	I/O	**Read/Write Control:** When the IOP is a bus master, this output controls the direction of data transfer on D15–D0. On the IOP, this signal is high for a write and low for a read. and corresponds to W/$\overline{R}$ on the 80386 and to $\overline{ST}$ on the 80286. When the IOP is not the current bus master, RWC is an input from the host MPU, with the same meaning.
DACKN	27	I/O	**Data Acknowledge:** When the IOP is a bus master, this is an input signal from memory and peripherals, acknowledging that the requested bus transfer has been completed. When the IOP is a bus slave, this is an open-drain output to the host MPU, with the same meaning. This signal corresponds to $\overline{READY}$ on the 80286 and 80386.
BRN	17	O	**Bus Request:** An active-low output to the host MPU or other bus arbiter, requesting the use of the MPU bus. It must be inverted to produce HOLD in an "Intel" system. BRN is not open-drain because if the host MPU is the arbiter and the IOP is the only other master, a totem-pole output eliminates the need for a pull-up resistor. Also, if there are other masters contending with the IOP for bus grants, the arbitration mechanism needs a separate request signal from each master to decide which one is to receive each grant.
BGN	20	I	**Bus Grant:** An active-low input from the host MPU or other arbiter, granting use of the MPU bus to the IOP. If there are no bus masters other than the IOP and host MPU, BGN can be inverted from the HLDA output of an Intel processor.
LBRN	21	I	**Local Bus Request:** An active-low input used in systems in which the MPU and IOP have separate buses, whereby the MPU can request access to the use of resources on the IOP's bus, including the IOP itself. It should be wired to a logic high in a system in which the MPU and IOP share the same bus. First MPU access to the IOP without asserting this signal will lock the IOP in one bus mode until reset.
LBGN	26	O	**Local Bus Grant:** LBGN is an active-low output by means of which the IOP responds to LBRN, and grants the host MPU access to resources on the IOP's bus.
IRQN	22	O	**Interrupt Request:** An active-low open-drain output to the host MPU, indicating that a channel program has requested an interrupt for one or more of the IOP channels. It must be inverted in an Intel style system. It requires an external pull-up resistor.
IACKN	23	I	**Interrupt Acknowledge:** An active-low input indicating the the host MPU is acknowledging the interrupt requested by IRQN. The IOP responds to the assertion of this signal by placing an interrupt vector on D7–D0, asserting DTACKN, and releasing IRQN if there is no further interrupt request for any channel.
BCLK	66	I	**Bus Clock:** The clock signal for the IOP.
RESETN	67	I	**Master Reset:** Active-low reset for the IOP. Must be asserted at power-up; may be asserted at other times the system is to be reset and restarted.
V_{CC}	19, 54, 68	I	**Power**
V_{SS}	18, 25, 36, 47, 53, 65	I	**Ground**

Product Spotlights

SCC2692 – Dual Asynchronous Receiver/Transmitter (DUART)

DESCRIPTION

The Philips SCC2692 Dual Universal Asynchronous Receiver/Transmitter (DUART) is a single-chip CMOS-LSI communications device that provides two full-duplex asynchronous receiver/transmitter channels in a single package. It interfaces directly with microprocessors and may be used in a polled or interrupt driven system.

The operating mode and data format of each channel can be programmed independently. Additionally, each receiver and transmitter can select its operating speed as one of eighteen fixed baud rates, a 16X clock derived from a programmable counter/timer, or an external 1X or 16X clock. The baud rate generator and counter/timer can operate directly from a crystal or from external clock inputs. The ability to independently program the operating speed of the receiver and transmitter make the DUART particularly attractive for dual-speed channel applications such as clustered terminal systems.

Each receiver is quadruply buffered to minimize the potential of receiver over-run or to reduce interrupt overhead in interrupt driven systems. In addition, a flow control capability is provided to disable a remote DUART transmitter when the receiver buffer is full.

Also provided on the SCC2692 are a multipurpose 7-bit input port and a multipurpose 8-bit output port. These can be used as general purpose I/O ports or can be assigned specific functions (such as clock inputs or status/interrupt outputs) under program control.

The SCC2692 is available in three package versions: 40-pin and 28-pin, 0.6" wide, DIPs and a 44-pin PLCC.

FEATURES

- Dual full-duplex asynchronous receiver/transmitters
- Quadruple buffered receiver data register
- Programmable data format
  - 5 to 8 data bits plus parity
  - Odd, even, no parity or force parity
  - 1, 1.5 or 2 stop bits programmable in 1/16-bit increments
- Programmable baud rate for each receiver and transmitter selectable from:
  - 18 fixed rates: 50 to 38.4k baud
  - One user-defined rate derived from programmable counter/timer
  - External 1X or 16X clock
- Parity, framing, and overrun error detection
- False start bit detection
- Line break detection and generation
- Programmable channel mode
  - Normal (full-duplex)
  - Automatic echo
  - Local loopback
  - Remote loopback
- Multi-function 7-bit input port
  - Can serve as clock or control inputs
  - Change of state detection on four inputs
- Multi-function 8-bit output port
  - Individual bit set/reset capability
  - Outputs can be programmed to be status/interrupt signals
- Versatile interrupt system
  - Single interrupt output with eight maskable interrupting conditions
  - Output port can be configured to provide a total of up to six separate wire-ORable interrupt outputs
- Maximum data transfer rates: 1X - 1Mb/s, 16X - 125Kb/s
- Automatic wake-up mode for multidrop applications
- Start-end break interrupt/status
- Detects break which originates in the middle of a character
- On-chip crystal oscillator
- Power down mode
- Receiver timeout mode
- Commercial and industrial temperature range versions
- TTL compatible
- Single +5V power supply

Product Spotlights

SCC68692 – Dual Asynchronous Receiver/Transmitter (DUART)

DESCRIPTION

The Philips Semiconductors SCC68692 Dual Universal Asynchronous Receiver/Transmitter (DUART) is a single-chip CMOS-LSI communications device that provides two full-duplex asynchronous receiver/transmitter channels in a single package. It is compatible with other S68000 family devices and can also interface easily with other microprocessors. The DUART can be used in a polled or interrupt driven systems.

The operating mode and data format of each channel can be programmed independently. Additionally, each receiver and transmitter can select its operating speed as one of eighteen fixed baud rates, a 16X clock derived from a programmable counter/timer, or an external 1X or 16X clock. The baud rate generator and counter/timer can operate directly from a crystal or from external clock inputs. The ability to independently program the operating speed of the receiver and transmitter make the DUART particularly attractive for dual-speed channel applications such as clustered terminal systems.

Each receiver is quadruple buffered to minimize the potential of receiver over-run or to reduce interrupt overhead in interrupt driven systems. In addition, a flow control capability is provided to disable a remote DUART transmitter when the receiver buffer is full.

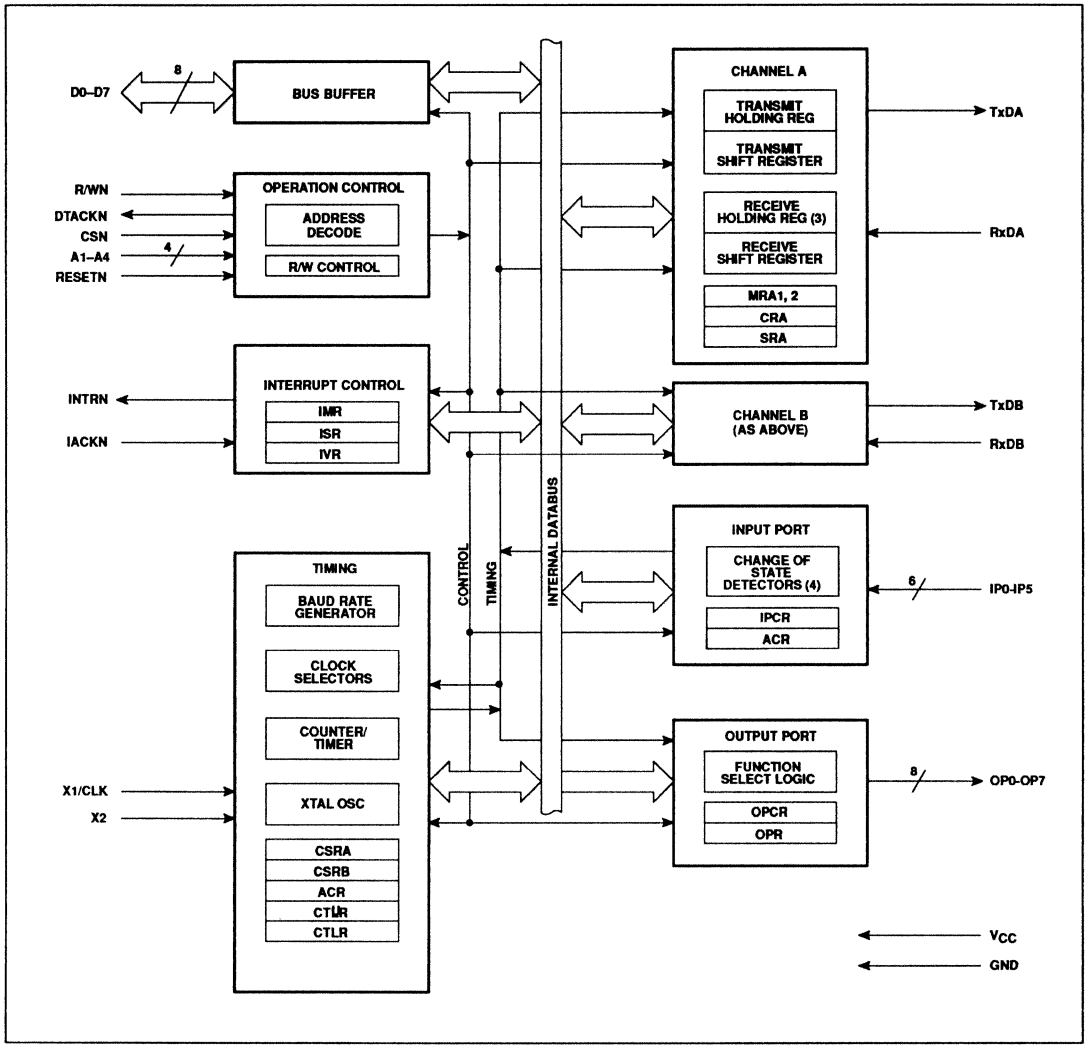
Also provided on the SCC68692 are a multipurpose 6-bit input port and a multipurpose 8-bit output port. These can be used as general purpose I/O ports or can be assigned specific functions (such as clock inputs or status/interrupt outputs) under program control.

FEATURES

- S68000 bus compatible
- Dual full-duplex asynchronous receiver/transmitters
- Quadruple buffered receiver data register
- Programmable data format:
  - 5 to 8 data bits plus parity
  - Odd, even, no parity or force parity
  - 1, 1.5 or 2 stop bits programmable in 1/16-bit increments
- Programmable baud rate for each receiver and transmitter selectable from:
  - 18 fixed rates: 50 to 38.4k baud
  - Non-standard rates to 115.2kb
  - One user-defined rate derived from programmable counter/timer
  - External 1X or 16X clock
- Parity, framing, and overrun error detection
- False start bit detection
- Line break detection and generation
- Programmable channel mode
  - Normal (full-duplex)
  - Automatic echo
  - Local loopback
  - Remote loopback
- Multi-function 6-bit input port
  - Can serve as clock or control inputs
  - Change of state detection on four inputs
- Multi-function 8-bit output port
  - Individual bit set/reset capability
  - Outputs can be programmed to be status/interrupt signals
- Versatile interrupt system
  - Single interrupt output with eight maskable interrupting conditions
  - Interrupt vector output on interrupt acknowledge
  - Output port can be configured to provide a total of up to six separate wire-ORable interrupt outputs
- Maximum data transfer rates: 1X – 1MB/sec, 16X – 125kB/sec
- Automatic wake-up mode for multidrop applications
- Start-end break interrupt/status
- Detects break which originates in the middle of a character
- On-chip crystal oscillator
- Power down mode
- Receiver timeout mode
- Commercial and Industrial temperature range versions
- TTL compatible
- Single +5V power supply

Product Spotlights

BLOCK DIAGRAM



07-92/07310

Product Spotlights

SCN68562/SCN26562 – Dual Universal Serial Communications Controller (DUSCC)

FEATURES

General Features

- SCN26562 is fully compatible with Intel
- SCN68562 is fully compatible with Motorola
- Dual full-duplex synchronous/asynchronous receiver and transmitter
- Multiprotocol operation
  - BOP: HDLC/ADCCP, SDLC, SDLC loop, X.25 or X.75 link level, etc.
  - COP: BISYNC, DDCMP
  - ASYNC: 5 - 8 bits plus optional parity
- Four character receiver and transmitter FIFOs
- 0 to 4MHz data rate
- Programmable bit rate for each receiver and transmitter selectable from:
  - 16 fixed rates: 50 to 38.4k baud
  - One user-defined rate derived from programmable counter/timer
  - External 1X or 16X clock
  - Digital phase-locked loop
- Programmable data transfer mode: polled, interrupt, DMA, wait
- DMA interface
  - Compatibe with Philips' SCB68430 Direct Memory Access Interface (DMAI) and other DMA controllers
  - Half- or full-duplex operation
  - Single or dual address data transfers
  - Automatic frame termination on counter/timer terminal count or DMA DONE
- Interrupt capabilities
  - Daisy chain option
  - Vector output (fixed or modified by status)
  - Programmable internal priorities
  - Maskable interrupt conditions
- Multifunction programmable 16-bit counter/timer
  - Bit rate generator
  - Event counter
  - Count received or transmitted characters
  - Delay generator
  - Automatic bit length measurement
- Modem controls
  - RTS, CTS, DCD, and up to four general purpose I/O pins per channel
  - CTS and DCD programmable autoenables for Tx and Rx
  - Programmable interrupt on change of CTS or DCD
  - 68562 is Military qualified

Asynchronous Mode Features

- Character length: 5 to 8 bits
- Odd or even parity, no parity, or force parity
- Up to two stop bits programmable in 1/16-bit increments
- 1X or 16X Rx and Tx clock factors
- Parity, overrun, and framing error detection
- False start bit detection
- Start bit search 1/2 bit time after framing error detection
- Break generation with handshake for counting break characters
- Detection of start and end of received break

Character-Oriented Protocol Features

- Character length: 5 to 8 bits
- Odd or even parity, no parity, or force parity
- LRC or CRC generation and checking
- Optional opening PAD transmission
- SYN detection and optional stripping
- SYN or MARK linefill on underrun
- Parity, FCS, overrun, and underrun error detection
- BISYNC Features
  - EBCDIC or ASCII header, test and control messages
  - SYN, DLE stripping
  - EOM (End Of Message) detection and transmission
  - Auto transparency mode switching
  - Auto hunt after receipt of EOM sequence (with closing PAD check after EOT or NAK)

Bit-Oriented Protocol Features

- Character length: 5 to 8 bits
- Detection and transmission of residual character: 0 - 7 bits
- Automatic switch to programmed character length for 1 field
- Zero insertion and deletion
- Optional opening PAD transmission
- ABORT, ABORT-FLAGs, or FCS-FLAGs line fill on underrun
- Extended address and control fields
- CRC generation and checking
- SDLC loop mode capability

04-92/07197

Product Spotlights

INDUSTRIAL

TDA514X – Brushless DC Motor Controllers

DESCRIPTION

The TDA514X are bipolar integrated circuits used to drive brushless DC motors in full-wave mode. The devices sense the rotor position using an EMF-sensing technique and are ideally suited as a drive circuit for a hard disk drive motor.

FEATURES

- Full-wave commutation (using push/pull drivers at the output stages) without position sensors
- Built-in start-up circuitry
- Three push-pull outputs:
  - 1.8 A output current
  - low saturation voltage
  - built-in current limiter
  - soft-switching outputs
- Thermal protection
- Flyback diodes
- Tacho output without extra sensor
- Position pulse stage for phase-locked-loop control
- Transconductance amplifier for an external control transistor

APPLICATIONS

- General purpose spindle driver (e.g. HDD, drum motor)

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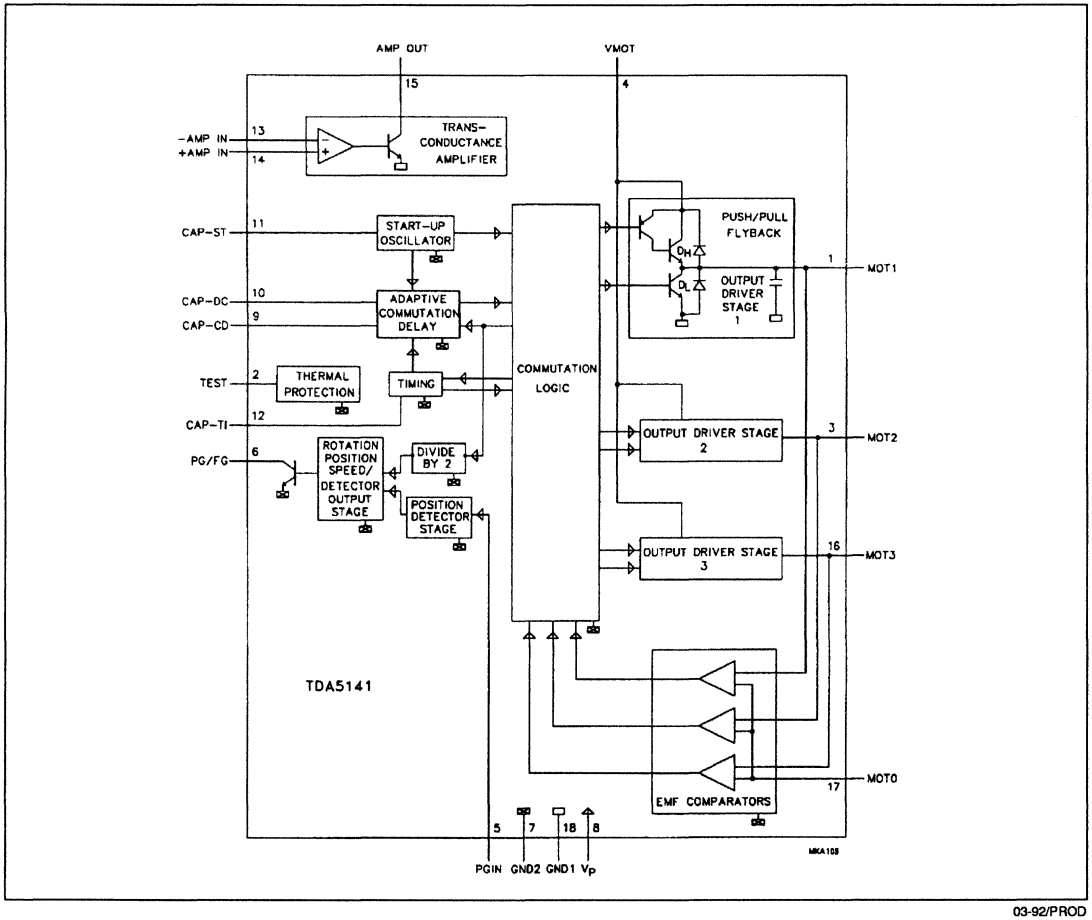

03-92/PROD

Product Spotlights

TEA1090 – A750V Battery Charger

DESCRIPTION

The TEA1090 is processed in a DMOS technology, which means that its working input voltage range comprises the rectified mains voltage up to 450V and peak transients up to 750V. The integrated high voltage switching transistor can handle currents up to 0.5A. The general function of the charger is an accurate, adjustable current source over the world wide mains voltage.

The TEA1090 contains a power switching stage and control functions which make, with only a few external components, a highly efficient charge power module for rechargeable batteries. The system can be fed from world wide mains or a low voltage source and can operate in stand alone or under external control.

FEATURES

- Integrated high-voltage power DMOS sense FET: 750V/0.5A
- Stand alone or remote controlled operation
- Current regulation in case of charger only
  - SOPS operation at fast charge
  - Fixed frequency at trickle charge
- Voltage regulation in case of charger in combination with battery load
- DMOS peak current limiting and thermal protection
- Fast and trickle charge mode at V_{IN} is 90-290V_{AC}
- Trickle charge mode at V_{IN} is 12-24V_{DC}
- LED driver for power on indication
- Interface signals
- 16-Pin Plastic Dual In-Line Package

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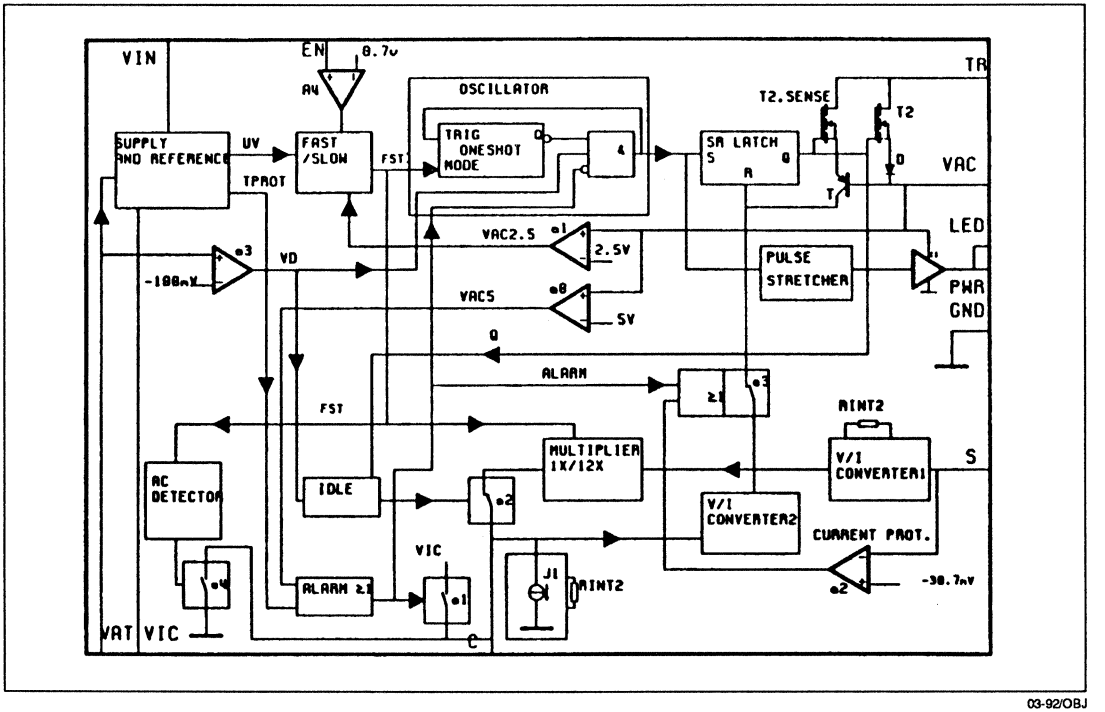

03-92/OBJ

Product Spotlights

TEA1100/T – NiCad Battery Charger/Monitor

GENERAL DESCRIPTION

The TEA1100/T is a monolithic integrated circuit, manufactured in a BiCMOS process intended to be used as a battery monitor circuit in charge systems for NiCd batteries.

The circuit has to be situated on the secondary side in mains-isolated systems where it monitors the battery voltage and the charge current. The circuit drives by means of an opto-coupler or a pulse transformer interface an SMPS circuit situated on the primary side of the system thus controlling the charge current of the batteries.

In switched mode systems with a DC power source the circuit can drive the switching transistor via a driver stage.

FEATURES

- Accurate regulation of charge current settings in cooperation with a switched mode power supply
- Accurate detection of fully charged batteries by currentless battery voltage sensing
- Switch over from fast to normal charging when batteries are fully charged
- Adjustable fast charging level (1C to 5C)
- Adjustable normal charging level (0.05C to 0.25C)
- Temperature guarding by means of an NTC resistor
- Tracking of maximum fast charging time with fast charging current level
- Protections against short-circuited and open batteries
- Large battery voltage range
- Both DC and PWM outputs with polarity switch

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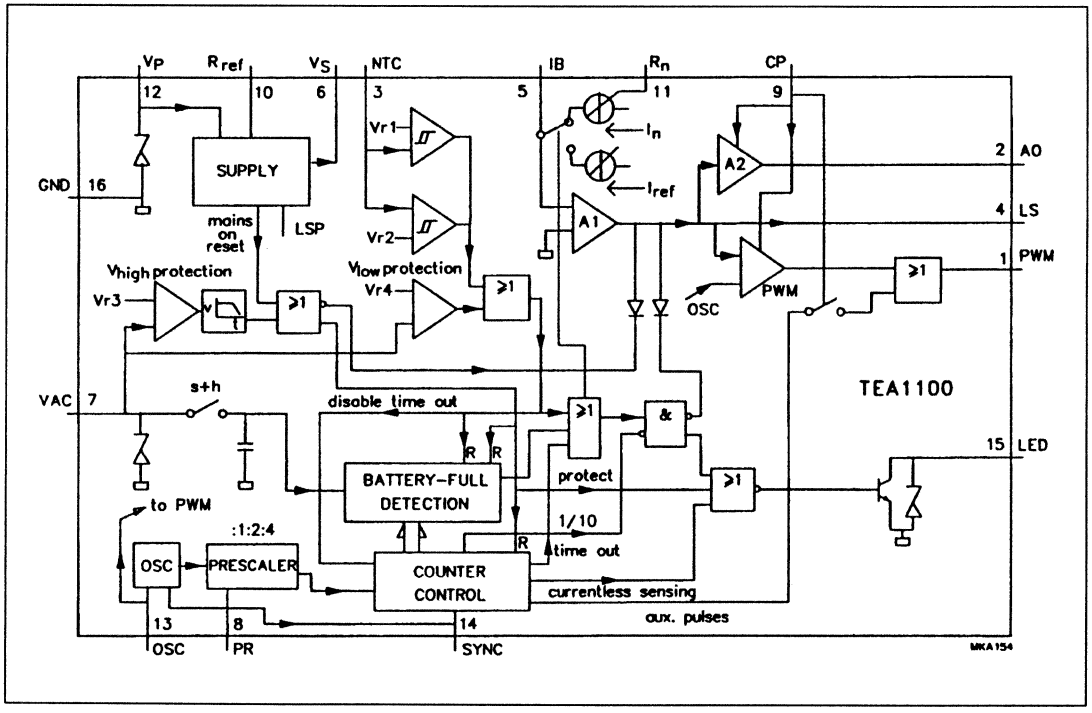


05-92/PRELIM

Product Spotlights

UAA1300 – Voltage Regulator with Watchdog Function

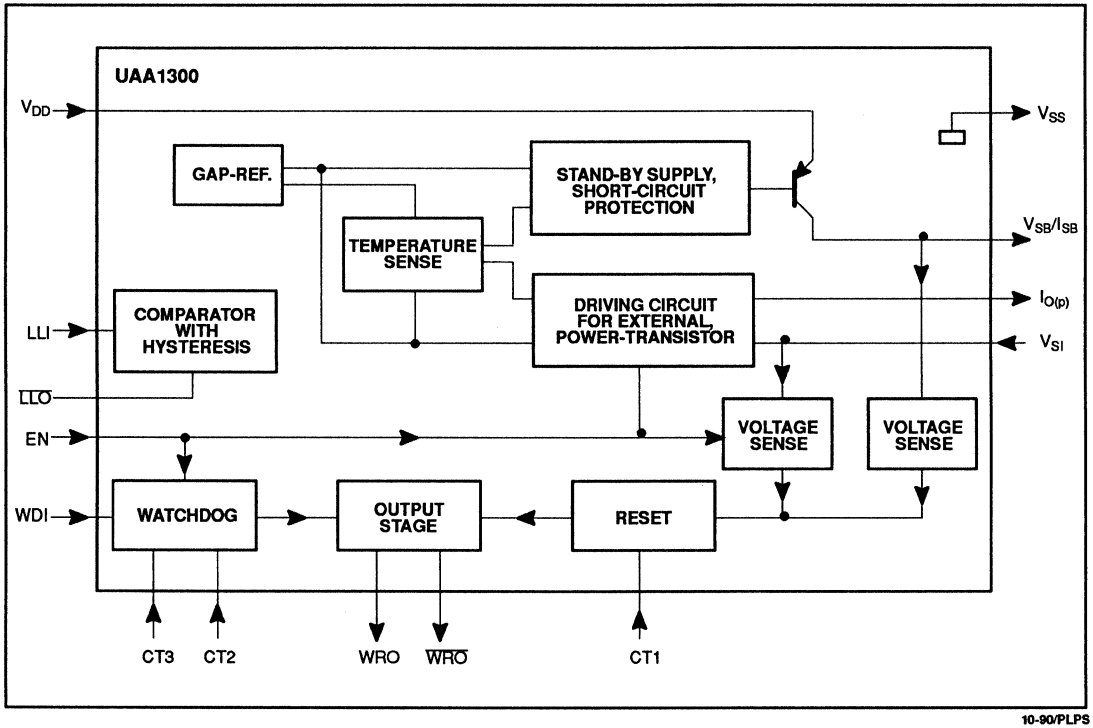
GENERAL DESCRIPTION

The UAA1300 is a bipolar IC voltage regulator especially designed for use within an automotive environment and also suitable to provide enhanced facilities within many microcontroller applications. The UAA1300 provides two stabilized low-drop outputs and offers special control functions to increase system protection and reliability.

FEATURES

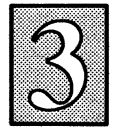
- Driving circuit for external PNP power transistor with adjustable output voltage via sense path, short-circuit protected
- Additional 5V/50mA output for RAM buffering, short-circuit protected
- Operating voltage range: 5.7V to 24V
- Reset with adjustable trigger pulse length activated by output voltage < 4.6V
- Watchdog with adjustable input trigger window
- Dual polarity reset and watchdog output pulse
- Low line detection adjustable by external resistor ratio
- Enable input to activate watchdog and driving circuit
- Low quiescent current typical: 380 µA
- Thermal protection

UAA1300 BLOCK DIAGRAM



10-90/PLPS

Product Information



Contents

Contents (Continued)

Product Information

PACKAGE CODES	DESCRIPTION
A	Plastic Leaded Chip Carrier (PLCC)
B	Plastic Quad Flat Pack
C	Chips
D	Plastic Small Outline
E	Hermetic TO46
F	Ceramic Dual In-Line
G	Ceramic Leadless Chip Carrier
H	Headers
I	Hermetic Sidebraze Ceramic Dual In-Line
K	Cerquad J Bend
L	Ceramic Leaded Chip Carrier
M	Module, Memories Programmer, Misc.
N	Plastic Dual In-Line
P	Pin Grid Array – Hermetic (PA = Cavity Up, PB = Cavity Down)
Q	Hermetic Ceramic Flat Pack
S	Microprocessors/Systems
U	Plastic Single In-Line
V	Plastic Pin Grid Array
W	Ceramic Flat Pack
Y	Ceramic Square Quad Flat Pack

Audio Products

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
DIGITAL AUDIO		
SAA7310GP	Compact Disk Decoder	B
SAA7322GP	Digital Filter & Bitstream DAC's + Filters	B
SAA7323GP	Digital Filter & Bitstream DAC's + Filters	B
SAA7350GP	20-Bit Bitstream DAC	B
SAA7360	16- or 18-Bit Bitstream Analog-to-Digital Converter	B
TDA1310/T	A Stereo Continuous Calbration DAC (CC-DAC)	D, N
TDA1311A	Continuous Calibration Dual 16-bit DAC w/Voltage Output	N
TDA1312/T	A Stereo Continuous Calbration DAC (CC-DAC)	D, N
TDA1541A	Dual 16-Bit DAC	N
TDA1542	Low Pass Filter	N
TDA1543	Low Cost Dual 16-Bit DAC	N
TDA1543A	Low Cost Dual 16-Bit DAC (Japan Format)	N
TDA1545	Continuous Calibration Dual 16-Bit DAC	D,N
TDA1547	Bitstream Bit DAC	N

Product Information

Audio Products (Continued)

DEVICE TYPE	DESCRIPTION	PINS	PACKAGE CODES
POWER AMPLIFIERS			
TDA1010A	6W Audio Power Amplifier	9	U
TDA1011	4W Audio Power Amp with Preamplifier	9	U
TDA1013B	4W Audio Amp with Voltage Control	9	U
TDA1015A	1W to 4W Audio Power Amp	9	U
TDA1015T	0.5W Audio Power Amp	8	D
TDA1016	2W Audio Power Amplifier with Preamplifier	16	N
TDA1020	12W Audio Power Amplifier with Preamplifier	9	U
TDA1514A	50W Hi-Fi Audio Amplifier	9	U
TDA1515B	24W BTL Power Amplifier	13	U
TDA1516Q	Power Amplifier 2 x 11 Watts	13	U
TDA1517	2 x 6W Audio Amplifier	9	U
TDA1518Q	22W Power Amplifier	13	U
TDA1519	2 x 6 Stereo Car Radio 40dB Gain	9	U
TDA1519A	2 x 6 or (22W BTL) Stereo Car Radio 40dB Gain	9	U
TDA1521	Audio Power Amp (2 x 12W)	9	U
TDA1521A	Audio Power Amp (2 x 12W)	9	U
TDA2611A	2-6W Audio Amplifier	9	U
TDA2613	6W Power Amp	9	U
TDA7050	Low Voltage Mono/Stereo Amp	8	N
TDA7050T	Low Voltage Mono/Stereo Amp	8	D
TDA7052	1W Low Voltage Power Amp	8	N
TDA7052A	1W Low Voltage Power Amp w/ DC Control	8	N
TDA7052AT	0.5W Low Voltage Power Amp w/ DC Control	8	D
TDA7053	2 x 1W Low Voltage Power Amp	16	N
TDA7056	3W Audio Power Amp	9	U
TDA7056A	3.0W Audio Power Amp w/ DC Control	9	U
TONE CONTROLLER AND PROCESSING			
TDA1029	Audio Switch 1	16	N
TDA1074A	Quad Electr. Potentiometer	18	N
TDA1524A	Stereo-Tone/Volume Control Circuit	18	N
TDA8421	TV Audio Processor (I^2C)	28	N
TDA8425	Audio Processor (I^2C)	20	N
TEA6300T	I^2C Active Tone Controller with Source Inputs & Fader	28	D
TEA6310T	I^2C Active Tone Controller & Fader	24	D
TEA6360	5-Band Equalizer (I^2C)	32	N
TEA9860	Universal Hi Fi Audio Processor for TV Sets	32	N
TEA6320T	Sound Fader Control Circuit	32	D
TEA6330T	Sound Fader Control Circuit for Car Radios	20	D

Product Information

CRT Products

DEVICE TYPE	DESCRIPTION	PACKAGE TYPE	ORDER CODE
SCN2672	Programmable Video Timing Controller (PVTC)	40-pin Plastic DIP 44-pin PLCC	SCN2672BC4N40 SCN2672BC4A44
SCN2672T	Programmable Video Timing Controller (Turbo-PVTC)	40-pin Plastic DIP 44-pin PLCC	SCN2672TC5N40 SCN2672TC5A4
SCN2674	Advanced Video Display Controller (AVDC)	40-pin Plastic DIP 44-pin PLCC	SCN2674BC4N40 SCN2674BC4A44
SCN2674T	Advanced Video Display Controller (Turbo-AVDC)	40-pin Plastic DIP 44-pin PLCC	SCN2674TC5N40 SCN2674TC5A44
SCB2675	Color/Monochrome Attributes Controller (CMAC)	40-pin Plastic DIP 44-pin PLCC 40-pin Plastic DIP 44-pin PLCC	SCB2675BC5N40 SCB2675BC5A44 SCB2675CC5N40 SCB2675CC5A44
SCC63484	Advanced CRT Controller (ACRTC)	64-pin Plastic DIP 68-pin PLCC	SCC63484C8N64 SCC63484C8A68

Data Communications Products

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
CONTROLLERS		
SCN2651	Programmable Communications Interface (PCI)	N
SCN2652/68652	Multi Protocol Communications Controller (MPCC)-dual numbering for same part	A, N
SCN2661/68661	Enhanced Programmable Communications Interface (EPCI)-dual numbering for same part	A, N
SCN2681	Dual Universal Asynchronous Receiver/Transmitter (DUART)-standard version	A, N
SCN2681T	Dual Universal Asynchronous Receiver/Transmitter (DUART)-fast (Turbo) version	A, N
SCN68681	Dual Universal Asynchronous Reciever/Transmitter (DUART)-68000 Series bus interface	A, N
SCC2691	Universal Asynchronous Receiver/Transmitter (UART)-CMOS	A, D, N
SCC2692	Dual Universal Asynchronous Receiver/Transmitter (DUART)-CMOS	A, F, N
SCC68692	Dual Universal Asynchronous Receiver/Transmitter(DUART)-CMOS, 68000 Series bus interface	A, N
SC26C92	Dual Universal Asynchronous Receiver/Transmitter (DUART)	A, N
SC26C94	Quad Universal Asynchronous Receiver/Transmitter	N, A
SC68C94	Quad Universal Asynchronous Receiver/Transmitter	N, A
SC26C460	I/O Processor	A
SC68C460	Input/Output Processor (IOP)	A
SC26C562	CMOS Dual Universal Serial Communications Controller (CDUSCC)	A, N
SC68C562	CMOS Dual Universal Serial Communications Controller (CDUSCC)	A, N
SCC2698B	Enhanced Octal Universal Asynchronous Receiver/Transmitter (Octal-DUART)- CMOS	A, N
SCN26562	Dual Universal Serial Communications Controller (DUSCC)-general purpose bus interface	A, N
SCN68562	Dual Universal Serial Communications Controller (DUSCC)-68000 Series bus interface	A, N

Product Information

Data Communications Products (Continued)

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
FIBRE OPTIC RECEIVERS		
NE/SE564	Phase-Locked Loop	D, F, N
NE/SA568A	150MHz Phase-Locked Loop	D, N
NE5210	Transimpedance Amplifier (280 MHz)	D
NE/SA5211	Transimpedance Amplifier (150 MHz)	D
NE/SA/SE5212A	Transimpedance Amplifier (140 MHz)	D, N
NE/SA5214	Fibre Optic Postamplifier with Link Status Indicator	D
NE/SA5217	Fibre Optic Postamplifier with Link Status Indicator	D
SA5222	FDDI Transimpedance Amplifier	D
NE/SA5224	Fibre Optic Postamplifier with Link Status Indicator 100K ECL	D
NE/SA5225	Fibre Optic Postamplifier with Link Status Indicator 10K ECL	D
LAN		
NE8392C	Ethernet Coaxial Transceiver	A, N
NE83Q92	Low Power Ethernet Coaxial Transceiver	A, D, N
NE86C92C	10BASE-T Transceiver	D, N
LINE DRIVERS AND RECEIVERS		
AM26LS31	Quad High-Speed Differential Line Driver	D, N
AM26LS32/33	Quad (RS-422/423) Line Receivers	D, N
AM26LS32B	Quad (RS-422/423) Line Receiver	D, N
MC145406	CMOS Triple Driver/Receiver (EIA-232-D)	D, N
NE5170	Octal Line Driver	A, N
NE5180/87	Octal Differential Line Receiver	A, N
MODEMS		
NE/SA5050	Power Line Modem	D, N
NE5080	High-Speed FSK Modem Transmitter (IEEE 802.4)	N
NE5081	High-Speed FSK Modem Receiver (IEEE 802.4)	N
PHASE-LOCKED LOOPS		
NE/SE564	Phase-Locked Loop	D, N
NE/SE567	Tone Decoder/Phase-Locked Loop	D, F, FE, N
NE/SE568A	150MHz Phase-Locked Loop	D, N
TELEPHONY		
NE/SE567	Tone Decoder/Phase-Locked Loop	D, F, FE, N
NE5900	Call Progress Decoder	D, N

