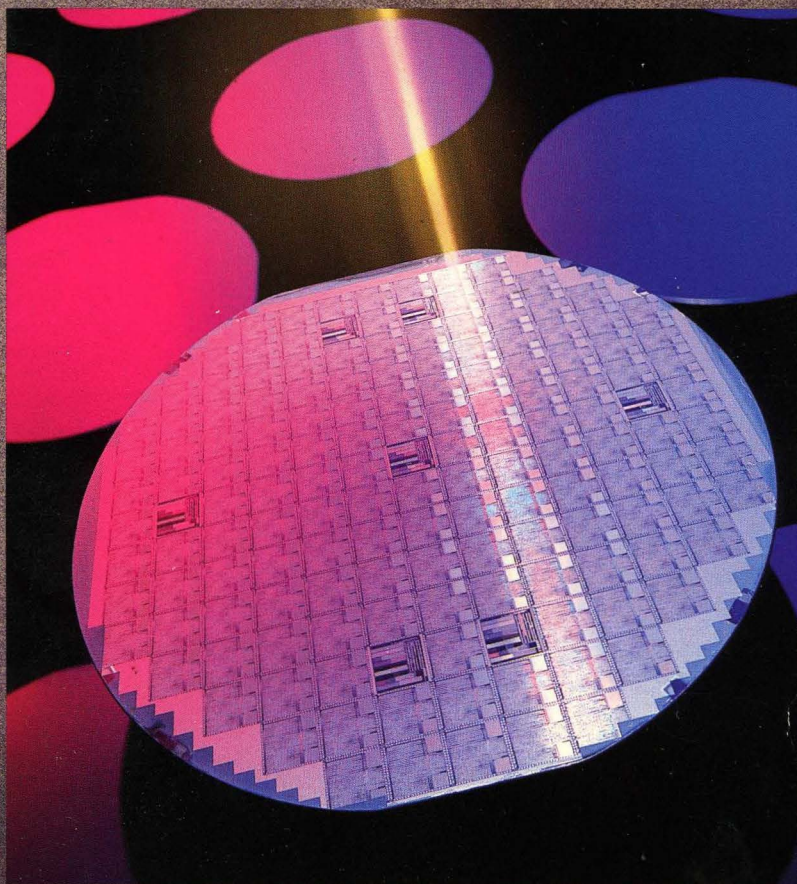


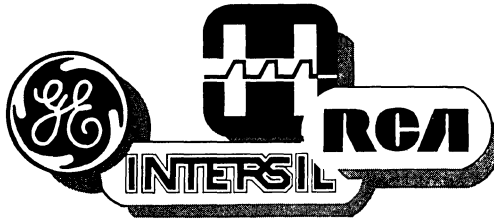
A Short-Form Reference to
Harris Semiconductor Products



PRODUCTS GUIDE '89



HARRIS



THE NEW HARRIS SEMICONDUCTOR

In December 1988, the General Electric Solid State Division was acquired by Harris, adding GE, RCA, and Intersil semiconductor products to the Harris line.

This Product Guide describes only pre-acquisition Harris Semiconductor products. For GE/RCA/Intersil listings, consult the GESS "Product Selection Guide" (SPG-201P).

Harris Semiconductor products are sold by description only. Harris reserves the right to make changes in circuit design, specifications, and other information at any time without prior notice. Reference to products of other manufacturers are solely for convenience of comparison and do not imply total equivalency of design, performance, or otherwise.

To obtain Harris Semiconductor product information from overseas locations, please consult the directory on page 87.

To order literature or receive more information about Harris Semiconductor products, services, or capabilities, contact:

Harris Semiconductor Literature Dept.
P.O. Box 883, MS CB-1-25
Melbourne, FL 32901
(407) 724-3739

INTRODUCTION



Harris Semiconductor's Melbourne, Florida, complex contains complete facilities for design, masking, wafer fab and final testing.

Harris Semiconductor sector is a leading manufacturer of analog DI, digital CMOS, radiation-hardened, ASIC and custom integrated circuits. All represent the state-of-the-art in complexity and performance.

Because of this expertise in design and production, Harris can offer you the most reliable product available in a wide variety of formats, options and packages.

Continuing research and development maintains our position as the eighth largest U.S. merchant producer of semiconductors. Harris is recognized worldwide as an industry innovator and technology leader.

This booklet contains brief descriptions of all Harris silicon and gallium arsenide products currently available. Plus helpful information on packaging and a product cross reference. For more detailed information, contact your local Harris sales representative or call our literature dept. (407) 724-7418.

Analog Products

Harris is a major force in analog integrated circuitry, with a broad line of products — including bipolar and CMOS switches, multiplexers, data

acquisition and conversion circuits and telecommunications products — recognized industrywide for their high performance and reliability.

Two material processes, Dielectric Isolation (DI) and Complementary Metal Oxide Semiconductor (CMOS), are prime examples of Harris leadership in high-performance analog products development.

The DI process developed by Harris is utilized to meet the high-performance requirements of the commercial, military, telecommunications and space markets which need high voltage and high temperature circuits.

Dielectric Isolation (DI) effectively surrounds each active device, such as NPN or PNP transistors, with an insulating layer of silicon dioxide. This isolation removes any possibility of latch-up and also reduces inherent leakage currents.

The Harris SAJI (Self-Aligned Junction Isolation) CMOS process is key to attaining the low-power, high performance and density potential of LSI (Large Scale Integration) and VLSI (Very Large Scale Integration).

This commitment to innovation, coupled with strong engineering and processing capabilities, enables Harris to continually give customers the competitive edge.

INTRODUCTION

Custom Integrated Circuits

Harris designs, develops and manufactures custom and semicustom analog, digital bipolar and CMOS circuits for specialized military and commercial applications.

In the government marketplace, Harris is a leading supplier of radiation-hardened ICs for a number of U.S. military projects such as the Peacekeeper and advanced Trident missile programs, B-1B bomber and major satellite programs. Harris recently introduced the 80C86RH radiation-hardened 16-bit CMOS microprocessor family.

Harris is also using its systems expertise and semiconductor technologies to meet the challenge of VHSIC-like, next-generation micron and sub-micron IC systems for DOD.

Harris also produces an array of non-military custom and semicustom products. These include ICs for commercial aircraft as well as telecommunications, data processing and industrial applications.

Digital Products

Harris is a pioneer in the development and production of digital integrated circuits, achieving many breakthroughs in CMOS and bipolar technology: the first 16-bit CMOS microprocessor family (80C86); first CMOS PROM; first 4K static CMOS RAM; first 256K static CMOS RAM module; and, most recently, the first CMOS programmable logic circuit and first CMOS version of the 16-bit 80286 microprocessor.

More than a decade of technological creativity and performance — marked by continual research and development, increasing quality control and a relentless commitment to excellence — has made Harris today's leader in digital products.

Military/Space Products

For over a decade Harris has been a leader in high reliability radiation hardened standard data

sheet products for military and space environments. Both Dielectric Isolation and junction isolation process technologies have been hardened to levels exceeding 100K rad total dose radiation. Harris' portfolio of standard hardened CMOS products includes 4K and 16K static RAMS, 8 and 16 bit microprocessors and peripheral devices, a 16K CMOS PROM, 8 and 16-bit analog multiplexers, a family of hardened analog switches and the 15530RH Manchester encoder-decoder. Hardened bipolar devices include a full line of high performance op amps, a latching comparator and a regulating pulse width modulator. Harris also will offer JAN Class S rad hard products and has been JAN certified for the 16K and 4K Rad Hard SRAMs. The standard manufacturing flows adhere closely to Mil Std Class B and Class S requirements.

Harris is a supplier of hi-rel radiation hardened products to programs such as Milstar, Cruise Missile, GPS, Trident, Galileo, Mars Observer, ITALSAT, INMARSAT, ISO and a number of classified programs. Harris' on-going research and development programs will continue to provide a source of new radiation hardened products and technologies for extended environment military and space programs.