Product Information

Industrial Products

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
AMPLIFIERS		
AU2902	Low Power Quad Operational Amplifier	D, N
AU2904	Low Power Quad Operational Amplifier	D, N
LM124/224/324/A	Low Power Quad Operational Amplifier	D, F, N
LM158/258/358/A	Low Power Quad Operational Amplifier	D, N
MC/SA1458/1558	General Purpose Operational Amplifier	D, N
NE/SA/SE532	Low Power Dual Operational Amplifier	D, N
NE/SA/SE5512	Dual High Performance Operational Amplifier	D, N
NE/SA5230	Low Voltage Operational Amplifier	D, N
NE/SA5234	Quad Low Voltage High Performance Operational Amplifier	D, N
NE/SA5534A	Single and Dual Low Noise Operational Amplifier	D, FE, N
NE/SE4558	Dual General Purpose Operational Amplifier	D, FE, N
NE/SE531	High Slew Rate Operational Amplifier	FE, N
NE/592	Video Amplifier	D8, D14, N8, N14
NE/SE5514	Quad High Performance Operational Amplifier	D, N
NE/SE5517/A	Dual Operational Transconductance Amplifier	D, N
NE/SE5539	Ultra High Frequency Operational Amplifier	D, F, N
NE5533/A	Single and Dual Low Noise Operational Amplifier	D, N
NE/5592	Video Amplifier	D, N
SA534	Low Power Quad Operational Amplifier	D, F, N
SA741C	General Purpose Operational Amplifier	FE, N
SA747C	Dual Operational Amplifier	N
μA733/C	Differential Video Amplifier	N
μA741/741C	General Purpose Operational Amplifier	D, N
μA747/747C	Dual Operational Amplifier	F, N
BATTERY MANAGEMENT		
TEA1041T	Battery Low-Level Indicator	D
TEA1090T	750 Volt Battery Charger	D
TEA1100/T	NiCad Battery Charger/Monitor	D
TEA1101/T	NiCad and NiMH Charger	D
SAA1500T	Time Charge Controller	D
COMPARATORS		
AU2901	Quad Voltage Comparator	D, N
AU2903	Low Power Dual Voltage Comparator	D, N
LM111/211/311	Voltage Comparator	D, FE, N
LM119/219/319	Voltage Comparator	D, F, N
LM139/A/239/A/339/A	Quad Voltage Comparator	D, F, N
LM193/A/293/A/393/A	Low Power Dual Voltage Comparator	D, FE, N
LM2901	Quad Voltage Comparator	D, F, N
LM2903	Low Power Dual Voltage Comparator	D, N
MC3302	Quad Voltage Comparator	D, F, N
NE/SE521	High-Speed Dual Differential Comparator/Sense Amp	D, F, N
NE/522	High-Speed Dual Differential Comparator/Sense Amp	D, N
NE/527	Voltage Comparator	D, N
NE/529	Voltage Comparator	D, N

Product Information

Industrial Products (Continued)		
DEVICE TYPE	**DESCRIPTION**	**PACKAGE CODES**
CONVERTERS		
ADC0803/4	8-Bit CMOS A/D Converter	D, N
ADC0820	8-Bit CMOS A/D Converter	D, N
AM6012	12-Bit Multiplying D/A Converter	D, F
DAC-08 Series	8-Bit High-Speed Multiplying D/A Converter	D, F, N
MC1408-8	8-Bit Multiplying D/A Converter	F, N, D
MC1508-8	8-Bit Multiplying D/A Converter	F
MC3410C	10-Bit High-Speed Multiplying D/A Converter	F
MC3510	10-Bit High-Speed Multiplying D/A Converter	F
NE/SE5018	8-Bit Microprocessor-Compatible D/A Converter	D, F, N
NE/SE5019	8-Bit Microprocessor-Compatible D/A Converter	D, N, F
NE/SE5410	10-Bit High-Speed Multiplying D/A Converter	F
NE5020	10-Bit Microprocessor-Compatible D/A Converter	F, N
NE5037	6-Bit A/D Converter, Parallel Outputs	N
TDA8702	8-Bit 30MHz D/A	D, N
TDA8703	8-Bit 40MHz A/D, TTL Output	D, N
TDA8708	8-Bit 30MHz A/D Source Select, Clamp	D, N
TDA8713, T	8-Bit 40MHz A/D, TTL Output	D, N
TDE8715D	8-Bit 50MHz A/D, ECL Output	F
DISPLAY DRIVERS		
NE/SA594	Vacuum Fluorescent Display Driver	D, F, N
PCF1174CTD	4MHz LCD Car Clock	D
PCF1175CTD	4MHz LCD Car Clock (MPX)	D
PCF8569T	DOT Matrix LCD Driver (Column)	D
PCF8578T	DOT Matrix LCD Driver (Row/Column)	D
PCF8579T	DOT Matrix LCD Driver (Column)	D
PCF2100P, T	40-Segment LCD Driver	D, N
PCF2110P, T	60-Segment LCD Driver and 2 LED	D, N
PCF2111P, T	LCD Duplex Driver 64-Segments	D, N
PCF2112P, T	LCD Driver 32-Segments	D, N
PCF8566P, T	24, 48, 72, 96-Segment LCD Driver	D
PCF8576T	40, 80, 120, 160-Segment LCD Driver	D
PCF8577P, T	32/64-Segment LCD Driver	D, N
SAA1064P	4-Bit LED Driver (I^2C)	N
DRIVERS		
NE/SA594	Vacuum Fluorescent Display Driver	D, F, N
NE/SA5090	Addressable Relay Driver	D, N
NE587	LED Decoder/Driver	D, N
NE590	Addressable Peripheral Drivers	N
NE591	Addressable Peripheral Drivers	N
I^2C/CLIPS		
PCF8570P, T	256 x 8-Bit Static RAM	D, N
PCF8571P, T	128 x 8 Static RAM	D, N
PCF8573P, T	Clock/Calendar w/Serial I/O	D, N
PCF8574AP, T	8-Bit Remote I/O Expandor	D, N

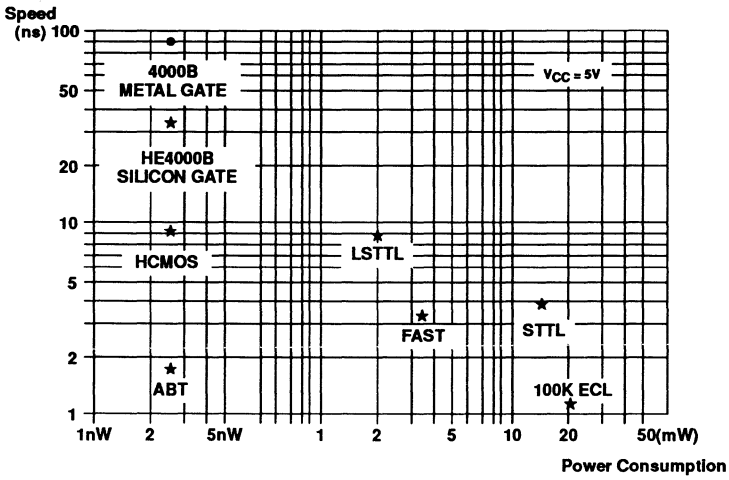
Product Information

Industrial Products (Continued)		
DEVICE TYPE	**DESCRIPTION**	**PACKAGE CODES**
I²C/CLIPS (Continued)		
PCF8574P, T	8-Bit Remote I/O Expandor	D, N
PCF8581P, T	128 x 8 EEPROM; 10K E/W Cycles	D, N
PCF8581CP, T	128 x 8 EEPROM; 10K E/W Cycles, 2.5V	D, N
PCD8582D2D	256 x 8 EEPROM; –25 to +70°C; 3V – 6V	D, N
PCD8582D2N	256 x 8 EEPROM; –25 to +70°C; 3V – 6V	D, N
PCF8582C2N	256 x 8 EEPROM; 500K E/W Cycles, 2.5V	D, N
PCF8582C2D	256 x 8 EEPROM; 100K E/W Cycles	D, N
PCF8583P, T	Clock I/O with 256 x 8 RAM, I²C	D, N
PCD8584P, T	Parallel Bus to I²C Converter	D, N
PCF8582E2D	128 x 8 EEPROM; 100 E/W Cycles; 5V ± 10%	D, N
PCF8582E2N	128 x 8 EEPROM; 100 E/W Cycles; 5V ± 10%	D, N
PCF8591P, T	ADC/DAC with I²C	D, N
PCF8594C2D	512 x 8 EEPROM; 2.5V – 6.0V	D, N
PCF8594C2N	512 x 8 EEPROM; 2.5V – 6.0V	D, N
PCD8594D2D	512 x 8 EEPROM; 3.0V – 6.0V	D, N
PCD8594D2N	512 x 8 EEPROM; 3.0V – 6.0V	D, N
PCF8594E2D	512 x 8 EEPROM; 5V ± 10%	D, N
PCF8594E2N	512 x 8 EEPROM; 5V ± 10%	D, N
TDA8444T	Octal 6-Bit DAC	D
MOTOR CONTROLLER/VOLTAGE DETECTOR		
HEF4752VP	AC Motor Control Circuit	N
PCF1252-0 thru 9	Micropower Voltage Detector	D, N
NE/SA/SE5570	Brushless DC Motor Controller Package	D, N
TDA5142T	Brushless DC Motor Driver Requires External FETS	D
TDA5143T	Brushless DC Motor Driver 0.6 Amp Output Drive	D
TDA5144AT	Brushless DC Motor Driver 1.8 Amp Output Drive	D
TDA5145	Brushless DC Motor Driver Bidirectional Driver	D
TDA1023	TRIAC Control	D, N
POSITION MEASUREMENT		
NE/SA/SE5521	LVDT Signal Conditioner	N, D, F
SAMPLE-AND-HOLD		
LF198/298/398	Sample-and-Hold Amplifier	D, FE, N
NE/SE5537	Sample-and-Hold Circuit	D, FE, N
SPEECH SYNTHESIS/VOICE/SOUND		
SAA1099	Stereo Sound Generator for Sound Effects and Music Synthesis	N
TIMERS AND CLOCKS		
ICM7555	General Purpose CMOS Timer	D, N
NE/SA/SE556/-1	Dual Timer	D, F, N
NE558	Quad Timer	D, F, N
NE/SE555/SE555C	Timer	D, FE, N

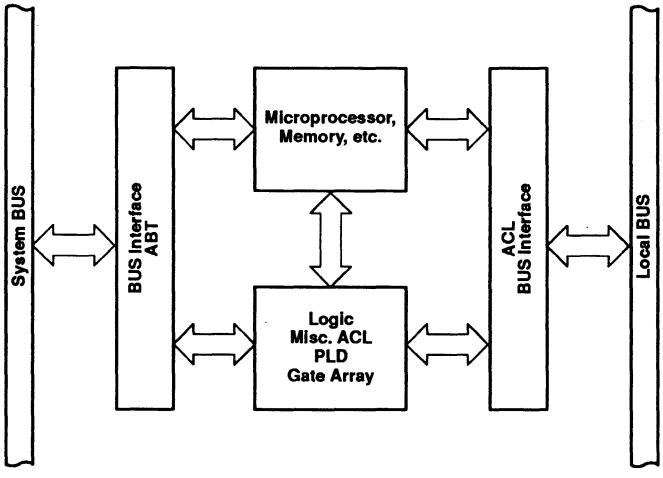
Product Information

Logic Products

LOGIC FAMILY SPEED/POWER SPECTRUM



POWER/PERFORMANCE CONSCIOUS SYSTEM



Product Information

Logic Products (Continued)			
DEVICE TYPE	**DESCRIPTION**	**PINS**	**PACKAGE CODES**
ABT			
74ABT125	Quad Buffer, 3-State	14	D, N
74ABT126	Quad Buffer, 3-State	14	D, N
74ABT240	Octal Inverting Buffer, 3-State	20	DB, D, N
74ABT240–1	Octal Inverting Buffer with 25 Ohm Output Series Resistor, 3-State	20	DB, D, N
74ABT241	Octal Buffer, 3-State	20	DB, D, N
74ABT244	Octal Buffer, 3-State	20	DB, D, N
74ABT244–1	Octal Buffer with 25 Ohm Output Series Resistor, 3-State	20	DB, D, N
74ABT245	Octal Transceiver, 3-State	20	DB, D, N
74ABT273	Octal D Flip/Flop, Asynchronous Reset	20	DB, D, N
74ABT373	Octal Latch, 3-State	20	DB, D, N
74ABT374	Octal D Flip/Flop, 3-State	20	DB, D, N
74ABT377	Octal D Flip/Flop, Enable	20	DB, D, N
74ABT534	Octal D Flip/Flop, Inverting, 3-State	20	DB, D, N
74ABT540	Octal Buffer, Inverting, 3-State	20	DB, D, N
74ABT541	Octal Buffer, 3-State	20	DB, D, N
74ABT543	Octal Latched Transceiver, 3-State	24	DB, D, N
74ABT544	Octal Latched Transceiver, Inverting, 3-State	24	DB, D, N
74ABT573	Octal Latch, 3-State	20	DB, D, N
74ABT574	Octal D Flip/Flop, 3-State	20	DB, D, N
74ABT620	Octal Transceiver with Dual Enable, Inverting	20	DB, D, N
74ABT623	Octal Transceiver, 3-State	20	DB, D, N
74ABT640	Octal Transceiver with Direction Pin, Inverting, 3-State	20	DB, D, N
74ABT646	Octal Registered Transceiver, 3-State	24	DB, D, N
74ABT648	Octal Registered Transceiver, Inverting, 3-State	24	DB, D, N
74ABT652	Octal Registered Transceiver, 3-State	24	DB, D, N
75ABT657	Octal Transceiver, 8-Bit Parity, 3-State	24	DB, D, N
74ABT821	10-Bit D-Type Flip-Flop; Positive Edge Trigger, 3-State	24	DB, D, N
74ABT823	9-Bit D-Type Flip-Flop with Reset and Enable, 3-State	24	DB, D, N
74ABT827/-1	10-Bit Buffer/Line Driver, Non-inverting, 3-State	24	DB, D, N
74ABT833	Octal Transceiver with Parity Generator/Checker, 3-State	24	DB, D, N
74ABT841	10-Bit Bus Interface Latch, 3-State	24	DB, D, N
74ABT843	9-Bit Bus Interface Latch with Set and Reset, 3-State	24	DB, D, N
74ABT845	8-Bit Bus Interface Latch with Set and Reset, 3-State	24	D, N
74ABT853	8-Bit Transceiver with 9-Bit Parity Checker/Generator and Flag Latch, 3-State	24	DB, D, N
74ABT861	10-Bit Bus Transceiver, 3-State	24	DB, D, N
74ABT863	9-Bit Transceiver, 3-State	24	DB, D, N
74ABT899	9-Bit Dual Latch Transceiver with 8-Bit Parity Generator/Checker, 3-State	28	A, D, N
74ABT2952	Octal Registered Transceiver, 3-State	24	DB, D, N
74ABT2953	Octal Registered Transceiver, Inverting, 3-State	24	DB, D, N
MULTIBYTE			
MB2240	16-Bit Inverting Buffer/Line Driver, 3-State	52	B
MB2241	16-Bit Buffer/Line Driver, 3-State	52	B
MB2244	16-Bit Buffer/Line Driver, 3-State	52	B
MB2245	Dual Octal Transceivers with Direction Pins, 3-State	52	B

Logic Products (Continued)			
DEVICE TYPE	**DESCRIPTION**	**PINS**	**PACKAGE CODES**
MULTIBYTE (Continued)			
MB2373	Dual Octal D-Type Transparent Latch, 3-State	52	B
MB2374	Dual Octal D-Type Flip-Flop; Positive Edge Trigger, 3-State	52	B
MB2541	Dual Octal Buffer/Line Drivers, 3-State	52	B
MB2543	Dual Octal Latched Transceiver with Dual Enable, 3-State	52	B
MB2623	Dual Octal Transceiver with Dual Enable, Non-inverting, 3-State	52	B
MB2821	Dual 10-Bit D-Type Flip-Flop; Positive-Edge Trigger, 3-State	52	B
MB2827	Dual 10-Bit Buffer/Line Driver, Non-Inverting, 3-State	52	B
FUTUREBUS+			
FB2000	Parallel Protocol Controller	100	B
FB2012	Central Arbitration Controller	68	A
FB2031	9-Bit Latch/Resistor Transceiver; Inverted	52	B
FB2033	8-Bit Universal Transceiver; Inverted	52	B
FB2040	8-Bit Handshake Transceiver; Inverted	52	B
FB2041	7-Bit Handshake Transceiver; Inverted	52	B

74	DESCRIPTION	COM	F	ALS	COMMENTS
BIPOLAR LOGIC					
CODE DEFINITIONS: COM = *Complexity*: S = *Small Scale Integration (SSI)* M = *Medium Scale Integration (MSI)* L = *Large Scale Integration (LSI)*		A = *Available* * = *See Comments* *SSF = Single Source FAST*			
00	Quad 2-Input NAND Gate	S	A	A*	* "A" version
02	Quad 2-Input NOR Gate	S	A	A*	* "A" version
04	Hex Inverter	S	A	A	
06	Hex Inverter, Buffer/Driver, OC	S	A*		* SSF ** 30V, 30mA output version of 7404
07	Hex Buffer/Driver, OC	S	A*		* SSF ** Non-inverting version of 7406
08	Quad 2-Input AND Gate	S	A	A	
10	Triple 3-Input NAND Gate	S	A	A*	* "A" version
11	Triple 3-Input AND Gate	S	A	A*	* "A" version
14	Hex Schmitt Trigger	M	A*		* SSF
20	Dual 4-Input NAND Gate	S	A	A*	* "A" version
27	Triple 3-Input NOR Gate	S	A*	A	* SSF
30	8-Input NAND Gate	S	A	A*	* "A" version
32	Quad 2-Input OR Gate	S	A	A	
37	Quad 2-Input NAND Buffer	S	A		
38	Quad 2-Input NAND Buffer, OC	S	A	A*	* "A" version
40	Dual 4-Input NAND Buffer	S	A*		* SSF
51	Dual 2-Wide 2-Input AOI Gate	S	A		
64	4-2-3-2-Input AOI Gate	S	A		
74	Dual D-Type Edge-Triggered Flip-Flop	S	A	A	
85	4-Bit Magnitude Comparator	M	A*		* SSF

Product Information

Logic Products (Continued)

74	DESCRIPTION	COM	F	ALS	COMMENTS
BIPOLAR LOGIC (Continued)					
86	Quad 2-Input Exclusive-OR Gate	S	A	A	
109	Dual J-K Positive Edge-Triggered Flip-Flop	S	A	A	
112	Dual J-K Negative Edge-Triggered F/F	S	A		
113	Dual J-K Negative Edge-Triggered F/F	S	A		
114	Dual J-K Flip/Flop	S	A		
125	Quad 3-State Buffer	S	A		
126	Quad 3-State Buffer	S	A		
132	Quad Schmitt Trigger	M	A		
133	13-Input NAND Gate	S	A		
138	3-to-8 Decoder/Demux	M	A		
139	Dual 2-to-4 Decoder/Demux	M	A		
148	8-to-3 Priority Encoder	M	A		
151	8-to-1 MUX	M		A	
151A	8-to-1 MUX	M	A		
153	Dual 4-to-1 MUX	M	A	A	
154	4-to-16 Decoder/Demux	M	A		
157	Quad 2-to-1 MUX	M	A	A	
157A	Quad 2-to-1 MUX	M	A		
158	Quad 2-to-1 MUX	M	A	A	
158A	Quad 2-to-1 MUX	M	A		
161	Synchronous 4-Bit Binary Counter	M	A*	A**	* "A" version ** "B" version
163	Synchronous 4-Bit Binary Counter	M	A*	A**	* "A" version ** "B" version
164	8-Bit PISO Shift Register	M	A		
166	8-Bit PISO Shift Register	M	A*		* SSF
169	4-Bit Binary Up/Down Counter	M	A		
173	Quad D-Type F/F, 3-State	M	A*		* SSF
174	Hex D-Type F/F with Clear	M	A	A	
175	Quad D-Type F/F	M	A	A	
181	4-Bit Arithmetic Logic Unit	M	A		
182	Carry Look-Ahead Generator	M	A		
189A	64-Bit RAM, 3-State	L	A		C3F189A replaces NSC 300mil SO. 74F189A 150mil SO recommended for new designs.
191	Binary Up/Down Counter	M	A		
193	4-Bit Binary Up/Down Counter	M	A		
194	4-Bit Bidirectional Shift Register	M	A		
195	4-Bit Parallel-Access Shift Register	M	A		
198	8-Bit Bidirectional Universal S/R	M	A*		* SSF
199	8-Bit Universal Shift Register	M	A*		* SSF
219A	64-Bit RAM	L	A		C3F219A replaces NSC 300mil SO. 74F219A recommended for new designs.
240	Octal 3-State Buffer	M	A*		* "A" version
240A-1	Octal 3-State Buffer	M		A	
241	Octal 3-State Buffer	M	A	A*	* "A" version
241A-1	Octal 3-State Buffer	M		A	

Product Information

Logic Products (Continued)

74	DESCRIPTION	COM	F	ALS	COMMENTS
BIPOLAR LOGIC (Continued)					
242	Quad Bus Transceiver	M	A		
243	Quad Bus Transceiver	M	A		
244	Octal 3-State Buffer	M	A	A*	* "A" version
244A-1	Octal 3-State Buffer	M		A	
245	Octal Bus Transceiver	M	A	A*	* "A" version
245A-1	Octal Bus Transceiver	M		A	
251	8-to-1 MUX, 3-State	M		A	
251A	8-to-1 MUX, 3-State	M	A		
253	Dual 4-to-1 MUX, 3-State	M	A	A	
256	Dual 4-Bit Addressable Latch	M	A		
257	Quad 2-to-1 MUX, 3-State	M		A	
257A	Quad 2-to-1 MUX, 3-State	M	A		
258	Quad 2-to-1 MUX, 3-State	M		A	
258A	Quad 2-to-1 MUX, 3-State	M	A		
259	8-Bit Addressable Latch	M	A		
260	Dual 5-Input NOR Gate	S	A		
269	8-Bit Binary Counter	M	A*		* SSF
273	Octal D Flip/Flop	M	A	A	
280	9-Bit Odd/Even Parity Generator/Checker	M	A*		* "A" and "B" versions. SSF
283	4-Bit Adder	M	A		
298	Quad 2-Input MUX with Storage	M	A		
299	Octal Shift/Storage Register, 3-State	M	A		
322	Octal Shift/Storage Register, 3-State	M	A		
323	Octal Shift/Storage Register, 3-State	M	A		
350	4-Bit Four-Way Shifter	M	A		
353	Dual 4-to-1 MUX, 3-State, Inverting (Inverting version of LS253)	M	A		
365	Hex Buffer with Common Enable, 3-State	M	A		
366	Hex Inverter with Common Enable, 3-State	M	A		
367	Hex Buffer, 4-Bit & 2-Bit, 3-State	M	A		
368	Hex Inverter, 4-Bit & 2-Bit, 3-State	M	A		
373	Octal 3-State Latch	M	A	A	
374	Octal D Flip/Flop, 3-State	M	A	A	
377	Octal D-Type Flip/Flop with Enable	M	A	A	
378	Hex D Flip/Flop with Enable	M	A		
379	Quad Flip/Flop with Enable	M	A		
381	4-Bit ALU	M	A		
382	4-Bit ALU	M	A		
385	Quad Serial Adder/Subtractor	M	A		
393	Dual Binary Ripple Counter	M	A*		* SSF
395A	4-Bit Cascadable S/R, 3-State	M	A		
398	Quad 2-Port Register	M	A		
399	Quad 2-Port Register	M	A		
410	Register Stack 16 x 4 RAM	M	A		
455	Octal Buffer with Parity Gen/Check	M	A*		* SSF
456	Octal Buffer with Parity Gen/Check	M	A*		* SSF

Product Information

Logic Products (Continued)

74	DESCRIPTION	COM	F	ALS	COMMENTS
BIPOLAR LOGIC (Continued)					
521	8-Bit Identity Comparator	M	A		
524	8-Bit Register Comparator	M	A		
533	Inverting Octal D-Latch, 3-State	M	A		
534	Octal Clocked Latch Inverting Outputs	M	A		
537	1-of-10 Decoder, 3-State	M	A		
538	1-of-8 Decoder, 3-State	M	A		
539	Dual 1-of-4 Decoder, 3-State	M	A		
540	Octal Driver	M	A		
541	Octal Driver	M	A		
543	Octal Transparent Bidirectional Latch	M	A		
544	Octal Transparent Bidirectional Latch	M	A		
545	Octal Bus Transceiver	M	A		
552	Octal Registered XCVR w/Flags, INV, 3-State	M	A		
563	Octal D-Latch Broadside 'F533	M		A*	* "A" version
564	Octal D F/F Broadside 'F534	M	A	A*	* "A" version
569	4-Bit Binary Up/Down Counter	M	A		
573	Octal D-Latch Broadside 'F373	M	A	A*	* "B" version
574	Octal D F/F Broadside 'F374	M	A	A*	* "A" version
579	8-Bit Counter Common I/O, 3-State	M	A		
583	4-Bit BCD Adder	M	A		High Speed 82S83
595	8-Bit Shift Register w/Output Latch	M	A*		* SSF
597	8-Bit Shift Register w/Input Latch	M	A*		* SSF
604	Dual 8-Bit Latch, 3-State	M	A*		* SSF
620	Octal Transceiver, 3-State	M	A	A*	* "A" version
620-1	Octal Transceiver, 3-State	M		A*	* "A" version
621	Octal Transceiver, OC	M	A		
623	Octal Transceiver, OC	M	A	A*	* "A" version
623-1	Octal Transceiver, 3-State	M		A*	* "A" version
640	Octal Bus Transceiver	M	A		
641	Octal Bus Transceiver, OC	M	A*		* SSF
642	Octal Bus Transceiver	M	A*		* SSF
645	Octal Bus Transceiver	M		A	
645-1	Octal Bus Transceiver	M		A	
646	Octal Bus Transceiver/Register, 3-State	M	A	A	
646A	Octal Bus Transceiver/Register, 3-State	M	A		
646-1	Octal Bus Transceiver/Register, 3-State	M		A	
647	Octal Bus Transceiver/Register, OC	M	A*		* SSF
648	Octal Bus Transceiver/Register, 3-State	M	A	A	
648A	Octal Bus Transceiver/Register, 3-State	M	A		
648-1	Octal Bus Transceiver/Register, 3-State	M		A	
649	Octal Bus Transceiver/Register, INV, OC	M	A*		* SSF
651	Octal Transceiver/Register, INV, 3-State	M	A	A	
651A	Octal Transceiver/Register, INV, 3-State	M	A		
651-1	Octal Transceiver/Register, INV, 3-State	M		A	
652	Octal XCVR/Register, NINV, 3-State	M	A	A	
652A	Octal XCVR/Register, NINV, 3-State	M	A		

Product Information

Logic Products (Continued)

74	DESCRIPTION	COM	F	ALS	COMMENTS
BIPOLAR LOGIC (Continued)					
652-1	Octal XCVR/Register, NINV, 3-State	M		A	
653	Octal Transceiver/Register, INV, OC	M	A*		* SSF
655A	Octal Inverting Buffer w/ Parity Gen/Check	M	A*		* SSF
656A	Octal Buffer with Parity Gen/Check	M	A*		* SSF
657	Octal Transceiver w/ Parity Gen/Check	M	A		
670	4 x 4 Register File, 3-State	M	A		
674	16-Bit Shift Register, PISO	M	A		
676	16-Bit Shift Register, PISO	M	A		
711A	Quint 2-Input MUX	M	A*		* SSF
711-1	Quint 2-Input MUX	M	A*		* SSF
712	Quint 3-Input MUX	M	A*		* SSF
712A	Quint 3-Input MUX	M	A*		* SSF
712-1	Quint 2-Input MUX	M	A*		* SSF
723A	Quad 3-Input MUX	M	A*		* SSF
723-1	Quad 3-Input MUX	M	A*		* SSF
725	Quad 3-Input MUX	M	A*		* SSF
725A	Quad 3-Input MUX	M	A*		* SSF
725-1	Quad 4-Input MUX	M	A*		* SSF
733	Quad Data MUX, INV	M	A*		* SSF
756	Octal Bus Line Driver	M	A*		* SSF
757	Octal Bus Line Driver	M	A*		* SSF
760	Octal Bus Line Driver	M	A*		* SSF
764-1	DRAM Dual Ported Controller w/Latch	L	A*		* SSF
765-1	DRAM Dual Ported Controller w/o Latch	L	A*		* SSF
776	Octal Bidirectional Latched Pi-Bus Transceiver	M	A*		* SSF
779	8-Bit Counter, 3-State	M	A*		* SSF
786	4-Bit Async. Arbiter	M	A*		* SSF
804	Hex 2-Input NAND Driver	M	A*		* SSF
805	Hex 2-Input NOR Driver	M	A*		* SSF
808	Hex 2-Input AND Driver	M	A*		* SSF
821	10-Bit Register, NINV, 3-State	M	A		
822	10-Bit Register, INV, 3-State	M	A		
823	9-Bit Register, NINV, 3-State	M	A		
824	9-Bit Register, INV, 3-State	M	A		
825	8-Bit Register, NINV, 3-State	M	A		
826	8-Bit Register, INV, 3-State	M	A		
827	10-Bit Buffer, NINV, 3-State	M	A		
828	10-Bit Buffer, INV, 3-State	M	A		
832	Hex 2-Input OR Driver	M	A*		* SSF
835	Latched Octal Shift Register w/2:1 MUX	M	A*		* SSF
841	10-Bit Latch, NINV, 3-State	M	A		
842	10-Bit Latch, INV, 3-State	M	A		
843	9-Bit Latch, NINV, 3-State	M	A		
844	9-Bit Latch, INV, 3-State	M	A		
845	8-Bit Latch, NINV, 3-State	M	A		
846	8-Bit Latch, INV, 3-State	M	A		

Product Information

Logic Products (Continued)

74	DESCRIPTION	COM	F	ALS	COMMENTS
BIPOLAR LOGIC (Continued)					
861	10-Bit Transceiver, NINV, 3-State	M	A*		* SSF
862	10-Bit Transceiver, INV, 3-State	M	A*		* SSF
863	9-Bit Transceiver, NINV, 3-State	M	A*		* SSF
864	9-Bit Transceiver, INV, 3-State	M	A*		* SSF
1240	Octal Buffer, 3-State	M	A*		* SSF
1241	Octal Buffer, 3-State	M	A*		* SSF
1243	Quad Bus Transceiver	M	A*		* SSF
1244	Octal Buffer, 3-State	M	A*		* SSF
1245	Octal Bus Transceiver, 3-State	M	A*		* SSF
1604	Dual Octal Latch	M	A*		* SSF
1762	4MBit Memory Address Controller	L	A*		* SSF
1763	1MBit Intelligent DRAM Controller	L	A*		* SSF
1764	1MBit DRAM Dual Ported Controller with Latch	L	A*		* SSF, 100MHz
1764-1	1MBit DRAM Dual Ported Controller with Latch	L	A*		* SSF
1765	1MBit DRAM Dual Ported Controller without Latch	L	A*		* SSF, 100MHz
1765-1	1MBit DRAM Dual Ported Controller without Latch	L	A*		* SSF
1766	Burst Mode DRAM Controller	L	A*		* SSF
1779	8-Bit Counter, 3-State	M	A*		* SSF
1804	Hex 2-Input NAND Driver, Center Power 'F804	M	A*		* SSF
1805	Hex 2-Input NOR Driver, Center Power 'F805	M	A*		* SSF
1808	Hex 2-Input AND Driver, Center Power 'F808	M	A*		* SSF
1832	Hex 2-Input OR Driver, Center Power 'F832	M	A*		* SSF
2240	Octal Bus/Line Driver, INV, 3-State	M	A*		* SSF
2241	Octal Bus/Line Driver, NINV, 3-State	M	A*		* SSF
2244	Octal Bus/Line Driver, NINV, 3-State	M	A*		* SSF
2952	Octal Registered XCVR, NINV, 3-State	M	A		
2953	Octal Registered XCVR, INV, 3-State	M	A		
3037	30Ω Transmission Line Driver, Quad 2-Input NAND	S	A*		* SSF
3038	30Ω Transmission Line Driver, Quad 2-Input NAND, OC	S	A*		* SSF
3040	30Ω Transmission Line Driver, Dual 4-Input NAND	S	A*		* SSF
3893	Quad Futurebus XCVR	M	A*		* SSF
5074	Dual-D Synchronizing Flip/Flop (Metastable Immune)	M	A*		* SSF
5300	Fiber Optics Driver	S	A*		* SSF
5302	Fiber Optic Dual LED Driver	S	A*		* SSF
8961	Octal Latched Bidirectional Futurebus XCVR, NINV, OC	M	A*		* SSF
8962	9-Bit Latched Bidirectional Futurebus XCVR, INV, 3-State	M	A*		* SSF
8963	9-Bit Latched Bidirectional Futurebus XCVR, NINV, 3-State	M	A*		* SSF
8965	9-Bit BTL Address/Data Transceiver	M	A*		* SSF
8966	9-Bit BTL Address/Data Transceiver	M	A*		* SSF

Logic Products (Continued)					
74	DESCRIPTION	COM	F	ALS	COMMENTS
BIPOLAR LOGIC (Continued)					
30240	Octal Inverting 30W Transmission Line Driver, OC	M	A*		* SSF
30244	Octal 30Ω Transmission Line Driver, OC	M	A*		* SSF
50109	Dual J-K Synchronizing Flip/Flop (Metastable Immune)	M	A*		* SSF
50728	Sync. Cascaded Dual-D Flip/Flop (Metastable Immune)	M	A*		* SSF
50729	Synchronizing Dual-D Flip/Flop (Metastable Immune) with Edge-Triggered Set/Reset	M	A*		* SSF

Logic Products (Continued)			
DEVICE TYPE	DESCRIPTION	PINS	PACKAGE CODES
10K ECL SERIES			
10149	256 x 4 PROM (20ns)	16	F
10149A	256 x 4 PROM (10ns)	16	F
10H20EV8	ECL, PAL, 20 x 90 x 8	24	F
100K ECL SERIES			
100101	Triple 5-Input OR/NOR Gate	24	A, F
100102	Quint 2-Input OR/NOR Gate	24	A, F
100107	Quint Exclusive-OR/NOR Gate	24	A, F
100112	Quad Driver	24	A, F
100113	Quad Driver	24	A, F
100114	Quint Differential Receiver	24	A, F
100117	Triple OR-AND/NAND Gate	24	A, F
100122	9-Bit Buffer	24	A, F
100123	Hex Bus Driver	24	A, F
100124	Hex TTL-to-ECL Translator	24	A, F
100125	Hex ECL-to-TTL Translator	24	A, F
100131	Triple D Flip-Flop (350MHz)	24	A, F
100136	Counter/Shift Register	24	A, F
100141	8-Bit Shift Register	24	A, F
100149	256 x 4 PROM (20ns)	16	F
100149A	256 x 4 PROM (10ns)	16	F
100149B	256 x 4 PROM (5ns)	16	F
100150	Hex D-Latch	24	A, F
100151	Hex D Flip-Flop	24	A, F
100155	Quad Multiplexer/Latch	24	A, F
100158	Shift Matrix	24	A, F
100160	Dual Generator/8-Bit Comparator	24	A, F
100163	Dual 8-Input Multiplexer	24	A, F
100164	16-Input Multiplexer	24	A, F
100166	9-Bit Comparator	24	A, F
100170	Universal Demultiplexer Decoder	24	A, F

Product Information

Logic Products (Continued)			
DEVICE TYPE	**DESCRIPTION**	**PINS**	**PACKAGE CODES**
100K ECL SERIES (Continued)			
100171	Triple 4-Input Multiplexer	24	A, F
100180	6-Bit Adder	24	A, F
100181	4-Bit ALU Binary/Decimal	24	A, F
100231	Triple D Flip-Flop (400MHz)	24	A, F
100255	TTL-100K Translating Transceiver	16	F
100790	9-Bit 25Ω Transceiver, 3-State	28	A
100982	6-Bit Registered Translating Transceiver, 25Ω	28	A
100984	4-Bit Registered Translating Transceiver, 25Ω	28	A
100990	9-Bit 25Ω Transceiver, 3-State	28	A
10020EV8	ECL PAL, 20 × 90 × 8	24	A, F

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
LSI		
74F764-1	DRAM Dual-Ported Controller w/Latch	A, N
74F765-1	DRAM Dual-Ported Controller without address input latch	A, N
74F1762	1MBit DRAM Address Controller	A, N
74F1763	1MBit Intelligent DRAM Controller	A, N
74F1764	1MBit DRAM Dual-Ported Controller (100MHz)	A, N
74F1764-1	1MBit DRAM Dual-Ported Controller (100MHz)	A, N
74F1765	1MBit DRAM Dual-Ported Controller (100MHz) without address input latch	A, N
74F1765-1	1MBit DRAM Dual-Ported Controller (100MHz)	A, N
74F1766	Burst Mode DRAM Controller	A, N
74ABT4764	4MBit Programmable DRAM Controller	D, N

DEVICE TYPE	FUNCTION	COM	PINS	PACKAGE CODES
4000 CMOS				
CODE DEFINITIONS:	COM = *Complexity*: S = *Small Scale Integration (SSI)* M = *Medium Scale Integration (MSI)* L = *Large Scale Integration (LSI)*			
HEF4000B	Dual 3-Input NOR Gate and Inverter	S	14	D, N
HEF4001B	Quadruple 2-Input NOR Gate	S	14	D, N
HEF4001UB	Quadruple 2-Input NOR Gate, Unbuffered	S	14	D, N
HEF4002B	Dual 4-Input NOR Gate	S	14	D, N
HEF4006B	18-Stage Static Shift Register	M	14	D, N
HEF4007UB	Dual Complementary Pair and Inverter	S	14	D, N
HEF4008B	4-Bit Binary Full Adder	M	16	D, N
HEF4011B	Quadruple 2-Input NAND Gate	S	14	D, N
HEF4011UB	Quadruple 2-Input NAND Gate, Unbuffered	S	14	D, N
HEF4012B	Dual 4-Input NAND Gate	S	14	D, N