Microwave (GaAs) Products

Harris Microwave Semiconductor was established in 1980 in Milpitas, California, with a clear goal: research and develop gallium arsenide technology for use in electronic systems requiring great speed, high frequencies and extreme miniaturization.

Today, this Harris company is setting new standards in manufacturing consistency in the production of GaAs FETs and MMICs. Custom design and fabrication services are also available whereby customers can design or specify specialized MMIC or FET devices for manufacture at HMS.

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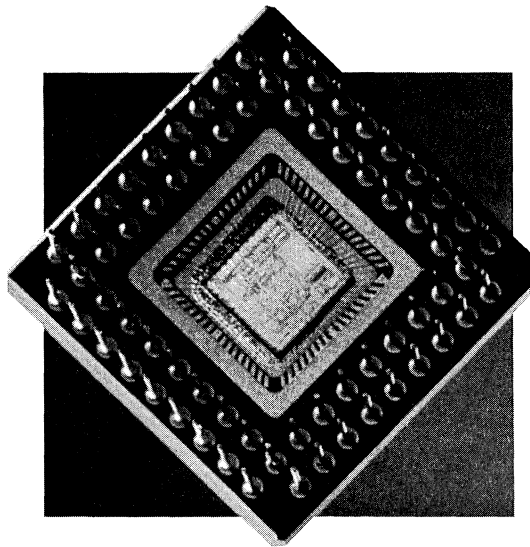
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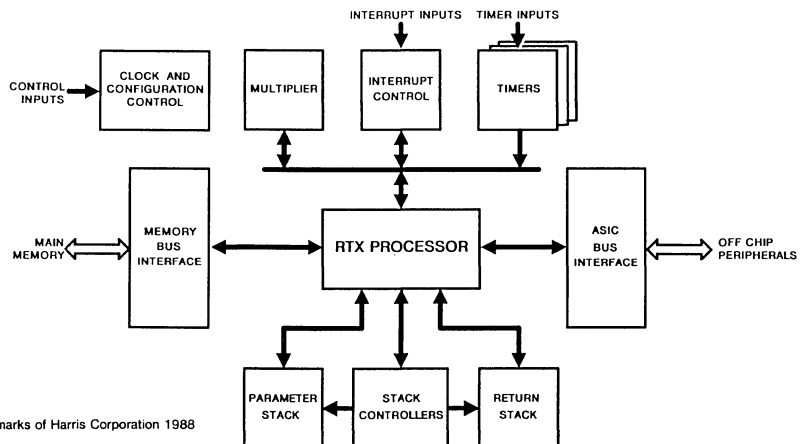
**Revolution Through Evolution:
Our 80C286 shatters your
best ideas about μ P speed,
power and throughput!**

CMOS REAL-TIME MICROCONTROLLER

RTX 2000™

Features	Description
<ul style="list-style-type: none"> • Fast 100ns Machine Cycle • Single Cycle Instruction Execution • Direct Execution of FORTH <ul style="list-style-type: none"> >Eliminates Assembly Language Programming • Single Cycle 16-bit Multiply • Fast Division, Square Root • Single Cycle Subroutine Call/Return • Three Cycle Interrupt Latency • Two On-Chip 256 Word Stacks • On-Chip Interrupt Controller • Three On-Chip 16-bit Timer/Counters • ASIC Bus™ for Off-Chip Extension of Architecture • 1 Megabyte Total Address Space • Word and Byte Memory Access • Low Power CMOS 5mA/MHz Typical • Fully Static • 84-Pin PGA Package • Available in Harris Standard Cell Library 	<p>The RTX 2000 is a high performance 16-bit microcontroller with on-chip timer, interrupt controller, and multiplier. A unique feature of this processor is the high performance ASIC Bus, which provides for architecture extension using off-chip hardware acceleration logic and application specific I/O devices.</p> <p>Utilizing a stack oriented, multiple bus architecture and one or two cycle instruction timers, the RTX 2000 allows the efficient implementation of such real-time applications as Digital Signal Processing (DSP), Digital Control Processing, Image Processing, Robotics, Graphics, Simulation, Animation, and many other applications. Because these applications can be supported in high level languages such as FORTH and C on the RTX 2000, the development cycle time to system implementation is drastically reduced.</p> <p>The RTX 2000 Microprocessor is an exceptionally powerful device with the ability to meet numerous application specific needs. The advantages of the RTX are further enhanced through the use of optional peripherals and by the development system support which Harris provides for the RTX hardware and IBM™ PC-based software.</p> <p>The RTX 2000 has been designed and fabricated utilizing the Harris Advanced Standard Cell and Compiler Library. As part of the Harris family of compatible cell libraries, the RTX 2000 can be incorporated into customer ASIC designs.</p>

RTX Block Diagram

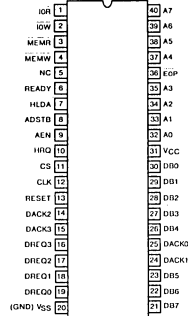


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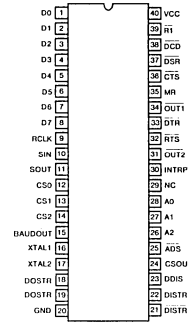
CMOS PERIPHERAL CIRCUITS

COMING SOON

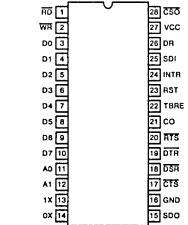
DMA Controller 82C37A
Features
<ul style="list-style-type: none"> • Compatible with NMOS 8237A • Provides control for direct memory access operation • Up to 4 Mb/s transfer rate with 8 MHz clock • Four independently programmable DMA channels • Low power operation • 12.5 MHz operation with 0 wait state DMA transfers • 16 bit DMA transfer capability



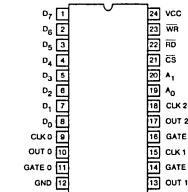
Asynchronous Communication Element 82C50A
Features
<ul style="list-style-type: none"> • Complete serial communication interface <ul style="list-style-type: none"> — UART — Baud rate generator • 80C86/88 compatible • DC to 10 MHz operation (DC to 625 Kbaud) • Modem interface control lines • Low CMOS power dissipation • Compatible with NMOS 8250A



Serial Controller Interface 82C52
Features
<ul style="list-style-type: none"> • UART/Baud rate generator in a single 28-pin package • Operates from DC to 1 Mbaud with an asynchronous 16X clock • 72 programmable baud rates • Low power operation: <ul style="list-style-type: none"> — 1 mA/MHz operating current, typical • 40-pin version available (HD-6406)



Programmable Interval Timer 82C54
Features
<ul style="list-style-type: none"> • Compatible with NMOS 8254 • Enhanced version NMOS 8253 • Three independent 16-bit counters • Six programmable counter modes • Completely TTL compatible • 8 MHz count frequency • Low power operation: <ul style="list-style-type: none"> >ICCP: 10 mA @ 8 MHz count frequency >ICCSB: 10 μA maximum

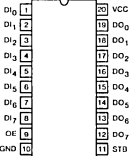
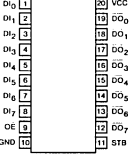
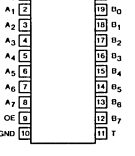
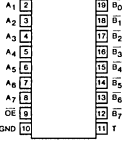


CMOS PERIPHERAL CIRCUITS

Programmable Peripheral Interface 82C55A	
<p style="text-align: center;">Features</p>	
<ul style="list-style-type: none"> • Three independent programmable 8-bit I/O ports • High speed, no “wait state” operation with 5 MHz/8 MHz 80C86/88 • Fully TTL compatible • 2.5 mA drive capability on all I/O port outputs • Compatible with NMOS 8255A • 24 programmable I/O pins • Enhanced control word read capability • High darlington drive outputs on all ports • Standby current: 10μA, maximum 	

Priority Interrupt Controller 82C59A	
<p style="text-align: center;">Features</p>	
<ul style="list-style-type: none"> • Compatible with NMOS 8259A • Eight maskable interrupt inputs • Cascade operation allows up to 64 interrupt inputs with no additional circuitry • Supports both 8080/85 and 80C86/88 formats • Standby current: 10 μA, maximum • Fully TTL compatible • Programmable interrupt modes 	