Product Information

Logic Products (Continued)				
DEVICE TYPE	**FUNCTION**	**COM**	**PINS**	**PACKAGE CODES**
4000 CMOS (Continued)				
HEF4013B	Dual D-Type Flip/Flop	S	14	D, N
HEF4014B	8-Bit Static Shift Register	M	16	D, N
HEF4015B	Dual 4-Bit Static Shift Register	M	16	D, N
HEF4016B	Quadruple Bilateral Switches	S	14	D, N
HEF4017B	5-Stage Johnson Counter	M	16	D, N
HEF4018B	Presettable Divide-by-n Counter	M	16	D, N
HEF4019B	Quadruple 2-Input Multiplexer	M	16	D, N
HEF4020B	14-Stage Binary Counter	M	16	D, N
HEF4021B	8-Bit Static Shift Register	M	16	D, N
HEF4022B	4-Stage Divide-by-8 Johnson Counter	M	16	D, N
HEF4023B	Triple 3-Input NAND Gate	S	14	D, N
HEF4024B	7-Stage Binary Counter	M	14	D, N
HEF4025B	Triple 3-Input NOR Gate	S	14	D, N
HEF4027B	Dual J-K Flip/Flop	S	16	D, N
HEF4028B	1-to-10 Decoder	M	16	D, N
HEF4029B	Synchronous Up/Down-Binary/Decade Counter	M	16	D, N
HEF4030B	Quadruple Exclusive-OR Gate	S	14	D, N
HEF4031B	64-Stage Static Shift Register	L	16	D, N
HEF4035B	4-Bit Universal Shift Register	M	16	D, N
HEF4040B	12-Stage Binary Counter	M	16	D, N
HEF4041B	Quadruple True/Complement Buffer	S	14	D, N
HEF4042B	Quadruple D-Latch	M	16	D, N
HEF4043B	Quadruple R/S Latch with 3-State Outputs	M	16	D, N
HEF4044B	Quadruple R/S Latch with 3-State Outputs	M	16	D, N
HEF4046B	Phase-Locked Loop	M	16	D, N
HEF4047B	Monostable/Astable Multivibrator	M	14	D, N
HEF4049B	Hex Inverting Buffer	S	16	D, N
HEF4050B	Hex Non-Inverting Buffer	S	16	D, N
HEF4051B	8-Channel Analog Multiplexer/ Demultiplexer	M	16	D, N
HEF4052B	Dual 4-Channel Analog Multiplexer/ Demultiplexer	M	16	D, N
HEF4053B	Triple 2-Channel Analog Multiplexer/Demultiplexer	M	16	D, N
HEF4059B	Programmable Divide-by-n Counter	L	24	D, N
HEF4060B	14-Stage Ripple-Carry Binary Counter/Divider and Oscillator	M	16	D, N
HEF4066B	Quadruple Bilateral Switch	S	14	D, N
HEF4067B	16-Channel Analog Multiplexer/Demultiplexer	M	24	D, N
HEF4068B	8-Input NAND Gate	S	14	D, N
HEF4069UB	Hex Inverter	S	14	D, N
HEF4070B	Quadruple Exclusive-OR Gate	S	14	D, N
HEF4071B	Quadruple 2-Input OR Gate	S	14	D, N
HEF4072B	Dual 4-Input OR Gate	S	14	D, N
HEF4073B	Triple 3-Input AND Gate	S	14	D, N
HEF4075B	Triple 3-Input OR Gate	S	14	D, N
HEF4076B	Quadruple D-Type Register with 3-State Outputs	M	16	D, N
HEF4077B	Quadruple Exclusive-NOR Gate	S	14	D, N
HEF4078B	8-Input NOR Gate	S	14	D, N

Product Information

Logic Products (Continued)				
DEVICE TYPE	**FUNCTION**	**COM**	**PINS**	**PACKAGE CODES**
4000 CMOS (Continued)				
HEF4081B	Quadruple 2-Input AND Gate	S	14	D, N
HEF4082B	Dual 4-Input AND Gate	S	14	D, N
HEF4085B	Dual 2-Wide 2-Input AND-OR-INVERT Gate	S	14	D, N
HEF4093B	Quadruple 2-Input NAND Schmitt Trigger	S	14	D, N
HEF4094B	8-Stage Shift-and-Store Bus Register	M	16	D, N
HEF4104B	Quadruple Low-to-High Voltage Translator	M	16	D, N
HEF4502B	Strobed Hex Inverter/Buffer	S	16	D, N
HEF4508B	Dual 4-Bit Latch	M	24	D, N
HEF4510B	BCD Up/Down Counter	M	16	D, N
HEF4511B	BCD to 7-Segment Latch/Decoder/Driver	M	16	D, N
HEF4512B	8-Input Multiplexer with 3-State Output	M	16	D, N
HEF4514B	1-to-16 Decoder/Demultiplexer with Input Latches	M	24	D, N
HEF4515B	1-to-16 Decoder/Demultiplexer with Input Latches	M	24	D, N
HEF4516B	Binary Up/Down Counter	M	16	D, N
HEF4517B	Dual 64-Bit Static Shift Register	L	16	D, N
HEF4518B	Dual BCD Counter	M	16	D, N
HEF4519B	Quadruple 2-Input Multiplexer	M	16	D, N
HEF4520B	Dual Binary Counter	M	16	D, N
HEF4521B	24-Stage Frequency Divider	M	16	D, N
HEF4522B	Programmable 4-Bit BCD Down Counter	M	16	D, N
HEF4526B	Programmable 4-Bit Binary Down Counter	M	16	D, N
HEF4527B	BCD Rate Multiplier	M	16	D, N
HEF4528B	Dual Monostable Multivibrator	M	16	D, N
HEF4531B	13-Input Parity Generator/Checker	M	16	D, N
HEF4532B	8-Input Priority Encoder	M	16	D, N
HEF4534B	Real-Time 5-Decade Counter	L	24	D, N
HEF4538B	Dual Precision Monostable Multivibrator	M	16	D, N
HEF4539B	Dual 4-Input Multiplexer	M	16	D, N
HEF4541B	Programmable Timer	M	14	D, N
HEF4543B	BCD to 7-Segment Latch/Decoder/Driver	M	16	D, N
HEF4555B	Dual 1-of-4 Decoder/ Demultiplexer	M	16	D, N
HEF4556B	Dual 1-of-4 Decoder/ Demultiplexer	M	16	D, N
HEF4557B	1-to-64 Bit Variable Length Shift Register	L	16	D, N
HEF4585B	4-Bit Magnitude Comparator	M	16	D, N
HEF4720B;V	256-Bit, 1-Bit per Word RAM	L	16	N
HEF4724B	8-Bit Addressable Latch	M	16	D, N
HEF4731B;V	Quadruple 64-Bit Static Shift Register	L	14	N
HEF4737B;V	Quadruple Static Decade Counter	L	18	N
HEF4738V	IEC/IEEE Bus Interface	L	40	N
HEF40097B	3-State Hex NINV Buffer	S	16	D, N
HEF40098B	3-State Hex INV Buffer	S	16	D, N
HEF40106B	Hex Schmitt Trigger	S	14	D, N
HEF40160B	4-Bit Synchronous Decade Counter; Asynchronous Reset	M	16	D, N
HEF40161B	4-Bit Synchronous Binary Counter; Asynchronous Reset	M	16	D, N
HEF40162B	4-Bit Synchronous Decade Counter; Synchronous Reset	M	16	D, N
HEF40163B	4-Bit Synchronous Binary Counter; Synchronous Reset	M	16	D, N

Product Information

Logic Products (Continued)				
DEVICE TYPE	**FUNCTION**	**COM**	**PINS**	**PACKAGE CODES**
4000 CMOS (Continued)				
HEF40174B	Hex D-Type Flip/Flop	M	16	D, N
HEF40175B	Quadruple D-Type Flip/Flop	M	16	D, N
HEF40192B	4-Bit Up/Down Decade Counter	M	16	D, N
HEF40193B	4-Bit Up/Down Binary Counter	M	16	D, N
HEF40194B	4-Bit Bidirectional Universal Shift Register	M	16	D, N
HEF40195B	4-Bit Universal Shift Register	M	16	D, N
HEF40240B	Octal Inverting Buffers w/3-State Outputs	M	20	D, N
HEF40244B	Octal Buffers w/3-State Outputs	M	20	D, N
HEF40245B	Octal Bus Transceiver w/3-State Outputs	M	20	D, N
HEF40373B	Octal Transparent Latch w/3-State Outputs	M	20	D, N
HEF40374B	Octal D-Type Flip/Flop w/3-State Outputs	M	20	D, N

DEVICE TYPE	DESCRIPTION	PINS	PACKAGE CODES
HIGH-SPEED CMOS			
CODE DEFINITIONS:	HC = *CMOS compatible switching levels* HCT = *LS compatible switching levels* *Most HC/T MOS now available with burn-in* * = *Types with bus driver output stage*		
HC/HCT00	Quad 2-Input NAND Gate	14	D, N
HC/HCT02	Quad 2-Input NOR Gate	14	D, N
HC/HCT03	Quad 2-Input NAND Gate, Open-Drain	14	D, N
HC/HCT04	Hex Inverter	14	D, N
HCU04	Hex Inverter	14	D, N
HC/HCT08	Quad 2-Input AND Gate	14	D, N
HC/HCT10	Triple 3-Input NAND Gate	14	D, N
HC/HCT11	Triple 3-Input AND Gate	14	D, N
HC/HCT14	Hex Inverting Schmitt Trigger	14	D, N
HC/HCT20	Dual 4-Input NAND Gate	14	D, N
HC/HCT21	Dual 4-Input AND Gate	14	D, N
HC/HCT27	Triple 3-Input NOR Gate	14	D, N
HC/HCT30	8-Input NAND Gate	14	D, N
HC/HCT32	Quad 2-Input OR Gate	14	D, N
HC/HCT42	BCD-to-Decimal Decoder	16	D, N
HC58	Dual 4-Input AND-OR Gate	14	D, N
HC/HCT73	Dual J-K Flip/Flop w/Clear; Negative-Edge Trigger	14	D, N
HC/HCT74	Dual D-Type Flip/Flop w/Set and Clear; Positive-Edge Trigger	14	D, N
HC/HCT75	4-Bit Bi-stable Latch	16	D, N
HC/HCT85	4-Bit Magnitude Comparator	16	D, N
HC/HCT86	Quad 2-Input Exclusive-OR Gate	14	D, N
HC/HCT93	4-Stage Binary Ripple Counter	14	D, N
HC/HCT107	Dual J-K Flip/Flop w/Clear; Negative-Edge Trigger	14	D, N
HC/HCT109	Dual J-K Flip/Flop w/Set and Clear; Positive-Edge Trigger	16	D, N
HC/HCT112	Dual J-K Flip/Flop w/Set and Clear; Negative-Edge Trigger	16	D, N

Product Information

Logic Products (Continued)			
DEVICE TYPE	**DESCRIPTION**	**PINS**	**PACKAGE CODES**
HIGH-SPEED CMOS (Continued)			
HC/HCT123	Dual Retriggerable Monostable Multivibrator	16	D, N
HC/HCT125*	Quad 3-State Non-Inverting Buffer	14	D, N
HC/HCT126*	Quad 3-State Non-Inverting Buffer	14	D, N
HC/HCT132	Quad 2-Input NAND Schmitt Trigger	14	D, N
HC/HCT137	3-to-8 Line Inverting Decoder/Multiplexer w/Address Latches	16	D, N
HC/HCT138	1-of-8 Decoder/Demultiplexer	16	D, N
HC/HCT139	Dual 2-to-4 Decoder/Demultiplexer	16	D, N
HC/HCT147	10-to-4 Line Priority Encoder	16	D, N
HC/HCT151	8-Input Multiplexer	16	D, N
HC/HCT153	Dual 4-Input Multiplexer	16	D, N
HC/HCT154	4-to-16 Decoder/Demultiplexer, 600mil-wide DIP	24	D, N
HC/HCT157	Quad 2-Input Multiplexer	16	D, N
HC/HCT158	Quad 2-Input Multiplexer, INV	16	D, N
HC/HCT160	Synch. BCD Decade Counter; Asynch. Clear	16	D, N
HC/HCT161	Synch. 4-Bit Binary Counter; Asynch. Clear	16	D, N
HC/HCT162	Synch. BCD Decade Counter; Synch. Clear	16	D, N
HC/HCT163	Synch. 4-Bit Binary Counter; Synch. Clear	16	D, N
HC/HCT164	8-Bit Serial-In/Parallel-Out Shift Register	14	D, N
HC/HCT165	8-Bit Parallel-In/Serial-Out Shift Register	16	D, N
HC/HCT166	8-Bit Parallel/Serial-In/Serial-Out Shift Register	16	D, N
HC/HCT173*	Quad D-Type Flip/Flop; Positive-Edge Trigger, 3-State	16	D, N
HC/HCT174	Hex D-Type Flip/Flop w/Clear; Positive-Edge Trigger	16	D, N
HC/HCT175	Quad D-Type Flip/Flop w/Clear; Positive-Edge Trigger	16	D, N
HC/HCT181	4-Bit Arithmetic Logic Unit	24	D, N
HC/HCT182	Carry Look-Ahead Generator	16	D, N
HC/HCT190	Presettable BCD Decade Up/Down Counter	16	D, N
HC/HCT191	Presettable 4-Bit Binary Up/Down Counter	16	D, N
HC/HCT192	Presettable BCD Decade Up/Down Counter	16	D, N
HC/HCT193	Presettable 4-Bit Binary Up/Down Counter	16	D, N
HC/HCT194	4-Bit Bidirectional Universal Shift Register	16	D, N
HC/HCT195	4-Bit Parallel Access Shift Register	16	D, N
HC/HCT221	Dual Monostable Multivibrator	16	D, N
HC/HCT237	1-to-8 Line Decoder/Multiplexer	16	D, N
HC/HCT238	1-of-8 Decoder/Demultiplexer w/Clear	16	D, N
HC/HCT240*	Octal Inverting Buffer, 3-State	20	D, N
HC/HCT241*	Octal Buffer, 3-State	20	D, N
HC/HCT242*	Quad Inverting Transceiver, 3-State	14	D, N
HC/HCT243*	Quad Transceiver, 3-State	14	D, N
HC/HCT244*	Octal Buffer, 3-State	20	D, N
HC/HCT245*	Octal Transceiver, 3-State	20	D, N
HC/HCT251	8-Input Multiplexer, 3-State	16	D, N
HC/HCT253*	Dual 4-Input Multiplexer, 3-State	16	D, N
HC/HCT257*	Quad 2-Input Multiplexer, 3-State	16	D, N
HC/HCT258	Quad 2-to-1 Date Selector/Multiplexer, 3-State	16	D, N
HC/HCT259	8-Bit Addressable Latch	16	D, N

Logic Products (Continued)			
DEVICE TYPE	**DESCRIPTION**	**PINS**	**PACKAGE CODES**
HIGH-SPEED CMOS (Continued)			
HC266	See HC7266		D, N
HC/HCT273*	Octal D-Type Flip/Flop w/Clear; Positive-Edge Trigger	20	D, N
HC/HCT280	9-Bit Odd/Even Parity Generator/Checker	14	D, N
HC/HCT283	4-Bit Binary Full Adder w/Fast Carry	16	D, N
HC/HCT297	Digital Phase-Locked Loop Filter	16	D, N
HC/HCT299*	8-Bit Universal Shift Register, 3-State	16	D, N
HC/HCT354*	8-Input Multiplexer/Register, 3-State	20	D, N
HC/HCT356*	8-Input Multiplexer/Register, 3-State	20	D, N
HC/HCT365*	Hex Buffer, 3-State	16	D, N
HC/HCT366*	Hex Inverting Buffer, 3-State	16	D, N
HC/HCT367*	Hex Buffer, 3-State	16	D, N
HC/HCT368*	Hex Inverting Buffer, 3-State	16	D, N
HC/HCT373*	Octal Transparent Latch, 3-State	20	D, N
HC/HCT374*	Octal D-Type Flip/Flop; Positive-Edge Trigger, 3-State	20	D, N
HC/HCT377	Octal D-Type Flip/Flop w/Data Enable; Positive-Edge Trigger	20	D, N
HC/HCT390	Dual Decade Ripple Counter	16	D, N
HC/HCT393	Dual 4-Bit Binary Ripple Counter	14	D, N
HC/HCT423	Dual Retriggerable Monostable Multivibrator	16	D, N
HC/HCT533*	Octal Transparent Inverting Latch, 3-State	20	D, N
HC/HCT534*	Octal D-Type Inverting Flip/Flop; Positive-Edge Trigger, 3-State	20	D, N
HC/HCT540*	Octal Inverting Buffer, 3-State	20	D, N
HC/HCT541*	Octal Buffer, 3-State	20	D, N
HC/HCT563*	Octal Transparent Inverting Latch, 3-State	20	D, N
HC/HCT564*	Octal D-Type Inverting Flip/Flop; Positive-Edge Trigger, 3-State	20	D, N
HC/HCT573*	Octal Transparent Latch, 3-State	20	D, N
HC/HCT574*	Octal D-Type Flip/Flop; Positive-Edge Trigger, 3-State	20	D, N
HC/HCT583	BCD Adder	16	D, N
HC/HCT594	8-Bit Shift Register with Output Register	16	D, N
HC/HCT595	8-Bit Serial-In/Serial or Parallel-Out Shift Register w/ Output Latches (3-State)	16	D, N
HC/HCT597	8-Bit Shift Register w/Input Latches	16	D, N
HC/HCT640*	Octal Inverting Transceiver, 3-State	20	D, N
HC/HCT643*	Octal True/Inverting Transceiver, 3-State	20	D, N
HC/HCT646*	Octal Transceiver/Register, 3-State	24	D, N
HC/HCT648*	Octal Inverting Transceiver/Register, 3-State	24	D, N
HC/HCT670*	4 x 4 Register File, 3-State	16	D, N
HC/HCT688	8-Bit Magnitude Comparator	20	D, N
HC/HCT4002	Dual 4-Input NOR Gate	14	D, N
HC/HCT4015	Dual 4-Bit Serial-In/Parallel-Out Shift Register	16	D, N
HC/HCT4016	Quad Bilateral Switch	14	D, N
HC/HCT4017	Johnson Decade Counter w/10 Decoded Outputs	16	D, N
HC/HCT4020	14-Stage Binary Counter	16	D, N
HC/HCT4024	7-Stage Binary Counter	14	D, N
HC/HCT4040	12-Stage Binary Counter	16	D, N
HC/HCT4046A	Phase-Locked Loop w/VCO	16	D, N

Product Information

Logic Products (Continued)			
DEVICE TYPE	**DESCRIPTION**	**PINS**	**PACKAGE CODES**
HIGH-SPEED CMOS (Continued)			
HC4049	Hex Inverting High-to-Low Level Filter	16	D, N
HC4050	Hex High-to-Low Level Shifter	16	D, N
HC/HCT4051	8-Channel Analog Multiplexer/Demultiplexer	16	D, N
HC/HCT4052	Dual 4-Channel Analog Multiplexer/Demultiplexer	16	D, N
HC/HCT4053	Triple 2-Channel Analog Multiplexer/Demultiplexer	16	D, N
HC/HCT4059	Programmable Divide-by-n Counter	24	D, N
HC/HCT4060	14-Stage Ripple-Carry Binary Counter	16	D, N
HC/HCT4066	Quad Bilateral Switch	14	D, N
HC/HCT4067	16-Channel Analog Multiplexer/Demultiplexer	24	D, N
HC/HCT4075	Triple 3-Input OR Gate	14	D, N
HC/HCT4094	8-Stage Shift-and-Store Bus Register	16	D, N
HC/HCT4316	Quad Bilateral Switch	16	D, N
HC/HCT4351	8-Channel Analog Multiplexer/Demultiplexer w/Latch	20	D, N
HC/HCT4352	Dual 4-Channel Analog Multiplexer/Demultiplexer w/Latch	20	D, N
HC/HCT4353	Triple 2-Channel Analog Multiplexer/Demultiplexer w/Latch	20	D, N
HC/HCT4510	BCD Up/Down Counter	16	D, N
HC/HCT4511	BCD to 7-Segment Latch/Decoder/Driver	16	D, N
HC/HCT4514	1-of-16 Decoder/Demultiplexer w/Input Latches	24	D, N
HC/HCT4515	1-of-16 Decoder/Demultiplexer w/Input Latches	24	D, N
HC/HCT4516	Binary Up/Down Counter	16	D, N
HC/HCT4518	Dual BCD Counter	16	D, N
HC/HCT4520	Dual 4-Bit Binary Counter	16	D, N
HC/HCT4538	Dual Retriggerable Precision Monostable Multivibrator	16	D, N
HC/HCT4543	BCD to 7-Segment Latch/Decoder/Driver for LCDs	16	D, N
HC/HCT5555	Programmable Delay Timer with Oscillator	16	D, N
HC/HCT6323A	Programmable Ripple Counter with Oscillator; 3-State)	8	D
HC/HCT7030	9-Bit x 16-Word Exp. FIFO Register	28	D, N
HC/HCT7046A	Phase-Locked Loop w/Lock Detector	16	D, N
HC/HCT7080	16-Bit Odd/Even Parity Generator/Checker	20	D, N
HCT7174	Hex D-Type Flip/Flop with Reset, Positive Edge-Triggered, Open Drain Outputs	16	D, N
HC/HCT7245*	Octal Bus Schmitt Trigger Transceiver; 3-State	20	D, N
HC7266	Quad 2-Input Exclusive-NOR Gate	14	D, N
HCT7273	Octal D-Type Flip/Flop with Reset, Positive Edge-Trigered Open Drain Outputs	20	D, N
HC/HCT7403	4-Bit x 64-Word FIFO Register; 3-State	16	D, N
HCHCT7404	5-Bit x 64-Word FIFO Register; 3-State	20	D, N
HC/HCT7540	Octal Schmitt Trigger Inverting Buffer, 3-State	20	D, N
HC/HCT7541	Octal Schmitt Trigger Buffer, 3-State	20	D, N
HC/HCT7597	8-Bit Shift Register w/Input Latches	16	D, N
HC/HCT7731	Quad 64-Bit Static Shift Register	16	D, N
HC/HCT9014	Nine Wide Schmitt Trigger Inverting Buffer	20	D, N
HC/HCT9015	Nine Wide Schmitt Trigger Buffer	20	D, N
HC/HCT9114	Nine Wide Schmitt Trigger Buffer, Open-Drain	20	D, N
HC/HCT9115	Nine Wide Schmitt Trigger Buffer, Open-Drain	20	D, N
HC/HCT40102	Presettable 2-Decade BCD Down Counter	16	D, N

Logic Products (Continued)			
DEVICE TYPE	**DESCRIPTION**	**PINS**	**PACKAGE CODES**
HIGH-SPEED CMOS (Continued)			
HC/HCT40103	8-Bit Binary Down Counter	16	D, N
HC/HCT40104*	4-Bit Bidirectional Universal Shift Register	16	D, N
HC/HCT40105	4-Bit x 16-Word FIFO Register	16	D, N
LOW VOLTAGE			
74HL33XXXX			
240	Octal Buffer/Line Driver, 3-State, Inverting	24	D, DB
241	Octal Buffer/Line Driver, 3-State, OE Active Low/High	24	D
244	Octal Buffer/Line Driver, 3-State, OE Active Low	24	D
245	Octal Buffer/Line Driver, 3-State	24	D
373	Octal D Transparent Latch, 3-State	24	D
374	Octal D Flip-Flop, Positive Edge-Trigger, 3-State	24	D
533	Octal D Transparent Latch, 3-State, Inverting	24	D
534	Octal D Flip-Flop, Positive Edge-Trigger, 3-State, Inverting	24	D
620	Octal Transceiver w/ Dual Enable, 3-State, Inverting	24	D
74LVXXXX			
00	Quad 2-Input NAND Gate	14	D
02	Quad 2-Input NAND Gate	14	D
04	Hex Inverter	14	D
U04	Hex Inverter (unbuffered)	14	D
08	Quad 2-Input and Gate	14	D
14	Hex Inverting Schmitt Trigger	14	D
32	Quad 2-Input or Gate	14	D
74	Dual D Flip-Flop with SR, Positive Edge Trigger	14	D
125	Quad Buffer/Line Driver, 3-State, OE Active Low	14	D
138	3-to-8 Line Decoder/Demultiplexer, Inverting	16	D
139	Dual 2-4 Line Decoder/Demultiplexer	16	D
164	8-Bit Serial In/Parallel Out Shift Register	14	D
174	Hex D Flip-Flop with Reset, Positive Edge Trigger	16	D
244	Octal Buffer/Line Driver, 3-State, OE Activer	20	D, DB
245	Octal Transceiver, 3-State	20	D, DB
273	Octal D Flip-Flop with R, Positive Edge Trigger	20	D, DB
373	Octal D Latch, 3-State	20	D, DB
374	Octal D Flip-Flop, Positive Edge-Trigger	20	D, DB
573	Octal D Latch, 3-State, Flow-Through Pin-Out	20	D, DB

Product Information

Memory Products

DEVICE	COMPLEXITY	PACKAGE CODES	t_{AA}/ns
CMOS EPROMs			
27C64A-12	8K × 8	A, N	120
27C64A-15	8K × 8	A, N	150
27C64AI15	8K × 8	A, N	150
27C64A-20	8K × 8	A, N	200
27C64AI20	8K × 8	A, N	200
27C256-90	32K × 8	A, D, N	90
27C256-12	32K × 8	A, D, N	120
27C256I12	32K × 8	A, D, N	120
27C256-15	32K × 8	A, D, N	150
27C256I15	32K × 8	A, D, N	150
27C256-20	32K × 8	A, D, N	200
27C256I20	32K × 8	A, D, N	200
27C512-12	64K × 8	A, D, N	120
27C512I12	64K × 8	A, D, N	120
27C512-15	64K × 8	A, D, N	150
27C512I15	64K × 8	A, D, N	150
27C512-20	64K × 8	A, D, N	200
27C512I20	64K × 8	A, D, N	200

DEVICE	DENSITY	COMPLEXITY	PACKAGE CODES	SPEED (t_{AA}/ns)
BIPOLAR PROMs				
82S23	1/4K	32 × 8	F, N,	50
82S23A	1/4K	32 × 8	A, D, F, N	25
82S123	1/4K	32 × 8	F, N	50
82S123A	1/4K	32 × 8	A, D, F, N	25
82S126	1K	256 × 4	F, N	50
82S126A	1K	256 × 4	A, D, F, N	30
82S129	1K	256 × 4	F, N	50
82S129A	1K	256 × 4	A, D, F, N	27
10149	1K	256 × 4	F	20
10149A	1K	256 × 4	F	10
100149	1K	256 × 4	F	20
100149A	1K	256 × 4	F	10
82S115*	4K	512 × 8	F, N	60
82S130	2K	512 × 4	F, N	50
82S130A	2K	512 × 4	A, D, F, N	30
82S131	2K	512 × 4	F, N	50
82S131A	2K	512 × 4	A, D, F, N	30
82S135	2K	256 × 8	A, D, F, N	45
82LS135	2K	256 × 8	A, D, F, N	100
82S137	4K	1024 × 4	F, N	60
82S137A	4K	1024 × 4	F, D, N	45
82S137B	4K	1024 × 4	F, D, N	35

Product Information

Memory Products (Continued)

DEVICE	DENSITY	COMPLEXITY	PACKAGE CODES	SPEED (t_{AA}/ns)
BIPOLAR PROMs (Continued)				
82S141	4K	512 x 8	F, N	60
82S141A	4K	512 x 8	A, N, N3	45
82S147	4K	512 x 8	F, N	60
82S147A	4K	512 x 8	F, N	45
82S147B	4K	512 x 8	F, N	25
82S181	8K	1024 x 8	F, N	70
82S181A	8K	1024 x 8	A, F, N, N3	55
82S181C	8K	1024 x 8	A, F, N, N3	35
82S183*	8K	1024 x 8	F, N	60
82S185A	8K	2048 x 4	F, D, N	50
82S185B	8K	2048 x 4	F, D, N	45
82S191	16K	2048 x 8	F, N	80
82S191A	16K	2048 x 8	A, F, F3, N, N3	55
82S191C	16K	2048 x 8	A, F, F3, N, N3	35
82HS195	16K	4096 x 4	F, N	45
82HS195A	16K	4096 x 4	A, F, N	35
82HS195B	16K	4096 x 4	A, F, N	25
82HS321	32K	4096 x 8	F, N	45
82HS321A	32K	4096 x 8	A, F, N	35
82HS321B	32K	4096 x 8	A, F, N	30
82HS641	64K	8192 x 8	F, N	55
82HS641A	64K	8192 x 8	F, N	45
82HS641B	64K	8192 x 8	F, N	35

NOTE: All t_{AA} values are maximums
* Latched devices.

DEVICE	FUNCTION	PINS	PKG. CODES	SPEED (t_{AA}/ns)
RAM				
74F189A	64-Bit RAM (16 x 4) TS	16	D, N	15
74F219A	64-Bit RAM	16	D, N	15
74F225	16 x 5 FIFO	20	N	N/A

DEVICE	COMPLEXITY	PACKAGE CODES	E/W CYCLE
MOS EEPROMs			
PCA8582B	256 x 8	D, N	500K
PCD8582D	256 x 8	D, N	10K
PCF8581	128 x 8	D, N	10K
PCF8581C	128 x 8	D, N	10K
PCF8582C	256 x 8	D, N	500K
PCF8582E	256 x 8	D, N	100K

Product Information

Microcontroller Products

PART NUMBER	DESCRIPTION	PACKAGE TYPE	ORDER CODE
80XX NMOS SERIES			
SCN8031	ROMless 8-Bit MCU	40-pin Plastic DIP (Com temp, 12MHz)	SCN8031HCCN40
		44-pin PLCC (Com temp, 12MHz)	SCN8031HCCA44
		40-pin Plastic DIP (Ext temp, 12MHz)	SCN8031HACN40
		44-pin PLCC (Ext temp, 12MHz)	SCN8031HACA44
		40-pin Plastic DIP (Com temp, 15MHz)	SCN8031HCFN40
		44-pin PLCC (Com temp, 15MHz)	SCN8031HCFA44
		40-pin Plastic DIP (Ext temp, 15MHz)	SCN8031HAFN40
		44-pin PLCC (Ext temp, 15MHz)	SCN8031HAFA44
SCN8032	ROMless 8-Bit MCU	40-pin Plastic DIP (Com temp, 12MHz)	SCN8032HCCN40
		44-pin PLCC (Com temp, 12MHz)	SCN8032HCCA44
		40-pin Plastic DIP (Ext temp, 12MHz)	SCN8032ACN40
		44-pin PLCC (Ext temp, 12MHz)	SCN8032ACA44
		40-pin Plastic DIP (Com temp, 15MHz)	SCN8032HCFN40
		44-pin PLCC (Com temp, 15MHz)	SCN8032HCFA44
		40-pin Plastic DIP (Ext temp, 15MHz)	SCN8032HAFN40
		44-pin PLCC (Ext temp, 15MHz)	SCN8032HAFA44
SCN8039	ROMless 8-Bit MCU	40-pin Plastic DIP (Com temp. 11MHz)	SCN8039HCBN40
		44-pin PLCC (Com temp.11MHz)	SCN8039HCBA44
		40-pin Plastic DIP(Ext temp, 11MHz	SCN8039HABN40
		44-pin PLCC (Ext temp, 11MHz)	SCN8039HABA44
SCN8040	ROMless 8-Bit MCU	40-pin Plastic DIP (Com temp. 11MHz)	SCN8040HCBN40
		44-pin PLCC (Com temp. 11MHz)	SCN8040HCBA44
SCN8049	8-Bit MCU	Com & Ext temp, 11MHz	ROM coded-CP# upon verification
SCN8050	8-Bit MCU	Com temp, 11MHz	ROM coded-CP# upon verification
SCN8051	8-Bit MCU	Com & Ext temp, 12 & 15MHz	CP# upon verification
SCN8052	8-Bit MCU	Com & Ext temp, 12 & 15MHz	CP# upon verification
80CXX CMOS SERIES			
SC80C31B	ROMless CMOS 8-Bit MCU	40-pin Plastic DIP (Com temp, 12MHz)	SC80C31BCCN40
		44-pin PLCC (Com temp, 12MHz)	SC80C31BCCA44
		44-pin QFP (Com temp, 12MHz)	SC80C31BCCB44
		40-pin Plastic DIP (Ext temp, 12MHz)	SC80C31BACN40
		44-pin PLCC (Ext temp, 12MHz)	SC80C31BACA44
		40-pin Plastic DIP (Com temp, 16MHz)	SC80C31BCGN40
		44-pin PLCC (Com temp, 16MHz)	SC80C31BCGA44
		44-pin QFP (Com temp, 16MHz)	SC80C31BCGB44
		40-pin Plastic DIP (Ext temp, 16MHz)	SC80C31BAGN40
		44-pin PLCC (Ext temp, 16MHz)	SC80C31BAGA44
		40-pin Plastic DIP (Com temp, 24MHz)	SC80C31BCPN40
		44-pin PLCC (Com temp, 24MHz)	SC80C31BCPA44

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
SC80C31B (Continued)		44-pin QFP (Com temp, 24MHz)	SC80C31BCPB44
		40-pin Plastic DIP (Ext temp, 24MHz)	SC80C31BAPN40
		44-pin PLCC (Ext temp, 24MHz)	SC80C31BAPA44
		40-pin Plastic DIP (Com temp, 33MHz)	SC80C31BCYN40
		44-pin PLCC (Com temp, 33MHz)	SC80C31BCYA44
		44-pin QFP (Com temp, 33MHz)	SC80C31BCYB44
		40-pin Plastic DIP (Ext temp, 33MHz)	SC80C31BAYN40
		44-pin PLCC (Ext temp, 33MHz)	SC80C31BAYA44
SC80C51B	8-Bit CMOS MCU, 4K, MASK ROM version	Speed, pkg. and temp same as 80C31	ROM coded-CV# upon verification
SC87C51	8-Bit CMOS MCU; /OTP	40-pin Plastic DIP (Com temp, 12MHz)	SC87C51CCN40
	EPROM version of /OTP	44-pin PLCC (Com temp, 12MHz)	SC87C51CCA44
	SC80C51 /OTP	44-pin QFP (Com temp, 12MHz)	SC87C51CCB44
	Erasable	40-pin CerDIP (Com temp, 12MHz)	SC87C51CCF40
	Erasable	44-pin CLCC (Com temp, 12MHz)	SC87C51CCL44
	/OTP	40-pin Plastic DIP (Ext temp, 12MHz)	SC87C51ACN40
	OTP	44-pin PLCC (Ext temp, 12MHz)	SC87C51ACA44
	Erasable	40-pin Ceramic DIP (Ext temp, 12MHz)	SC87C51ACF40
	Erasable	44-pin CLCC (Ext temp, 12MHz)	SC87C51ACL44
	OTP	40-pin Plastic DIP (Com temp, 16MHz)	SC87C51CGN40
	OTP	44-pin PLCC (Com temp, 3.5-16MHz)	SC87C51CGA44
	OTP	44-pin QFP (Com temp, 16MHz)	SC87C51CGB44
	Erasable	40-pin CerDIP (Com temp, 16MHz)	SC87C51CGF40
	Erasable	44-pin CLCC (Com temp, 16MHz)	SC87C51CGK44
	OTP	40-pin Plastic DIP (Ext temp, 16MHz)	SC87C51AGN40
	OTP	44-pin PLCC (Ext temp, 16MHz)	SC87C51AGA44
	Erasable	40-pin Ceramic DIP (Ext temp, 16MHz)	SC87C51AGF40
	Erasable	44-pin CLCC (Ext temp, 16MHz)	SC87C51AGK44
	OTP	40-pin Plastic DIP (Com temp, 24MHz)	SC87C51CPN40
	OTP	44-pin PLCC (Com temp, 24MHz)	SC87C51CPA44
	OTP	44-pin QFP (Com temp, 24MHz)	SC87C51CPB44
	Erasable	40-pin CerDIP UV (Com temp, 24MHz)	SC87C51CPF40
	Erasable	44-pin CLCC UV (Com temp, 24MHz)	SC87C51CPK44
	OTP	40-pin Plastic DIP (Ext temp, 24MHz)	SC87C51APN40
	/OTP	44-pin PLCC (Ext temp, 24MHz)	SC87C51APA44
	Erasable	40-pin CerDIP UV (Ext temp, 24MHz)	SC87C51APF40
	Erasable	44-pin CLCC UV (Ext temp, 24MHz)	SC87C51APK44
	OTP	40-pin DIP (Com temp, 33MHz)	SC87C51CYN40
	OTP	44-pin PLCC (Com temp, 33MHz)	SC87C51CYA44
	OTP	44-pin PQFP (Com temp, 33MHz)	SC87C51CYB44
	Erasable	40-pin Ceramic DIP (Com temp, 33MHz)	SC87C51CYF40
	Erasable	44-pin CLCC (Com temp, 33MHz)	SC87C51CYK44
	OTP	40-pin Plastic DIP (Ext temp, 33MHz)	SC87C51AYN40

Product Information

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
SC87C51 (continued)	OTP	44-pin PLCC (Ext temp, 33MHz)	SC87C51AYA44
	OTP	44-pin PQFP (Ext temp, 33MHz)	SC87C51AYB44
	Erasable	40-pin Ceramic DIP (Ext temp, 33MHz)	SC87C51AYF40
	Erasable	44-pin CLCC (Ext temp, 33MHz)	SC87C51AYK44
P80CL31	8-Bit MCU with UART (1.8 – 6 Volt operation) (ROMless version)	40-pin DIP (Ext temp, 16MHz)	P80CL31HFP N
		40-pin Very Small Outline (Ext temp, 16MHz)	P80CL31HFT D
P80CL51	8-Bit MCU with UART & 4KB ROM (1.8 Volts) Masked ROM version	Speed, pkg and temp.–same as 80CL31.	ROM coded–CV# upon verification
P80C32	8-Bit MCU with 3 Timers, 256 bytes RAM (ROM-less version)	Die unscribed wafer (Com temp, 16MHz)	P80C32EBP CU
		40-pin Plastic DIP (Com temp, 16MHz)	P80C32EBP N
		44-pin PLCC (Com temp, 16MHz)	P80C32EBA A
		44-pin QFP (Com temp, 16MHz)	P80C32EBB B
		40-pin Plastic DIP (Ext temp, 16MHz)	P80C32EFP N
		44-pin PLCC (Ext temp, 16MHz)	P80C32EFA A
		44-pin QFP (Ext temp, 16MHz)	P80C32EFB B
		40-pin Plastic DIP (Com temp, 20MHz)	P80C32GBP N
		44-pin PLCC (Com temp, 20MHz)	P80C32GBA A
		44-pin QFP (Com temp, 20MHz)	P80C32GBB B
		40-pin Plastic DIP (Ext temp, 20MHz)	P80C32GFP N
		44-pin PLCC (Ext temp, 20MHz)	P80C32GFA A
		44-pin QFP (Ext temp, 20MHz)	P80C32GFB B
		40-pin Plastic DIP (Com temp, 24MHz)	P80C32IBP N
		44-pin PLCC (Com temp, 24MHz)	P80C32IBA A
		44-pin PQFP (Com temp, 24MHz)	P80C32IBB B
		40-pin Plastic DIP (Ext temp, 24MHz)	P80C32IFP N
		44-pin PLCC (Ext temp, 24MHz)	P80C32IFA A
		44-pin PQFP (Ext temp, 24MHz)	P80C32IFB B
P80C52	8-Bit MCU with 3 timers, 256 bytes RAM, 8K ROM. Mask ROM Version	Speed, pkg., and temp. same as 80C32	ROM coded-CV# upon verification
P87C52	8-Bit CMOS MCU; /OTP	40-pin Plastic DIP, (Com temp, 12MHz)	P87C52EBP N
	8K; EPROM /Erasable	40-pin CerDIP UV (Com temp, 16MHz)	P87C52EBF FA
	OTP	44-pin PLCC (Com temp, 16MHz)	P87C52EBA A
	Erasable	44-pin CLCC UV (Com temp, 16MHz)	P87C52BLK A
	OTP	40-pin Plastic DIP (Ext temp, 16MHz)	P87C52EFP N
	Erasable	40-pin CerDIP UV (Ext temp, 16MHz)	P87C52EFF FA
	OTP	44-pin PLCC (Ext temp, 16MHz)	P87C52EFA A
	Erasable	44-pin CLCC UV (Ext temp, 16MHz)	P87C52EFL KA
	OTP	40-pin Plastic DIP (Com temp, 20MHz)	P87C52GMP N
	Erasable	40-pin CerDIP UV (Com temp, 20MHz)	P87C52GBF FA
	OTP	44-pin PLCC (Com temp, 20MHz)	P87C52GBA A