CMOS BUS SUPPORT CIRCUITS

<p>Octal Latching Bus Driver 82C82</p>	
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • Bipolar 8282 function compatible • Propagation delay guaranteed: 35 ns maximum <ul style="list-style-type: none"> — Full temperature range — 10% power supply tolerances — Load capacitance: 300 pf • Gated inputs reduce operating power • ICCSB: 10 μA maximum 	
<p>Octal Latching Inverting Bus Driver 82C83H</p>	
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • Bipolar 8283 function compatible • Full eight-bit latching buffer with inverted data output • Guaranteed propagation delay of 25 ns Max. @ $C_L = 300$ pf • Gated inputs reduce operating power • ICCSB: 10 μA maximum • High output sink current: 20 mA 	
<p>Octal Transceiver 82C86H</p>	
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • Bipolar 8286 function compatible • Eight-bit bidirectional bus transceiver • Guaranteed propagation delay of 32 ns Max. @ $C_L = 300$ pf • Gated inputs reduce operating power • ICCSB: 10 μA maximum • High output sink current: 20 mA 	
<p>Octal Inverting Transceiver 82C87H</p>	
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • Bipolar 8287 function compatible • Eight-bit bidirectional bus transceiver with inverting data outputs • Guaranteed propagation delay of 30 ns Max. @ $C_L = 300$ pf • Gated inputs reduce operating power dissipation • ICCSB: 10 μA maximum • High output sink current: 20 mA 	

CMOS BUS SUPPORT CIRCUITS

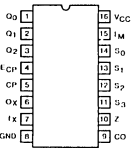
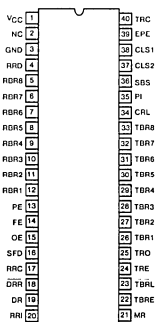
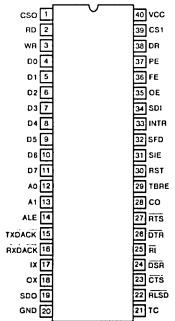
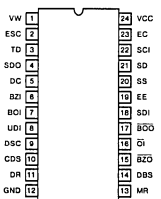
Clock Generator/Driver 82C84A	
<p style="text-align: center;">Features</p>	
<ul style="list-style-type: none"> • Compatible with bipolar 8284A • Output frequencies up to 8 MHz. • Provides Ready synchronization • Parallel resonant crystal inputs • ICCOP: 40 mA @ 8 MHz system frequency • TTL compatible inputs/outputs 	

Static Clock Controller/Generator 82C85	
<p style="text-align: center;">Features</p>	
<ul style="list-style-type: none"> • Provides complete static clock control for 80C86 and 80C88 systems • Supports stop-clock, stop-oscillator and low-frequency operation • 80C86/88 status line interface allows software control • DC to 8 MHz system clock • Low CMOS power dissipation • 24 pin slimline package 	

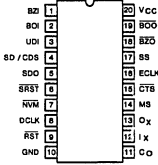
Bus Controller 82C88	
<p style="text-align: center;">Features</p>	
<ul style="list-style-type: none"> • Pin compatible with bipolar 8288 • Generates system control signals for maximum mode 80C86/88, 8086/88 • Bipolar drive capability • Low power operation: <ul style="list-style-type: none"> — ICC standby: 10 μA maximum — ICC operating: 1 mA/MHz maximum 	

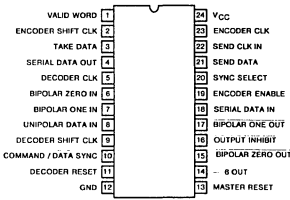
Bus Arbiter 82C89	
<p style="text-align: center;">Features</p>	
<ul style="list-style-type: none"> • Pin compatible with bipolar 8289 • Provides bus control arbitration in multi-master processor systems • Low power operation: <ul style="list-style-type: none"> — ICCSB: 10 μA maximum — ICCOP: 1 mA/MHz maximum • Bipolar drive capability 	

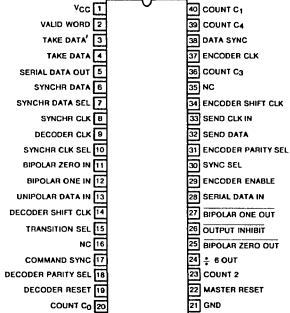
CMOS DATA COMMUNICATION

<p>Bit Rate Generator (BRG) HD-4702</p>	 <p>Pinout diagram for HD-4702 (16 pins):</p> <ul style="list-style-type: none"> 1: Q0 2: Q1 3: Q2 4: Cr 5: Cr 6: Ox 7: Ix 8: GND 16: VCC 15: 1M 14: S0 13: S1 12: S2 11: S3 10: Z 9: CO
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • Low power dissipation • Programmable bit rate selection • 13 commonly used bit rates • Uses standard 2.4575 MHz crystal • Conforms to EIA RS-404 • On-chip input pull-up circuits 	 <p>Pinout diagram for HD-6402R and HD-6402B (20 pins):</p> <ul style="list-style-type: none"> 1: VCC 2: NC 3: GND 4: RRD 5: RBR6 6: RBR7 7: RBR6 8: RBR5 9: RBR4 10: RBR3 11: RBR2 12: RBR1 13: PE 14: FE 15: OE 16: SFD 17: RRC 18: DR 19: DR 20: GND 20: TRC 19: TRC 18: CLS1 17: CLS2 16: SRS 15: SRS 14: CRL 13: TBR8 12: TBR7 11: TBR6 10: TBR5 9: TBR4 8: TBR3 7: TBR2 6: TBR1 5: TRIO 4: TBR1 3: TBR2 2: TBR3 1: TBR4 1: MR
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • Operates from DC to 8 MHz (DC to 500 Kbaud) • Programmable word length, stop bits and parity • Industry standard pinout • Single +5 V power supply • Fully TTL compatible • Automatic data formatting and status generation 	 <p>Pinout diagram for HD-6406 (28 pins):</p> <ul style="list-style-type: none"> 1: CS0 2: RD 3: WR 4: DG 5: D1 6: D2 7: D3 8: D4 9: D5 10: D6 11: D7 12: AG 13: A1 14: ALE 15: TXDACK 16: RXDACK 17: IX 18: OX 19: SDO 20: GND 20: VCC 19: CS1 18: DR 17: PE 16: FE 15: OE 14: SDI 13: SDI 12: NTR 11: SFD 10: SFE 9: RST 8: TBR6 7: CO 6: HTS 5: DTR 4: RI 3: DSR 2: CTB 1: RESO 1: TC
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • UART/Baud rate generator in a single 40-pin package • Data rates from DC to 1 Mbaud with an asynchronous 16X clock • 72 programmable baud rates • Complete modem interface signals • DMA handshaking operation • Low power operation: <ul style="list-style-type: none"> — 1 mA/MHz, typical • 28-pin version available (82C52) 	 <p>Pinout diagram for HD-6408 (24 pins):</p> <ul style="list-style-type: none"> 1: VW 2: ESC 3: TD 4: SDO 5: DC 6: BZ 7: BDI 8: UDI 9: DSC 10: CDS 11: DR 12: GND 24: VCC 23: EC 22: SCI 21: SD 20: SS 19: EE 18: SDI 17: BDO 16: GI 15: BZO 14: DBS 13: MR
<p style="text-align: center;">Features</p> <ul style="list-style-type: none"> • 1 Mb/s data rate • Sync identification and lock-in • Clock recovery • Manchester II encode and decode • Low bit error rate • Industrial temperature range -40°C to +85°C 	

CMOS DATA COMMUNICATION

<p>Manchester Encoder/Decoder (MED) HD-6409</p>	 <p>Pinout diagram for HD-6409 showing 20 pins. Pin 1: BZ, Pin 2: BOI, Pin 3: UDI, Pin 4: SD/CDS, Pin 5: SDO, Pin 6: SRST, Pin 7: NVM, Pin 8: DCLK, Pin 9: RST, Pin 10: GND, Pin 11: Ix, Pin 12: Co, Pin 13: OX, Pin 14: MS, Pin 15: CT8, Pin 16: ECLK, Pin 17: BS, Pin 18: BZ0, Pin 19: B00, Pin 20: VCC.</p>
<p>Features</p>	
<ul style="list-style-type: none"> • 1 Mb/s data rate • Digital PLL clock recovery • On chip oscillator • Independent Manchester II encode and decode • Wide temperature ranges available <ul style="list-style-type: none"> -40°C to +85°C -55°C to +125°C 	

<p>Manchester Encoder/Decoder (MED) HD-15530</p>	 <p>Pinout diagram for HD-15530 showing 24 pins. Pin 1: VALID WORD, Pin 2: ENCODER SHIFT CLK, Pin 3: TAKE DATA, Pin 4: SERIAL DATA OUT, Pin 5: DECODER CLK, Pin 6: BIPOLAR ZERO IN, Pin 7: BIPOLAR ONE IN, Pin 8: UNIPOLAR DATA IN, Pin 9: DECODER SHIFT CLK, Pin 10: COMMAND / DATA SYNC, Pin 11: DECODER RESET, Pin 12: GND, Pin 13: MASTER RESET, Pin 14: I/O OUT, Pin 15: BIPOLAR ZERO OUT, Pin 16: OUTPUT INHIBIT, Pin 17: BIPOLAR ONE OUT, Pin 18: SERIAL DATA IN, Pin 19: ENCODER ENABLE, Pin 20: SYNC SELECT, Pin 21: SEND DATA, Pin 22: SEND CLK IN, Pin 23: ENCODER CLK, Pin 24: VCC.</p>
<p>Features</p>	
<ul style="list-style-type: none"> • Support of MIL-STD-1553 • 1.25 Mb/s data rate • Sync identification and lock-in • Clock recovery • Separate encode and decode • Low operating power: 50 mW @ 5 Volts • Full temperature range: -55°C to +125°C 	

<p>Manchester Encoder/Decoder (MED) HD-15531</p>	 <p>Pinout diagram for HD-15531 showing 40 pins. Pin 1: VCC, Pin 2: VALID WORD, Pin 3: TAKE DATA, Pin 4: TAKE DATA, Pin 5: SERIAL DATA OUT, Pin 6: SYNCHR DATA, Pin 7: SYNCHR CLK, Pin 8: SYNCHR CLK, Pin 9: DECODER CLK, Pin 10: SYNCHR CLK SEL, Pin 11: BIPOLAR ZERO IN, Pin 12: BIPOLAR ONE IN, Pin 13: UNIPOLAR DATA IN, Pin 14: DECODER SHIFT CLK, Pin 15: TRANSITION SEL, Pin 16: NC, Pin 17: COMMAND SYNC, Pin 18: DECODER PARITY SEL, Pin 19: DECODER RESET, Pin 20: COUNT C0, Pin 21: GND, Pin 22: MASTER RESET, Pin 23: COUNT 2, Pin 24: I/O OUT, Pin 25: BIPOLAR ZERO OUT, Pin 26: OUTPUT INHIBIT, Pin 27: BIPOLAR ONE OUT, Pin 28: SERIAL DATA IN, Pin 29: ENCODER ENABLE, Pin 30: SYNC SEL, Pin 31: ENCODER PARITY SEL, Pin 32: SEND DATA, Pin 33: SEND CLK IN, Pin 34: ENCODER SHIFT CLK, Pin 35: NC, Pin 36: COUNT C3, Pin 37: ENCODER CLK, Pin 38: DATA SYNC, Pin 39: COUNT C4, Pin 40: COUNT C1.</p>
<p>Features</p>	
<ul style="list-style-type: none"> • Support of MIL-STD-1553 • 1.25 Mb/s data rate • 2.5 Mb/s option (HD-15531B) • Sync identification and lock-in • Clock recovery • Variable frame length to 32 bits • Separate encode and decode • Low operating power: 50 mW @ 5 Volts • Full temperature range: -55°C to +125°C 	

APPLICATION SPECIFIC INTEGRATED CIRCUITS (ASIC)

The Harris ASIC Commitment

Provide a single graphics interface for today's designer that ties together many design tools, operates in a single framework, is capable of accessing multiply technology libraries, and operates on multiple UNIX 68XXX-based platforms.

Harris Semiconductor, a leader in custom micro-electronic products for over two decades, is firmly established in the ASIC market and now brings the designer a combination of state-of-the-art proven process technologies and the most widely used and efficient designs systems in the industry.

The Harris Track Record

Harris ASIC customers benefit from the experience, resources and stability of a major IC manufacturer. Harris Semiconductor is presently the eighth largest merchant semiconductor supplier in the United States and is widely considered the foremost manufacturer of radiation hardened and dielectrically isolated (DI) devices. Harris introduced the world's first low power CMOS versions of the 8086, 8088, and 80286 microprocessors. Harris is well known for its high performance, high reliability analog ICs which are used in the world's most demanding systems.

The Harris Design Libraries

In addition to working with a full capability semiconductor vendor, the Harris ASIC customer gains full access to our semiconductor design tools, libraries, databases, and process technologies. Libraries include standard cell CMOS, bipolar DI, radiation-hardened, and gallium arsenide. Harris libraries are available through designer use of Daisy™, Mentor™, SDA™, or FutureNet™ software.

Of course, design migration from one library to another is always available.

Standard Cell CMOS library Group:

Included in this group are 2.0 micron, 1.5 micron and 2.0 micron "hard field" double level metal (DLM) libraries. For military applications, class S and rad-hard designs are available. When a design is done in one library, it can be easily migrated to another library whenever necessary. The powerful Harris FORCE (FORTH Optimized RISC Computing Engine) core cell and peripherals are available in this library group, along with ARINC and other advanced macrocells.

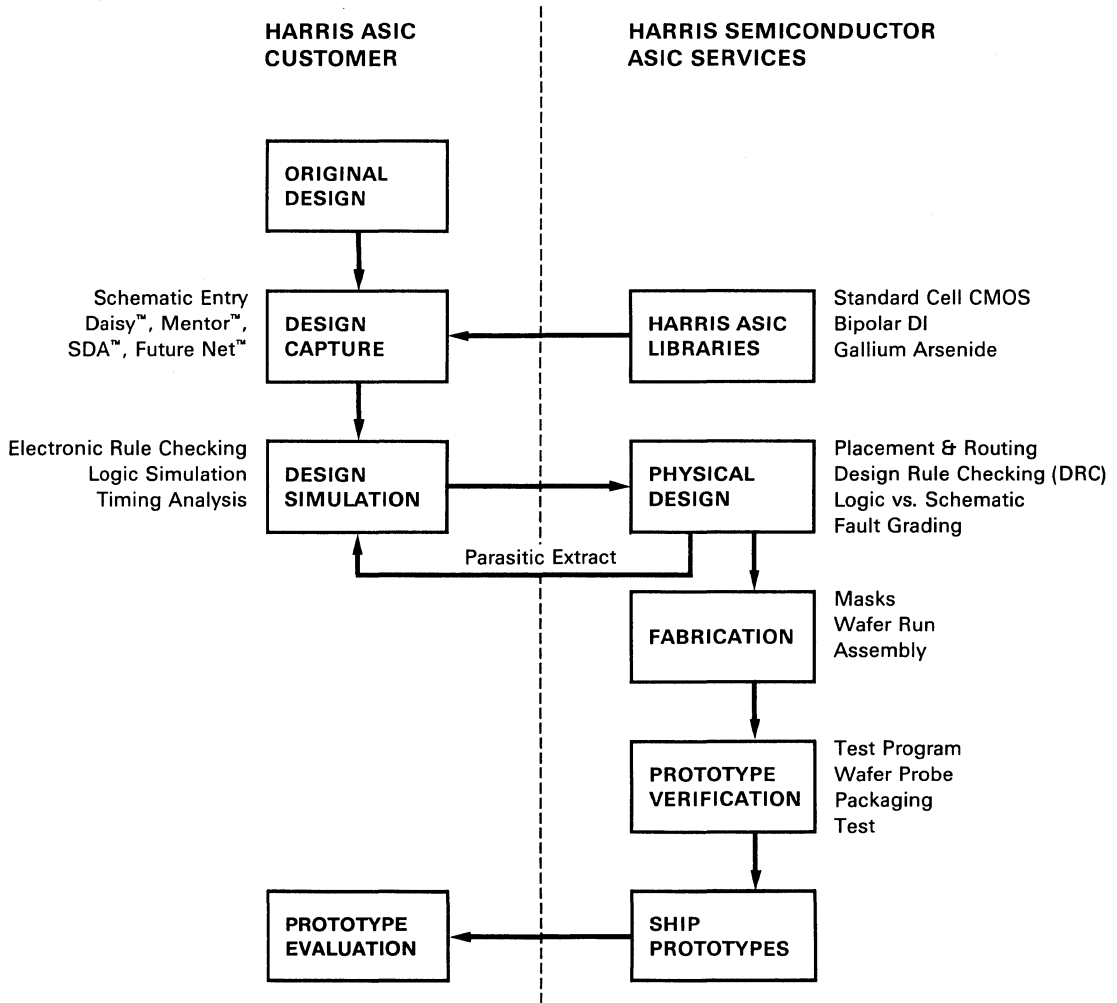
Bipolar DI Library:

Harris is the world's leader in dielectrically isolated (DI) IC processing — years of linear design experience and leadership is made available to designers who can take full advantage of the same tools and processes used to manufacture Harris' exemplary low noise, high speed circuits. The design system is highly integrated, with SPICE (industry standard circuit simulator) capability. Designers can mix n-p-n and p-n-p transistors in the same circuit.

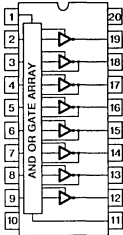
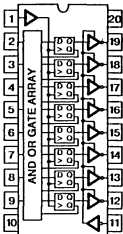
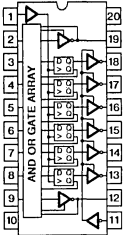
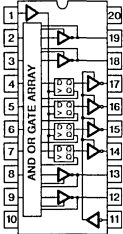
Gallium Arsenide Library:

The Harris Microwave Standard Cell (HMS) library is a broad and growing collection of predefined standard cell — consisting of basic logic functions, gates, and appropriate I/O circuitry. Each is fully characterized to support custom placement, routing and simulation of your circuit design.

ASIC DESIGN FLOW



CMOS PROGRAMMABLE LOGIC

Part Number	Description	Maximum Pwr. Supply Current	Maximum I/O Propagation Delay	
HPL-16LC8	CMOS 16L8 10 inputs 6 bidirectionals 2 outputs Programmable output polarity Security fuse for pattern protection	ICCSB: 150 μ A ICCOP: 6 mA/MHz	125 ns	
HPL-16RC8	CMOS 16R8 8 inputs 8 registered outputs Programmable output polarity Security fuse for pattern protection	ICCSB: 150 μ A ICCOP: 7 mA/MHz	125 ns	
HPL-16RC6	CMOS 16R6 8 inputs 6 registered outputs 2 bidirectionals Programmable output polarity Security fuse for pattern protection	ICCSB: 150 μ A ICCOP: 7 mA/MHz	125 ns	
HPL-16RC4	CMOS 16R4 8 inputs 4 registered outputs 4 bidirectionals Programmable output polarity Security fuse for pattern protection	ICCSB: 150 μ A ICCOP: 7 mA/MHz	125 ns	

CMOS PROGRAMMABLE LOGIC

Part Number	Description	Maximum Pwr. Supply Current	Maximum Propagation Delay	
HPL-82C339	<ul style="list-style-type: none"> • 24-pin Programmable Chip Select Decoder (PCSD™) • Nine programmable inputs • Superset of 74138/74139 	ICCSB: 50 μ A ICCOP: 2 mA/MHz	50 ns	
HPL-82C338	<ul style="list-style-type: none"> • 20-pin Programmable Chip Select Decoder (PCSD™) • Five programmable inputs • Superset of 74138 	ICCSB: 50 μ A ICCOP: 2 mA/MHz	50 ns	
HPL-82C138	<ul style="list-style-type: none"> • 16-pin Programmable Chip Select Decoder (PCSD™) • Five programmable inputs • Similar to 74138 	ICCSB: 50 μ A ICCOP: 2 mA/MHz	50 ns	
HPL-82C139	<ul style="list-style-type: none"> • 16-pin Programmable Chip Select Decoder (PCSD™) • Six programmable inputs • Similar to 74139 	ICCSB: 50 μ A ICCOP: 2 mA/MHz	50 ns	

CMOS STATIC RAMs 64K

8192 x 8 — 64K Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-65642	150 ns	20 mA	250 μ A	AM99C88 NMC6164 MB8464 CDM6264
HM-65642B	150 ns	20 mA	100 μ A	

CMOS STATIC RAMs — 16K

2048 x 8 — 16K Synchronous				
Part Number	Access Time	Power Supply Current		Similar To
		Operating	Standby	
HM-6516B	120 ns	10 mA/MHz	50 μ A	Hitachi 6116 Toshiba 5517 National 6516
HM-6516	200 ns	10 mA/MHz	100 μ A	

2048 x 8 — 16K Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-65162S	55 ns	70 mA	100 μ A	Fujitsu 8416 Hitachi 6116 NEC 446 Toshiba 5517 National 6116 IDT 6116
HM-65162B	70 ns	70 mA	50 μ A	
HM-65162	90 ns	70 mA	100 μ A	
HM-65162C	90 ns	70 mA	900 μ A	

16384 x 1 — 16K Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-65262S	55 ns	50 mA	50 μ A	Hitachi 6167 IDT 6167
HM-65262B	70 ns	50 mA	50 μ A	
HM-65262	85 ns	50 mA	50 μ A	

CMOS STATIC RAMs — 4K & 1K

4096 x 1 — 4K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-6504S	120 ns	7 mA/MHz	25 μ A	Fujitsu 8404 Oki 5104 National 6504
HM-6504B	200 ns	7 mA/MHz	25 μ A	
HM-6504	300 ns	7 mA/MHz	25 μ A	

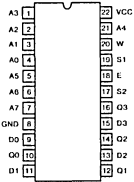
1024 x 4 — 4K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-6514S	120 ns	7 mA/MHz	25 μ A	Fujitsu 6514 Hitachi 4334 Nec 444 RCA 5114 Toshiba 5514 National 6514
HM-6514B	200 ns	7 mA/MHz	25 μ A	
HM-6514	300 ns	7 mA/MHz	25 μ A	

1024 x 1 — 1K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-6508B	180 ns	4 mA/MHz	10 μ A	National 74C929 Intersil 6508 AMI 56508
HM-6508	250 ns	4 mA/MHz	10 μ A	

1024 x 1 — 1K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-6518B	180 ns	4 mA/MHz	10 μ A	National 74C930 Intersil 6518
HM-6518	250 ns	4 mA/MHz	10 μ A	

CMOS STATIC RAMS — 1K

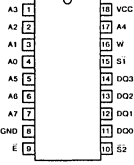
256 x 4 — 1K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-6551 B	220 ns	4 mA/MHz	10 μ A	Intersil 6551
HM-6551	300 ns	4 mA/MHz	10 μ A	



Pinout diagram for Intersil 6551 (28-pin package):