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
P87C52	Erasable	44-pin CLCC UV (Com temp, 20MHz)	P87C52GBL KA
(Continued)	OTP	40-pin Plastic DIP (Ext temp, 20MHz)	P87C52GFP N
	Erasable	40-pin CerDIP UV (Ext temp, 20MHz)	P87C52GFF FA
	OTP	44-pin PLCC (Ext temp, 20MHz)	P87C52GFA A
	Erasable	40-pin CerDIP UV (Ext temp, 20MHz)	P87C52IFF FA
	Erasable	44-pin CLCC UV (Ext temp, 20MHz)	P87C52GFL KA
	OTP	44-pin Quad Flatpack (Com temp, 16MHz)	P87C52EBB B
	OTP	44-pin Quad Flatpack (Ext temp, 16MHz)	P87C52EFB B
	OTP	44-pin Quad Flatpack (Com temp, 20MHz)	P87C52GBB B
	OTP	44-pin Quad Flatpack (Ext temp, 20MHz)	P87C52GFB B
	OTP	40-pin Plastic DIP (Com temp, 24MHz)	P87C52IBP N
	OTP	44-pin PLCC (Com temp, 24MHz)	P87C52IBA A
	OTP	44-pin PQFP (Com temp, 24MHz)	P87C52IBB B
	Erasable	40-pin CerDIP UV (Com temp, 24MHz)	P87C52IBF FA
	Erasable	44-pin CLCC UV (Com temp, 24MHz)	P87C52IBL KA
	OTP	40-pin Plastic DIP (Ext temp, 24MHz)	P87C52IFP N
	OTP	44-pin PLCC (Ext temp, 24MHz)	P87C52IFA A
	OTP	44-pin PQFP (Ext temp, 24MHz)	P87C52IFB B
	Erasable	40-pin CerDIP UV (Ext temp, 24MHz)	P87C52IFF FA
	Erasable	44-pin CLCC UV (Ext temp, 24MHz)	P87C52IFL KA
		68-pin PLCC (Com temp, 12MHz)	SC80C451CCA68
		64-pin Plastic DIP (Ext temp, 12MHz)	SC80C451ACN64
		68-pin PLCC (Ext temp, 12MHz)	SC80C451ACA68
		64-pin Plastic DIP (Com temp, 16MHz)	SC80C451CGN64
		68-pin PLCC (Com temp, 16MHz)	SC80C451CGA68
		64-pin Plastic DIP (Ext temp, 16MHz)	SC80C451AGN64
		68-pin PLCC (Ext temp, 16MHz)	SC80C451AGA68
SC83C451	I/O Expanded 8-Bit MCU, 4K, Masked ROM version	Speed, pkg. and temp. same as 80C451	ROM coded-CV# upon verification
SC87C451	I/O Expanded 8-Bit /OTP	64-pin Plastic DIP (Com temp, 12MHz)	SC87C451CCN64
	/OTP	68-pin PLCC (Com temp, 12MHz)	SC87C451CCA68
	/Erasable	68-pin CLCC (Com temp, 12MHz)	SC87C451CCL68
	MCU; OTP	64-pin Plastic DIP (Ext temp, 12MHz)	SC87C451ACN64
	4K, EPROM OTP	68-pin PLCC (Ext temp, 12MHz)	SC87C451ACA68
	version of Erasable	68-pin CLCC (Ext temp, 12MHz)	SC87C451ACL68
	SC80C451 OTP	64-pin Plastic DIP (Com temp, 16MHz)	SC87C451CGN64
	OTP	68-pin PLCC (Com temp, 16MHz)	SC87C451CGA44
	Erasable	68-pin CLCC (Ext temp, 16MHz)	SC87C451CGL68
	OTP	64-pin Plastic DIP (Ext temp, 16MHz)	SC87C451AGN64
	OTP	68-pin PLCC (Ext temp, 16MHz)	SC87C451AGA68
	Erasable	68-pin CLCC (Ext temp, 16MHz)	SC87C451AGL68

Product Information

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
P87C524	8-Bit CMOS MCU, /OTP EPROM version /OTP w/ 3 timers, /Erasable Watchdog, /Erasable	40-pin Plastic DIP (Com temp, 16MHz) 44-pin PLCC (Com temp, 16MHz) 40-pin Ceramic DIP (Com temp, 16MHz) 44-pin CLCC (Com temp, 16MHz)	P87C524EBP N P87C524EBA A P87C528EBF FA P87C528EBL KA
P83C053	8-Bit MCU with 8K ROM & On-Screen-Display Function. Mask ROM version	42-pin Plastic DIP (Com temp, 12MHz)	P83C053BBP NB ROM coded-CV# upon verification
P83C054	8-Bit MCU with 16K ROM & On-Screen-Display Function. Mask ROM version	42-pin Plastic DIP (Com temp, 12MHz)	P83C04BBP NB ROM coded-CV# upon verification
P87C054	8-Bit MCU with 16K EPROM & On-Screen-Display Function	42-pin Plastic DIP OTP (Com temp, 12MHz) 42-pin Plastic DIP OTP (Ext temp, 12MHz)	P87C054BBP NB P87C054BFP NB
P80CL410	8-Bit MCU with I²C (1.8 - 6 volt operation) (ROMless version)	40-pin DIP (Ext temp, 16MHz) 40-pin Very Small Outline (Ext temp, 16MHz)	P80CL410HF N P80CL410HF D
P85CL000	Piggyback EPROM for 83CLXXX family	Piggyback EPROM (Ext temp, 16MHz)	P85CL000HF Z
P83CL410	8-Bit MCU with I²C and 4K bytes ROM (1.8 volts) Masked ROM version	Speed, pkg. and temp. same as 80CL410	ROM coded-CV# upon verification
SC80C451	I/O Expanded 8-Bit MCU; 7 8-Bit I/O ports plus mailbox port ROMless version	64-pin Plastic DIP (Com temp, 12MHz)	SC80C451CCN64
P87C524	I²C & UART, 4 8-Bit /OTP ports, 512 bytes /OTP RAM, 16K /Erasable EPROM /Erasable	40-pin Plastic DIP (Ext temp, 20MHz) 44-pin PLCC(Ext temp, 20MHz) 40-pin Ceramic DIP (Ext temp, 20MHz) 44-pin CLCC (Ext temp, 20MHz)	P87C528GFP N P87C528GFA A P87C528GFF FA P87C528GFL KA
P80C528	8-Bit CMOS MCU, 512 Bytes RAM, ROMless version	40-pin Plastic DIP (Com temp, 16MHz) 44-pin PLCC (Com temp, 16MHz) 40-pin Plastic DIP (Ext temp, 16MHz) 44-pin PLCC (Ext temp, 16MHz)	P80C528EBP N P80C528EBA A P80C528EFP N P80C528EFA A
P83C528	8-Bit CMOS MCU, 32KB ROM, Masked ROM version	Speed, pkg. and temp. same as 80C528	ROM coded CV# upon verification
P87C528	8-Bit CMOS MCU /OTP EPROM version w/ /OTP 3 timers, /Erasable Watchdog, /Erasable I²C& UART, /OTP	40-pin Plastic DIP (Com temp, 16MHz) 44-pin PLCC (Com temp, 16MHz) 40-pin Ceramic DIP (Com temp, 16MHz) 44-pin CLCC (Com temp, 16MHz) 40-pin Plastic DIP (Ext temp, 16MHz)	P87C528FBP N P87C528FBA A P87C528FBF FA P87C528FBL KA P87C528FFP N

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
P87C528 (Continued)	4 8-Bit ports, /OTP 512 bytes RAM, /Erasable 32K EPROM /Erasable OTP OTP Erasable Erasable OTP OTP Erasable Erasable	44-pin PLCC (Ext temp, 16MHz) 40-pin Ceramic DIP (Ext temp, 16MHz) 44-pin CLCC (Ext temp, 16MHz) 40-pin Plastic DIP (Com temp, 20MHz) 44-pin PLCC (Com temp, 20MHz) 40-pin Ceramic DIP (Com temp, 20MHz) 44-pin CLCC (Com temp, 20MHz) 40-pin Plastic DIP (Ext temp, 20MHz) 44-pin PLCC (Ext temp, 20MHz) 40-pin Ceramic DIP (Ext temp, 20MHz) 44-pin CLCC (Ext temp, 20MHz)	P87C528FFA A P87C528FFF FA P87C528FFL KA P87C528FBP N P87C528FBA A P87C528FBF FA P878C528GBL KA P87C528GFP N P87C528GFA A P87C528GFF FA P87C528GFL KA
P80C550	8-Bit MCU w/ 8-Bit A/D, 3 timers watchdog, 4 8-Bit ports, 128 bytes RAM ROMless version (Cont)	40-pin Plastic DIP (Com temp, 16MHz) 44-pin PLCC (Com temp, 16MHz) 40-pin Plastic DIP (Ext temp, 16MHz) 44-pin PLCC (Ext temp, 16MHz)	P80C550EBP N P80C550EBA A P80C550EFP N P80C550EFA A
P83C550	8-Bit MCU with 8-Bit A/D, 3 timers watchdog, 4 8-Bit ports, 128 bytes RAM, 4K ROM Masked ROM version	Speed, pkg. and temp. same as 80C550	RAM coded CV# upon verification
P87C550	8-Bit MCU with /OTP 8-Bit, A/D, 3 timers, /OTP watch-dog, 4 /Erasable 8-Bit ports, 128 /Erasable bytes 4K EPROM /OTP RAM, UV erasable /OTP or OTP depending /Erasable on package) /Erasable	40-pin Plastic DIP (Com temp, 16MHz) 44-pin PLCC (Com temp, 16MHz) 40-pin Ceramic DIP w/window (Com temp, 16MHz) 44-pin CLCC w/window (Com temp, 16MHz) 40-pin Plastic DIP (Ext temp, 16MHz) 44-pin PLCC (Ext temp, 16MHz) 40-pin Ceramic DIP w/ window (Ext temp, 16MHz) 44-pin CLCC w/ window in J-Bend	P87C550EBP N P87C550EBA A P87C550EBF FA P87C550EBL KA P87C550EFP N P87C550EFA A P87C550EFF FA P87C550EFL KA
S80C552	8-Bit CMOS MCU, ROM-less version, 10-Bit A/D, PWM outputs, 8 high-speed outputs, capture/compare counter/timer (I^2C)	68-pin PLCC (Com temp, 16MHz) 80-pin QFP (Com temp, 16MHz) 68-pin PLCC (Ext temp, 16MHz) 80-pin QFP (Ext temp, 16MHz) 68-pin PLCC (-40 to +125°C) 12MHz 80-pin QFP (-40 to +125°C) 12MHz	S80C552-1A68 S80C552-1B S80C552-2A68 S80C552-2B S80C552-6A68 S80C552-6B
S83C552	8-Bit CMOS MCU, 4KB, Mask ROM vertsion	Speed, package and temp. same as 80C552	ROM coded CV# upon verification
S87C552	8-Bit CMOS MCU /OTP 4KB, EPROM /Erasable OTP Erasable /OTP	68-pin PLCC (Com temp, 12MHz) 68-pin CLCC (Com temp, 12MHz) 068-pin PLCC (Ext temp, 12MHz) 68-pin CLCC (Ext temp, 12MHz) 68-pin PLCC (Com temp, 16MHz)	S87C552-1A68 S87C552-1K68 S87C552-2A68 S87C552-2K68 S87C552-4A68

Product Information

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
S87C552 (Continued)	Erasable	68-pin CLCC (Com temp, 16MHz)	S87C552-4K68
	OTP	68-pin PLCC (Ext temp, 16MHz)	S87C552-5A68
	Erasable	68-pin CLCC (Ext temp, 16MHz)	S87C552-5K68
S80C562	8-Bit MCU with 4 timers, watchdog, 8-Bit A/D, 6 8-Bit ports, 256 bytes RAM (ROMless version)	68-pin PLCC (Com temp, 16MHz)	S80C562-4 A68
		68-pin PLCC (Ext temp, 12MHz)	S80C562-2 A68
		68-pin PLCC (-40 to +125°C & 12MHz)	S80C562-6 A68
S83C562	8-Bit MCU with 4 timers, watchdog, 8-Bit A/D, 6 8-Bit ports, 256 bytes RAM and 8K ROM Masked ROM version	Speed, pkg. and temp. same as 80C562	ROM coded CV# upon verification
S80C652	8-Bit CMOS MCU, I²C serial port, 8K ROM, 256 bytes RAM ROMless version	40-pin Plastic DIP (Com temp, 12MHz)	S80C652-1N40
		44-pin PLCC (Com temp, 12MHz)	S80C652-1A44
		40-pin Plastic DIP (Ext temp, 12MHz)	S80C652-2N40
		44-pin PLCC (Ext temp, 12MHz)	S80C652-2A44
		40-pin DIP (-40 to +125°C) 12MHz	S80C652-6N40
		44-pin PLCC (-40 to +125°C) 12MHz	S80C652-6A44
S83C652	8-Bit CMOS MCU, 8KB, Mask ROM version	Speed, package and temp. same as 80C652	ROM coded CV# upon verification
S87C652	8-Bit CMOS MCU, /OTP	40-pin Plastic DIP (Com temp, 16MHz)	S87C652-4N40
	8KB EPROM /OTP	44-pin PLCC (Com temp, 16MHz)	S87C652-4A44
	Erasable	40-pin Ceramic DIP (Com temp, 16MHz)	S87C652-4F40
	Erasable	44-pin CLCC (Com temp, 16MHz)	S87C652-4K44
	OTP	40-pin Plastic DIP (Ext temp, 16MHz)	S87C652-5N40
	OTP	44-pin PLCC (Ext temp, 16MHz)	S87C652-5A44
	Erasable	40-pin CerDIP UV (Ext temp, 16MHz)	S87C652-5F40
	Erasable	44-pin CLCC UV (Ext temp, 16MHz)	S87C652-5K44
	8-Bit CMOS MCU, /OTP	40-pin Plastic DIP (Com temp, 20MHz)	S87C652-7N40
	8KB EPROM OTP	44-pin PLCC (Com temp, 20MHz)	S87C652-7A44
	Erasable	40-pin CerDIP UV (Com temp, 20MHz)	S87C652-7F40
	Erasable	44-pin CLCC UV (Com temp, 20MHz)	S87C652-7K44
	OTP	40-pin Plastic DIP (Ext temp, 20MHz)	S87C652-8N40
	OTP	44-pin PLCC (Ext temp, 20MHz)	S87C652-8A44
	Erasable	40-pin CerDIP UV (Ext temp, 20MHz)	S87C652-8F40
	Erasable	44-pin CLCC UV (Ext temp, 20MHz)	S87C652-8K44
S83C654	8-Bit CMOS MCU, I6K ROM (ROM code only)	Speed, package and temp. same as 80C652	ROM coded CV# upon verification
S87C654	8-Bit CMOS MCU, /OTP	40-pin Plastic DIP (Com temp, 12MHz)	S87C654-4N40
	16KB EPROM /OTP	44-pin PLCC (Com temp, 12MHz)	S87C654-4A44
	Erasable	40-pin Ceramic DIP (Com temp, 12MHz)	S87C654-4F40

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
S87C654 (Continued)	Erasable	44-pin CLCC (Com temp, 12MHz)	S87C654-4K44
	OTP	40-pin Plastic DIP (Ext temp, 16MHz)	S87C654-5N40
	OTP	44-pin PLCC (Ext temp, 16MHz)	S87C654-5A44
	Erasable	40-pin CerDIP UV (Ext temp, 16MHz)	S87C654-5F40
	Erasable	44-pin CLCC UV (Ext temp, 16MHz)	S87C654-5K44
	OTP	40-pin Plastic DIP (Com temp, 20MHz)	S87C654-7N40
	OTP	44-pin PLCC (Com temp, 20MHz)	S87C654-7A44
	Erasable	40-pin CerDIP UV (Com temp, 20MHz)	S87C654-7F40
	Erasable	44-pin CLCC UV (Com temp, 20MHz)	S87C654-7K44
	OTP	40-pin Plastic DIP (Ext temp, 20MHz)	S87C654-8N40
	OTP	44-pin PLCC (Ext temp, 20MHz)	S87C654-8A44
	Erasable	40-pin CerDIP UV (Ext temp, 20MHz)	S87C654-8F40
	Erasable	44-pin CLCC UV (Ext temp, 20MHz)	S87C654-8K44
S83C751	8-Bit MCU, 24-pin Skinny DIP and 28-pin PLCC packages, I^2C-ROM code only, 2KB Masked ROM version	24-pin Plastic DIP (Com temp, 12MHz)	S83C751-1N24
		28-pin PLCC (Com temp, 12MHz)	S83C751-1A28
		24-pin Plastic DIP (Ext temp, 12MHz)	S83C751-2N24
		28-pin PLCC (Ext temp, 12MHz)	S83C751-2A28
		24-pin Plastic DIP (Com temp, 16MHz)	S83C751-4N24
		28-pin PLCC (Com temp, 16MHz)	S83C751-4A28
		24-pin Plastic DIP (Ext temp, 16MHz)	S83C751-5N24
		28-pin PLCC (Ext temp, 16MHz)	S83C751-5A28
S87C751	8-Bit MCU, 2KB /Erasable EPROM version /OTP of S83C751 /OTP	24-pin CerDIP (Com temp, 12MHz)	S87C751-1F24
		24-pin Plastic DIP (Com temp, 12MHz)	S87C751-1N24
		28-pin PLCC (Com temp, 12MHz)	S87C751-1A28
	OTP	24-pin Plastic DIP (Ext temp, 12MHz)	S87C751-2N24
	OTP	28-pin PLCC (Ext temp, 12MHz)	S87C751-2A28
	Erasable	24-pin CerDIP (Com temp, 12MHz)	S87C751-3F24
	OTP	24-pin Plastic DIP (Com temp, 0.5-12MHz)	S87C751-3N24
	OTP	28-pin PLCC (Com temp, 0.5-12MHz)	S87C751-3A28
	OTP	24-pin Plastic DIP (Ext temp, 16MHz)	S87C751-5N24
	OTP	28-pin PLCC (Ext temp, 16MHz)	S87C751-5A28
S83C752	8-Bit MCU, A/D converter and PWM output, 2KB Masked ROM version	28-pin Plastic DIP (Com temp, 12MHz)	S83C752-1N28
		28-pin PLCC (Com temp, 12MHz)	S83C752-1A28
		28-pin Plastic DIP (Ext temp, 12MHz)	S83C752-2N28
		28-pin PLCC (Ext temp, 12MHz)	S83C752-2A28
		28-pin Plastic DIP (Com temp, 16MHz)	S83C752-4N28
		28-pin PLCC (Com temp, 16MHz)	S83C752-4A28
		28-pin Plastic DIP (Ext temp, 16MHz)	S83C752-5N28
		28-pin PLCC (Ext temp, 16MHz)	S83C752-5A28
	8-Bit MCU, /Erasable 2KB EPROM /OTP	28-pin Ceramic DIP (Com temp, 12MHz)	S87C752-1F28
		28-pin Plastic DIP (Com temp, 12MHz)	S87C752-1N28
	OTP	28-pin PLCC (Com temp, 12MHz)	S87C752-1A28

Product Information

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
80CXX CMOS SERIES (Continued)			
87C752 (Continued)	Erasable	28-pin Ceramic DIP (Ext temp, 12MHz)	S87C752-2F28
	OTP	28-pin Plastic DIP (Ext temp, 12MHz)	S87C752-2N28
	OTP	28-pin PLCC (Ext temp, 12MHz)	S87C752-2A28
	Erasable	28-pin Ceramic DIP (Com temp, 16MHz)	S87C752-4F28
	OTP	28-pin Plastic DIP (Com temp, 16MHz)	S87C752-4N28
	OTP	28-pin PLCC (Com temp, 16MHz)	S87C752-4A28
	Erasable	28-pin Ceramic DIP (Ext temp, 16MHz)	S87C752-5F28
	OTP	28-pin Plastic DIP (Ext temp, 16MHz)	S87C752-5N28
	OTP	28-pin PLCC (Ext temp, 16MHz)	S87C752-5A28
S80C851	8-Bit MCU with E^2PROM for data storage; security features; ROMless version	40-pin Plastic DIP (Com temp, 12MHz) 44-pin PLCC (Com temp, 12MHz) 40-pin Plastic DIP (Ext temp, 12MHz) 44-pin PLCC (Ext temp, 12MHz)	S80C851-1N40 S80C851-1A44 S80C851-2N40 S80C851-2A44
S83C851	8-Bit MCU Mask ROM version	Speed, package and temp. same as 80C851	ROM coded CV# upon verification
90CXX CMOS SERIES			
P90C100	16-/32-Bit MCU (ROMless version) 512 bytes RAM counters/timers UART, I^2C 40 I/O lines 80C51 bus interface	84-pin PLCC (Com temp, 15MHz)	P90C100AB A
P93C100	16-/32-Bit MCU 34K bytes ROM 512 bytes RAM counters/timers UART, I^2C 40 I/O lines 80C51 bus interface Mask ROM version	84-pin PLCC (Com temp, 15MHz)	P93C100ABA ROM coded CP# upon verification
P97C100	16-/32-Bit MCU 32K bytes EPROM 512 bytes RAM counters/ timers, UART, I^2C, 40 I/O lines 80C51 bus interface	84-pin PLCC (Com temp, 15MHz) 84-pin CLCC (Com temp, 15MHz)	P97C100ABA P97C100ABL
SM90C100SK	MicroCore III Evaluation Board	P93C110 ROM, RAM UART, I^2C Software, Probe	SM90C100SK
SM90C100SK	MicroCore III Evaluation Board	P93C110 ROM, RAM UART, I^2C Software, Probe	SM90C100SK
SBE68070	SCC68070 Single Board Emulator	SCC68070 SCC66470 EPROM, RAM, UART, I^2C, Software, Probe	SBE68070SD
SBE90C100	P90C100 Family Single Board Emulator	P93C110 SCC68070, SCC66470 EPROM, RAM, UART, I^2C Software, Probe	SBE90C100SD

Microcontroller Products (Continued)			
PART NUMBER	**DESCRIPTION**	**PACKAGE TYPE**	**ORDER CODE**
MICROPROCESSORS			
SCN68000	16-/32-Bit Microprocessor	64-pin Plastic DIP 8MHz	SCN68000C8N64
		68-pin PLCC 8MHz	SCN68000C8A68
		64-pin Plastic DIP 10MHz	SCN68000CAN64
		68-pin PLCC 10MHz	SCN68000CAA68
SCC68070	16-/32-Bit Highly Integrated Microprocessor	84-pin PLCC (Com temp, 12.5MHz)	SCC68070CBA84
		120-pin QFP (Ext temp, 12.5MHz)	SCC68070CBB
		84-pin PLCC (Ext temp, 12.5MHz)	SCC68070ABA84
		120-pin QFP (Ext temp, 12.5MHz)	SCC68070ABB
		84-pin PLCC (Com temp, 15MHz)	SCC68070CCA84
		120-pin QFP (Com temp, 15MHz)	SCC68070CCB
		84-pin PLCC (Ext temp, 15MHz)	SCC68070ACA84
		120-pin QFP (Ext temp, 15MHz)	SCC68070ACB
		84-pin PLCC (Com temp, 17.5MHz)	SCC68070CDA84
		120-pin QFP (Com temp, 17.5MHz)	SCC68070CDB
SCC66470	Video & System Controller	120-pin Plastic QFP (Com temp)	SCC66470CAB
		120-pin QFP (Ext. temp)	SCC66470AAB
SM68070SK	MicroCore Evaluation Board	SCC68070, SCC66470, ROM, RAM, UART, I^2C, Software	SM68070SK

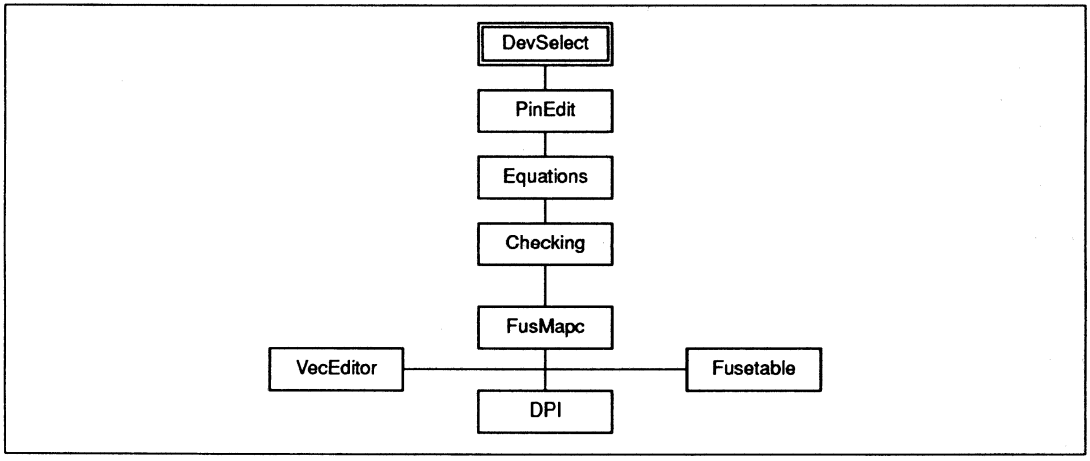
Product Information

Programmable Logic Devices

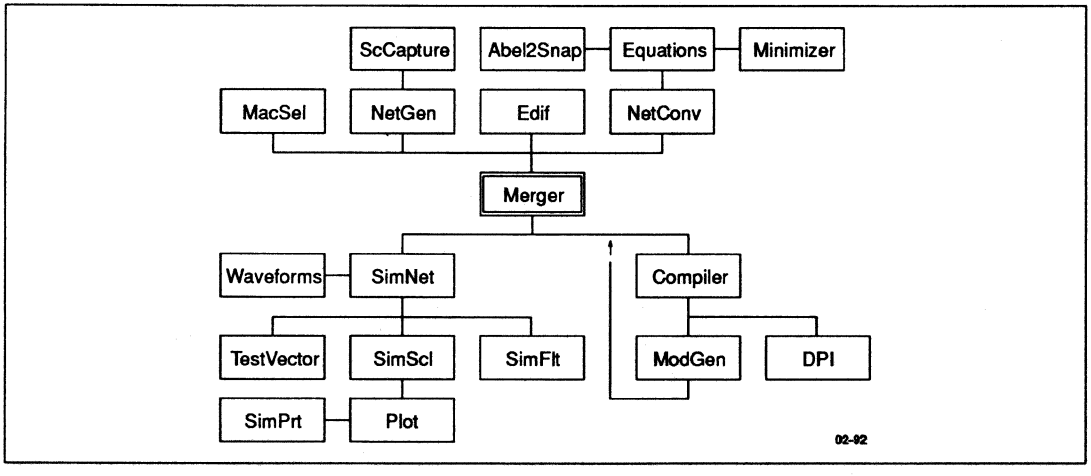
To support the Philips Semiconductors PLD product line, we offer two powerful design software packages. SLICE, a menu driven PC based design package, is available at no charge and allows the first-time user to immediately produce a working PLD design. It features Boolean and state equation entry, a fuse table editor, a test vector editor and is upwards compatible to SNAP.

For the high-end designs we offer SNAP. SNAP is a device independent, netlist-based development software environment. It offers Boolean and state equation entry, direct netlist entry, Edif 2.xx entry, as well as interfaces to schematic capture packages like OrCAD and Futurenet. It features the Espresso minimizer, a fuse table editor, and a Boolean equations extractor. The Philips 5-state gate array simulator "LESIM" provides unsurpassed accuracy in functional, fault, timing simulation and logic analysis.

SLICE BLOCK DIAGRAM



SNAP BLOCK DIAGRAM



Product Information

Line Card

PHILIPS PART NUMBER	ARCHITECTURE (Inputs X Terms* X Outputs)	PACKAGE TYPE & PIN COUNT	TOTAL INPUTS (# Dedicated)	PRODUCT TERMS PER OR GATE
PAL® DEVICES				
10H20EV8-4	20 × 90 × 8	A28, F24	20 (12)	8 to 12
10020EV8-4	20 × 90 × 8	A28, F24	20 (12)	8 to 12
PHD16N8-5	16 × 16 × 8	A20, N20	16 (10)	1
PHD48N22-7	48 × 73 × 22	A68	48 (36)	7 to 12
PLUS16L8-7	16 × 64 × 8	A20, N20	16 (10)	7
PLUS16R4-7	16 × 64 × 8	A20, N20	16 (8)	7 to 8
PLUS16R6-7	16 × 64 × 8	A20, N20	16 (8)	7 to 8
PLUS16R8-7	16 × 64 × 8	A20, N20	16 (8)	8
PLUS16L8D	16 × 64 × 8	A20, N20	16 (10)	7
PLUS16R4D	16 × 64 × 8	A20, N20	16 (8)	7 to 8
PLUS16R6D	16 × 64 × 8	A20, N20	16 (8)	7 to 8
PLUS16R8D	16 × 64 × 8	A20, N20	16 (8)	8
PLUS20L8-7	20 × 64 × 8	A28, N24	20 (14)	7
PLUS20R4-7	20 × 64 × 8	A28, N24	20 (12)	7 to 8
PLUS20R6-7	20 × 64 × 8	A28, N24	20 (12)	7 to 8
PLUS20R8-7	20 × 64 × 8	A28, N24	20 (12)	8
PLUS20L8D	20 × 64 × 8	A28, N24	20 (14)	7
PLUS20R4D	20 × 64 × 8	A28, N24	20 (12)	7 to 8
PLUS20R6D	20 × 64 × 8	A28, N24	20 (12)	7 to 8
PLUS20R8D	20 × 64 × 8	A28, N24	20 (12)	8
PL22V10-15	22 × 130 × 10	A28, D24, N42	22(12)	8 to 16
PL22V10/15 (Ind temp)	22 × 130 × 10	A28, D24, N42	22(12)	8 to 16
PL22V10-12	22 × 130 × 10	A28, D24, N42	22(12)	8 to 16
PL22V10-10	22 × 130 × 10	A28, D24, N42	22(12)	8 to 16
PLC18V8Z35/PLC18V8ZI	18 × 74 × 8	A20, D20, FA20, N20	18(8)	8
PLC18V8Z25/PLC18V8ZIA	18 × 74 × 8	A20, D20, FA20, N20	18(8)	8
PLA				
PLS100/101	16 × 48 × 8	A28, N28	16 (16)	Up to 48
PLS153	18 × 42 × 10	A20, N20	18 (8)	Up to 32
PLS153A	18 × 42 × 10	A20, N20	18 (8)	Up to 32
PLUS153B	18 × 42 × 10	A20, N20	18 (8)	Up to 32
PLUS153D	18 × 42 × 10	A20, N20	18 (8)	Up to 32
PLUS153-10	18 × 42 × 10	A20, N20	18(8)	Up to 32
PLS173	22 × 42 × 10	A28, N24	22 (12)	Up to 32
PLUS173B	22 × 42 × 10	A28, N24	22 (12)	Up to 32
PLUS173D	22 × 42 × 10	A28, N24	22 (12)	Up to 32
PLUS173-10	22 × 42 × 10	A28, N24	22(12)	Up to 32

Product Information

INTERNAL STATE REGISTERS (# Dedicated)	OUTPUTS C, I/O, R, R I/O	t_{PD} (Max)	f_{MAX}	I_{CC} (Max)
PAL® DEVICES				
0	8 varied	4.5ns	204MHz	–250mA
0	8 varied	4.5ns	204MHz	–250mA
0	2 C, 6 I/O	5ns		180mA
0	10 C, 12 I/O	7.5ns		420mA
0	2 C, 6 I/O	7.5ns		180mA
4 (0)	4 I/O, 4 R	7.5ns	74MHz	180mA
6 (0)	2 I/O, 6 R	7.5ns	74MHz	180mA
8 (0)	8 R		74MHz	180mA
0	2 C, 6 I/O	10ns		180mA
4 (0)	4 I/O, 4 R	10ns	60MHz	180mA
6 (0)	2 I/O, 6R	10ns	60MHz	180mA
8 (0)	8 R		60MHz	180mA
0	2 C, 6 I/O	7.5ns		210mA
4 (0)	4 I/O, 4 R	7.5ns	74MHz	210mA
6 (0)	2 I/O, 6 R	7.5ns	74MHz	210mA
8 (0)	8 R		74MHz	210mA
0	2 C, 6 I/O	10ns		210mA
4 (0)	4 I/O, 4R	10ns	60MHz	210mA
6 (0)	2 I/O, 6 R	10ns	60MHz	210mA
8 (0)	8 R		60MHz	210mA
10 (0)	10 varied	15ns	53MHz	110mA 0.5mA/MHz
10 (0)	10 varied	15ns	53MHz	120mA 0.5mA/MHz
10 (0)	10 varied	12ns	67MHz	110mA 0.5mA/MHz
10 (0)	10 varied	10ns	77MHz	110mA 0.5mA/MHz
8 (0)	8 varied	35ns, 40ns	18MHz, 20MHz	100µA 1.5mA/MHz
8 (0)	8 varied	25ns	30MHz	100µA 1.5mA/MHz
PLA				
0	8 C	50ns		170mA
0	10 I/O	40ns		155mA
0	10 I/O	30ns		155mA
0	10 I/O	15ns		200mA
0	10 I/O	12ns		200mA
0	10 I/O	10ns		200mA
0	10 I/O	30ns		170mA
0	10 I/O	15ns		200mA
0	10 I/O	12ns		200mA
0	10 I/O	10ns		210mA

Line Card

PHILIPS PART NUMBER	ARCHITECTURE (Inputs × Terms* × Outputs)	PACKAGE TYPE & PIN COUNT	TOTAL INPUTS (# Dedicated)	PRODUCT TERMS PER OR GATE
PLS				
PLS105	22 × 48 × 8	A28, N28	22 (16)	Up to 48
PLS105A	22 × 48 × 8	A28, N28	22 (16)	Up to 48
PLUS105-45	22 × 48 × 8	A28, N28, N3-28	22(16)	Up to 48
PLUS105-55	22 × 48 × 8	A28, N28, N3-28	22 (16)	Up to 48
PLUS405-37	24 × 64 × 8	A28, N28	24 (16)	Up to 48
PLUS405-45	24 × 64 × 8	A28, N28	24 (16)	Up to 48
PLUS405-55	24 × 64 × 8	A28, N28	24 (16)	Up to 48
PLS155	16 × 45 × 12	A20, N20	16 (4)	Up to 32
PLS157	16 × 45 × 12	A20, N20	16 (4)	Up to 32
PLS159A	16 × 45 × 12	A20, N20	16 (4)	Up to 32
PLS167	22 × 48 × 6	A28, N24	22 (14)	Up to 48
PLS167A	22 × 48 × 6	A28, N24	22 (14)	Up to 48
PLS168	22 × 48 × 6	A28, N24	22 (12)	Up to 48
PLS168A	22 × 48 × 6	A28, N24	22 (12)	Up to 48
PLS179	20 × 45 × 12	A28, N24	20 (8)	Up to 32
PLC42VA12	42 × 105 × 12	A28, FA24, N24	42 (10)	Up to 64
PLC415-16	25 × 68 ×	A28, FA28, N28	25 (17)	Up to 64
PML™				
PLHS501	104 × 116 × 24	A52	32 (24)	Up to 136**
PML2552-35	205 × 210 × 24	A68, KA68	53 (29)	Up to 258**
PML2552-50	205 × 210 × 24	A68, KA68	53(29)	Up to 258**
PML2852-35	205 × 210 × 40	A84, KA84	53(29)	Up to 258**
PML2852-50	205 × 210 × 40	A84, KA84	53(29)	Up to 258**

NOTES:
$f_{MAX} = 1/(t_{IS} + t_{CKO})$ worst case
* Includes control product terms
** Product terms per NAND gate
PAL is a trademark of AMD/MMI.
PML is a trademark of Philips Semiconductors.

OUTPUTS:
C = Combinatorial output
R = Registered output
I/O = Combinatorial I/O
R I/O = Registered I/O
Varies = Output may be C, R, I/O or R I/O

Product Information

INTERNAL STATE REGISTERS (# Dedicated)	OUTPUTS C, I/O, R, R I/O	t_{PD} (Max)	f_{MAX}	I_{CC} (Max)
PLS				
6 (6)	8 R		14MHz	180mA
6 (6)	8 R		20MHz	180mA
6 (6)	8R		45MHz	200mA
6 (6)	8 R		55MHz	200mA
8 (8)	8 R		37MHz	225mA
8 (8)	8 R		45MHz	225mA
8 (8)	8 R		55MHz	225mA
4 (0)	8 I/O, 4 R I/O	50ns	14MHz	190mA
6 (0)	6 I/O, 6 R I/O	50ns	14MHz	190mA
8 (0)	4 I/O, 8 R I/O	35ns	18MHz	190mA
8 (6)	6 R		14MHz	180mA
8 (6)	6 R		20MHz	180mA
10 (6)	8 R		14MHz	180mA
10 (6)	8 R		20MHz	180mA
8 (0)	4 I/O, 8 R I/O	35ns	18MHz	210mA
10 (0)	10 Varied, 2 I/O	35ns	25MHz	120mA
8 (8)	8 R		16MHz	100µA/80mA
PML™				
0	16 C, 8 I/O	22ns		295mA
36 (20)	8 I/O, 16 R I/O	35ns	50MHz	10mA/120mA
36(20)	8 I/O, 16 R I/O	50ns	35MHz	10mA/120mA
36(20)	16 C, 8 I/O, 16 R I/O	35ns	50MHz	10mA/120mA
36(20)	16 C, 8 I/O, 16 R I/O	50ns	35MHz	10mA/120mA

PACKAGE TYPES AND ORDERING CODES

A = Plastic Leaded Chip Carrier (PLCC)
D = Plastic Small Outline Large Package (SO-L)
F = Ceramic Dual In-Line Package (F20 and F24 are 300 mil; F28 is 600 mil)
FA = Windowed Ceramic
KA = Widowed Ceramic Leaded Chip Carrier (CLCC)
N = Dual In-Line Plastic (N20 and N24 are 300 mil; N28 is 600 mil)
N3 = 300 mil 28-Pin Dual In-Line Plastic Package

PRODUCT DEFINITIONS

PAL = Programmable Array Logic (Fixed OR Array)-Type
PHD = Programmable High-Speed Decoder
PLA = Programmable Logic Array
PLS = Programmable Logic Sequencer
PML = Programmable Macro Logic

Product Information

RF/Wireless Communications Products

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
MC1496/1596	Balanced Modulator/Demodulator	F, N
MC3361	Low Power FM IF	D, N
NE/SE567	Tone Decoder/Phase-Locked Loop	D, F, FE, N
NE570	Compandor	D, F, N
NE/SA571	Compandor	D, F, N
NE/SA572	Programmable Compandor	D, N
NE/SA575	Low Voltage Compandor	D, DK, N
NE/SA576	Low Power Compandor	D, N
NE/SA577/578	Low Power Compandor	D, N
NE/SA5200	Dual Gain Stage FM Amplifier	D
NE/SA5204A	Wideband High Frequency Amplifier	D, N
NE/SA/SE5205	Wideband High Frequency Amplifier	D, FE, N
NE/SA5209	Variable Gain RF Amplifier	D, N
NE/SA/SE5212A	Transimpedance Amplifier	D
NE/SA5219	Wideband Variable Gain Amplifier	D, N
NE/SE5230	Low Voltage Operational Amplifier	D, N
NE/SA5234	Quad High Performance Low Voltage Operational Amplifier	D, N
NE/SE5539	Ultra High Frequency Operational Amplifier	D, F, N
NE/SA5241	Digital Dolby	D, N
NE/SA568A	150MHz Phase-Locked Loop	D, N
NE/SA5750	Audio Processor System Compandor and Amplifier	D, N
NE/SA5751	Audio Processor Filter and Control Section	D, N
NE/SA5752	Audio Processor: Companding, VOX, and Amplifier	D, DK
NE/SA5753	Audio Processor: Filter and Control	D, DK
NE/SA600	1 GHz – LNA/Mixer	D
NE/SA602A	Low Power VHF Mixer/Oscillator	D, N
NE/SA604A	High Performance, Low Power FM IF System	D, N
NE/SA605	High Performance One-Chip FM System	D, DK, N
NE/SA606	Low Power FM IF System	D, DK, N
SA607	Low Power FM IF System	D, DK, N
SA608	Low Power FM IF System	D, DK, N
NE612A	Low Power VHF/Mixer/Oscillator	D, N
NE/SA614A	Low Power FM IF System	D, N
NE/SA615	High Performance, Low Power Mixer FM IF System	D, DK, N
NE/SA616	Low Power FM IF System	D, DK, N
SA617	Low Power FM IF System	D, DK, N
SA620	Low Voltage Front-end w/VCO (1GHz)	DK
NE/SA624	Low Power FM IF with High Speed RSSI	D, N
NE/SA625	Low Power FM IF with High Speed RSSI	D, DK, N
SA626	Low Voltage FM IF System with High Speed RSSI	D, DK
NE/SA627	Low Power FM IF with High Speed RSSI	D, DK, N
NE/SA630	Single Pole Double Throw Switch	D, N
NE/SA701	1, 2 GHz - Dual Modulus Prescalers	D, N
NE/SA702/3	1, 2 GHz - Triple Modulus Prescalers	D, N

Product Information

Radio Products

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
FM RADIO CIRCUITS		
SAA6579T	Radio Data system Demodulator (RDS)	D
TDA1574, T	FM Front End (VHF Mixer & Oscillator)	D, N
TDA1576	FM IF System	N
TDA1578A	PLL Stereo Decoder	N
TDA1591, T	FM Stereo Decoder with Noise Canceller	D, N
TDA1596, T	FM IF System	D, N
TDA1598	PLL Stereo Decoder	N
TDA7000	FM Radio - Single Chip	N
TDA7010T	FM Radio - Single Chip	D
TDA7021T	LV One Chip FM - Single Chip	D
TDA7040T	LV Stereo Decoder	D
TDA7088T	FM Radio with Search Tuning	D
TEA5570	AM-FM Radio	N
TEA5581T	Stereo Decoder and Preamp	D
TEA5594	AM/FM Radio for Digital Tuning	N
TEA5711/T	AM/FM with Stereo Decoder Radio Circuit	D, N
TEA5712/T	AM/FM with Stereo Decoder for DTS Radio Circuit	D, N
TEA6100	IF Amp with Demodulator – I^2C	N
TEA6101, T	ANT Diversity Circuit for FM	D, N
SYNTHESIZERS/PRESCALERS		
NE/SA701	1, 2 GHz – Dual Modulus Prescaler	D, N
NE/SA702/3	1, 2 GHz – Triple Modulus Prescaler	D, N
SAA1057	AM/FM Frequency Synthesizer	N
TDD1742T	Low Power Synthesizer	D
TSA6057, T	AM-FM Frequency Synthesizer with I^2C	D, N
UMF1009T	I^2C Low Power Frequency Synthesizer	D
UMF1014T	50MHz - 1.0GHz Frequency Synthesizer	D
AM RECEIVERS		
TDA1072A, T	AM Receiver Circuit	D, N
TDA1572	AM Receiver Circuit with IF Output	N
TEA5591	AM/FM Radio Receiver	N
TEA5594	AM/FM Radio for Digital Tuning	N
TEA6200	AM Receiver with up Conversion	N
CELLULAR RADIO CHIP SET		
NE/SA5750	Audio Processor Compandor and Amplifier	D, N
NE/SA5751	Audio Processor Filter and Control Section	D, N
NE/SA5752	Audio Processor 3V	D, DK
NE/SA5753	Audio Processor 3V	D, DK
S80C552	Microcontroller, 10-Bit A/D, I^2C, PWM	A
S83C552	Microcontroller, ROM coded Version (8KB ROM)	A
NE/SA605	High Performance FM IF System	D, DK, N
UMF1000T	Data Processor for AMP/TAC Cellular Radio	D
UMA1014T	RF Frequency Synthesizer	D

Product Information

Telecom Products

DEVICE TYPE	DESCRIPTION	PACKAGE CODES
DIALERS & SPEECH TRANSMISSION CIRCUITS		
PCD3310AP, T	DTMF Pulse Dialer with Redial	D, N
PCD3310P, T	DTMF Pulse Dialer with Redial	D, N
PCD3311CP, T	DTMF Generator (Parallel/I²C)	D, N
PCD3312CP, T	DTMF Generator, I²C	D, N
PCD3360P, T	Programmable Multi Tone Ringer	D, N
TEA1060	Transmission Circuit	N
TEA1061	Telephony Speech Transmission IC	N
TEA1062/A	Telephony Speech Transmission IC	N
TEA1064A, BP, T	Telephony Speech Transmission IC	D, N
TEA1066T	Telephony Speech Transmission IC	D
TEA1067P, T	Telephony Speech Transmission IC	D, N
TEA1068P, T	Telephony Speech Transmission IC	D, N
TEA1081P, T	Supply Circuit for Telephone	D, N
TEA1085/AP, T	Listening-In Amp	D, N
TEA1093P, T	Handsfree/Speaker Phone IC	D, N
TEA1096/AP, T	Line Interface and Listening-In	D, N
LOW VOLTAGE MICROCONTROLLERS		
PCD3315AP, T	CMOS Microcontroller with 1.5k, 160 Bytes	D, N
PCD3343P, T	CMOS Microcontroller with I²C, 3K, 224 Bytes	D, N
PCD3344P, T	CMOS Microcontroller with DTMF, 2K, 224 Bytes	D, N
PCD3347P, T	CMOS Microcontroller with DTMF Generator	D, N
PCD3348P, T	CMOS Microcontroller with I²C, 8K, 256 Bytes	D, N
PCD3349P, T	CMOS Microcontroller with I²C, DTMF, 4K, 224 Bytes	D, N
PCF84C12P, T	CMOS Microcontroller, 1.5K, 64 Bytes	D, N
PCF84C21P, T	CMOS Microcontroller with I²C, 2K, 64 Bytes	D, N
PCF84C22P, T	CMOS Microcontroller, 2K, 64 Bytes	D, N
PCF84C41P, T	CMOS Microcontroller with I²C, 4K, 128 Bytes	D, N
PCF84C42P, T	Micro with 4K/64 Bytes	D, N
PCF84C81P, T	CMOS Microcontroller with I²C, 8K, 256 Bytes	D, N
PCF84C85P, T	CMOS Microcontroller with I²C, 8K, 256 Bytes, 32 I/O	D, N
PCF84C121T	CMOS Microcontroller with EEPROM, 1.5K, 64 Bytes	D
PCF84C270P, T	CMOS Microcontroller with Cap, Keyboard Interface	D, N
PCF84C271P, T	CMOS Microcontroller with Mech, Keyboard Interface	D, N
PCF84C430T	CMOS Microcontroller with I²C, with LCD Driver	D
PCF84C470P, T	CMOS Microcontroller with Cap Keyboard Interface	D, N
PCF84C633P	CMOS Microcontroller with LCD Driver	N
PCF84C640P	CMOS Microcontroller with I²C (TV Tuning)	N

Product Information

Video Products

PART NUMBER	DESCRIPTION	PACKAGE CODES
TUNERS/TUNING SYSTEMS		
SAB3035	FLL Tuning and Control Circuit (Eight D/A Converters)	N
SAB3036	FLL TV Tuning Circuit	N
SAB3037	FLL TV Tuning Circuit (Four D/A Converters)	N
SAB6456, T	1GHz Divide by 64 or 256 Prescaler	D, N
TDA5030A, T	VHF Mixer/Oscillator (VHF Tuner IC)	D, N
TDA5330T	VHF/UHF Mixer-Oscillator	D
TSA5511, T	Digital Synthesizer for TV with Prescaler	D, N
REMOTE CONTROL SYSTEMS		
SAA3007P, T	IR Transmitter (2K Commands, 455kHz)	D, N
SAA3010P, T	IR Transmitter (2K Commands, Low Voltage)	D, N
SAA3049P, T	IR Remote Control Decoder	D, N
TDA3047P, T	IR Preamplifier	D, N
TDA3048P, T	IR Preamplifier	D, N
TELEVISION SUBSYSTEMS		
TDA4501	Small-Signal Subsystem IC for Color TV	N
TDA4502	Complete Video IF IC with Vertical & Horizontal Sync	N
TDA4503	Small-Signal Subsystem for Monochrome TV	N
TDA4505	Small-Signal Subsystem for Color TV	N
VIDEO IF		
TDA8340	Video IF Amplifier and Demodulator, AFT, NPN Tuners	N
TDA8341N	Video IF Amplifier and Demodulator, AFT, NPN Tuners	N
SOUND IF AND SPECIAL AUDIO DECODING		
TDA2545A	Quasi-Split Sound IF System	N
TDA2546A	Quasi-Split Sound IF and Sound Demodulator	N
SYNC PROCESSING AND GENERATION/VERTICAL DEFLECTION		
SAA1101P, T	Universal Sync Generator	D, N
TDA2579	Synchronization Circuit (with Horizontal Output)	N
TDA2593	Horizontal Combination	N
TDA2595	Horizontal Combination	N
TDA2653A	Vertical Deflection Circuit with Oscillator	U
TDA3653B/C	Vertical Deflection	U
TDA3654	Vertical Deflection	U
TDA8433	Deflection Processor	N
ANALOG COLOR DECODING, ENCODING, AND SWITCHING		
TDA3505	Chroma Control Circuit	N
TDA3507	Chroma Control Circuit	N
TDA3566	PAL/NTSC Decoder with RGB Inputs	N
TDA3567	NTSC Color Decoder	N
TDA4555	Multistandard Color Decoder	N
TDA4565	Color Transient Improvement Circuit (CTI)	N
TDA4570	NTSC Color Difference Decoder	N
TDA4580	Video Control Combination Circuit with Automatic Cut-off Control	N
TDA4650	PAL/NTSC/SECAM Decoder	N

Product Information

Video Products (Continued)		
PART NUMBER	**DESCRIPTION**	**PACKAGE CODES**
ANALOG COLOR DECODING, ENCODING, AND SWITCHING (Continued)		
TDA4670	Picture Signal Improvement	N
TDA4680	Video Processor	N
TDA8440	Audio/Video Switch	N
TDA8442	Quad DAC (I^2C) for Color Decoder	N
TDA8443, A	RGB/YUV Matrix Switch	N
TDA9045	Gain Control, Video Switch	N
DIGITAL VIDEO PROCESSING		
SAA7151AP	8-Bit Digital PAL/NTSC/SECAM Decoder	A
SAA7157	Clock Generator for SAA7151	N
SAA7191WP	8-Bit Digital PAL/NTSC/SECAM Decoder	A
SAA7192WP	Digital Color Space Converter	A
SAA7197, T	Clock Generator for SAA7191	D, N
SAA7199WP	Digital PAL/NTSC Encoder	A
SAA7199BWP	Digital PAL/NTSC Encoder	A
SAA9051WP	7-Bit Digital PAL/NTSC Decoder	A
SAA9056	Digital SECAM Decoder	N
SAA9057AP, T	Clock Generator for SAA9051	D, N
SAA9065P	Video Processor with DACs	A
SAA7186	Digital Video Data Scaler	B
HIGH-SPEED DATA CONVERTERS		
TDA8702, T	8-Bit Digital-to-Analog Converter	D, N
TDA8703, T	8-Bit Analog-to-Digital Converter	D, N
TDA8708, T	8-Bit Video Analog-to-Digital Converter	D, N
TDA8709, T	8-Bit Video Analog-to-Digital Converter	D, N
TDE8715D	8-Bit Analog-to-Digital Converter	F
TDA8713, T2	8-Bit Analog-to-Digital Converter	D, N

Commercial Products Available in SMD

Contents

Commercial Products Available in SMD

Commercial Products Available in Surface Mount Device

ADC0803C	8 BIT A/D CONVERTER 0 TO 70	SO-20
ADC0803LC	8 BIT A/D CONVERTER -40 TO +85	SO-20
ADC0804C	8 BIT A/D CONVERTER 0 TO 70	SO-20
ADC0804LC	8-BIT A/D CONVERTER -40 TO +85	SO-20
ADC0820CNE	8 BIT CMOS A/D CONVERTER	SO-20
AM26LS31C	QUAD HIGH SPEED LINE DRIVER	SO-16
AM26LS32C	QUAD HIGH SPEED DIFF RECEIVER	SO-16
AM26LS32I	QUAD HIGH SPEED DIFF RECEIVER	SO-16
AM6012	12-BIT D/A CONVERTER	SO-20
AU2902	AUTO QUAD OP AMP -40 TO +125	SO-14
AU2904	AUTO DUAL OP AMP -40 TO +125	SO-8
DAC-08E	8-BIT D/A CONVERTER	SO-16
FB2012	14-INPUT FB+ CENTRAL ARBITER	PLCC-68
HEF4001BT	QUADRUPLE 2-INPUT NOR GATE	SO-14
HEF4002BT	DUAL 4-INPUT NOR GATE	SO-14
HEF4007UBT	DUAL CMPLEMENTARY PREINVERTER	SO-14
HEF40097BT	3-STAGE HEX NON-INVERTING BFFR	SO-16
HEF40098BT	3-STAGE HEX INVERTING BUFFER	SO-16
HEF40106BT	HEX SCHMITT TRIGGER	SO-14
HEF4011BT	QUADRUPLE 2-INPUT NAND GATE	SO-14
HEF4011UBT	QUAD 2-INPUT NAND GATE:UNBUFFD	SO-14
HEF4013BT	DUAL D-TYPE FLIP-FLOP	SO-14
HEF4014BT	8-BIT STATIC SHIFT REGISTER	SO-16
HEF4015BT	DUAL 4-BIT STATIC SHFT REGISTR	SO-16
HEF4016BT	QUADRUPLE BILATERAL SWITCHES	SO-14
HEF40161BT	4-BIT SYNCHRON BINARY COUNTER	SO-16
HEF4017BT	5-STAGE JOHNSON COUNTER	SO-16
HEF40174BT	HEX D-TYPE FLIP-FLOP	SO-16
HEF40175BT	QUADRUPLE D-TYPE FLIP-FLOP	SO-16
HEF4020BT	14-STAGE BINARY COUNTER	SO-16
HEF4021BT	8-BIT STATIC SHIFT REGISTER	SO-16
HEF4022BT	4-STAGE DIV-BY-8 JOHNSN COUNTR	SO-16
HEF4023BT	TRIPLE 3-INPUT NAND GATE	SO-14
HEF4024BT	7-STAGE BINARY COUNTER	SO-14
HEF40244BT	OCTAL BUFFER W/3-STATE OUTPUTS	SO-20
HEF4025BT	TRIPLE 3-INPUT NOR GATE	SO-14
HEF4027BT	DUAL JK FLIP-FLOP	SO-16
HEF4028BT	1-OF-10 DECODER	SO-16
HEF4029BT	SYN UP/DN BIN DECADE COUNTER	SO-16
HEF4030BT	QUADRUPLE EXCLUSIVE-OR GATE	SO-14
HEF40373BT	OCT.TRNSPARNT LTCH W/3ST OUTPT	SO-20
HEF4040BT	12-STAGE BINARY COUNTER	SO-16
HEF4043BT	QUAD R/S LATCH W/3-STATE OUTPT	SO-16
HEF4044BT	QUAD R/S LATCH W/3-STATE OUTPT	SO-16
HEF4046BT	PHASE LOCKED LOOP	SO-16

*NOTE: Any SO product of 20 or more pins is SOL; the 16-pin packages can be either SO or SOL.

Commercial Products Available in SMD

HEF4047BT	MONOSTABLE/ASTABLE MLTIVIBRATR	SO-14
HEF4049BT	HEX INVERTING BUFFERS	SO-16
HEF4050BT	HEX NON-INVERTING BUFFERS	SO-16
HEF4051BT	8-CHANNEL MUX/DEMUX	SO-16
HEF4052BT	DUAL 4-CHANNEL MUX/DEMUX	SO-16
HEF4053BT	TRIPLE 2-CHANNEL MUX/DEMUX	SO-16
HEF4059BT	PROGRMABLE DIVIDE-BY-N COUNTER	SO-24
HEF4060BT	14-STG RC BIN CTR/DIV W/OSC.	SO-16
HEF4066BT	QUADRUPLE BILATERAL SWITCHES	SO-14
HEF4068BT	8-INPUT NAND GATE	SO-14
HEF4069UBT	HEX INVERTER	SO-14
HEF4070BT	QUADRUPLE EXCLUSIVE-OR GATE	SO-14
HEF4071BT	QUADRUPLE 2-INPUT OR GATE	SO-14
HEF4073BT	TRIPLE 3-INPUT AND GATE	SO-14
HEF4075BT	TRIPLE 3-INPUT OR GATE	SO-14
HEF4076BT	QUAD D-REGISTER TRI-STATE	SO-16
HEF4078BT	8-INPUT NOR GATE	SO-14
HEF4081BT	QUADRUPLE 2-INPUT AND GATE	SO-14
HEF4085BT	DUAL 2WIDE 2IN AND/OR INVERT	SO-14
HEF4093BT	QUAD 2IN NAND SCHMITT TRIGGER	SO-14
HEF4094BT	8-STAGE SHIFT-&-STORE BUS REG	SO-16
HEF4104BT	QUAD LOW TO HIGH VOLT TRNSLATR	SO-16
HEF4502BT	STROBED HEX INVERTER/BUFFER	SO-16
HEF4511BT	BCD TO 7-SEG LATCH/DECODR/DRVR	SO-16
HEF4512BT	8-INPUT MULT W/3-STAGE OUTPUT	SO-16
HEF4514BT	1-OF-16 DECODER/DEMUX	SO-24
HEF4515BT	1-OF-16 DECODER/DEMUX	SO-24
HEF4518BT	DUAL BCD COUNTER	SO-16
HEF4520BT	DUAL BINARY COUNTER	SO-16
HEF4521BT	24-STAGE FREQUENCY DIVIDER	SO-16
HEF4522BT	PROGRMMABL 4-BIT BCD DOWN CTR	SO-16
HEF4526BT	PROGRMMABL 4-BIT BCD DOWN CTR	SO-16
HEF4527BT	BCD RATE MULTIPLIER	SO-16
HEF4528BT	DUAL MONOSTABLE MULTIVIBRATOR	SO-16
HEF4532BT	8-INPUT PRIORITY ENCODER	SO-16
HEF4538BT	DUAL PRECISION MONOST MULTIVIB	SO-16
HEF4541BT	PROGRAMMABLE TIMER	SO-14
HEF4543BT	BCD TO 7-SEG LATCH/DECDR/DRIVR	SO-16
HEF4555BT	DUAL 1-OF-4 DECODER/DEMUX	SO-16
HEF4556BT	DUAL 1-OF-4 DECODER/DEMUX	SO-16
HEF4557BT	1-TO-64 BIT VAR LNGTH SHFT REG	SO-16
HEF4585BT	4-BIT MAGNITUDE COMPARATOR	SO-16
ICM7555C	CMOS TIMER-MICRO MIN.	SO-8
ICM7555I	CMOS TIMER -40 TO +85	SO-8
I74F00	QUAD 2-IN NAND GATE IND TEMP	SO-14
I74F02	QUAD 2-IN NOR GATE IND TEMP	SO-14
I74F04	HEX INVERTER IND TEMP	SO-14
I74F109	DUAL J-K POS EDGE F/F IND TEMP	SO-16
I74F112	DUAL J-K NEG EDGE F/F IND TEMP	SO-16
I74F113	DUAL J-K NEG EDGE F/F	SO-14
I74F138	1-OF-8 DECODER/DEMUX IND TEMP	SO-16

Commercial Products Available in SMD

I74F14	HEX SCHMITT TRIGGER IND TEMP	SO-14
I74F166	8-BIT SHIFT REGISTER IND TEMP	SO-16
I74F175	QUAD D-TYPE F/F INDUS TEMP	SO-16
I74F175A	QUAD D-TYPE F/F INDUS TEMP	SO-16
I74F244	OCTAL BUS/LINE DRVR INDUS TEMP	SO-20
I74F27	TRIPLE 3-INPUT NOR GATE	SO-14
I74F280B	9BIT O/E PAR GEN CHKR IND TEMP	SO-14
I74F3037	QUAD 2-IN NAND TRN LN DRV IND	SOL-16
I74F32	QUAD 2-INPUT OR GATE IND TEMP	SO-14
I74F38	QUAD 2-IN NAND BUF O/C IND TMP	SO-14
I74F50728	M-STABLE IMM N/D PKGS IND TEMP	SO-14
I74F50729	M-STABLE IMM N/D PKGS IND TEMP	SO-14
I74F652A	BUS TRANS/REG NINV 3-S IND TMP	SO-24
I74F655A	OCT INV BUFF W/PARITY IND TEMP	SO-24
I74F656A	OCT BUFFER W/PARITY G/C IND TE	SO-24
I74F657	OCT BUFF W/PARITY G/C IND TEMP	SO-24
I74F74	DL D-TYPE EDGE TRGR F/F INDTMP	SO-14
I74F776	OCT BIDIRCT P1-BUS XCVR-INDTEM	PLCC-28
I74F786	4-INPUT ASYNCH BUS ARBITER	SO-16
I74F823	9-BIT REG NINV 3-S IND TEMP	SO-24
I74F86	QUAD EXCL OR GATE IND TEMP	SO-14
LF398	SAMPLE AND HOLD AMPLIFIER	SO-14
LM211	VOLTAGE COMPARATOR	SO-8
LM224	QUAD OP AMPLIFIER	SO-14
LM239	QUAD VOLTAGE COMPARATOR	SO-14
LM258	DUAL OPAM-MICRO	SO-8
LM2901	QUAD VOLTAGE COMPARATOR	SO-14
LM2902	QUAD OP AMP	SO-14
LM2903	DUAL VOLTAGE COMPARATOR	SO-8
LM2904	DUAL OP AMP	SO-8
LM293	DUAL COMPARATOR	SO-8
LM293A	DUAL COMPARATOR	SO-8
LM311	VOLTAGE COMPARATOR	SO-8
LM319	HIGH SPEED DUAL COMPARATOR	SO-14
LM324	QUAD OP AMP	SO-14
LM324A	QUAD OP AMP	SO-14
LM339	QUAD VOLT COMP	SO-14
LM358	DUAL OP AMP	SO-8
LM358A	DUAL OP AMP	SO-8
LM393	DUAL COMP	SO-8
LM393A	DUAL COMPARATOR	SO-8
MC1408-8	8 BIT D/A CONVERTER	SO-16
MC145406	CMOS RS232-D TRPLE RECEIVER/DR	SOL-16
MC1458	DUAL OP AMP	SO-8
MC3302	QUAD VOLTAGE COMPARATOR	SO-14
MC3361	LOW POWER FM IF	SOL-16
NE4558	DUAL GENERAL PURPOSE OP AMP	SO-8
NE5018	8 BIT D/A CONVERTER VOLT OUT	SO-24
NE5044	PROGRAMMABLE 7 CHANNEL ENCODER	SO-16
NE5050	POWER LINE MODEM	SO-20
NE5090	ADDRESSABLE RELAY DRIVER	SOL-16

Commercial Products Available in SMD

NE5170	OCTAL LINE DRIVER	PLCC-28
NE5180	OCTAL LINE RECEIVERS	PLCC-28
NE5181	OCTAL DIFF LINE RECEIVER	PLCC-28
NE5200	DUAL GAIN STAGE RF AMPLIFIER	SO-8
NE5204A	HI FREQ AMP DC TO 350 MHZ	SO-8
NE5205A	HI FREQ AMP DC TO 550 MHZ	SO-8
NE5209	WIDEBAND VARIABLE GAIN AMP	SO-16
NE521	HIGH SPEED DUAL DIFF COMP	SO-14
NE5210	280 MHZ TRANSIMPEDANCE AMP	SO-14
NE5211	180 MHZ TRANSIMPEDANCE AMP	SO-14
NE5212A	FIBER OPTIC TRANSIMPEDENCE AMP	SO-8
NE5214	POST AMP WITH LINK STATUS INDI	SO-20
NE5217	POST AMP WITH LINK STATUS INDI	SO-20
NE5219	WIDEBAND VARIABLE GAIN AMP	SO-16
NE522	HIGH SPEED DUAL DIFF COMP	SO-14
NE5224	POST AMP-100K ECL DIF OUTPUT	SO-16
NE5225	POST AMP-10K ECL DIF OUTPUT	SO-16
NE5230	LOW VOLTAGE OP AMP MICRO MIN	SO-8
NE5234	MATCHED QUAD HI-PERF OP AMP	SO-14
NE527	HIGH SPEED COMPARATOR	SO-14
NE529	HIGH SPEED COMPARATOR	SO-14
NE532	DUAL OP AMPLIFIER	SO-8
NE5512	DUAL OP AMP	SO-8
NE5514	QUAD OP AMP	SOL-16
NE5517	HP DUAL TRANSCON AMP	SO-16
NE5521	LVDT SIGNAL CONDITIONER	SOL-16
NE5532	DUAL LOW NOISE OP AMP-MICRO MI	SOL-16
NE5534	OP AMP	SO-8
NE5534A	LOW NOISE OP AMP-MICRO	SO-8
NE5537	SAMPLE AND HOLD AMPLIFIER	SO-14
NE5539	FAST OP AMP	SO-14
NE555	TIMER	SO-8
NE556	DUAL TIMER	SO-14
NE5561	S.M.P.S. CONTROL CIRCUIT	SO-8
NE5570	BRUSHLESS DC MOTOR CONTROLLER	SO-24
NE558	QUAD TIMER	SOL-16
NE5592	DUAL VIDEO AMPLIFIER	SO-14
NE564	HIGH FREQUENCY PLL	SO-16
NE566	FUNCTION GENERATOR	SO-8
NE567	TONE DECODER MICRO	SO-8
NE568A	150 MHZ PHASE LOCKED LOOP	SO-20
NE570	COMPANDOR-MICRO MIN PKG	SOL-16
NE571	COMPANDOR	SOL-16
NE572	PROGRAMMABLE COMPANDOR	SOL-16
NE575	LOW VOLTAGE COMPANDOR	SO-20
NE575	LOW VOLTAGE COMPANDOR SSOP	SO-20
NE5750	AUDIO PROCES-COMPANDOR/AMP SEC	SO-24
NE5751	AUDIO PROCESS-FILTER/CTRL SEC	SO-28
NE576	LOW POWER COMPANDOR	SO-14
NE577	LOW POWER COMPANDOR W/PRG ODB	SO-14
NE578	LOW POWER COMPANDOR W/PRG ODB	SO-16

Commercial Products Available in SMD

NE5900	CALL PROGRESS DECODER	SOL-16
NE592	VIDEO AMPLIFIER	SO-14
NE592	VIDEO AMPLIFIER	SO-8
NE594	VACUUM FLORESNT DISPLAY DRIVER	SO-20
NE600	1 GHZ LNA AND MIXER	SO-14
NE602A	DOUBLE BAL MIXER/OSCILLATOR	SO-8
NE604A	HI PERF FM IF	SO-16
NE605	HI PERF FM IF SYSTEM	SO-20
NE605	HI PERF FM IF SYSTEM SSOP	SO-20
NE612A	DOUBLE BAL MIXER/OSCILLATOR	SO-8
NE614A	LOW POWER FM IF SYSTEM	SO-16
NE615	HI PERF FM IF SYSTEM	SO-20
NE615	HI PERF FM IF SYSTEM SSOP	SO-20
NE624	HI PERF FM IF WITH FAST RSSI	SO-16
NE625	HI PERF FM IF WITH FAST RSSI	SO-20
NE625	HI PERF FM IF WITH FAST RSSI	SO-20
NE627	HI PERF FM IF WITH FAST RSSI	SO-20
NE627	HI PERF FM IF WITH FAST RSSI	SO-20
NE630	RF SINGLE POLE DOUBLE THROW SW	SO-8
NE701	1 GHZ PRESCALER	SO-8
NE8392A	ETHERNET COAXIAL TCVR PLCC	PLCC-28
NE86C92	10 BASE-T TRANSCEIVER	SO-28
N74ALS00A	QUAD 2-INPUT POS. NAND GATE	SO-14
N74ALS02	QUAD 2-INPUT POSITIVE NOR GATE	SO-14
N74ALS04B	HEX INVERTER	SO-14
N74ALS08	QUAD 2-INPUT POSITIVE AND GATE	SO-14
N74ALS10A	TRIPLE 3-INPUT POS. NAND GATE	SO-14
N74ALS109A	DUAL JK FLIP FLOP	SO-16
N74ALS11A	TRIPLE 3-INPUT POS. AND GATE	SO-14
N74ALS112A	DUAL J-K NEG; EDGE TRIGRO F/F	SO-16
N74ALS138	3-TO-8 DECODER/DEMUX	SO-16
N74ALS139	DUAL 1 OF 4 DECODER/DEMULTIPLE	SO-16
N74ALS151	SINGLE 8 TO 1 MUX	SO-16
N74ALS153	DUAL 4 TO 1 MUX	SO-16
N74ALS157	QUAD 2-INPUT MULTIPLEXER NINV	SO-16
N74ALS158	QUAD 2-INPUT MULTIPLEXER INV	SO-16
N74ALS161B	4-BIT BINARY COUNTER	SO-16
N74ALS163B	4-BIT BINARY COUNTER	SO-16
N74ALS164	8BIT SERIAL IN/PARALLEL OUT SH	SO-14
N74ALS174	HEX D-TYPE F/F WITH CLEAR	SO-16
N74ALS175	QUAD D-TYPE EDGE TRIGGERED F/F	SO-16
N74ALS20A	DUAL 4-INPUT POS. NAND GATE	SO-14
N74ALS240A	OCTAL BUFFER/LINE DRVR INV 3-S	SO-20
N74ALS240A-1	OCTAL BUFFER/LINE DRVR INV 3-S	SO-20
N74ALS241A	OCTAL 3-STATE BUFFER	SO-20
N74ALS241A-1	OCTAL 3-STATE BUFFER	SO-20
N74ALS244A	OCT BUFFER/LINE DRVR NINV 3-S	SO-20
N74ALS244A-1	OCT BUFFER/LINE DRVR NINV 3-S	SO-20
N74ALS245A	OCTAL BUS TRANSCEIVER 3-S	SO-20
N74ALS245A-1	OCTAL BUS TRANSCEIVER 3-S	SO-20
N74ALS253	DUAL 4 TO 1 DATA SELECTOR MUX	SO-16

Commercial Products Available in SMD

N74ALS257	QUAD 2-INPUT MULTIPLEXER	SO-16
N74ALS258	QUAD 2-TO-1 MUX 3-STATE	SO-16
N74ALS27	TRIPLE 3-INPUT POS. NOR GATE	SO-14
N74ALS273	OCTAL D-TYPE FLIP-FLOP	SO-20
N74ALS30A	8 BIT NAND GATE	SO-14
N74ALS32	QUAD 2-INPUT POSITIVE OR GATE	SO-14
N74ALS373	OCTAL TRANSPARENT LATCH 3-S	SO-20
N74ALS374	OCTAL D FLIP-FLOP 3-STATE	SO-20
N74ALS377	OCTAL D-TYPE F/F W/ENABLE	SO-20
N74ALS38A	QUAD 2-INPUT POS NAND BUFFER	SO-14
N74ALS563A	OCT D TRANSPRINT LATCH (3-S)	SO-20
N74ALS564A	OCT D EDGE-TRIGGED LATCH (3-S)	SO-20
N74ALS573B	OCTAL D TRANS LATCH (3-S)	SO-20
N74ALS574A	OCTAL D FLIP-FLOP (3-S)	SO-20
N74ALS620A-1	OCTAL BUS TRANSCEIVER INV 3-S	SO-20
N74ALS623A-1	OCTAL BUS TRANSCEIVER NINV 3-S	SO-20
N74ALS645A	OCTAL BUS TRANSCEIVER (3-S)	SO-20
N74ALS645A-1	OCTAL BUS TRANSCEIVER (3-S)	SO-20
N74ALS646	OCTAL BUS TRANSCEIVER/REG NINV	SO-24
N74ALS646-1	OCTAL BUS TRANSCEIVER/REG NINV	SO-24
N74ALS648	OCTAL BUX XCVR/REG INV 3-S	SO-24
N74ALS648-1	OCTAL BUS XCVR/REG INV	SO-24
N74ALS652	XCVR/REGISTER NINV 3-STATE	SO-24
N74ALS652-1	OCT TRANSCEIVER/REG,NON-INV3-S	SO-24
N74ALS74A	DUAL D-TYPE FLIP FLOP	SO-14
N74ALS86	QUAD 2-INPUT EXCLUSIVE-OR GATE	SO-14
N74F00	QUAD 2-INPUT NAND GATE	SO-14
N74F02	QUAD 2-INPUT NOR GATE	SO-14
N74F04	HEX INVERTER	SO-14
N74F06	HEX INV BUFFER/DRIVER (OC)	SO-14
N74F07	HEX INV BUFFER/DRIVER (OC)	SO-14
N74F08	QUAD 2-INPUT AND GATE	SO-14
N74F10	TRIPLE 3-INPUT NAND GATE	SO-14
N74F109	DUAL J-K POS EDGE F/F	SO-16
N74F11	TRIPLE 3-INPUT AND GATE	SO-14
N74F112	DUAL J-K NEG EDGE F/F	SO-16
N74F113	DUAL J-K NEG EDGE F/F	SO-14
N74F114	DUAL J-K NEG EDGE F/F W/RESET	SO-14
N74F1240	OCTAL 3-STATE BUFFER	SO-20
N74F1241	OCTAL BUS LINE DRIVER	SO-20
N74F1243	QUAD BUS TRANSCEIVER	SO-14
N74F1244	OCTAL BUS/LINE DRIVER	SO-20
N74F1245	OCTAL TRANSCEIVER 3-S	SO-20
N74F125	QUAD 3-STATE BUS BUFFER	SO-14
N74F126	QUAD 3-STATE BUS BUFFER	SO-14
N74F132	QUAD SCHMITT TRIGGER	SO-14
N74F133	13-INPUT NAND GATE	SO-16
N74F138	1-OF-8 DECODER/DEMUX	SO-16
N74F139	DUAL 2 TO 10 OF 4 DECODER/DEMU	SO-16
N74F14	HEX SCHMITT TRIGGER	SO-14
N74F148	8-TO-3 PRIORITY ENCODER	SO-16

Commercial Products Available in SMD

N74F151A	8-TO-1 MUX	SO-16
N74F153	DUAL 4-INPUT MULTIPLEXER	SO-16
N74F154	4-TO-16 DECODER/DEMUX	SO-24
N74F157	QUAD 2-IN DATA SELECTOR INV	SO-16
N74F157A	QUAD 2-IN DATA SELECTOR INV	SO-16
N74F158	QUAD 2-IN MULTIPLXR NINV	SO-16
N74F158A	GUAD 2-INPUT MULTIPLEXER	SO-16
N74F1604	DUAL 8-BIT LATCH 3-STATE	SO-28
N74F161A	SYNC. 4-BIT BINARY COUNTER	SO-16
N74F163A	SYNC. 4-BIT BINARY COUNTER	SO-16
N74F164	8-BIT SIPO SHIFT REGISTER	SO-14
N74F166	8-BIT SHIFT REGISTER	SO-16
N74F169	SYN BINARY UP/DOWN COUNTER	SO-16
N74F173	QUAD 3-STATE D-TYPE F/F	SO-16
N74F174	HEX D F/F WITH CLEAR	SO-16
N74F175	QUAD D-TYPE F/F	SO-16
N74F175A	QUAD D-TYPE F/F	SO-16
N74F1762	MEM ADDRESS MULTIPLEXER	PLCC-44
N74F1763	1MBIT INTELLIGENT DRAM CNTRLLR	PLCC-44
N74F1764	DUAL PORT RAM CONTROLLER	PLCC-44
N74F1764-1	DUAL PORT RAM CONTROLLER	PLCC-44
N74F1765	DUAL PORT RAM CONTROLLER	PLCC-44
N74F1765-1	DUAL PORT RAM CONTROLLER	PLCC-44
N74F1766	BURST MODE DRAM CONTROLLER	PLCC-44
N74F1779	8-BIT COUNTER	SOL-16
N74F1804	HEX 2-INPUT NAND DRIVER	SO-20
N74F1805	HEX 2-INPUT NOR DRIVER	SO-20
N74F1808	HEX 2-INPUT AND DRIVER	SO-20
N74F181	4-BIT ARITHMETIC LOGIC UNIT	SO-24
N74F182	FAST CARRY LOOKAHEAD GENERATOR	SO-16
N74F1832	HEX 2-INPUT OR DRIVER	SO-20
N74F189A	64 BIT RANDOM ACC MEM,INV 3-S	SO-16
N74F191	BINARY UP/DOWN COUNTER	SO-16
N74F193	4-BIT BINARY UP/DOWN COUNTER	SO-16
N74F194	4-BIT SHIFT REGISTER	SO-16
N74F195	4-BIT PARALLEL ACC. SHIFT REG.	SO-16
N74F195A	4-BIT PARALLEL-ACCESS SHIF REG	SO-16
N74F198	8-BIT SHIFT REGISTER	SO-24
N74F199	8-BIT SHIFT REGISTER	SO-24
N74F20	DUAL 4-INPUT NAND GATE	SO-14
N74F219A	64 BIT RANDOM ACC MEM,INV 3-S	SO-16
N74F2240	OCTAL BUS DRIVER 30 OHM OUTPUT	SO-20
N74F2241	OCTAL BUS DRIVER 30 OHM OUTPUT	SO-20
N74F2244	OCTAL BUS DRIVER 30 OHM DRIVER	SO-20
N74F225	16X5 ASYNCHRONOUS FIFO 3-S	SO-20
N74F240	OCTAL 3-STATE BUFFER	SO-20
N74F240A	OCTAL 3-STATE BUFFER	SO-20
N74F241	OCTAL BUFFER 3-STATE	SO-20
N74F241A	OCTAL BUS/LINE DRIVER	SO-20
N74F242	QUAD BUS TRANSCIEVER	SO-14
N74F243	QUAD BUS TRANSCEIVER	SO-14