- Pin 1: A3
- Pin 2: A2
- Pin 3: A1
- Pin 4: A0
- Pin 5: A5
- Pin 6: A6
- Pin 7: A7
- Pin 8: GND
- Pin 9: D0
- Pin 10: D1
- Pin 11: D1
- Pin 12: Q1
- Pin 13: D2
- Pin 14: D3
- Pin 15: D3
- Pin 16: S2
- Pin 17: S2
- Pin 18: VCC
- Pin 19: E
- Pin 20: W
- Pin 21: A4
- Pin 22: S1
- Pin 23: W
- Pin 24: S1
- Pin 25: Q3
- Pin 26: D3
- Pin 27: Q2
- Pin 28: Q1

256 x 4 — 1K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-6561 B	220 ns	4 mA/MHz	10 μ A	Intersil 6561
HM-6561	300 ns	4 mA/MHz	10 μ A	



Pinout diagram for Intersil 6561 (28-pin package):

- Pin 1: A3
- Pin 2: A2
- Pin 3: A1
- Pin 4: A0
- Pin 5: A5
- Pin 6: A6
- Pin 7: A7
- Pin 8: GND
- Pin 9: E
- Pin 10: S2
- Pin 11: D0
- Pin 12: D0
- Pin 13: D1
- Pin 14: D1
- Pin 15: D2
- Pin 16: D2
- Pin 17: D3
- Pin 18: D3
- Pin 19: W
- Pin 20: A4
- Pin 21: S1
- Pin 22: S1
- Pin 23: VCC
- Pin 24: W
- Pin 25: S2
- Pin 26: D0
- Pin 27: D0
- Pin 28: S2

CMOS STATIC RAM MODULES

LCC RAM Module — 8K x 8 — 64K Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-8808AS HM-8808AB HM-8808A	100 ns 120 ns 150 ns	70 mA 70 mA 70 mA	250 μ A 250 μ A 900 μ A	EDH8808A IDT7M864 HM6264

LCC RAM Module — 8K x 8 — 64K Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-8808S HM-8808B HM-8808A	100 ns 120 ns 150 ns	70 mA 70 mA 70 mA	250 μ A 250 μ A 900 μ A	EDH8808 IDT8M864

LCC RAM Module — 16K x 8 — 128K Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-8816H HM-8816HB	85 ns 70 ns	400 mA 400 mA	800 μ A 800 μ A	— —

LCC RAM Module — 32768 x 8 — 256K Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-8832	180 ns	20 mA	900 μ A	EDH8832 IDT7M856 HM62256 MSM5256 μ PD43256 TC55256

CMOS STATIC RAM MODULES

LCC RAM Module — 16384 x 16 / 32768 x 8 — 256K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-92560 HM-92560-5	150 ns 250 ns	30/15 mA	500 μ A	— —
		35/20 mA	3.5 mA	

LCC Buffered Ram Module — 16384 x 16 / 32768 x 8 — 256K Synchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-92570	250 ns 300 ns	30/15 mA	600 μ A	EDH892570
		35/20 mA	3.5 mA	

LCC Buffered Ram Module — 65536 x 16 / 131072 x 8 — 1M Asynchronous				
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin
		Operating	Standby	
HM-91M2	180 ns	20 mA	750 mA	EDH891M2

CMOS STATIC RAM MODULES

LCC RAM Module — 16384 x 4 / 8192 x 8 — 64K Synchronous					
Part Number	Access Time	Power Supply Current		Replaces Pin for Pin	
		Operating	Standby		
HM5-6564 HM5-6564-5	350 ns 450 ns	56/28 mA 60/30 mA	800 μ A 5.6 mA	— —	

CMOS PROMs — 4K & 16K

512 x 8 — 4K Synchronous						
Part Number	Fuse Element	Access Time	Power Supply Current		Replaces Pin for Pin	
			Operating	Standby		
HM-6642B HM-6642	NiCr NiCr	120 ns 200 ns	20 mA/MHz 20 mA/MHz	100 μ A 100 μ A	Harris 6641 Similar to: Harris 7641 Signetics 82S141	

2048 x 8 — 16K Synchronous						
Part Number	Fuse Element	Access Time	Power Supply Current		Replaces Pin for Pin	
			Operating	Standby		
HM-6617B HM-6617	NiCr NiCr	90 ns 120 ns	20 mA/MHz 20 mA/MHz	100 μ A 100 μ A	Harris 6616 Similar to: NMOS 2716 National 27C16 National 6716 Intersil 6716 Harris 6616	

MILITARY PRODUCT REFERENCE GUIDE

Harris Semiconductor has long been a major supporter of the military market. The knowledge and expertise gained from this association is manifested in our latest military efforts: Military Drawing and 883-compliant products. This Military Product Guide gives you a complete overview of our commitment to military support. For more information on these products, please contact Harris Semiconductor or your nearest Harris sales office or representative.

Radiation Hardened Products			
Part Number	JAN Part Number	DESC Drawing Number	883 Part Number
HS-6504RH	24503SVC	—	HS-6504RH/883
HS-6514RH	24504SVC	—	HS-6504RH/883
HS-65C262RH	29107SJB	—	HS-65C262RH/883
HS-65T262RH	29108SJB	—	HS-65T262RH/883
HS-508ARH	—	5962R8753701EX	HS-508ARH/883
HS-1840RH	—	5962R8753801XX	HS-1840RH/883

Microprocessor Products			
Part Number	JAN Part Number	Military Drawing Number	883 Part Number
MD80C86	—	8405201QA	MD80C86/883
MR80C86	—	84052012C	—
MD80C88	—	—	*MD80C88/883
MR80C88	—	—	*MR80C88/883
MD82C37A	—	*IN DEVELOPMENT	*MD82C37A/883
MR82C37A	—	*IN DEVELOPMENT	—
MD82C50A-5	—	—	*MD82C50A-5/883
MR82C50A-5	—	—	*MR82C50A-5/883
MD82C52	—	8501501XA	MD82C52/883
MR82C52	—	85015013C	—
MD82C54	—	8406501JA	*MD82C54/883
MR82C54	—	84065013C	—
MD82C55A-5	—	8406601QA	—
MR82C55A-5	—	8406601XC	—
MD82C55A	—	8406602QA	*MD82C55A/883
MR82C55A	—	8406602XC	—
MD82C59A-5	—	8501601YA	—
MR82C59A-5	—	85016013C	—
MD82C59A	—	8501602YA	*MD82C59A/883
MR82C59A	—	85016023C	—
MD82C82	—	8406701RA	*MD82C82/883
MR82C82	—	84067012C	—
MD82C83H	—	8406702RA	*MD82C83H/883
MR82C83H	—	84067022C	—
MD82C84A	—	8406801VA	*MD82C84A/883
MR82C84A	—	84068012C	—
MD82C85	—	*IN DEVELOPMENT	*MD82C85/883
MR82C85	—	*IN DEVELOPMENT	—
MD82C86H-5	—	8757701RA	*MD82C86H/883
MR82C86H-5	—	87577012C	—
MD82C87H-5	—	8757702RA	*MD82C87H/883
MR82C87H-5	—	87577022C	—
MD82C88	—	8406901RA	*MD82C88/883
MR82C88	—	84069012C	—
MD82C89	—	8552801RA	*MD82C89/883
MR82C89	—	85528012C	—

*Scheduled for Q1 CY89

MILITARY PRODUCT REFERENCE GUIDE

Microprocessor Products (continued)			
Part Number	JAN Part Number	Military Drawing Number	883 Part Number
HD1-4702	—	—	HD1-4702/883
HD1-6402	—	—	HD1-6402/883
HD1-15530	—	7802991JA	HD1-15530/883**
HD4-15530	—	78029913C	—
HD1-15531	—	—	HD1-15531/883*