Commercial Products Available in SMD

N74F244	OCTAL BUFFER 3-STATE	SO-20
N74F244A	OCTAL BUS/LINE DRIVER	SO-20
N74F244B	OCTAL 3-STATE DRIVER	SO-20
N74F245	OCTAL BUS TRANSCEIVER	SO-20
N74F251A	8-TO-1 MUX (3-STATE)	SO-16
N74F253	DUAL 4-INPUT MULTIPLEXER 3-STA	SO-16
N74F256	DUAL 4-BIT ADDRESSABLE LATCH	SO-16
N74F257A	QUAD 2 TO 1 MUX 3-STATE	SO-16
N74F258A	QUAD 2 TO 1 MUX 3-STATE	SO-16
N74F259	8-BIT ADDRESSABLE LATCH	SO-16
N74F260	DUAL 5-INPUT NOR GATE	SO-14
N74F269	8-BIT BIDIRECTIONAL BINARY CTR	SO-24
N74F27	TRIPLE 3-INPUT NOR GATE	SO-14
N74F273	OCTAL D-TYPE F/F	SO-20
N74F273A	OCTAL D-TYPE F/F	SO-20
N74F280A	9-BIT ODD/EVEN PAR GEN CHECKER	SO-14
N74F280B	9-BIT ODD/EVEN PAR GEN CHECKER	SO-14
N74F283	4-BIT ADDER	SO-16
N74F2952	OCT REGISTER XCVR NINV(3-ST)	PLCC-28
N74F2952	OCT REGISTER XCVR, NINV (3-S)	SO-24
N74F2953	OCT REGISTER XCVR, INV (3-S)	SO-24
N74F298	QUAD-2-INPUT MUX W/STORAGE	SO-16
N74F299	OCTAL SHIFT/STORAGE REG 3-S	SO-20
N74F30	8-BIT NAND GATE	SO-14
N74F30240	30 OHM TRAN LINE/B DRVR INV	SO-24
N74F30244	30 OHM TRANSM LNE/B DRVR NINV	SO-24
N74F3037	QUAD 2-IN NAND TRANS LINE DRVR	SOL-16
N74F3038	30-OHM TRANS LINE DRIVER	SOL-16
N74F3040	DUAL 4-IN NAND TRANS LINE DRVR	SOL-16
N74F32	QUAD 2-INPUT OR GATE	SO-14
N74F322	OCT SHIFT/STORAGE REG (3-S)	SO-20
N74F323	OCTAL SHIFT/STORAGE RGSTR 3-S	SO-20
N74F350	4-BIT SHIFT W/3-STATE OUTPUT	SO-16
N74F353	DUAL 4-INPUT MULTI (INVERT)253	SO-16
N74F365	HEX BUFFER W/COMMON ENABLE, 3-S	SO-16
N74F366	HEX INVERT W/COMMON ENABLE, 3-S	SO-16
N74F367	HEX BUFFER, 4-BIT & 2-BIT, 3-S	SO-16
N74F368	HEX INVERT, 4-BIT & 2-BIT, 3-S	SO-16
N74F37	QUAD 2-INPUT NAND BUFFER	SO-14
N74F373	OCTAL 3-STATE LATCH	SO-20
N74F374	OCTAL D-F/F 3-STATE	SO-20
N74F377	OCTAL D-TYPE F/F WITH ENABLE	SO-20
N74F377A	OCTAL D-TYPE F/F WITH ENABLE	SO-20
N74F378	HEX D F/F WITH ENABLE	SO-16
N74F379	QUAD D F/F WITH ENABLE	SO-16
N74F379A	QUAD D F/F WITH ENABLE	SO-16
N74F38	QUAD 2-INPUT NAND BUFFER O/C	SO-14
N74F381	4-BIT ARITHMETIC LOGIC UNIT	SO-20
N74F382	4-BIT ARITHMETIC LOGIC UNIT	SO-20
N74F385	QUAD SERIAL ADDER/SUBTRACTOR	SO-20
N74F3893	QUAD FUTUREBUS TRANSCEIVER	PLCC-20

Commercial Products Available in SMD

N74F393	DUAL BINARY RIPPLE COUNTER	SO-14
N74F395	4-BIT CASCADABLE SHIFT REG 3-S	SO-16
N74F398	4-BIT F/F TRUE AND COMP OUTPUT	SO-20
N74F399	4-BIT F/F TRUE AND COMP OUTPUT	SO-16
N74F40	DUAL 4-INPUT NAND BUFFER	SO-14
N74F455	OCTAL INV BUFFER W/PARITY	SO-24
N74F456	OCTAL NON-INV BUFFER W/PARITY	SO-24
N74F50109	METASTABLE IMMUNE D & N PKGS	SO-16
N74F50728	METASTABLE IMMUNE D & N PKGS	SO-14
N74F50729	METASTABLE IMMUNE D & N PKGS	SO-14
N74F5074	METASTABLE IMMUNE D & N PKGS	SO-14
N74F51	DUAL 2-WIDE 2INPUT AOI GATE	SO-14
N74F521	8-BIT IDENT COMPARATOR	SO-20
N74F524	8-BIT REGISTER COMPARATOR	SO-20
N74F5300	FIBER OPTICS LED DRIVER	SO-8
N74F5302	FIBER OPTIC DUAL LED DRIVER	SO-14
N74F533	OCTAL 3-STATE LATCH INVERTING	SO-20
N74F534	OCTAL D F/F 3-STATE INVERTING	SO-20
N74F537	1-OF-10 DECODER 3-STATE	SO-20
N74F538	1-OF-8 DECODER 3-STATE	SO-20
N74F539	DUAL 1 OF 4 DECODER 3-STATE	SO-20
N74F540	OCTAL 3-STATE DRIVER/BU	
N74F377	OCTAL D-TYPE F/F WITH ENABLE	SO-20
N74F377A	OCTAL D-TYPE F/F WITH ENABLE	SO-20
N74F378	HEX D F/F WITH ENABLE	SO-16
N74F379	QUAD D F/F WITH ENABLE	SO-16
N74F379A	QUAD D F/F WITH ENABLE	SO-16
N74F38	QUAD 2-INPUT NAND BUFFER O/C	SO-14
N74F381	4-BIT ARITHMETIC LOGIC UNIT	SO-20
N74F382	4-BIT ARITHMETIC LOGIC UNIT	SO-20
N74F385	QUAD SERIAL ADDER/SUBTRACTOR	SO-20
N74F3893	QUAD FUTUREBUS TRANSCEIVER	PLCC-20
N74F393	DUAL BINARY RIPPLE COUNTER	SO-14
N74F395	4-BIT CASCADABLE SHIFT REG 3-S	SO-16
N74F398	4-BIT F/F TRUE AND COMP OUTPUT	SO-20
N74F399	4-BIT F/F TRUE AND COMP OUTPUT	SO-16
N74F40	DUAL 4-INPUT NAND BUFFER	SO-14
N74F455	OCTAL INV BUFFER W/PARITY	SO-24
N74F456	OCTAL NON-INV BUFFER W/PARITY	SO-24
N74F50109	METASTABLE IMMUNE D & N PKGS	SO-16
N74F50728	METASTABLE IMMUNE D & N PKGS	SO-14
N74F50729	METASTABLE IMMUNE D & N PKGS	SO-14
N74F5074	METASTABLE IMMUNE D & N PKGS	SO-14
N74F51	DUAL 2-WIDE 2INPUT AOI GATE	SO-14
N74F521	8-BIT IDENT COMPARATOR	SO-20
N74F524	8-BIT REGISTER COMPARATOR	SO-20
N74F5300	FIBER OPTICS LED DRIVER	SO-8
N74F5302	FIBER OPTIC DUAL LED DRIVER	SO-14
N74F533	OCTAL 3-STATE LATCH INVERTING	SO-20
N74F534	OCTAL D F/F 3-STATE INVERTING	SO-20
N74F537	1-OF-10 DECODER 3-STATE	SO-20

Commercial Products Available in SMD

N74F538	1-OF-8 DECODER 3-STATE	SO-20
N74F539	DUAL 1 OF 4 DECODER 3-STATE	SO-20
N74F540	OCTAL 3-STATE DRIVER/BUFFER	SO-20
N74F541	OCTAL 3-STATE DRIVER/BUFFER	SO-20
N74F543	OCT TRANS BIDIRECT LATCH	SO-24
N74F544	OCT TRANS BIDIRECT LATCH	SO-24
N74F545	OCTAL BUS TRANSCEIVER	SO-20
N74F547	OCT DECODER/MUX W/LATCHES	SO-20
N74F552	OCT REG XCVR W/PARITY/ST FLAGS	SO-28
N74F564	OCTAL D FLIP-FLOP	SO-20
N74F569	4-BIT BINARY UP/DOWN COUNTER	SO-20
N74F573	OCTAL D-TYPE LATCH	SO-20
N74F574	OCTAL D FLIP-FLOP	SO-20
N74F579	8-BIT COUNTER COMMON I/O, 3-S	SO-20
N74F583	4-BIT BCD ADDER	SOL-16
N74F595	8-BIT SHIFT REGISTER W/LATCH	SO-16
N74F597	8-BIT SHIFT REGISTER W/LATCH	SO-16
N74F598	8-BIT SHIFT REG W/INPUT LATCH	SO-20
N74F604	DUAL 8-BIT LATCH 3-STATE	SO-28
N74F620	OCTAL BUS TRANSCEIVER 3-STATE	SO-20
N74F621	OCTAL BUS TRANSCEIVER O/C	SO-20
N74F623	OCTAL BUS TRANSCEIVER 3-STATE	SO-20
N74F64	AND/OR-INVERT GATE	SO-14
N74F640	OCTAL BUS TRANSCEIVER	SO-20
N74F641	OCTAL BUS TRANSCEIVER (O/C)	SO-20
N74F642	OCTAL BUS TRANSCEIVER	SO-20
N74F646	OCTAL BUS TRAN AND REGISTER	SO-24
N74F646A	OCTAL BUS TRANS 1 REG NINV	SO-24
N74F647	OCTAL BUS TRAN AND REGISTER	SO-24
N74F648	OCTAL BUS TRAN AND REGISTER	SO-24
N74F648A	OCTAL BUS TRANCEIVER AND REGIS	SO-24
N74F649	OCTAL BUS TRAN AND REGISTER	SO-24
N74F651A	OCTAL BUS TRAN AND REG INV 3-S	SO-24
N74F652A	OCTAL BUS TRAN AND REG NINV3-S	SO-24
N74F655A	OCTAL INV BUFFER W/PARITY	SO-24
N74F656A	OCTAL NON-INV BUFFER W/PARITY	SO-24
N74F657	OCTAL BUFFER W/PARITY GEN/CHEK	SO-24
N74F670	4X4 REGISTER FILE	SOL-16
N74F674	16-BIT SHIFT REGISTER	SO-24
N74F676	16-BIT SHIFT REGISTER SIPO	SO-24
N74F711-1	QUINT 2-INPUT MUX 30 OHM TERM	SO-20
N74F711A	QUINT 2-INPUT MUX	SO-20
N74F712-1	QUINT 3-INPUT MUX 30 OHM TERM	SO-24
N74F712A	QUINT 3-INPUT MUX	SO-24
N74F723-1	QUAD 3-INPUT MUX 30 OHM TERM	SO-24
N74F723A	QUAD 2-INPUT MULTIPLEXER	SO-24
N74F725-1	QUAD 3-INPUT MUX 30 OHM TERM	SO-24
N74F725A	QUAD 3-INPUT MULTIPLEXER	SO-24
N74F733	QUAD DATA MULTIPLEXER, INV	SO-20
N74F74	DUAL D-TYPE EDGE TRIGGER F/F	SO-14
N74F756	OCT BUS LINE DRVR INV (O.C.)	SO-20

Commercial Products Available in SMD

N74F757	OCT BUS LINE DRVR, NINV (O.C.)	SO-20
N74F760	OCT BUS LINE DRVR, INV	SO-20
N74F764-1	DRAM DUAL-PORT CONTRLR W/LATCH	PLCC-44
N74F765-1	DRAM DUAL-PORTED CONTROLLER	PLCC-44
N74F776	OCT BIDIRECT PI-BUS XCVR (OC)	PLCC-28
N74F777	TRIPLE BIDIRECT LTCH BUS TRAN	PLCC-20
N74F779	8-BIT COUNTER	SOL-16
N74F786	4-INPUT ASYNCH BUS ARBITER	SO-16
N74F804	HEX 2-INPUT NAND DRIVER	SO-20
N74F805	HEX 2-INPUT NOR DRIVER	SO-20
N74F807	OCT SHIFT/COUNT REG XCVR ADDER	PLCC-28
N74F807	OCTAL SHIFT/COUNT REG XCVR ADD	SO-28
N74F808	HEX 2-INPUT AND DRIVER	SO-20
N74F821	10-BIT REGISTER, NINV (3-S)	SO-24
N74F822	10-BIT REGISTER, INV (3-S)	SO-24
N74F823	9-BIT REGISTER NINV (3-S)	SO-24
N74F824	9-BIT REGISTER INV (3-S)	SO-24
N74F825	8-BIT REGISTER NINV (3-S)	SO-24
N74F826	8-BIT REGISTER,INV (3-S)	SO-24
N74F827	10-BIT BUFFER/DRIVER NINV 3-S	SO-24
N74F828	10-BIT BUFFER/DRIVER INV 3-S	SO-24
N74F832	HEX 2-INPUT OR DRIVER	SO-20
N74F835	LATCHED OCT SHFT RGSTR 2=1 MUX	SO-24
N74F841	10-BIT LATCH NON-INVERTING	SO-24
N74F842	10-BIT LATCH INVERTING 3-S	SO-24
N74F843	9-BIT LATCH, NINV (3-S)	SO-24
N74F844	9-BIT LATCH INVERTING 3-S	SO-24
N74F845	8-BIT LATCH, NINV (3-S)	SO-24
N74F846	8-BIT LATCH INVERTING 3-S	SO-24
N74F85	4-BIT MAGNITUDE COMPARATOR	SOL-16
N74F86	QUAD EXCL OR GATE	SO-14
N74F861	10-BIT BUS TRANCEIVER NINV 3-S	SO-24
N74F862	10-BIT BUS TRANCEIVER INV 3-S	SO-24
N74F863	9-BIT BUS TRANCEIVER NINV 3-S	SO-24
N74F864	9-BIT BUS TRANCEIVER INV 3-S	SO-24
N74F8960	OCTAL LATCHED BIDIRECTIONAL FB	PLCC-28
N74F8961	OCT BIDRCTL F-BUS XCVR NINV OC	PLCC-28
N74F8962	9BIT LTCHD BIDIRECT FBUS INV	PLCC-44
N74F8963	9BIT LTCH BIDIRECT FBUS NON-IV	PLCC-44
N74F8965	9-BIT LTCHD BTL TRANS FBUS INV	PLCC-44
N74F8966	9-BIT LTCHD BTL TRANS FBUS INV	PLCC-44
N8X305	8 BIT BIP MICROCONTROLLER PLCC	PLCC-68
N82HS195	16K PROM (4096X4) TS 45NS	PLCC-20
N82HS195A	16K PROM (4096X4) TS 35 NS	PLCC-20
N82HS321A	32K PROM (4096X8) TS 35NS	PLCC-28
N82HS321B	32K PROM (4096X8) TS 30NS	PLCC-28
N82LS135	2K PROM (256X8) TS 100 NS	PLCC-20
N82S123A	256 BIT PROM (32X8) TS 25 NS	PLCC-20
N82S123A	256 BIT PROM (32X8) TS 25 NS	SOL-16
N82S129A	1K PROM (256X4) TS 27 NS	PLCC-20
N82S131A	2K PROM (512X4) TS 30 NS	PLCC-20

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N82S131A	2K PROM (1512X4) TS 30 NS	SOL-16
N82S135	2K PROM (256X8) TS PLCC 45 NS	PLCC-20
N82S135	2K PROM (256X8) TS SO 45 NS	SO-20
N82S137B	4K PROM (1024X4) TS 20P 35NS	PLCC-20
N82S147A	4K PROM (512X8) TS 20P 45NS	PLCC-20
N82S147B	4K PROM (512X8) PLCC 25NS	PLCC-20
N82S181C	8K PROM (1024X8) TS 35 NS	PLCC-28
N82S191A	16K PROM (2048X8) PLCC 55 NS	PLCC-28
N82S191C	16K PROM (2048X8) PLCC 35 NS	PLCC-28
PCA82C200T	CAN SERIAL BUS INTERFACE VSO40	SOL-16
PCA84C422BT	36 KEY 4K BYTES IR REMOTE UC	SO-20
PCA84C822AT	16 10 8K BYTES IR REMOTE UC	SO-24
PCA84C822BT	12 10 8K BYTES IR REMOTE UC	SO-20
PCA84C822CT	20 10 8K BYTES IR REMOTE UC	SO-28
PCA8581CT	128X8 EEPROM I2C-BUS SO-8L	SO-8
PCA8581T	128X8 EEPROM I2C BUS SO-8L	SO-8
PCB80C31-5	ORDER SC80C31BCYA44 (33MHZ)	PLCC-68
PCD3310AT	PULSE TONE DIALLER 3:2 M/S	SO-28
PCD3311CT	DTMF/MODEM/MUSICAL GENERATOR	SOL-16
PCD3312CT	DTMF/MODEM/MUSICAL GENERATOR	SOL-8
PCD3343T	LOW V UC 3K 224B I2C	SO-28
PCD3344T	LOW VOLTAGE UC DTMF 2K 224BYTE	SO-28
PCD3346T	TELEPHONEY MICRO WITH EEPROM	SO-28
PCD3347T	LV UC DTMF 1.5K 64 BYTES	SO-20
PCD3348T	LV UC 12C 8K 256 BYTES	SO-28
PCD3349T	LV UC DTMF 4K 128 BYTES	SO-28
PCD3351AT	2K UC W/DTMF 128 BYTES EEPROM	SO-28
PCD3360T	PROG TONE GENERATOR	SOL-16
PCD8582D2	256X8 EEPROM I2C BUS SO-8	SO-8
PCD8584T	PARALLEL TO I2C CONVERTER	SO-20
PCD8594D2	512X8 EEPROM, 3.0V TO 6.0V	SO-8
PCF1252-0T	VOLTAGE DETECTOR 4.75V	SO-8
PCF1252-1T	VOLTAGE DETECTOR 4.55V	SO-8
PCF1252-2T	VOLTAGE DETECTOR 4.25V	SO-8
PCF1252-3T	VOLTAGE DETECTOR 4.05V	SO-8
PCF1252-4T	VOLTAGE DETECTOR 3.75V	SO-8
PCF1252-5T	VOLTAGE DETECTOR 3.55V	SO-8
PCF1252-6T	VOLTAGE DETECTOR 3.20V	SO-8
PCF1252-7T	VOLTAGE DETECTOR 3.05V	SO-8
PCF1252-8T	VOLTAGE DETECTOR 2.75V	SO-8
PCF1252-9T	VOLTAGE DETECTOR 2.55V	SO-8
PCF1254T	IF REMOTE TRANSMITTER (LV)	SO-8
PCF2100T	LCD DUPLEX DRIVER (40 SEGMENT)	SO-28
PCF2110T	LCD DUPLEX DRIVER W/LED DRIVE	SO-40
PCF2111T	LCD DUPLEX DRIVER (60 SEGMENT)	SO-40
PCF2112T	32 SEGMENT STATIC LCD DRIVER	SO-40
PCF5001T	POCSAG PAGING DECODER W/EPROM	SO-28
PCF84C12T	LOW V UC 1K 64B	SO-20
PCF84C121T	UC 256X8RAM 1KROM 8X8 EEPROM	SO-20
PCF84C21T	LOW VOLTAGE UC 2K 64B I2C	SO-28
PCF84C22T	LV UC 2K 64 BYTES	SO-20

Commercial Products Available in SMD

PCF84C41T	LOW V UC 4K 128B 12C	SO-28
PCF84C42T	MICRO WITH 4K/64 BYTES	SO-20
PCF84C633T	UC 256X8 RAM 8KROM 16BIT TIMER	VSO-56
PCF84C85T	LOW VUC 8K 256B I2C 32 I/O	SO-40
PCF8566T	24/48/72/96 SEG LCD DRIVER I2C	SO-40
PCF8567CT	LCD DIRECT MODE DRIVER W/I2C	SO-40
PCF8568T	LCD DOT MATRIX DRIVER	SO-28
PCF8569T	LCD DOT MATRIX DRIVER	VSO-56
PCF8570T	256X8 SRAM I2C	SOL-8
PCF8571T	128X8 SRAM I2C	SOL-8
PCF8573T	CLOCK CALENDAR I2C	SOL-16
PCF8574AT	EXTENDED I/O EXPANDER I2C	SOL-16
PCF8574T	I/O EXPANDER I2C	SOL-16
PCF8576T	40/80/120/160 SEG DRIVER I2C	VSO-56
PCF8577CT	32/64 SEG DRIVER I2C	SO-40
PCF8578T	DOT MATRIX LCD DRIVER (R/COLM)	VSO-56
PCF8579T	DOT MATRIX LCD DRIVER(COLUMN)	VSO-56
PCF8582C2	256X8 EEPROM I2C BUS SO-8	SO-8
PCF8582E2	256X8 EEPROM I2C-BUS SO-8	SO-8
PCF8583T	CLOCK CALENDAR W 256X8SRAM I2C	SOL-8
PCF8591T	8 BIT ADC/DAC I2C	SOL-16
PCF8594C2	512X8 EEPROM 2.5V TO 6.0V	SO-8
PCF8594E2	512X8 EEPROM, 4.5V TO 5.5.V	SO-8
PHD16N8-5	20 PIN HIGH SPEED DECODER PLCC	PLCC-20
PHD48N22-7	68 PIN HIGH SPEED DECODER PLCC	PLCC-68
PLC18V8ZI	ZRO PWR-40NS IND UNIV PAL	PLCC-20
PLC18V8ZI	ZRO PWR-40NS IND UNIV PAL	SO-20
PLC18V8Z1A	ZRO PWR-25NS IND UNIV PAL	PLCC-20
PLC18V8Z1A	ZRO PWR-25NS IND UNIV PAL	SO-20
PLC18V8Z25	ZRO PWR-25NS COM UNIV PAL	PLCC-20
PLC18V8Z25	ZRO PWR-25NS COM UNIV PAL	SO-20
PLC18V8Z35	ZRO PWR-35NS COM UNIV PAL	PLCC-20
PLC18V8Z35	ZRO PWR-35NS COMM UNIV PAL	SO-20
PLC415-16	PLD CMOS SEQNCR TS 16MHZ	PLCC-28
PLC42VA12	CMOS 22V10 SUPERSET PLCC	PLCC-28
PLHS501	PLD PROG MACRO LOGIC (32X72X24	PLCC-52
PLHS501I	IND TEMP PROG MACRO LOGIC	PLCC-52
PLS100	PLD LOGIC ARRAY (16X48X8) TS	PLCC-28
PLS101	PLD LOGIC ARRAY (16X48X8) OC	PLCC-28
PLS105	PLD SEQNCR (16X48X8) TS 14MHZ	PLCC-28
PLS105A	PLD SEQNCR (16X48X8) TS 20MHZ	PLCC-28
PLS153	PLD FPLA (18X32X10) TS PLCC	PLCC-20
PLS153A	PLD FPLA (18X32X10) TS 30NS	PLCC-20
PLS155	PLD SEQNCR (16X45X12) TS 4 BIT	PLCC-20
PLS157	PLD SEQNCR (16X45X12) TS 6 BIT	PLCC-20
PLS159A	PLD SEQNCR (16X45X12) 18 MHZ	PLCC-20
PLS167	PLD FPLA (12X48X6) 14MHZ	PLCC-28
PLS167A	PLD FPLA (12X48X6) 20MHZ	PLCC-28
PLS168	PLD FPLS 14MHZ 12X48X8 PLCC	PLCC-28
PLS168A	PLD FPLS 20MHZ 12X48X8 PLCC	PLCC-28
PLS173	PLD FPLA 30NS 22X42X10 PLCC	PLCC-28

Commercial Products Available in SMD

PLS179	FIELD PROGRAMMABLE LOGIC SEQU	PLCC-28
PLUS105-45	SEQNCR (16X48X8) 45MHZ PLCC	PLCC-28
PLUS105-55	SEQNCR (16X48X8) 55MHZ PLCC	PLCC-28
PLUS153-10	PLA (18X32X10) TPD10NS	PLCC-20
PLUS153B	PLD PLA (18X32X10) TPD 15NS	PLCC-20
PLUS153D	PLD PLA (18X32X10) TPD 12NS	PLCC-20
PLUS16L8-7	PLD PAL* STYLE DEVICE	PLCC-20
PLUS16L8D	PLD PAL* STYLE DEVICE TPD 10NS	PLCC-20
PLUS16R4-7	PLD PAL* STYLE DEVICE	PLCC-20
PLUS16R4D	PLD PAL* STYLE DEVICE	PLCC-20
PLUS16R6-7	PLD PAL* STYLE DEVICE	PLCC-20
PLUS16R6D	PLD PAL* STYLE DEVICE	PLCC-20
PLUS16R8-7	PLD PAL* STYLE DEVICE	PLCC-20
PLUS16R8D	PLD PAL* STYLE DEVICE	PLCC-20
PLUS173-10	PLA (22X32X10) TPD 10NS	PLCC-28
PLUS173B	PLD PLA (22X32X10) TPD 15NS	PLCC-28
PLUS173D	PLD PLA (22X32X10) TPD 12NS	PLCC-28
PLUS20L8-7	PLD PAL* STYLE DEVICE	PLCC-28
PLUS20L8D	PLD PAL* SYLE DEVICE	PLCC-28
PLUS20R4-7	PLD PAL* STYLE DEVICE	PLCC-28
PLUS20R4D	PLD PAL* STYLE DEVICE	PLCC-28
PLUS20R6-7	PLD PAL* STYLE DEVICE	PLCC-28
PLUS20R6D	PLD PAL* STYLE DEVICE	PLCC-28
PLUS20R8-7	PLD PAL* SYLTE DEVICE	PLCC-28
PLUS20R8D	PLD PAL* STYLE DEVICE	PLCC-28
PLUS405-37	PLD SEQNCR (16X64X8) TS 37MHZ	PLCC-28
PLUS405-45	PLD SEQNCR (16X64X8) TS 45MHZ	PLCC-28
PLUS405-55	PLD SEQNCR (16X64X8) TS 55MHZ	PLCC-28
PL22V10-10	E2 UNIV PAL 10NS TPD PLCC	PLCC-28
PL22V10-10	E2 UNIV PAL 10NS TPD SO-L	SO-24
PL22V10-15	E2 UNIV PAL 15NS TPD PLCC	PLCC-28
PL22V10-15	E2 UNIV PAL 15NS TPD SO-L	SO-24
PL22V10I15	IND E2 UNIV PAL 15NS PLCC	PLCC-28
PL22V10I15	IND E2 UNIV PAL 15NS SO-L	SO-24
PML2552-35	CMOS HI-DENS PML TPD 35NS	PLCC-68
PML2552-50	CMOS HI-DENS PML TPD 50NS	PLCC-68
P80CL31HFT	4K/128 RMLS 16MHZ EXT TEMP	SO-40
P80CL410HF	RMLS/128 1.8-6V 40 PIN VSO	SO-40
P80CL51HFT	4K/128 ROM 16MHZ EXT TEMP VSO	SO-40
P80C32EBA	ROMLESS/256 16MHZ COM TEM PLCC	PLCC-44
P80C32EFA	ROMLESS/256 16MHZ EXT TEM PLCC	PLCC-44
P80C32GBA	ROMLESS/256 20MHZ COM TEM PLCC	PLCC-44
P80C32GFA	ROMLESS/256 20MHZ EXT TEM PLCC	PLCC-44
P80C32IBA	ROMLS/256 24MHZ COM TEMP PLCC	PLCC-44
P80C32IFA	ROMLS/256 24MHZ EXT TEMP PLCC	PLCC-44
P80C52EBA	8K/256 ROM 16MHZ COM TEMP PLCC	PLCC-44
P80C52EFA	8K/256 ROM 16MHZ EXT TEMP PLCC	PLCC-44
P80C52GBA	8K/256 ROM 20MHZ COM TEMP PLCC	PLCC-44
P80C52GFA	8K/256 ROM 20MHZ EXT TEMP PLCC	PLCC-44
P80C52IBA	8K/256 ROM 24MHZ COM TEMP PLCC	PLCC-44
P80C52IFA	8K/256 ROM 24MHZ EXT TEMP PLCC	PLCC-44

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P80C528FBA	ROMLESS/512 16MHZ COM TEMP I2C	PLCC-44
P80C528FFA	ROMLESS/512 16MHZ EXT TEMP I2C	PLCC-44
P80C550EBA	ROMLESS/128 A/D 16MHZ COM TEMP	PLCC-44
P80C550EFA	ROMLESS/128 A/D 16MHZ EXT TEMP	PLCC-44
P80C652FBA	RMLS/256 I2C 16MHZ COM TEMPLCC	PLCC-44
P80C652FFA	RMLS/256 I2C 16MHZ EXT TEMPLCC	PLCC-44
P80C652FHA	RMLS/256 I2C 16MHZ -40TO125C	PLCC-44
P83CL410HF	4K/128 ROM 16MHZ EXT TEM VSO40	SO-40
P83C528FBA	32K/512 ROM 16MHZ COM TEMP I2C	PLCC-44
P83C528FFA	32K/512 ROM 16MHZ EXT TEMP I2C	PLCC-44
P83C550EBA	4K/128 ROM A/D 16MHZ COMM TEMP	PLCC-44
P83C550EFA	4K/128 ROM A/D 16MHZ EXT TEMP	PLCC-44
P83C652FBA	8K/256 ROM I2C 16MHZ COM TEMP	PLCC-44
P83C652FFA	8K/256 ROM I2C 16MHZ EXT TEMP	PLCC-44
P83C652FHA	8K/256 ROM I2C 16MHZ -40TO125	PLCC-44
P83C654FBA	16K/256 ROM I2C 16MHZ COM TEMP	PLCC-44
P83C654FFA	16K/256 ROM I2C 16MHZ EXT TEMP	PLCC-44
P83C654FHA	16K/256ROM I2C 16MHZ -40TO125C	PLCC-44
P83C654IBA	16K/256 ROM I2C 24MHZ COM TEMP	PLCC-44
P83C654IFA	16K/256 ROM I2C 24MHZ EXT TEMP	PLCC-44
P87C52EBA	8K/256 OTP 16MHZ COM TEMP PLCC	PLCC-44
P87C52EFA	8K/256 OTP 16MHZ EXT TEMP PLCC	PLCC-44
P87C52GBA	8K/256 OTP 20MHZ COM TEMP PLCC	PLCC-44
P87C52GFA	8K/256 OTP 20MHZ EXT TEMP PLCC	PLCC-44
P87C52IBA	8K/256 OTP 24MHZ COM TEMP PLCC	PLCC-44
P87C52IFA	8K/256 OTP 24MHZ EXT TEMP PLCC	PLCC-44
P87C524EBA	16K/512 OTP 16MHZ COM TEM PLCC	PLCC-44
P87C524GFA	16K/512 OTP 20MHZ EXT TEM PLCC	PLCC-44
P87C528EBA	32K/512 OTP 16MHZ COM TEM PLCC	PLCC-44
P87C528EFA	32K/512 OTP 16MHZ EXT TEM PLCC	PLCC-44
P87C528GBA	32K/512 OTP 20MHZ COM TEM PLCC	PLCC-44
P87C528GFA	32K/512 OTP 20MHZ EXT TEM PLCC	PLCC-44
P87C550EBA	4K/128 OTP A/D 16MHZ COM TEMP	PLCC-44
P87C550EFA	4K/128 OTP A/D 16MHZ EXT TEMP	PLCC-44
P87C575EBA	8K/256 OTP PCA WD 16MHZ COMM	PLCC-44
P87C575EHA	8/256 OTP PCA WD 16MHZ-40TO125	PLCC-44
P87C592EFA	8K/256 OTP 10BIT 16MHZ EXT CAN	PLCC-68
P90C100AB	RMLS/512 68000 MCU 15MHZ 0-70	PLCC-84
P93C100AB	34K/512 ROM 6800 MUC 15MHZ	PLCC-84
SAA1043T	UNIVERSAL SYNC GENERATOR	SO-28
SAA1064T	4-BIT LED DRIVER I2C	SO-24
SAA1101T	UNIVERSAL SYNC GEN 5V	SO-28
SAA1500T	BATTERY FUEL GAUGE	SO-20
SAA3010T	IR REMOTE CNTRL X-MITTER RC-5	SO-28
SAA3049T	REMOTE CONTROL DECODER	SO-20
SAA7151BWP	DIGITAL MULTISTANDARD DECODER	PLCC-68
SAA7152WP	DIGITAL VIDEO COMB FILTER-DCF	PLCC-44
SAA7157T	CLOCK GENERATOR CIRCUIT	SO-20
SAA7169WP	TRIPLE 10-BIT D/A	PLCC-44
SAA7191WP	DIGITAL MULTISTD VIDEO DECODER	PLCC-68
SAA7192AWP	DIGITAL COLOR SPACE CONVERTER	PLCC-68

Commercial Products Available in SMD

SAA7197T	CLOCK GENERATOR CIRCUIT	SO-20
SAA7199BWP	DIGITAL ENCODER (DENC)	PLCC-84
SAA7199WP	DIGITAL ENCODER (DENC)	PLCC-84
SAA9051WP	DIGITAL MULTISTANDARD DECORDER	PLCC-68
SAA9057AT	CLOCK GENERATOR CIRCUIT	SO-20
SAA9065WP	VIDEO ENHANCEMENT/TRIPLE DAC	PLCC-44
SA1458	DUAL OP AMP	SO-8
SA4558	DUAL GENERAL PURPOSE OP AMP	SO-8
SA5090	ADDRESSABLE RELAY DRIVER	SOL-16
SA5200	DUAL GAIN STAGE RF AMPLIFIER	SO-8
SA5204A	HI FREQ AMP DC TO 350 MHZ	SO-8
SA5205A	HI FREQ AMP DC TO 550 MHZ	SO-8
SA5209	WIDEBAND VARIABLE GAIN AMP	SO-16
SA5211	180 MHZ TRANSIMPEDANCE AMP	SO-14
SA5212A	FIBER OPTIC TRANSIMPEDANCE	SO-8
SA5214	POST AMP WITH LINK STATUS IND	SO-20
SA5217	POST AMP WITH LINK STATUS IND	SO-20
SA5219	WIDEBAND VARIABLE GAIN AMP	SO-16
SA5222	FDDDI TRANSIMPEDANCE AMPLIFIER	SO-8
SA5224	POST AMP-100K ECL DIF OUTPUT	SO-16
SA5225	POST AMP-10K ECL DIF OUTPUT	SO-16
SA5230	LOW VOLTAGE OP AMP	SO-8
SA5234	MATCHED QUAD HI-PERF OP AMP	SO-14
SA532	DUAL OP AMP/MICRO	SO-8
SA534	QUAD OP AMPLIFIER	SO-14
SA5512	DUAL-HIGH PERFORMANCE OP-AMP	SO-8
SA5521	LVDT SIGNAL CONDITIONER	SOL-16
SA5534A	LOW NOISE OP AMPLIFIER	SO-8
SA555	TIMER-MICRO	SO-8
SA568A	150 MHZ PHASE LOCKED LOOP	SO-20
SA571	COMPANDOR	SOL-16
SA572	PROGRAMMABLE COMPANDOR	SOL-16
SA575	LOW VOLTAGE COMPANDOR	SO-20
SA575	LOW VOLTAGE COMPANDOR SSOP	SO-20
SA5750	AUDIO PROCES-COMPANDOR/AMP SEC	SO-24
SA5751	AUDIO PROCESS-FILERT/CTRL SEC	SO-28
SA576	LOW POWER COMPANDOR	SO-14
SA577	LOW POWER COMPANDOR W/PRG ODB	SO-14
SA578	LOW POWER COMPANDOR W/PRG ODB	SO-16
SA594	VACUUM FLORESNT DISPLAY DRIVER	SO-20
SA600	1 GHZ LNA & MIXER EXT TEMP	SO-14
SA602A	DOUBLE BAL MIXER/OSCILLATOR	SO-8
SA604A	HI PERF FM IF	SO-16
SA605	HI PERF FM IF SYSTEM	SO-20
SA605	HI PERF FM IF SYSTEM SSOP	SO-20
SA606	LOW PWR HI PERF FM IF SYSTEM	SO-20
SA606	LOW PWR HI PERF FM IF SYS SSOF	SO-20
SA607	LOW PWR HI PERF FM IF W/FRQ CH	SO-20
SA607	LOW PWR HI PERF FM IF W/GRQ CH	SO-20
SA608	LOW PWR HI PERF FM IF W/FRQ CH	SO-20
SA608	LOW PWR HI PEF FM IF W/FRQ CH	SO-20

Commercial Products Available in SMD

SA612A	DOUBLE BAL MIXER/OSCILLATOR	SO-8
SA614A	LOW POWER FM IF SYSTEM	SO-16
SA615	HI PERF FM IF SYSTEM	SO-20
SA615	HI PERF FM IF SYSTEM SSOP	SO-20
SA616	LOW POWER HI PERF FM IF SYSTEM	SO-20
SA616	LOW POWER HI PERF FM IF SYSTEM	SO-20
SA617	LOW PWR HI PERF FM IF W/FRQ CH	SO-20
SA617	LOW PWR HI PERF FM IF W/FRQ CH	SO-20
SA624	HI PERF FM IF WITH FAST RSSI	SO-16
SA625	HI PERF FM IF WITH FAST RSSI	SO-20
SA627	HI PERF FM IF WITH FAST RSSI	SO-20
SA627	HI PERF IF WITH A FAST RSSI	SO-20
SA630	RF SINGLE POLE DOUBLE THROW SW	SO-8
SA701	1 GHZ PERSCALLER EXT TEMP	SO-8
SCB68172C2	VME BUS CONTROLLER (PLCC)	PLCC-44
SCC2691AC1	CMOS UART	PLCC-28
SCC2691AC1	CMOS UART SMALL OUTLINE	SO-24
SCC2691AE1	CMOS UART -40TO+85 PLCC	PLCC-28
SCC2692AC1	CMOS DUART PLCC (CMOS 2681)	PLCC-44
SCC2692AE1	CMOS DUART -40 TO 85 PLCC	PLCC-44
SCC2698BC1	CMOS OCTAL UART W/PROG INTRPT	PLCC-84
SCC2698BE1	CMOS OCTAL UART IND TEMP PLCC	PLCC-84
SCC63484C8	ADV CRT CONTROLLER 8 MHZ PLCC	PLCC-68
SCC68070AC	16/32-BIT MPU 15MHZ -40TO+85C	PLCC-84
SCC68070CC	16/32-BIT MPU 15MHZ 0TO+70C	PLCC-84
SCC68070CD	16/31 BI MPU 17.5 MHZ 0TO70	PLCC-84
SCC68692C1	68K CMOS DUART PLCC(CMOS68681)	PLCC-44
SCC68692E1	CMOS DUART IND TEMP PLCC	PLCC-44
SCN2641CC1	ASYNC COMM INTERFACE ACI PLCC	PLCC-28
SCN2652AC2	PLCC MPCC 2MHZ	PLCC-44
SCN26542C2	DMSC PLCC	PLCC-52
SCN26562C2	DUAL UNIV COMM CONTRLR (DUSCC)	PLCC-52
SCN26562C4	DUAL UNIV COMM CONTRLR (DUSCC)	PLCC-52
SCN2661AC1	PLCC ENHANCED PCI	PLCC-28
SCN2661BC1	PLCC ENHANCED PCI	PLCC-28
SCN2661CC1	PLCC ENHANCED PCI	PLCC-28
SCN2672BC4	VIDEO TIMING CONTROLLER (PLCC)	PLCC-44
SCN2672TC5	VIDEO TIMING CTRL TURBO 5.0MHZ	PLCC-44
SCN2674BC4	ADVANCED VIDEO TIMING (PLCC)	PLCC-44
SCN2674TC5	ADV VIDEO TIMING TURBO 5.5 MHZ	PLCC-44
SCN2681AC1	DUART PLCC	PLCC-44
SCN2681AE1	DUART -40TO+85 PLCC	PLCC-44
SCN2681TC1	NMOS DUART FAST BUS TIMING	PLCC-44
SCN68542C2	DUAL MULTI-PROTOCAL SERIAL CTR	PLCC-52
SCN68562C2	DUAL UNIV COMM CONTRLR (DUSCC)	PLCC-52
SCN68562C4	DUAL UNIV COMM CONTRLR (DUSCC)	PLCC-52
SCN68681C1	DUART 68K COMPATIBLE (PLCC)	PLCC-44
SCN68681E1	68K DUART IND TEMP	PLCC-44
SCN8031HAC	ROMLESS/128 12MHZ EXT TEM PLCC	PLCC-44
SCN8031HCC	RMLS/128 12MHZ COMM TEMP PLCC	PLCC-44
SCN8032HCC	RMLS/256 12MHZ COMM TEMP PLCC	PLCC-44