* Scheduled for Q1 CY89

** Scheduled for Q4 CY88

Data Acquisition Products			
Part Number	JAN Part Number	Military Drawing Number	883 Part Number
HA-2420	—	8001601CA	HA-2420/883
HI-506	38510/190-01BXC	—	HI-0506/883
HI-506A	38510/190-02BXC	8513101XA	See HI-546/883
HI-507	38510/190-03BXC	—	HI-0507/883
HI-507A	38510/190-04BXC	8513102XA	See HI-547/883
HI-508	38510/190-07BEC	7705201EC	HI-0508/883
HI-508A	38510/190-05BEC	7705202EA	See HI-548/883
HI-509	38510/190-08BEC	—	HI-0509/883
HI-509A	38510/190-06BEC	85131-03	See HI-549/883
HI-516	—	—	HI-0516/883
HI-518	—	—	HI-0518/883
HI-524	—	—	HI-0524/883
HI-546	—	8513101XA	HI-0546/883
HI-547	—	8513102XA	HI-0547/883
HI-548	—	7705202EA	HI-0548/883
HI-549	—	8513103EA	HI-0549/883
HI-562A	—	—	HI-0562A/883
HI-1818A	—	—	HI-1818/883
HI-1828A	—	—	HI-1828A/883
HA-2420	—	—	HA-2420/883
HI-5320	—	—	—
HI-5330	—	—	HI-5330/883
HI-562A	—	—	HI-562A/883
HI-5687	—	83003-02	HI-5687/883
HI-5697	—	—	HI-5697/883
HI-574ASD	—	—	HI-574ASD/883
HI-574ATD	—	85127-04	HI-574ATD/883
HI-674ASD	—	—	HI-674ATD/883
HI-674ATD	—	85127-06	HI-674ATD/883
HI-565A	—	—	HI-565A/883
HI-774SD	—	—	HI-774SD/883
HI-774TD	—	—	HI-774TD/883

MILITARY PRODUCT REFERENCE GUIDE

CMOS Memory Products			
Part Number	JAN Part Number	DESC Drawing Number	883 Part Number
1K CMOS Static RAMs HM1-6508 HM1-6508B HM1-6518 HM1-6518B HM1-6551 HM1-6551B HM1-6561 HM1-6561B	— — — — — — — —	— — — — — — — —	HM1-6508/883 HM1-6508B/883 HM1-6518/883 HM1-6518B/883 HM1-6551/883 HM1-6551B/883 HM1-6561/883 HM1-6561B/883
4K CMOS Static RAMs HM1-6504 HM1-6504B HM1-6504S HM1-6514 HM1-6514B HM1-6514S HM4-6514 HM4-6514B HM1-6514S	— — 24501BVX — — 24502BVX — — —	8102405VA 8102403VA 8102401VA* 8102406VA 8102404VA 8102402VA* — — —	HM1-6504/883 HM1-6504B/883 HM1-6504S/883 HM1-6514/883 HM1-6514B/883 HM1-6514S/883 HM4-6514/883 HM4-6514B/883 HM4-6514S/883
16K CMOS Synchronous Static RAMs HM1-6516 HM1-6516B HM4-6516	29102BJX — —	8403601JA 8403607JA 8403601ZC	HM1-6516/883 HM1-6516B/883 HM4-6516/883
16K CMOS Asynchronous Static RAMs HM1-65162 HM1-65162B HM1-65162C HM1-65162S HM4-65162 HM4-65162B HM4-65162C HM1-65262 HM1-65262B HM4-65262 HM4-65262B	29104BJX — — — — — — 29103BJX — — —	8403602JA 8403606JA 8403603JA — 8403602XC 8403606XC 8403603XC 8413201RA 8413203RA 8413201YC 8413203YC	HM1-65162/883 HM1-65162B/883 HM1-65162C/883 — HM4-65162/883 HM4-65162B/883 HM4-65162C/883 HM1-65262/883 HM1-65262B/883 HM4-65262/883 HM4-65262B/883
64K CMOS Static RAMs HM1-65642 HM4-65642 HM1-65642B	29201BJX — —	8552503YA 8552503XC —	HM1-65642/883 HM4-65642/883 HM1-65642B/883

*Obsolete - may still be purchased for contracts prior to 10/22/85.

MILITARY PRODUCT REFERENCE GUIDE

CMOS Memory Products (continued)			
Part Number	JAN Part Number	DESC Drawing Number	883 Part Number
CMOS Static RAM Modules HM5-6564 HM5-8808 HM5-8808B HM5-8808S HM5-8808A HM5-8808AB HM5-8808AS HM5-8816H HM5-8832B HM5-91M2 HM5-92560 HM5-92570	Harris CMOS static RAM modules are available for military and high-reliability applications processed to our high-rel DASH 8 program flow. This includes burn-in and value-added processing (temperature cycling, SEM inspection, etc.). Please contact your local Harris sales office or representative for details.		
CMOS Fuse Link PROMs HM1-6642 HM4-6642 HM6-6642 HM1-6617 HM4-6617 HM6-6617	— — — — — —	— — — — — —	HM1-6642/883 HM4-6642/883 HM6-6642/883 HM1-6617/883 HM4-6617/883 HM6-6617/883
Linear Products			
Part Number	JAN Part Number	DESC Drawing Number	883 Part Number
HA240X	—	—	HA1-2400/883
	—	—	HA4-2400/883
HA2500	12204BGC	—	HA2-2500/883
	—	—	HA7-2500/883
HA2502	—	—	HA2-2502/883
	—	—	HA4-2502/883
	—	—	HA7-2502/883
HA2510	12205BGC	—	HA2-2510/883
	—	—	HA7-2510/883
HA2512	—	—	HA2-2512/883
	—	—	HA4-2512/883
	—	—	HA7-2512/883
HA2520	12206BGC	—	HA2-2520/883
	—	—	HA7-2520/883
HA2522	—	—	HA2-2522/883
	—	—	HA4-2522/883
	—	—	HA7-2522/883
HA2529	—	—	HA2-2529/883
	—	—	HA4-2529/883
	—	—	HA7-2529/883

MILITARY PRODUCT REFERENCE GUIDE

Linear Products (continued)			
Part Number	JAN Part Number	DESC Drawing Number	883 Part Number
HA2539	—	—	HA1-2539/883
HA2540	—	—	HA4-2539/883
HA2541	—	—	HA1-2540/883
HA2542	—	—	HA4-2540/883
HA2544	—	—	HA2-2541/883
HA2600	12202BGC	—	HA1-2541/883
HA2602	—	—	HA2-2542/883
HA2620	12203BGC	—	HA2-2544/883
HA2622	—	—	HA4-2544/883
HA2640	—	7800302GC	HA7-2544/883
HA4741	—	—	HA2-2600/883
HA4900	—	—	HA7-2600/883
HA4902	—	—	HA2-2602/883
HA5002	—	—	HA4-2602/883
HA5033	—	—	HA7-2602/883
HA5101	—	—	HA2-2620/883
HA5102	—	—	HA7-2620/883
HA5104	—	—	HA2-2622/883
HA5111	—	—	HA4-2622/883
HA5112	—	—	HA7-2622/883
	—	—	HA2-2640/883
	—	—	HA4-2640/883
	—	—	HA7-2640/883
	—	—	HA1-4741/883
	—	—	HA4-4741/883
	—	—	—
	—	—	HA1-4902/883
	—	—	HA4-4902/883
	—	—	HA2-5002/883
	—	—	HA4-5002/883
	—	—	HA7-5002/883
	—	—	HA2-5033/883
	—	—	HA2-5101/883
	—	—	HA4-5101/883
	—	—	HA7-5101/883
	—	—	HA2-5102/883
	—	—	HA4-5102/883
	—	—	HA7-5102/883
	—	—	HA1-5104/883
	—	—	HA4-5104/883
	—	—	HA2-5111/883
	—	—	HA4-5111/883
	—	—	HA7-5111/883
	—	—	HA2-5112/883
	—	—	HA4-5112/883
	—	—	HA7-5112/883