Commercial Products Available in SMD

SCN8032HCF	RMLS/256 15MHZ COMM TEMP PLCC	PLCC-44
SCN8039HCB	RMLS/128 11MHZ COMM TEMP PLCC	PLCC-44
SCN8049HAB	2K/128 ROM 11MHZ EXT TEMP PLCC	PLCC-44
SCN8049HCB	2K/128 ROM 11MHZ COMM TEM PLCC	PLCC-44
SCN8050HCB	4K/256 ROM 11MHZ COMM TEM PLCC	PLCC-44
SCN8051HAC	4K/128 ROM 12MHZ EXT TEMP PLCC	PLCC-44
SCN8051HAF	4K/128 ROM 15MHZ EXT TEMP PLCC	PLCC-44
SCN8051HCC	4K/128 ROM 12MHZ COMM TEM PLCC	PLCC-44
SCN8051HCF	4K/128 ROM 15MHZ COMM TEM PLCC	PLCC-44
SCN8052HAC	8K/256 ROM 12MHZ EXT TEMP PLCC	PLCC-44
SCN8052HAF	8K/256 ROM 15MHZ EXT TEMP PLCC	PLCC-44
SCN8052HCC	8K/256 ROM 12MHZ COMM TEM PLCC	PLCC-44
SCN8052HCF	8K/256 ROM 15MHZ COMM TEM PLCC	PLCC-44
SC26C460C6	I/O PROCESSOR	PLCC-68
SC26C562C1	CMOS DUSCC 68 PIN PLCC	PLCC-52
SC26C92C1	DUAL CMOS UART	PLCC-44
SC26C94C1	QUAD CMOS UART	PLCC-52
SC68C460C6	I/O PROCESSOR	PLCC-68
SC68C562C1	CMOS DUSCC 68PIN PLCC	PLCC-52
SC68C94C1	QUAD CMOS UART	PLCC-52
SC80C31BAC	ROMLESS/128 12MHZ EXT TEM PLCC	PLCC-44
SC80C31BAG	ROMLESS/128 16MHZ EXT TEM PLCC	PLCC-44
SC80C31BAP	ROMLESS/128 24MHZ EXT TEM PLCC	PLCC-44
SC80C31BAY	ROMLESS/128 33MHZ EXT TEM PLCC	PLCC-44
SC80C31BCB	RMLS/128 .5-12MHZ COM TEM PLCC	PLCC-44
SC80C31BCC	ROMLESS/128 12MHZ COM TEM PLCC	PLCC-44
SC80C31BCG	ROMLESS/128 16MHZ COM TEM PLCC	PLCC-44
SC80C31BCL	ORDER SC80C31BCPA44 (24MHZ)	PLCC-44
SC80C31BCP	ROMLESS/128 24MHZ COM TEM PLCC	PLCC-44
SC80C31BCY	ROMLESS/128 33MHZ COM TEM PLCC	PLCC-44
SC80C451AC	RMLS/128 60I/O 12MHZ EXT TEMP	PLCC-68
SC80C451AG	RMLS/128 60I/O 16MHZ EXT TEMP	PLCC-68
SC80C451CC	RMLS/128 60I/O 12MHZ COM TEMP	PLCC-68
SC80C451CG	RMLS/128 60 I/O 16MHZ COM TEMP	PLCC-68
SC80C51BAC	4K/128 ROM 12MHZ EXT TEMP PLCC	PLCC-44
SC80C51BAG	4K/128 ROM 16MHZ EXT TEMP PLCC	PLCC-44
SC80C51BAP	4K/128 ROM 24MHZ EXT TEMP PLCC	PLCC-44
SC80C51BAY	RK/128 ROM 33MHZ EXT TEMP PLCC	PLCC-44
SC80C51BCB	4K/128 ROM .5-12MHZ 0-70 PLCC	PLCC-44
SC80C51BCC	4K/128 ROM 12MHZ COM TEMP PLCC	PLCC-44
SC80C51BCG	4K/128 ROM 16MHZ COM TEMP PLCC	PLCC-44
SC80C51BCP	4K/128 ROM 24MHZ COM TEMP PLCC	PLCC-44
SC80C51BCY	4K/128 ROM 33MHZ COM TEMP PLCC	PLCC-44
SC83C451AC	4K/128 ROM 60I/O 12MHZ EXT TEM	PLCC-68
SC83C451AG	4K/128 ROM 60I/O 16MHZ EXT TEM	PLCC-68
SC83C451CC	4K/128 ROM 60I/O 12MHZ COM TEM	PLCC-68
SC83C451CG	4K/128 ROM 60I/O 16MHZ COM TEM	PLCC-68
SC87C451AB	4K/128 OTP 60I/O .5-12MHZ EXT	PLCC-68
SC87C451AC	4K/128 OTP 60I/O 12MHZ EXT TEM	PLCC-68
SC87C451AG	4K/128 OTP 60I/O 16MHZ EXT TEM	PLCC-68
SC87C451CB	4K/128 OTP 60I/O .5-12MHZ 0-70	PLCC-68

Commercial Products Available in SMD

SC87C451CC	4K/128 OTP 60I/O 12MHZ COMTEMP	PLCC-68
SC87C451CG	4K/128 OTP 60I/O 16MHZ COM TEM	PLCC-68
SC87C51AB	4K/128 OTP .5-12MHZ EXT TEMP	PLCC-44
SC87C51AC	4K/128 OTP 12MHZ EXT TEMP PLCC	PLCC-44
SC87C51AG	4K/128 OTP 16MHZ EXT TEMP PLCC	PLCC-44
SC87C51AP	4K/128 OTP 24MHZ EXT TEMP PLCC	PLCC-44
SC87C51AY	4K/128 OTP 33MHZ EXT TEMP PLCC	PLCC-44
SC87C51CB	4K/128 OTP .5-12MHZ COM TEMP	PLCC-44
SC87C51CC	4K/128 OTP 12MHZ COM TEMP	PLCC-44
SC87C51CG	4K/128 OTP 16MHZ COM TEMP PLCC	PLCC-44
SC87C51CP	4K/128 OTP 24MHZ COM TEMP PLCC	PLCC-44
SC87C51CY	4K/128 OTP 33MHZ COM TEMP PLCC	PLCC-44
SE567	TONE DECODER	SO-8
SG3524	S.M.P.S. CONTROL CIRCUIT	SO-16
S80C552-A	RMLS/256 10BIT A/D 24MHZ COM	PLCC-68
S80C552-B	RMLS/256 10BIT A/D 24MHZ EXT	PLCC-68
S80C552-C	RMLS/256 10BIT A/D 30MHZ COM	PLCC-68
S80C552-4	RMLS/256 10BIT A/D 16MHZ COM	PLCC-68
S80C552-5	RMLS/256 10BIT A/D 16MHZ EXT	PLCC-68
S80C552-6	RMLS256 10BIT A/D 12MHZ 40-125	PLCC-68
S80C562-2	RMLS/256 8BIT A/D 12MHZ EXT TP	PLCC-68
S80C562-4	RMLS/256 8BIT A/D 16MHZ 0-70	PLCC-68
S80C562-6	RMLS/256 8BIT 12MHZ -40 TO 125	PLCC-68
S80C652-1	ORDER P80C652FBAA	PLCC-44
S80C652-2	ORDER P80C652FFAA	PLCC-44
S80C652-6	ORDER P80C652FHAA	PLCC-44
S80C851-1	RMLS/128 256 EEPROM 12MHZ 0-70	PLCC-44
S80C851-2	RMLS/128 256 EEPROM 12MHZ EXT	PLCC-44
S83C552-A	8K/256 ROM 10BIT A/D 24MHZ COM	PLCC-68
S83C552-B	8K/256 ROM 10BIT A/D 24MHZ EXT	PLCC-68
S83C552-C	8K/256 ROM 10BIT A/D 30MHZ COM	PLCC-68
S83C552-1	ORDER S83C552-4A68	PLCC-68
S83C552-2	ORDER S83C552-5A68	PLCC-68
S83C552-4	8K/256 ROM 10BIT A/D 16MHZ COM	PLCC-68
S83C552-5	8K/256 ROM 10BIT A/D 16MHZ EXT	PLCC-68
S83C552-6	8K/256 ROM 10BIT 12MHZ 40-125	PLCC-68
S83C562-2	8K/256 ROM 8BIT A/D 12MHZ EXT	PLCC-68
S83C562-4	8K/256 ROM 8BIT A/D 16MHZ COM	PLCC-68
S83C562-6	8K/256 ROM 8BIT 12MHZ 40 - 125	PLCC-68
S83C652-1	ORDER P83C652FBAA	PLCC-44
S83C652-2	ORDER P83C652FFAA	PLCC-44
S83C652-6	ORDER P83C652FHAA	PLCC-44
S83C654-1	ORDER P83C654FBAA	PLCC-44
S83C654-2	ORDER P83C654FFAA	PLCC-44
S83C654-6	ORDER P83C654FHAA	PLCC-44
S83C751-1	2K/64 ROM I2C 12MHZ COM TEMP	PLCC-28
S83C751-2	2K/64 ROM I2C 12MHZ EXT TEMP	PLCC-28
S83C751-3	2K/64 ROM I2C .5-12MHZ COM TEM	PLCC-28
S83C751-4	2K/64 ROM I2C 16MHZ COM TEMP	PLCC-28
S83C751-5	2K/64 ROM I2C 16MHZ EXT TEMP	PLCC-28
S83C752-1	2K/64 ROM A/D I2C 12MHZ COMTEM	PLCC-28

Commercial Products Available in SMD

S83C752-2	2K/64 ROM A/D I2C 12MHZ EXT	PLCC-28
S83C752-4	2K/64 ROM A/D I2C 16MHZ 0-70	PLCC-28
S83C752-5	2K/64 ROM A/D I2C 16MHZ EXT	PLCC-28
S83C851-1	128/256 ROM 12MHZ COM TEMP	PLCC-44
S83C851-2	128/256 ROM 12MHZ EXT TEMP	PLCC-44
S87C552-1	8K/256 OTP 12MHZ 10BIT A/D COM	PLCC-68
S87C552-2	8K/256 OTP 12MHZ 10BIT A/D EXT	PLCC-68
S87C552-4	8K/256 OTP 10BIT A/D 16MHZ COM	PLCC-68
S87C552-5	8K/256 OTP 10BIT A/D 16MHZ EXT	PLCC-68
S87C652-4	8K/256 OTP I2C 16MHZ COM TEMP	PLCC-44
S87C652-5	8K/256 OTP 16MHZ I2C EXT TEMP	PLCC-44
S87C652-7	8K/256 OTP 20MHZ COM TEMP I2C	PLCC-44
S87C652-8	8K/256 OTP 20MHZ EXT TEMP I2C	PLCC-44
S87C654-4	16K/256 OTP I2C 16MHZ COM TEMP	PLCC-44
S87C654-5	16K/256 OTP I2C 16MHZ EXT TEMP	PLCC-44
S87C654-7	16K/256 OTP I2C 20MHZ COM TEMP	PLCC-44
S87C654-8	16K/256 OTP I2C 20MHZ EXT TEMP	PLCC-44
S87C751-1	2K/64 OTP I2C 12MHZ COM TEMP	PLCC-28
S87C751-2	2K/64 OTP I2C 12MHZ EXT TEMP	PLCC-28
S87C751-4	2K/64 OTP I2C 16MHZ COM TEMP	PLCC-28
S87C751-5	2K/64 OTP I2C 16MHZ EXT TEMP	PLCC-28
S87C752-1	2K/64 OTP A/D I2C 12MHZ 0-70	PLCC-28
S87C752-2	2K/64 OTP A/D I2C 12MHZ EXT	PLCC-28
S87C752-4	2K/64 OTP A/D I2C 16MHZ 0-70	PLCC-28
S87C752-5	2K/64 OTP A/D I2C 16MHZ EXT	PLCC-28
S87C752-6	2K/64 OTP A/D 12MHZ -55-125	PLCC-28
TDA1015T	1 W TO 4W AUDIO POWER AMP	SO-8
TDA1310T	STEREO DAC (CONTINOUSE CAL)	SO-8
TDA1311AT	STEREO DAC W/VOLTAGE OUTPUT	SO-8
TDA1312T	STEREO DAC W/VOLTAGE OUTPUT	SO-8
TDA1543AT	ECONOMY DUAL 16-BIT DAC	SO-8
TDA1543T	ECONOMY DUAL 16-BIT DAC(I2S)	SO-8
TDA1545T	CONTINUOUS CALIB 2X 16BIT DAC	SO-8
TDA1574T	VHF MIXER OSCILLATOR	SO-20
TDA1576T	FM IF AMPLIFIER CIRCUIT	SO-20
TDA3047T	I/R PRE-AMP	SOL-16
TDA3048T	IR PREAMPS	SOL-16
TDA4661T	BASEBAND DELAY LINE	SO-16
TDA4680WP	RGB PROCESSOR	PLCC-28
TDA4820T	VIDEO SYNC STRIPPER	SO-8
TDA5030AT	VHF MIXER OSCILLATOR	SO-20
TDA5142T	BRUSHLESS DC MOTOR DRIVER	SO-24
TDA5143T	BRUSHLESS DC MOTOR DRIVER	SO-20
TDA5144AT	BRUSHLESS DC MOTOR DRIVER	SO-20
TDA5330T	3 BAND TUNER VHF-UHF-HYPER	SO-28
TDA7010T	FM RADIO CIRCUIT	SO-16
TDA7021T	FM CIRCUIT FOR MTS	SO-16
TDA7040T	PLL STEREO DECODER LOW VOLTAGE	SO-8
TDA7050T	LO VOLTAGE MONO/STEREO AMP	SO-8
TDA7052AT	0.5W AUDIO AMP W/DC VOL CNTL	SO-8
TDA8444AT	OCTUPLE 6-BIT D/A CONVERTER	SOL-16

Commercial Products Available in SMD

TDA8444T	OCTUPLE 6 BIT D/A CONVERTER	SOL-16
TDA8702T	8-BIT D/A CONVERTER	SOL-16
TDA8703T	8-BIT A/D CONVERTER	SO-24
TDA8706T	VIDEO A/O CONVERTER 6-BITW/MUX	SO-20
TDA8708T	8-BIT VIDEO ADC	SO-28
TDA8709T	8-BIT VIDEO A/D W/AGC	SO-28
TDA8713T	8-BIT FLASH A/D	SO-24
TDD1742T	FREQUENCY SYNTHESIZER	SO-28
TEA1064AT	TEL TRAN IC W/DYN LIMIT	SO-20
TEA1066T	TRANSMISSION 1C	SO-20
TEA1067T	LV TELEPHONE TRANS CIRCUIT	SO-20
TEA1068T	TELEPHONE TRANSMISSION IC	SO-20
TEA1081T	SUPPLY IC FOR TEL PERIPHERALS	SO-8
TEA1088T	BATTERY CHARGER	SOL-16
TEA1090T	NICD CHARGE CIRCUIT	SO-20
TEA1100T	NICAD CHARGER	SOL-16
TEA5711T	AM/FM W STEREO DECODER	SO-32
TEA5712T	AM/FM W STEREO DECODER FOR DTS	SO-32
TEA6300T	SOUND CONTROLLER AND FADER	SO-28
TEA6320T	SOUND FADER CONTROL (SOFAC)	SO-32
TEA6330T	SOUND CONTROLLER AND FADER	SO-20
TSA5511T	1.3 GHZ FREQUENCY SYNTHESIZER	SO-16
UAA2080T	PAGER RECEIVER	SO-28
UA723C	VOL REG	SO-14
UA741C	OP AMP	SO-8
UC3842	SMPS CONTROL IC	SO-14
UMA1005T	FREQ SYNTH W/FRACT N DIVIDER	SO-28
UMA1014T	1 GHZ FREQUENCY SYNTH	SO-16
UMA1016AT	1GHZ FREQUENCY SYTHESIZER	SO-16
UMF1000T	DATA PROCESSOR/CELLULAR RADIO	SO-28
10H20EV8-4	ECL PAL TYPE DEVICE 10K PLCC	PLCC-28
100101	TRIPLE 5-INPUT GATE	PLCC-28
100102	QUINT 2-INPUT GATE	PLCC-28
100107	QUINT EX-OR/NOR	PLCC-28
100114	LINE RECEIVER	PLCC-28
100124	TTL TO ECL TRANSLATOR	PLCC-28
100125	ECL TO TTL TRANSLATOR	PLCC-28
100131	TRIPLE "D" FLIP FLOP	PLCC-28
100136	MULTIPURPOSE COUNTING REGISTER	PLCC-28
100141	8-BIT UNIVERSAL SHIFT REGISTER	PLCC-28
100155	QUAD MULTIPLEXER/LATCH	PLCC-28
100158	SHIFT MATRIX	PLCC-28
100164	16 LINE MULTIPLEXER	PLCC-28
100170	UNIVERSAL DECODER	PLCC-28
100171	TRIPLE 4-INPUT MUX	PLCC-28
100180	FAST 6-BIT ADDER	PLCC-28
10020EV8-4	ECL PAL-TYPE DEVICE 100K PLCC	PLCC-28
100231	TRIPLE D FLIP-FLOP (1.8 NS)	PLCC-28
100790	9BIT REG TRANSCEIVER 3-STATE	PLCC-28
100982	6BIT REG TRANSLATING TRANSCEIV	PLCC-28
100984	4BIT REG TRANSLATING TRANSCEIV	PLCC-28

Commercial Products Available in SMD

27C010-15	1 MEG OTP CEPROM 128KX8 150NS	PLCC-32
27C010-20	1 MEG OTP CEPROM 128KX8 200NS	PLCC-32
27C010I15	1 MEG OTP - INDUSTRIAL TEMP	PLCC-32
27C010I20	1 MEG OTP - INDUSTRIAL TEMP	PLCC-32
27C210-15	1 MEG OTP CEPROM 64KX16 150NS	PLCC-44
27C210-20	1MEG OTP CEPROM(64KX16) 200NS	PLCC-44
27C256-12	256K O.T.P CPROM (32KX8) 120NS	PLCC-32
27C256-12	256K S.O. EPROM (32KX8) 120NS	SO-28
27C256-15	256K CMOS EPROM (32KX8) 150NS	PLCC-32
27C256-15	256K S.O. EPROM(32KX8) 150NS	SO-28
27C256-20	256K CMOS EPROM (32KX8) 200NS	PLCC-32
27C256-20	256K S.O. EPROM (32KX8) 200NS	SO-28
27C256-90	256K OTP CEPROM 90NS	PLCC-32
27C256-90	256K S.O. CEPROM 90NS	SO-28
27C256I12	256K OTP - INDUSTRIAL TEMP	PLCC-32
27C256I12	256K S.O.-INDUSTRIAL TEMP	SO-28
27C256I15	256K OTP - INDUSTRIAL TEMP	PLCC-32
27C256I15	256K S.O. EPROM INDUSTRIAL TEM	SO-28
27C256I20	256K OTP - INDUSTRIAL TEMP	PLCC-32
27C256I20	256K S.O. EPROM INDUSTRIAL TEM	SO-28
27C512-12	512K OTP CEPROM 64X8 120 NS	PLCC-32
27C512-12	512K S.O. CEPROM 120NS	SO-28
27C512-15	512K OTP CEPROM 64X8 150 NS	PLCC-32
27C512-15	512K SO EPRM 64KX8 150NS	SO-28
27C512-20	512K OTP CEPROM 64X8 200 NS	PLCC-32
27C512-20	512K S.O. CEPROM 200NS	SO-28
27C512-90	512K OTP CEPROM 90NS	PLCC-32
27C512-90	512K S.O. CEPROM 90NS	SO-28
27C512I12	512K OTP-INDUSTRIAL TEMP	PLCC-32
27C512I12	512K S.O. CEPROM-IND TEMP.	SO-28
27C512I15	512K PLCC CEPROM-IND TEMP.	PLCC-32
27C512I15	512K S.O. CEPROM-IND TEMP.	SO-28
27C512I20	512K OTP - INDUSTRIAL TEMP	PLCC-32
27C512I20	512K S.O. CEPROM-IND TEMP.	SO-28
27C64A-12	64K O.T.P CEPROM (8KX8) 120NS	PLCC-32
27C64A-15	64K O.T.P CEPROM (8KX8) 150NS	PLCC-32
27C64A-20	64K O.T.P. CEPROM (8KX8) 200NS	PLCC-32
27C64AI12	64K OTP INDUSTRIAL TEMP 120NS	PLCC-32
27C64AI15	64K OTP - INDUSTRIAL TEMP	PLCC-32
27C64AI20	64K OTP - INDUSTRIAL TEMP	PLCC-32
27HC641-45	64K PLCC EPROM (8KX8) 45NS	PLCC-28
27HC641-55	64K PLCC EPROM (8KX8) 45NS	PLCC-28
74ABT125	QUAD BUFFER 3-STATE	SO-14
74ABT126	QUAD BUFFER 3-STATE	SO-14
74ABT240	OCT BUFFER INVERTING 3-STATE	SO-20
74ABT240	OCT BUFFER INVERTING 3-STATE	SO-20
74ABT240-1	INV BUFFER W/OUTPUT SERIES RES	PLCC-20
74ABT240-1	INV BUFFER W/OUTPUT SERIES RES	SO-20
74ABT240-1	INV BUFFER W/OUTPUT SERIES RES	SO-20
74ABT241	OCTAL BUFFER/LINE DRIVER 3-S	SO-20
74ABT241	OCTAL BUFFER/LINE DRIVER 3-S	SO-20

Commercial Products Available in SMD

74ABT244	OCTAL BUFFER/LINE DRIV(3-STATE	SO-20
74ABT244	OCTAL BUFFER/LINE DRIVER 3-S	SO-20
74ABT244-1	BUFFER/DRVR W/OUTPT SERIES RES	SO-20
74ABT244-1	BUFFER/DRVR W/OUTPUT SERIES RE	SO-20
74ABT245	OCTAL TRANSVER W/DIRECT PN(3ST	SO-20
74ABT245	OCTAL TRANSVER W/DIRECT PN 3S	SO-20
74ABT273	OCTAL D-TYPE FLIP-FLOP	SO-20
74ABT273	OCTAL D-TYPE FLIP-FLOP	SO-20
74ABT2952	OCTAL REGISTERED XCVR, 3 STATE	SO-24
74ABT2952	OCTAL REGISTERED XCVR, 3STATE	SO-24
74ABT2953	OCTAL REGISTERED XCVR INV 3-S	SO-24
74ABT2953	OCTAL REGISTERED XCVR, INV 3-S	SO-24
74ABT373	D-TYPE TRANSPARENT LATCH 3-S	SO-20
74ABT373	D-TYPE TRANSPARENT LATCH 3-S	SO-20
74ABT374	OCT D-TYP F/F POS EDGE TRIG3ST	SO-20
74ABT374	OCT D-TYP F/F POS EDGE TRIG 3S	SO-20
74ABT377	OCT D-TYPE FLIP-FLOP W/ENABLE	SO-20
74ABT377	OCT D-TYPE FLIP-FLOP W/ENABLE	SO-20
74ABT534	OCTAL D F/F 3-STATE INVERTER	SO-20
74ABT540	OCT BUFFER INVERTING 3-STATE	SO-20
74ABT540	OCTAL BUFFER INVERTING 3-S	SO-20
74ABT541	OCTAL BUFFER/LINE DRIVER 3-S	SO-20
74ABT541	OCTAL BUFFER/LINE DRIVER 3-S	SO-20
74ABT543	OCTAL LATCHED XCVR 3 STATE	SO-24
74ABT543	OCTAL LATCHED XCVR 3-STATE	SO-24
74ABT544	OCTAL LATCHD XCVR,INV, 3-STATE	SO-24
74ABT544	OCTAL LATCHED XCVR, INV, 3-ST	SO-24
74ABT573	D-TYPE TRANSPARENT LATCH 3-S	SO-20
74ABT573	D-TYPE TRANSPARENT LATCH 3-S	SO-20
74ABT574	OCTAL D FLIP-FLOP 3-STATE	SO-20
74ABT574	OCTAL D FLIP/FLOP 3-STATE	SO-20
74ABT620	OCT TRANSCEIVER INVERTING 3-ST	SO-20
74ABT620	OCT TRANSCEIVER INVERTING 3-S	SO-20
74ABT623	OCT XCVR W/DUAL ENABLE INV 3-S	SO-20
74ABT623	OCT XCVR W/DUAL ENABLE INV 3-S	SO-20
74ABT640	XCVR W/DIRECTION PIN, INV 3-S	SO-20
74ABT640	XCVR W/DIRECTION, PIN, INV 3-S	SO-20
74ABT646	OCTAL REGISTERED XCVR 3 STATE	SO-24
74ABT646	OCTAL REGISTERED XCVR, 3-STATE	SO-24
74ABT648	OCTAL REGISTERD XCVR,INV 3-STA	SO-24
74ABT648	OCTAL REGISTERED XCVR, INV, 3-S	SO-24
74ABT652	OCTAL REIGSTERED XCVR 3 STATE	SO-24
74ABT652	OCTAL REGISTERED XCVR, 3-STATE	SO-24
74ABT657	OCTAL XCVR W/PARITY GEN. CHK.	SO-24
74ABT657	OCTAL XCVR W/PARITY GEN CHK	SO-24
74ABT821	10-BIT D-TYPE F/F 3-S	SO-24
74ABT821	10-BIT D-TYPE F/F 3-S	SO-24
74ABT823	9-BIT D-TYPE F/F 3-STATE	SO-24
74ABT823	9-BIT D-TYPE F/F 3-STATE	SO-24
74ABT827	10-BIT BUFFER/LINE DRIVER NINV	SO-24
74ABT827	10-BIT BUFFER LINE DRIVER NINV	SO-24

Commercial Products Available in SMD

74ABT827-1	BUFFR/DRVR W/OUTPUT SERIES RES	SO-24
74ABT827-1	BUFFR/DRVR W/OUTPUT SERIES RES	SO-24
74ABT833	XCVR W/PARITY GENERATR/CHECKER	SO-24
74ABT833	XCVR W/PARITY GENERATR/CHECKER	SO-24
74ABT841	10-BIT BUS INTERFACE LATCH 3-S	SO-24
74ABT841	10-BIT BUS INTERFACE LATCH 3-S	SO-24
74ABT843	9-BIT BUS INTER LTCH SET/RESET	SO-24
74ABT843	9-BIT BUS INTER LTCH SET/RESET	SO-24
74ABT853	8-BIT LATCH XCVR W/PARITY 3-S	SO-24
74ABT853	8-BIT LATCH XCVR W/PARITY 3-S	SO-24
74ABT861	10-BIT TRANSCEIVER 3-STATE	SO-24
74ABT861	10-BIT BUS XCVR 3-S	SO-24
74ABT863	9-BIT TRANSCEIVER, 3-STATE	SO-24
74ABT863	9-BIT TRANSCEIVER, 3-STATE	SO-24
74ABT899	9-BIT LATCH XCVR W/PARITY 3-S	PLCC-28
74ABT899	9-BIT LATCH XCVR W/PARITY 3-S	SO-28
74HCT00	QUAD 2-INPUT NAND GATE	SO-14
74HCT02	QUAD 2-INPUT NOR GATE	SO-14
74HCT03	QUAD 2-INPUT AND GATE	SO-14
74HCT04	HEX INVERTER	SO-14
74HCT08	QUAD 2-INPUT AND GATE	SO-14
74HCT10	TRIPLE 3-INPUT NAND GATE	SO-14
74HCT107	DUAL J-K NEG EDGE F/F	SO-14
74HCT109	DUAL J-K POS EDGE F/F	SO-16
74HCT11	TRIPLE 3-INPUT AND GATE	SO-14
74HCT112	DUAL J-K NEG EDGE F/F	SO-16
74HCT123	DUAL RETRIG MONOSTABLE MULTI	SO-16
74HCT125	QUAD 3-STATE BUS BUFFER	SO-14
74HCT126	QUAD 3-STATE BUS BUFFER	SO-14
74HCT132	QUAD 2-INPUT NAND SCHMITT TRIG	SO-14
74HCT137	3 TO 8 LINE DECODER/DEMUX	SO-16
74HCT138	1-OF-8 DECODER DEMULTIPLEXER	SO-16
74HCT139	DUAL 1 OF 4 DECOD/DEMUX	SO-16
74HCT14	HEX SCHMITT TRIGGER	SO-14
74HCT147	10-TO-4 LINE PRIORITY ENCODER	SO-16
74HCT151	8-INPUT MULTIPLEXER	SO-16
74HCT153	DUAL 4-INPUT MULTIPLEXER	SO-16
74HCT154	1 OF 16 DECOD/DEMUX	SO-24
74HCT157	QUAD 2-INPUT MULTIPLEXER	SO-16
74HCT158	QUAD 2-INPUT MUX,INVERTING	SO-16
74HCT160	SYNC. 4-BIT DECADE COUNTER	SO-16
74HCT161	4-BIT BINARY COUNTER	SO-16
74HCT162	SYNC. 4-BIT DECADE COUNTER	SO-16
74HCT163	SYNC. 4-BIT BINARY COUNTER	SO-16
74HCT164	8-BIT SIPO S/R	SO-14
74HCT165	PARALLEL-LOAD 8-BIT S/R	SO-16
74HCT166	8-BIT PISO SHIFT REGISTER	SO-16
74HCT173	QUAD 3-STATE D-TYPE F/F	SO-16
74HCT174	HEX D-TYPE F/F WITH CLEAR	SO-16
74HCT175	QUAD D-TYPE EDGE TRIGGER F/F	SO-16
74HCT181	4-BIT ARITHMETIC LOGIC UNIT	SO-24

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74HCT182	CARRY LOOK-AHEAD GENERATOR	SO-16
74HCT190	BCD SYNC DECADE UP/DOWN COUNTR	SO-16
74HCT191	SYNC BINARY UP/DOWN COUNTER	SO-16
74HCT192	SYNC DECADE UP/DOWN COUNTER	SO-16
74HCT193	4-BIT BINARY UP/DOWN COUNTER	SO-16
74HCT194	4-BIT BIDIRECTIONAL S/R	SO-16
74HCT195	4-BIT PARALLEL S/R	SO-16
74HCT20	DUAL 4-INPUT NAND GATE	SO-14
74HCT21	DUAL 4-INPUT AND GATE	SO-14
74HCT221	DUAL MONOSTABE MULTIVIBRATOR	SO-16
74HCT237	3-TO-8 L. DECOD/DEMULT W/A LAT	SO-16
74HCT238	1-TO-8 DECODER DEMULTIPLEXER	SO-16
74HCT240	OCTAL 3-STATE BUFFER, INV	SO-20
74HCT241	OCTAL 3-STATE BUFFER	SO-20
74HCT242	QUAD BUS TRANSCEIVER	SO-14
74HCT243	QUAD BUS TRANSCEIVER	SO-14
74HCT244	OCTAL 3-STATE DRIVER	SO-20
74HCT245	OCTAL TRANSCEIVER 3-STATE	SO-20
74HCT251	8-INPUT MUX, 3-STATE	SO-16
74HCT253	DUAL 4 TO 1 DATA SELECTOR/MUX	SO-16
74HCT257	QUAD 2-INPUT MULTIPLEXER	SO-16
74HCT258	QUAD 2 TO 1 MUX 3-STATE	SO-16
74HCT259	8-BIT ADDRESSABLE LATCH	SO-16
74HCT27	TRIPLE 3-INPUT NOR GATE	SO-14
74HCT273	QUAD D-TYPE FLIP-FLOP	SO-20
74HCT280	9-BIT ODD/EVEN PAR GEN/CHECKER	SO-14
74HCT283	4-BIT ADDER	SO-16
74HCT297	DIG PHASE-LOCKED LOOP FILTER	SOL-16
74HCT299	8-BIT UNIVERSAL SHIFT REG 3-S	SO-20
74HCT30	8-INPUT NAND GATE	SO-14
74HCT32	QUAD 2-INPUT OR GATE	SO-14
74HCT354	8-BIT MULTIPLEXER/REG, 3-STATE	SO-20
74HCT356	8-BIT MULTIPLEXER/REG, 3-STATE	SO-20
74HCT365	HEX BUFFER W/COMMON ENABLE 3-S	SO-16
74HCT366	HEX INVERT W/COMMON ENABLE 3-S	SO-16
74HCT367	HEX BUFFER, 4-BIT & 2-BIT 3-S	SO-16
74HCT368	HEX INVERT, 4-BIT & 2-BIT 3-S	SO-16
74HCT373	OCTAL 3-STATE LATCH	SO-20
74HCT374	OCTAL D F/F 3-STATE	SO-20
74HCT377	OCTAL D F/F WITH ENABLE	SO-20
74HCT390	DUAL DECADE RIPPLE COUNTER	SO-16
74HCT393	DUAL BINARY RIPPLE COUNTER	SO-14
74HCT4002	DUAL 4-INPUT NOR GATE	SO-14
74HCT40102	8-BIT SYNC BCD DOWN COUNTER	SO-16
74HCT40103	8-BIT BINARY DOWN COUNTER	SO-16
74HCT40104	4-BIT BIDRECT UNIV SHFT RGSTR	SO-16
74HCT40105	4-BIT X 16-WORD FIFO REGISTER	SO-16
74HCT4015	DUAL 4-BIT SHIFT REGISTER	SO-16
74HCT4016	QUAD BILATERAL SWITCH	SO-14
74HCT4017	JOHNSON COUNTER W/10 OUTPUTS	SO-16
74HCT4020	14-STAGE BINARY COUNTER	SO-16

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74HCT4024	7-STAGE BINARY RIPPLE COUNTER	SO-14
74HCT4040	12-STAGE BINARY COUNTER	SO-16
74HCT4046A	PHASE-LOCKED LOOP W/VCO	SO-16
74HCT4051	8-CHANNEL MUX/DEMUX	SO-16
74HCT4052	DUAL 4-CHANNEL ANALOG MUX/DMUX	SO-16
74HCT4053	TRIPLE 2-CHANNEL MUX/DEMUX	SO-16
74HCT4059	PROGRMBL DIVIDE-BY-N COUNTER	SO-24
74HCT4060	14-STAGE RC BINARY COUNTER	SO-16
74HCT4066	QUAD BILATERAL SWITCH	SO-14
74HCT4067	16-CHANNEL ANALOG MUX/DEMUX	SO-24
74HCT4075	TRIPLE 3-INPUT OR GATE	SO-14
74HCT4094	8-STAGE SHIFT-&-STORE BUS REG	SO-16
74HCT42	BCD-TO-DECIMAL DECODER	SO-16
74HCT423	DUAL RETRIG MONOSTABLE MULTI	SO-16
74HCT4316	QUAD BILATERAL SWITCH	SO-16
74HCT4351	8-CHANNEL ANALOG MUX/DEMUX	SO-20
74HCT4352	DUAL 4-CHAN MULTI/DEMUL W/LAT	SO-20
74HCT4353	TRIPLE 2-CHANNEL MUX/DEMUX	SO-20
74HCT4514	4-16 DECODER/MUX W/LATCHES	SO-24
74HCT4515	4-16 DECODER/MUX W/LATCHES	SO-24
74HCT4516	BINARY UP/DOWN COUNTER	SO-16
74HCT4520	DUAL BINARY COUNTER	SO-16
74HCT4538	DUAL MONOSTABLE MULTIVIBRATOR	SO-16
74HCT4543	BCD TO 7 SEG LATCH/DECODR/DEVR	SO-16
74HCT533	OCTAL 3-STATE LATCH INVERTING	SO-20
74HCT534	OCTAL D F/F INV, 3-STATE	SO-20
74HCT540	OCTAL INV BUFFER, 3-STATE	SO-20
74HCT541	OCTAL BUFFER, 3-STATE	SO-20
74HCT5555	PROG DELAY TIMER W/SCH.TRIGGER	SO-16
74HCT563	OCTAL 3-STATE TRANS LATCH INV	SO-20
74HCT564	OCTAL D-TYPE F/F, 3-STATE	SO-20
74HCT573	OCTAL 3-STATE TRANS LATCH	SO-20
74HCT574	OCTAL D-TYPE F/F POS EDGE 3-S	SO-20
74HCT595	8-BIT SHIFT REG W/OUTPUT LTCH	SO-16
74HCT597	8-BIT SHIFT REG W/INPUT LATCH	SO-16
74HCT6323A	PROGRAMBL RIPPLE CNTR W/OSC 3S	SO-8
74HCT640	OCT 3-STATE TRANSCEIVER, INV	SO-20
74HCT646	OCTAL TRAN/REGISTER 3-STATE	SO-24
74HCT648	OCT INVERT TRAN/REGISTER 3-S	SO-24
74HCT670	4X4 REGISTER FILE, 3-STATE	SO-16
74HCT688	8-BIT MAGNITUDE COMPARATOR	SO-20
74HCT7030	64 WORD X 9-BIT FIFO	SO-28
74HCT7046A	PHASED-LOCKED LOOP W/LOCK DTCT	SO-16
74HCT7174	HEX D-TYPE F/F W/CLEAR	SO-16
74HCT7245	OCT SCHMITT-TRIGGER XCVR 3-S	SO-20
74HCT7273	OCTAL D FLIP-FLOP	SO-20
74HCT73	DUAL J-K MASTER SLAVE F/F	SO-14
74HCT74	DUAL D-TYPE EDGE TRIGGER F/F	SO-14
74HCT7403	4-BIT X64 WORD FIFO REG 3-ST	SO-16
74HCT75	4-BIT BISTABLE LATCH	SO-16
74HCT7540	OCT SCHM TRIG BUF/LINE DR INV	SO-20

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74HCT7541	OCT SCHM TRIG BUF/LINE N/INV	SO-20
74HCT7597	8-BIT SHIFT REGISTER W/LATCHES	SO-16
74HCT7731	QUAD 64-BIT STATK SHIFT RGST	SO-16
74HCT85	4-BIT MAGNITUDE COMPARATOR	SO-16
74HCT86	QUAD 2-INPUT EXCLUSIVE-OR GATE	SO-14
74HCT9014	NINE WIDE BUFFER W/SCH TRIGGER	SO-20
74HCT9015	NINE WIDE BUFFER W/SCH TRIGGER	SO-20
74HCT9114	NINE WIDE BUFFER W/SCH TRIGGER	SO-20
74HCT9115	NINE WIDE BUFFER W/SCH TRIGGER	SO-20
74HCT93	4-BIT BINARY COUNTER	SO-14
74HCU04	HEX INVERTER	SO-14
74HC00	QUAD 2-INPUT NAND GATE	SO-14
74HC02	QUAD 2-INPUT NOR GATE	SO-14
74HC03	QUAD 2-INPUT AND GATE	SO-14
74HC04	HEX INVERTER	SO-14
74HC08	QUAD 2-INPUT AND GATE	SO-14
74HC10	TRIPLE 3-INPUT NAND GATE	SO-14
74HC107	DUAL J-K F/F W/NEG-EDGE TRIG	SO-14
74HC109	DUAL J-K POS EDGE F/F	SO-16
74HC11	TRIPLE 3-INPUT AND GATE	SO-14
74HC112	DUAL J-K NEG EDGE F/F	SO-16
74HC123	DUAL RETRIG MONO MULTIVIBRATOR	SO-16
74HC125	QUAD 3-STATE BUS BUFFER	SO-14
74HC126	QUAD 3-STATE BUS BUFFER	SO-14
74HC132	QUAD 2-INPUT NAND SCHMITT TRIG	SO-14
74HC137	3 TO 8 LINE DECODER/DEMUX	SO-16
74HC138	1-OF-8 DECODER/DEMUX	SO-16
74HC139	DUAL 1 OF 4 DECOD/DEMUX	SO-16
74HC14	HEX SCHMITT TRIGGER	SO-14
74HC147	10-TO-4 LINE PRIORITY ENCODER	SO-16
74HC151	8-INPUT MULTIPLEXER	SO-16
74HC153	DUAL 4-INPUT MULTIPLEXER	SO-16
74HC154	1 OF 16 DECOD/DEMUX	SO-24
74HC157	QUAD 2-INPUT MULTIPLEXER	SO-16
74HC158	QUAD 2-INPUT MUX INVERTING	SO-16
74HC160	SYNC. 4-BIT DECADE COUNTER	SO-16
74HC161	4-BIT BINARY COUNTER	SO-16
74HC162	SYNC. 4-BIT DECADE COUNTER	SO-16
74HC163	SYNC. 4-BIT BINARY COUNTER	SO-16
74HC164	8-BIT SIPO S/R	SO-14
74HC165	PARALLEL LOAD 8-BIT S/R	SO-16
74HC166	8-BIT PISO SHIFT REGISTER	SO-16
74HC173	DUAL AND/OR GATE	SO-16
74HC174	HEX D-TYPE F/F WITH CLEAR	SO-16
74HC175	QUAD D-TYPE EDGE TRIGGERED F/F	SO-16
74HC190	BCD SYNC DECADE UP/DOWN COUNTR	SO-16
74HC191	SYNC BINARY UP/DOWN COUNTER	SO-16
74HC192	SYNC DECADE UP/DOWN COUNTER	SO-16
74HC193	4-BIT BINARY UP/DOWN COUNTER	SO-16
74HC194	4-BIT BIDIRECTIONAL S/R	SO-16
74HC195	4-BIT UNIVERSAL S/R	SO-16

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74HC20	DUAL 4-INPUT NAND GATE	SO-14
74HC21	DUAL 4-INPUT AND GATE	SO-14
74HC221	DUAL MONOSTABLE MULTIVIBRATOR	SO-16
74HC237	3-TO-8 LNE DEC/DEMULTI	SO-16
74HC238	1-OF- DEC/DEMULTI; TRUE/INV	SO-16
74HC240	OCTAL 3-STATE BUFFER INV	SO-20
74HC241	OCTAL 3-STATE BUFFER	SO-20
74HC243	QUAD BUS TRANSCEIVER	SO-14
74HC244	OCTAL 3-STATE DRIVER	SO-20
74HC245	OCTAL TRANSCEIVER 3-STATE	SO-20
74HC251	8-INPUT MUX 3-STATE	SO-16
74HC257	QUAD 2-IN MULTIPLEX; 3-STATE	SO-16
74HC259	8-BIT ADDRESSABLE LATCH	SO-16
74HC27	TRIPLE 3-INPUT NOR GATE	SO-14
74HC273	OCTAL D F/F W/POS EDGE TRIG	SO-20
74HC280	9 BIT ODD/EVEN PAR GEN/CHECKER	SO-14
74HC283	4-BIT ADDER	SO-16
74HC297	DIG PHASE LOCKED LOOP FILTER	SOL-16
74HC299	8-BIT UNIVERSAL SHIFT REG 3-S	SO-20
74HC30	8-INPUT NAND GATE	SO-14
74HC32	GUAD 2-INPUT OR GATE	SO-14
74HC354	8-BIT MULTIPLEXER/REG, 3-STATE	SO-20
74HC356	8-BIT MULTIPLEXER/REG, 3-STATE	SO-20
74HC365	HEX BUFFER W/COMMON ENABLE 3-S	SO-16
74HC367	HEX-BUFFER, 4-BIT & 2-BIT, 3-S	SO-16
74HC368	HEX INVERT, 4-BIT & 2-BIT, 3-S	SO-16
74HC373	OCTAL 3-STATE LATCH	SO-20
74HC374	OCTAL D F/F 3-STATE	SO-20
74HC377	OCTAL D F/F W/ENABLE	SO-20
74HC390	DUAL DECADE RIPPLE COUNTER	SO-16
74HC393	DUAL BINARY RIPPLE COUNTER	SO-14
74HC4002	DUAL 4-INPUT NOR GATE	SO-14
74HC40102	8-BIT SYNC BCD DOWN COUNTER	SO-16
74HC40103	8-BIT BINARY DOWN COUNTER	SO-16
74HC40105	4-BIT X 16-WORD FIFO REGISTER	SO-16
74HC4015	DUAL 4-BIT SHIFT REGISTER	SO-16
74HC4016	QUAD BILATERAL SWITCH	SO-14
74HC4017	JOHNSON COUNTER W/10 OUTPUTS	SO-16
74HC4020	14 STAGE BINARY COUNTER	SO-16
74HC4024	7-STAGE BINARY RIPPLE COUNTER	SO-14
74HC4040	12-STAGE BINARY COUNTER	SO-16
74HC4046A	PHASE LOCKED LOOP W/VCO	SO-16
74HC4049	HEX INVERTING BUFFER	SO-16
74HC4050	HEX NON-INVERTING BUFFER	SO-16
74HC4051	8-CHANNEL MUX/DEMUX	SO-16
74HC4052	DUAL 4-CHANNEL ANALOG MUX/DMUX	SO-16
74HC4053	TRIPLE 2-CHANNEL MUX/DEMUX	SO-16
74HC4059	PROGRMBL DIVIDE-BY-N COUNTER	SO-24
74HC4060	14 STG RC BINARY COUNTER	SO-16
74HC4066	QUAD BILATERAL SWITCH	SO-14
74HC4067	16-CHANNEL ANALOG MUX/DEMUX	SO-24

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74HC4075	TRIPLE 3-INPUT OR GATE	SO-14
74HC4094	8-STAGE SHIFT & STORE BUS REG	SO-16
74HC423	DUAL RETRIG MONO MULTIVIBRATOR	SO-16
74HC4316	QUAD BILATERAL SWITCH	SO-16
74HC4351	8-CHANNEL ANALOG MUX-DEMUX	SO-20
74HC4510	BCD UP/DOWN COUNTER	SO-16
74HC4511	BCD TO 7-SEG LATCH DECODR/DRVR	SO-16
74HC4514	4-16 DECODER/MUX W/LATCHES	SO-24
74HC4515	4-16 DECODER/MUX W/LATCHES	SO-24
74HC4516	BINARY UP/DOWN COUNTER	SO-16
74HC4518	DUAL BCD COUNTER	SO-16
74HC4520	DUAL BINARY COUNTER	SO-16
74HC4538	DUAL MONOSTABLE MULTIVIBRATOR	SO-16
74HC4543	BCD TO 7-SEG LATCH DECODR/DRVR	SO-16
74HC533	OCTAL 3-STATE LATCH INVERTING	SO-20
74HC534	OCTAL D F/F INV 3-STATE	SO-20
74HC540	OCTAL INV BUFFER, 3-STATE	SO-20
74HC541	OCTAL BUFFER, 3-STATE	SO-20
74HC563	OCTAL 3-STATE TRANS LATCH,INV	SO-20
74HC564	OCTAL D-TYPE F/F, 3-STATE	SO-20
74HC573	OCTAL 3-STATE TRANS LATCH,INV	SO-20
74HC574	OCTAL D-TYPE F/F POS EDGE 3-S	SO-20
74HC58	DUAL AND/OR GATE	SO-14
74HC595	8-BIT SHIFT REG W/OUTPUT LATCH	SO-16
74HC597	8-BIT SHIFT REG W/INPUT LATCH	SO-16
74HC6323A	PROGRAMBL RIPPLE CNTR W/OSC 3S	SO-8
74HC640	OCTAL 3-STATE TRANSCEIVER,INV	SO-20
74HC643	OCTAL TRUE/INV TRANS 3-STATE	SO-20
74HC646	OCTAL TRAN/REGISTER	SO-24
74HC670	4X4 REGISTER FILE 3-STATE	SO-16
74HC688	8-BIT MAGNITUDE COMPARATOR	SO-20
74HC7030	64 WORD X 9-BIT FIFO	SO-28
74HC7046A	PHASED-LOCKED LOOP W/LOCK	SO-16
74HC7245	OCT SCHMITT-TRIGGER XCVR 3-S	SO-20
74HC7266	QUAD 2-INPUT EXCLUSIVE-NOR GAT	SO-14
74HC73	DUAL J-K MASTER SLAVE F/F	SO-14
74HC74	DUAL D-TYPE EDGE TRIGGER F/F	SO-14
74HC7403	4-BIT X64 WORD FIFO REG 3-ST	SO-16
74HC75	4-BIT BISTABLE LATCH	SO-16
74HC7540	OCT SCHM TRIG BUF/LINE DR INV	SO-20
74HC7541	OCT SCHM TRIG BUF/LINE N/INV	SO-20
74HC7597	8-BIT SHIFT REGISTER W/LATCHES	SO-16
74HC7731	QUAD 64-BIT STATIC SHIFT RGST	SO-16
74HC85	4-BIT MAGNITUDE COMPARATOR	SO-16
74HC86	QUAD 2-INPUT EXCLUSIVE-OR GATE	SO-14
74HC9014	NINE WIDE BUFFER W/SCH TRIGGER	SO-20
74HC9114	NINE WIDE BUFFER W/SCH TRIGGER	SO-20
74HC9115	NINE WIDE BUFFER W/SCH TRIGGER	SO-20
74HC93	4-BIT BINARY COUNTER	SO-14
74LVU04	HEX INVERTER	SO-14
74LV00	QUAD 2-INPUT NAND GATE 3VOLT	SO-14

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74LV02	QUAD 2-INPUT NOR GATE 3-VOLT	SO-14
74LV04	HEX INVERTER 3-VOLT	SO-14
74LV08	QUAD 2-INPUT AND GATE 3-VOLT	SO-14
74LV125	QUAD BUFR/DRVR OE ACTIVE LOW	SO-14
74LV138	3TO8 LINE DECODER/DEMLTIPLXR	SO-16
74LV244	BUFR/DRVR, 3-S OE ACTIVE LOW	SO-20
74LV245	OCT BUS XCVR 3-STATE	SO-20
74LV32	QUAD 2-INPUT OR GATE	SO-14
74LV373	OCT D-TYPE TRANSPARNT LATCH 3S	SO-20
74LV374	OCT D F/F POS EDGE TRIGGER 3S	SO-20
74LV573	OCT D LATCH, 3-S FLOW-THRM	SO-20
74LV74	DUAL D F/F EDGE TRIGGER	SO-14

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PAL DEVICE PLDs

Numeric	AMD	Texas Instruments	Philips
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20L8	PAL20L8-10JC	TIBPAL20L8-10CFN	PLUS20L8DA
20L8	PAL20L8-7PC	TIBPAL20L8-7CN	PLUS20L8-7N
20L8	PAL20L8-7JC	TIBPAL0L8-7CFN	PLUS20L8-7A
20R8	PAL20R8-10PC	TIBPAL20R8-10CN	PLUS20R8DN
20R8	PAL20R8-10JC	TIBPAL20R8-10CFN	PLUS20R8DA
20R8	PAL20R8-7PC	TIBPAL20R8-7CN	PLUS20R8-7N
2048	PAL20R8-7JC	TIBPAL20R8-7CFN	PLUS20R8-7A
20R6	PAL20R6-10PC	TIBPAL20R6-10CN	PLUS20R6DN
20R6	PAL20R6-10JC	TIBPAL20R6-10CFN	PLUS20R6DA
20R6	PAL20R6-7PC	TIBPAL20R6-7CN	PLUS20R6-7N
20R6	PAL20R6-7JC	TIBPAL20R6-7CFN	PLUS20R6-7A
20R4	PAL20R4-10PC	TIBPAL20R4-10CN	PLUS20R4DN
20R4	PAL20R4-10JC	TIBPAL20R4-10CFN	PLUS20R4DA
20R4	PAL20R4-7PC	TIBPAL20R4-7CN	PLUS20R4-7N
20R4	PAL20R4-7JC	TIBPAL20R4-7CFN	PLUS20R4-7A
16L8	PAL16L8DCN	TIBPAL16L8-10CN	PLUS16L8DN
16L8	PAL16L8DCNL	TIBPAL16L8-10CFN	PLUS16L8DA
16L8	PAL16L8-7PC	TIBPAL16L8-7CN	PLUS16L8-7N
16L8	PAL16L8-7JC	TIBPAL16L8-7CFN	PLUS16L8-7A
16R8	PAL16R8DCN	TIBPAL16R8-10CN	PLUS16R8DN
16R8	PAL16R8DCNL	TIBPAL16R8-10CFN	PLUS16R8DA
16R8	PAL16R8-7PC	TIBPAL16R8-7CN	PLUS16R8-7N
16R8	PAL16R8-7JC	TIBPAL16R8-7CFN	PLUS16R8-7A
16R6	PAL16R6DCN	TIBPAL16R6-10CN	PLUS16R6DN
16R6	PAL16R6DCNL	TIBPAL16R6-10CFN	PLUS16R6DA
16R6	PAL16R6-7PC	TIBPAL16R6-7CN	PLUS16R6-7N
16R6	PAL16R6-7JC	TIBPAL16R6-7CFN	PLUS16R6-7A
16R4	PAL16R4DCN	TIBPAL16R4-10CN	PLUS16R4DN
16R4	PAL16R4DCNL	TIBPAL16R4-10CFN	PLUS16R4DA
16R4	PAL16R4-PC	TIBPAL16R4-7CN	PLUS16R4-7N
16R4	PAL16R4-JC	TIBPAL16R4-7CFN	PLUS16R4-7A
16N8	–	TIBPAD16N8-7C	PHD16N8-5N
		TIBPAD16N8-7CFN	PHD16N8-5A

UNIVERSAL PAL DEVICE PLDs

Numeric	AMD CMOS	AMD Bipolar	Cypress	Lattice	ICT	TI	Philips
22V10-10		PAL22V10-10PC	PAL22V10C-10PC	GAL22V10B-10P	PEEL22CV10A-10P		PL22V10-10N
22V10-10		PAL22V10-10JC	PAL22V10C-10JC	GAL22V10B-10J	PEEL22CV10A-10J		PL22V10-10A
22V10-12			PAL22V10C-12PC		PEEL22CV10A-12P		PL22V10-12N
22V10-12			PAL22V10C-12JC		PEEL22CV10A-12J		PL22V10-12A
22V10-15	PALCE22V10H-15PC	PAL22V10-15PC	PALC22V10B-15PC	GAL22V10B-15P GAL22V10-15P	PEEL22CV10A-15P	TIBPAL22V10-15CNT	PL22V10-15N
22V10-15	PALCE22V10H-15JC	PAL22V10-15JC	PALC22V10B-15JC	GAL22V10B-15J GAL22V10-15J	PEEL22CV10A-15J	TIBPAL22V10-15CFN	PL22V10-15A

PAL Devices/PLDs Packaging	AMD	Texas Instruments	Philips
DIP Molded (DIL)	P	N	N
DIP Molded (300mil) (DIL)	N3	N3	N3
Plastic Leaded Chip Carrier (PLCC)	J	F	A
Hermetic CERDIP (DIL)	D	–	F

Competitive Cross Reference Guide

Bipolar PROMs

Size (Bits)	Organization	PHILIPS		AMD		MMI		FUJTSU	
		P/N	TAA	P/N	TAA	P/N	TAA	P/N	TAA
256	32x8(OC)	N82S23 N82S23A	50 25	AM27S18 AM27S18A	40 25	63S080	25	MB711L MB711E MB711H	50 35 25
256	32x8(TS)	N82S123 N82S123A	50 25	AM27S19 AM27S19A	40 25	63S08I	25	MB7112L MB7112E MB7112H	50 35 25
1K	256x4(IOK ECL)	10149 Δ 10149A	20 10						
1K	256x4(IOOK ECL)	100149 Δ 100149A	20 10						
1K	256x4(OC)	N82S126 N82S126A	50 30	AM27S20 AM27S20A	45 30	63S140	45	MB7113L MB7113E MB7113H	50 40 30
1K	256x4(TS)	N82S129 N82S129A	50 27	AM27S21 AM27S21A	45 30	63S141 63S141A	45 30	MB7114L MB7114E MB7114H	50 40 30
2K	256x8(TS)	Δ N82S135	45			63S281	45	MB7118L MB7118E	60 45
2K	512x4(OC)	N82S130 N82S130A	50 33	AM27S12 AM27S12A	50 30	63S240	45	MB7115L MB7115E MB7115H	70 45 35
2K	512x4(TS)	N82S131 N82S131A	50 30	AM27S13 AM27S13A	50 30	63S241 63S241A	45 35	MB7116L MB7116E MB7116H	60 45 35
4K	51 2x8(TS)	N82S 147 N82S147A N82S147B	60 45 25	AM27S29 AM27S29A	55 35	63S481 63S481A	45 30	MB7124L MB7124E MB7124H MB7124Y	60 45 35 30
4K	51 2x8(TS)	N82S 141 N82S141A	60 45	AM27S31	55				
4K	1Kx4(TS)	N82S137 N82S137A N82S137B	60 45 25	AM27S33 AM27S33A	55 35	63S441 63S441A	45 30	MB7122L MB7122E MB7122H MB7122Y	60 45 35 30
8K	1Kx8(TS)	N82S181 N82S181A N82S181C	70 55 35	AM27S181 AM27S181A	60 35	63S881 63S881A	45 30	MB7132L MB7132E MB7132H MB7132Y	70 55 45 35
8K	IKx8(rS)	Δ N82S183	60						
8K	2Kx4(IS)	N82S185A N82S 1 85B N82S185C	70 50 35	AM27S185 AM27S185A	50 35	63S841 63S841A	50 35	MB7128L MB7128E MB7128H MB7128Y	70 55 45 35
16K	2Kx8(TS)	N82S 191 N82S191A N82S191C	80 55 35	AM27S1(2)91 AM27S1(2)91A	50 35	63S1681 63S1681A	50 35	MB7138E MB7138H MB7138Y	55 45 35
16K	4Kx4(TS)	N82HS195 N82HS195A Δ N82HS195B	45 35 25	AM27S41 AM27S41A	50 35			MB7152 MB7152H MB7152Y	55 45 35
32K	4Kx8(TS)	N82HS321 N82HS321A N82HS321B N82HS321C	45 35 30 25	AM27S43 AM27S43A	55 40	63S3281 63S3281A	45 35	MB7142E MB7142H	65 55
64K	8Kx8(TS)	N82HS641 N82HS641A N82HS641B N82HS641C	55 45 35 25	AM27AS49 AM27AS49A AM27C49	55 40 35			MB7144E MB7144H MB71C44-45 MB71C44-35	65 55 45 35

All Philips PROMs listed are available to MIL spec 883C Level 1.2.1 except those noted with a Δ.

Competitive Cross Reference Guide

NATIONAL		CYPRESS		FAIRCHILD		TI		WAFERSCALE	
P/N	TAA	P/N	TAA	P/N	TAA	P/N	TAA	P/N	TAA
DM74S188 DM74S188A	35 25					18SA030 38A030	40 25		
DM74S288 DM74S288A	35 25					18S030 38030	40 25		
DM74S387 DM74S387A	50 30					24SA10	65		
DM74S287 DM74S287A	50 30					24S10	55		
DM74LS471	60					28L22	70		
DM74S570 DM74S570A	55 45								
DM74S571 DM74S571A DM74S571B	55 45 35								
DM74S472 DM74S472A DM74S472B	60 45 35					28LS2 28LS42	95 60		
DM74S573 DM74S573A DM74S573B	60 45 35					24S41	60		
DM87S181 DM87S181A	55 45	CY7C282-45	45	93Z451 93Z451 A	40 35	28S86A	65		
DM87S185 DM87S185A DM87S185B	55 45 35					24S81	70		
DM87S191 DM87S191A DM87S191B	65 45 35	CY7C291(2)(A)-50 CY7C291(2)(A)-35	50 35	93Z511	45	28S166	70	WS57C191(2)-55 WS57C191(2)-45	55 45
DM87S195A DM87S195B	45 35								
DM87S321	55							WS57C43-70 WS57C43-55	70 55
		CY7C263-45 CY7C263-35	45 35	93Z565 93Z565A 93Z665-35	55 45 35			WS57C49-70 WS57C49-55 WS57C49B-45 WS57C49B-35	70 55 45 35

Competitive Cross Reference Guide

Bipolar PROMs (Continued)

Bipolar PROMs Packaging	AMD	MMI	Fujitsu	National	Philips
DIP Molded	P	N	P	N	N
Small Outline (SO)	–	–	PJ*	M	D
Hermetic CERDIP (DIL)	D	D	C/Z	–	F
Plastic Leaded Chip Carrier (PLCC)	–	–	–	V	A

* Japanese Standard Small Outline SOJ

EEPROMs

Numeric	Description	General Instruments/ Micro Chip Technology	SGS/Thompson	Xicor	Philips
8581	128 x 8-Bit EEPROM	PCD8572 PCD8572I	–	–	PCF8581
8582	256 x 8-Bit EEPROM	PCD8582 PCD8582I	ST24C02	X24C021	PCF8582

EEPROMs Packaging	General Instruments/ Micro Chip Technology	SGS/Thompson	Xicor	Philips
Small Outline (SO)	SO	S	S	TD (SO14)
DIP Molded (DIL)	P	P	P	PN (DIL8)

Standard TTL Logic

Prefix	Texas Instruments	National	Mitsubishi	Motorola	Harris	Toshiba	Philips
74ABT	SN	–	–	–	–	–	No Prefix
74ALS	SN	DM	M	–	–	–	N
74F	SN	DM	M	MC	–	–	N
74HC/HCT	SN	MM	M	MC	CD	TC	No Prefix
4000	–	CD/LH	–	MC	CD	TC	HEF

Standard TTL Logic Packaging	Texas Instruments	National	Mitsubishi	Motorola	Harris	Toshiba	Philips
DIP Molded (DIL)	N	N	P	P	3	P	N
Small Outline (SO)	DW	M	–	D	M	J*	D
Hermetic CERDIP (DIL)	J	D	K	U	I	D	F
Plastic Leaded Chip Carrier (PLCC)	FN	–	–	FN	4P	T	A

* Japanese Standard Small Outline SOJ

FAST (BUS Interface Registers, Buffers, Latches and Transceivers)

AMD	National	Motorola	Mitsubishi	Philips
AM29821	74F821	–	M74F821	N74F821
AM29823	74F823	–	M74F823	N74F823
AM29824	–	–	–	N74F824
AM29825	74F825	–	M74F825	N74F825
AM29827	74F827	MC74F827	–	N74F827
AM29828	74F828	MC74F828	–	N74F828
AM29841	74F841	–	M74F841	N74F841
AM29843	74F843	–	M74F843	N74F843
AM29845	–	–	M74F845	N74F845
AM29861	–	–	–	N74F861
AM29863	–	–	–	N74F863

Competitive Cross Reference Guide

EPROMs

Numeric	Access Time	Org.	National	AMD	Intel	Texas Instruments	NEC	Philips
27C010	200ns	128K × 8	NM27C010Q200	–	–	TMS27C010A-200JL	–	–
			–	–	–	–	–	27C010-20A
			NM27C010V200	–	–	TMS27PC010A-20FML	–	27C010-20N
	150ns	128K × 8	NM27C010Q150	–	–	TMS27C010A-15JL	–	–
			–	–	–	–	–	27C010-15A
			NM27C010V150	–	–	–	–	27C010-15N
27C210	200 ns	64K × 16	NM27C210Q200	AM27C1024-200DC	D27210–200V10	TMS27C210–200JL	µPD27C1024D-20	–
			–	–	–	–	µPD27C1024C-20	27C210-20N
			NM27C210V200	–	N27210–200V10	–	µPD27C1024K-20	27C210-20A
	150 ns	64K × 16	NM27C210Q150	AM27C1024-155DC	D27210-150V10	TMS27C210A-15JL	µPD27C1024D-15	–
			–		–	–	µPD27C1024C-15	27C210-15N
			NM27C210V150		N27210–150V10	–	µPD27C1024K-15	27C210-15A
27C256	200 ns	32K × 8	NM27C256Q200	AM27C256-200DC	D27C256-200V10	TMS27C256-20JL	µPD27C256D-20	–
			NM27C256N200	–	P27C256-200V10	TMS27PC256-2NL	µPD27C256C-20	27C256-20N
			NM27C256V200	–	N27C256-200V10	TMS27PC256-20FML	µPD27C256K-20	27C256-20A
	150 ns	32K × 8	NM27C256Q150	AM27C256-150DC	D27C256-150V10	TMS27C256-15JL	µPD27C256D-15	–
			NM27C256N150	–	P27C256-150V10	TMS27PC256-150NL	µPD27C256C-15	27C256-15N
			–	–	N27C256-150V10	TMS27PC256-15FML	µPD27C256K-15	27C256-15A
	120 ns	32K × 8	NM27C256Q120	AM27C256-120DC	D27C256-120V10	TMS27C256-120JL	–	–
			–	–	P27C256-120V10	–	–	27C256-12N
			–	–	N27C256-120V10	–	–	27C256-12A
27C512	200 ns	64K × 8	NM27C512Q200	AM27C512-200DC	D27C512–200V10	TMS27C512-20JL	µPD27C512D-20	–
			NM27C512N200	–	–	TMS27PC512-2NL	µPD27C512C-20	27C512-20N
			NM27C512V200	–	–	TMS27PC512-2FML	µPD27C512K-20	27C512-20A
	150 ns	64K × 8	NM27C512Q150	AM27C512-150DC	D27C512–150V10	TMS27C512-15JL	µPD27C512D-15	–
			NM27C512N150	–	–	TMS27PC512-150NL	µPD27C512C-15	27C512-15N
			NM27C512V150	–	–	TMS27PC512-150FML	µPD27C512K-20	27C512-15A
	120 ns	64K × 8	NM27C512Q120	AM27C512-120DC	D27C512–120V10	TMS27C512-12JL	–	–
			NM27C512N120	–	–	–		27C512-12N
			NM27C512V120	–	–	TMS27PC512-120FML		27C512-12A
27C64	200 ns	8K × 8	–	AM27C64-200DC	–	–	–	–
			–	AM27C64-200PC	–	–	–	27C64A-20N
			–	–	–	–	–	27C64A-20A
	150 ns	8K × 8	–	AM27C64-150DC	–	–	–	–
			–	–	–	–	–	27C64A-15N
			–	–	–	–	–	27C64A-15A
	120 ns	8K × 8	–	AM27C64-120DC	–	–	–	–
			–	–	–	–	–	27C64A-12N
			–	–	–	–	–	27C64A-12A
Industrial Temperature Range								
27C010	200ns	128K × 8	NM27C010QE200	–	–	TMS27C010A-200JE	–	–
			–	–	–	–	–	27C010I20A
			–	–	–	–	–	27C010I20N
	150ns	128K × 8	NM27C010QE150	–	–	TMS27C010A-150JE	–	–
			–	–	–	–	–	27C010I15A
			–	–	–	–	–	27C010I15N
27C210	200ns	64K × 16	–	–	–	–	–	–
			–	–	–	–	–	27C210I20A
			–	–	–	–	–	27C210I20N
	150ns	64K × 16	NM27C210QE150	–	–	–	–	–
			–	–	–	–	–	27C210I15A
			–	–	–	–	–	27C210I15N
27C256	200 ns	32K × 8	NM27C256QE200	AM27C256-200DI	TD27C256-200V10	TMS27C256-2JE	–	–
			–	–	–	–	–	27C256I-20N
			–	AM27C256-200LI	–	TMS27PC256-2FME	–	27C256I-20A
	150 ns	32K × 8	NM27C256QE150	AM27C256-150DI	–	TMS27C256-15JE	–	–
			–	–	–	–	–	27C256I-15N
			–	AM27C256-150LI	–	–	–	27C256I-15A

Competitive Cross Reference Guide

EPROMs (Continued)

Numeric	Access Time	Org.	National	AMD	Intel	Texas Instruments	NEC	Philips
27C512	200 ns	64K × 8	NM27C512AQE200	AM27C512-200DI	–	TMS27C512-2JE	–	–
			NM27C512ANE200	–	–	TMS27PC512-2NE	–	27C512I-20N
			–	AM27C512-200LI	–	TMS27PC512-2FME	–	27C512I-20A
	150 ns	64K × 8	NM27C512AQE150	AM27C512-15DI	–	–	–	–
			NM27C512ANE150	–	–	–	–	27C512I-15N
			–	AM27C512-15LI	–	–	–	27C512I-20A
27C64	200 ns	8K × 8	NM27C64QE200	AM27C64-200DI	–	–	–	–
			–	–	–	–	–	27C64A-20N
			–	AM27C64-200LI	–	–	–	27C64A-20A
	150ns	8K × 8	NM27C64QE150	AM27C64A-150DI	–	–	–	–
			–	–	–	–	–	27C64A-15N
			–	AM27C64A-150LI	–	–	–	27C64A-15A

EPROMs Packaging	National	AMD	Intel	Texas Instruments	NEC	Philips
Hermetic CERDIP (Quartz Window)	Q	DC	D	JL	D	
Plastic Leaded Chip Carrier (PLCC)	V	PC	N	FM	K	A
DIP Molded (OTP)	N	L	P	NL	C	N

Linear

Numeric	Description	Motorola	National	SGS/ Thompson	Texas Instruments	Others	Philips
DAC-08	8-Bit D/A Converter	DAC-08	DAC-0800 DAC-0801 DAC-0802	–	–	– AMD DAC-08	DAC-08 NE5009 NE5007 NE5008
0803/ 0804	8-Bit A/D Converter	–	ADC0803 ADC0804	–	ADC0803 ADC0804	Intersil ADC0803 ADC0804	ADC0803 ADC0804
0820	8-Bit CMOS A/D Converter	–	ADC0820	–	–	Analog Devices AD7820	ADC0820
124	Quad Op Amp	LM124	LM124	–	LM124	RCA CA124	LM124
13600	High Performance Dual Transcon Amp	–	LM13600/A	–	–	Exar XR13600	NE5517
1408/ 1508	8-Bit D/A Converter	MC1408/ 1508	DAC0806 DAC0807 DAC0808	–	–	Harris HI5618	MC1408-6 MC1408-8 MC1508-8
145406	CMOS RS 232-D Triple Receiver	MC145406	–	–	–	–	MC145406
1458/ 1558	Dual Op Amp	MC1458 MC1558	LM1458 LM1558	MC1458	MC1458	Samsung MC1458	MC1458 MC1558
1496/1596	Balanced Modulator/ Demodulator	MC1496 MC1596	LM1496 LM1596	–	–	Silicon General SG1496	MC1496 MC1596
158	Dual Op Amp	LM158	LM158	LM158	LM158	Intersil CA158	SE532
198	Sample-and-Hold Amp	–	LF198	–	–	AMD LF1998	LF198 SE5537
211	Voltage Comparator	LM211	LM211	–	LM211	Silicon General SG211	LM211
219	Dual Comparator	–	LM219	TDE0119	–	–	LM219
224	Quad Op Amp	LM224	LM224	LM224	LM224	–	LM224 SA534
239	Quad Voltage Comparator	LM239	LM239	–	LM239	RCA CA239	LM239/A
258	Dual Op Amp	LM258	LM258	LM258	LM258	NEC µPC258	LM258 SA532
26LS31	Quad Hi-Speed Line Driver	AM26LS31	DS26LS31	–	AM26LS31	AMD AM26LS31	AM26LS31

Competitive Cross Reference Guide

Linear (Continued)

Numeric	Description	Motorola	National	SGS/ Thompson	Texas Instruments	Others	Philips
26LS32	Quad Hi-Speed Receiver	AM26LS32	DS26LS32	–	AM26L32	AMD AM26LS32	AM26LS32
26LS33	Quad Hi-Speed Receiver	–	–	–	–	AMD AMD26LS33	AM26LS33
2901	Quad Voltage Comparator	LM2901	LM2901	–	LM2901	–	LM2901
2902	Quad Op Amp	LM2902	LM2902	–	LM2902	–	LM2902 SA534
2903	Dual Voltage Comparator	LM2903	LM2903	–	LM2903	–	LM2903
2904	Dual Op Amp	LM2904	LM2904	–	LM2904	–	LM2904
293	Dual Comparator	LM293/A	LM293/A	–	LM293/A	–	LM293
311	Voltage Comparator	LM311	LM311	–	LM311	–	LM311
319	High-Speed Dual Comparator	–	LM319	LM319	–	NEC µPC319	LM319
324	Quad Op Amp	LM324/A	LM324/A	LM324	LM324	Samsung LM324	LM324/A
3302	Quad Voltage Comparator	MC3302	–	–	–	–	MC3302
3361	Low Power FM IF	MC3361	–	–	–	Samsung MC3361	MC3361
339	Quad Voltage Comparator	LM339/A	LM339/A	LM339	LM339	RCA CA339	LM339
3524	SMPS Control Circuit	–	LM3524	SG3524	SG3524	Unitrode UC3524	SG3524
358	Dual Op Amp	LM358/A	LM358/A	LM358	LM358/A	RCA CA358/A	LM358/A NE532
361	See 529						
3842	SMPS IC	UC3842AN	–	–	–	Unitrode UC3842	UC3842
393	Dual Comparator	LM393/A	LM393/A	LM393	LM393/A	–	LM393/A
398	Sample-and-Hold Amp	–	LF398	–	–	AMD LF398	LF398 NE5537
4558	Dual General Purpose Op Amp	MC4558	–	–	–	Exar XR4558	NE4558
5007	See DAC-08C						
5008	See DAC-08E						
5009	See DAC-08H						
5018	8-Bit Converter Voltage Out	–	–	–	–	Datel DACµP8B	NE5018
5019	8-Bit D/A Converter Voltage Out	–	–	–	–	Datel DACµP8B	NE5019
5020	10-Bit D/A Converter Voltage Out	–	–	–	–	Datel DACµP10B	NE5020
5170	Octal Line Driver	–	–	–	–	Unitrode UC5170	NE5170
5180	Octal Line Receiver	–	–	–	–	Unitrode UC5180	N35180
529	High Speed Comparator	–	LM161 LM361	–	–	–	NE529
532	See 358						
5517	See 13600						

Competitive Cross Reference Guide

Linear (Continued)

Numeric	Description	Motorola	National	SGS/ Thompson	Texas Instruments	Others	Philips
5532	Dual Low Noise Op Amp	–	–	–	NE5532/A TL072	Exar XR5532/A	NE5532
5533	Dual Low Noise Op Amp	–	–	–	NE5533/A	Exar XR5533	NE5533
5534	Low Noise Op Amp	–	–	–	NE5534/A	Exar XR5534	NE5534
5537	See 398						
5539	Fast Op Amp	MC5539	LM5539	–	–	Analog Devices AD5539	NE5539
555	Timer	NE555 MC1455	LM555	NE555	NE555	Exar XR555	NE555
556	Dual Timer	NE556	LM556	NE556	NE556	Samsung NE556	NE556
5560	SMPS Control Circuit	–	–	–	–	Goldstar GL5560	NE5560
5561	SMPS Control Circuit	–	–	–	–	Goldstar GL5561	NE5561
5568	SMPS Control Circuit	–	–	–	–	Sprague ULN8168	NE5568
558	Quad Timer	–	–	–	–	Samsung NE558 Exar XR558	NE558
566	Function Generator	–	LM566	–	–	–	NE566
567	Time Decoder Phase-Locked Loop	–	LM567	–	–	Exar XR567	NE567
571	COMPANDOR	–	–	–	–	NEC µPC571	NE571
592	Video Amplifier	NE592	LM592	–	NE592 TL592	Intersil NE592	NE592
594	Vacuum Fluorescent, Display Driver	–	–	–	–	Exar XR6118 Sprague ULN618	NE594
6012	12-Bit D/A Coverter	–	NS8464	–	–	AMD AM6012	AM6012
6081	See 5018						
723	Precision Voltage Regulator	MC1723	LM723	LM723	µA723	RCA CA723	µA723
733	Differential Video Amp	MC1733	LM733	–	µA733	–	µA733
741	General Purpose Op Amp	MC1741	LM741	LM741	µA741	Samsung LM741	µA741/C
747	Dual Op Amp	MC1747	LM747	–	µA747	RCA CA747	µA747/C
7555	CMOS Timer	–	LMC555	–	TLC555	Intersil ICM7555	ICM7555
7820	See 0820						
8160	See 5560						
8161	See 5561						
8168	See 5568						
8392	Ethernet Coaxial Transceiver	–	DP8392A	–	–	–	NE8392AN
8464	See 6012						
8564	See 564						

Competitive Cross Reference Guide

Linear Packaging	Motorola	National	SGS	TI	AMD	EXAR	RCA	Philips
DIP Molded (DIL)	P	N	N	N	P	P	E	N
Hermetic CERDIP (DIL)	U	J	J	J	D	N	D	F
Small Outline (SO)	D	M	M	D	–	–	M	D
Plastic Leaded Chip Carrier (PLCC)	FN	V	–	FN	L	–	Q	A
TO-5	G/H	H-05	–	L	–	–	S	H

Microcontrollers

Numeric	Intel	AMD	Siemens	Philips
8039	8039AL	–	–	SCN8039H
8049	8049AH	–	–	SCN8049H
8040	8040AHL	–	–	SCN8040H
8050	8050AH	–	–	SCN8050H
8031	8031AH	–	SAB8031A	SCN8031H
8051	8051AH	–	SAB8051A	SCN8051H
8032	8032AH	–	SAB8032A	SCN8032H
8052	8052AH	8052	SAB8052A	SCN8052H
80C31	80C31BH	80C31BH	SAB80C31	SC80C31B
80C32	80C32FA	–	–	P80C32
80C51	80C51BH	80C51BH	SAB80C51	SC80C51B
80C52	83C51FA	–	–	P80C52
87C51	87C51	87C51	–	SC87C51
87C52	87C51FA	87C52T2	–	P87C52

Microcontrollers Packaging	Intel	AMD	Siemens	Philips
DIP Molded (DIL)	P	P	D	N
Hermetic CERDIP (Quartz Window)	–	D	–	F
Ceramic Leaded Chip Carrier (CLCC)	R	–	–	L
Plastic Leaded Chip Carrier (PLCC)	N	L	–	A

CRT

Numeric	Motorola	Philips
2672	MC2672B3P MC2672B4P	SCN2672C4 SCN2672C4
2674	MC2674B3P MC2674B4P	SCN2674BC4 SCN2674BC4
68000	MC68000P8 MC68000P10	SCN68000C8N64 SCN68000CAN64

CRT Packaging	Motorola	Philips
DIP Molded (DIL)	P	N
Plastic Leaded Chip Carrier (PLCC)	FN	A

Data Communications

Numeric	Exar	Motorola	Standard Microsystems Corporation	Philips
2651	–	–	COM2651	SCN2651
2652/68652	–	MC68652	–	SCN68652
2661/ 68661	–	MC2661 MC68661	COM2661	SCN2661 SCN68661
2681/68681	XR88C681 XR68C681	MC2681 MC68681	–	SCN2681 SCN68681
2692/ 68692	XR88C681 XR68C681	–	–	SCC2692 SCC68692
26/68C94	XR88C684	–	–	SC26/68C94

Competitive Cross Reference Guide

Data Communications Packaging	Exar	Motorola	Standard Microsystems Corporation	Philips
DIP Molded (DIL)	Q	P	P	N
Plastic Leaded Chip Carrier (PLCC)	–	FN	LJ	A
Hermetic CERDIP (DIL)	N	U	CD	F

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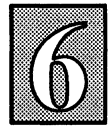

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