MILITARY PRODUCT REFERENCE GUIDE

Linear Products (continued)			
Part Number	JAN Part Number	DESC Drawing Number	883 Part Number
HA5114	—	—	HA1-5114/883
	—	—	HA4-5114/883
HA5127	—	—	HA2-5127/883
	—	—	HA4-5127/883
	—	—	HA7-5127/883
HA5134	—	—	HA1-5134/883
	—	—	HA4-5134/883
HA5135	—	—	HA2-5135/883
	—	—	HA4-5135/883
	—	—	HA7-5135/883
HA5137	—	—	HA2-5137/883
	—	—	HA4-5137/883
	—	—	HA7-5137/883
HA5141	—	—	HA2-5141/883
	—	—	HA4-5141/883
	—	—	HA7-5141/883
HA5142	—	—	HA2-5142/883
	—	—	HA4-5142/883
	—	—	HA7-5142/883
HA5144	—	—	HA1-5144/883
	—	—	HA4-5144/883
HA5147	—	—	HA2-5147/883
	—	—	HA4-5147/883
	—	—	HA7-5147/883
HA5151	—	—	HA2-5151/883
	—	—	HA4-5151/883
	—	—	HA7-5151/883
HA5152	—	—	HA2-5152/883
	—	—	HA4-5152/883
	—	—	HA7-5152/883
HA5154	—	—	HA1-5154/883
	—	—	HA4-5154/883
HA5177	—	—	HA2-5177/883
	—	—	HA4-5177/883
	—	—	HA7-5177/883
HA5190	—	—	HA1-5190/883
HA5190	—	—	HA2-5190/883
	—	—	HA4-5190/883
HI200	—	—	HI1-200/883
	—	—	HI2-200/883
HI201	12302BEA	—	HI1-201/883
	12302BEC	—	—
	—	—	HI4-201/883
HI201HS	—	8671601EA	HI1-201HS/883
	—	86716012A	HI-201HS/883
HI222	—	—	HI1-222/883
	—	—	HI4-222/883

MILITARY PRODUCT REFERENCE GUIDE

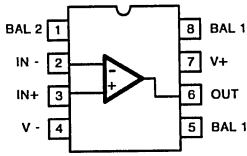
Linear Products (continued)			
Part Number	JAN Part Number	DESC Drawing Number	883 Part Number
HI300	—	86716012C	HI2-300/883
	—	—	HI1-300/883
HI301	—	—	HI2-301/883
	—	—	HI1-301/883
HI302	—	—	HI1-302/883
HI303	—	—	HI1-303/883
HI304	—	—	HI1-304/883
	—	—	HI2-304/883
HI305	—	—	HI1-305/883
	—	—	HI2-305/883
HI306	—	—	HI1-306/883
HI307	—	—	HI1-307/883
HI381	—	—	HI1-381/883
	—	—	HI2-381/883
HI384	—	—	HI1-384/883
HI387	—	—	HI1-387/883
	—	—	HI2-387/883
HI390	—	—	HI1-390/883
HI5040	—	8100609EX	HI1-5040/883
HI5041	—	8100610EX	HI1-5041/883
HI5042	—	8100611EX	HI1-5042/883
HI5043	—	8100612EX	HI1-5043/883
	—	81006122A	HI4-5043/883
HI5044	—	8100613EX	HI1-5044/883
HI5045	—	8100614EX	HI1-5045/883
	—	81006142A	HI4-5045/883
HI5046	—	8100615EA	HI1-5046/883
HI5046A	—	8100621EA	HI1-5046A/883
HI5047	—	8100616EA	HI1-5047/883
HI5047A	—	8100622EA	HI1-5047A/883
HI5048	—	8100617EA	HI1-5048/883
HI5049	—	8100620EA	HI1-5049/883
	—	81006202A	HI4-5049/883
HI5050	—	8100618EA	HI1-5050/883
HI5051	—	8100619EA	HI1-5051/883
	—	81006192A	HI4-5051/883

OPERATIONAL AMPLIFIERS: PINOUTS

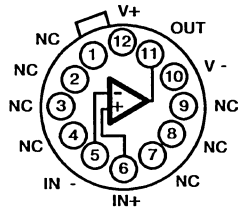
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<p>5</p>	<p>6</p>	<p>7</p>	<p>8</p> <p>Intentionally left blank</p>
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OPERATIONAL AMPLIFIERS PINOUTS

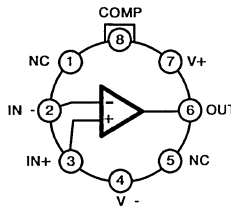
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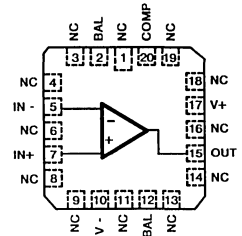
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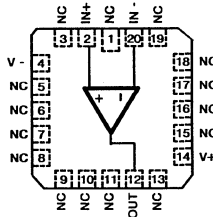
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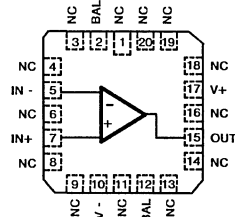
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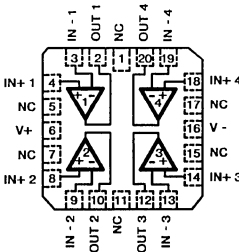
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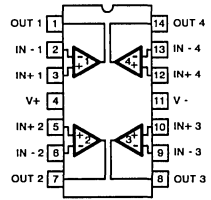
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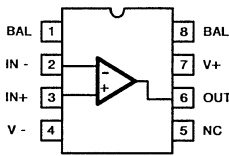
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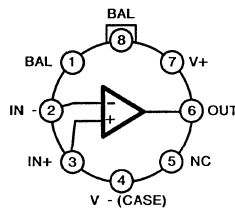
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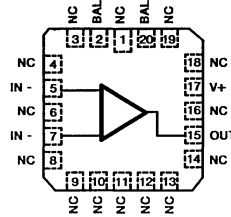
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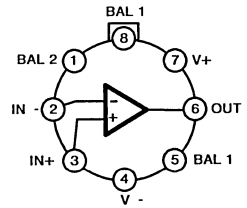
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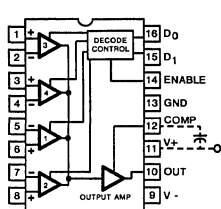
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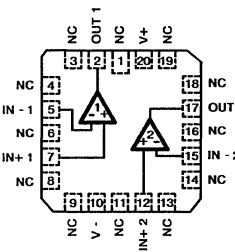
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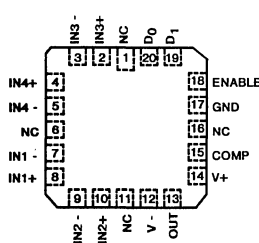
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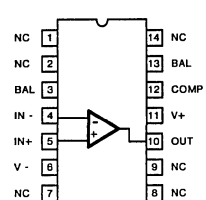
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OPERATIONAL AMPLIFIERS: WIDE BANDWIDTH

	Part Number	Temperature Range	Pinout (See pages 26, 27)	Gain Band-Width Product (MHz)	Full Power Bandwidth (MHz)	Slew Rate (V/ μ s)	Bias Current (nA)	Open Loop Gain (KV/V)	Minimum Gain Stable	Comments
SINGLES	HA-2500	-55°C to +125°C	1,2	12	0.5	30	100	30	Unity	
	HA-2502	-55°C to +125°C	1,2	12	0.5	30	125	25	Unity	
	HA-2505	0°C to +75°C	1,2	12	0.5	30	125	25	Unity	
	HA-2510	-55°C to +125°C	1,2,20	12	1.0	65	100	15	Unity	
	HA-2512	-55°C to +125°C	1,2	12	1.0	60	125	15	Unity	
	HA-2515	0°C to +75°C	1,2	12	1.0	60	125	15	Unity	
	HA-2520	-55°C to +125°C	1,2,20	20	2.0	120	100	15	3	
	HA-2522	-55°C to +125°C	1,2	20	1.6	120	125	15	3	
	HA-2525	0°C to +75°C	1,2	20	1.6	-120	125	15	3	
	HA-2529	-55°C to +125°C	1,2,20	20	2.6	150	50	18	3	New
	HA-2539	-55°C to +125°C -25°C to +85°C 0°C to +75°C	3,21	600	9.5	600	5000	30	10	
	HA-2540	-55°C to +125°C -25°C to +85°C 0°C to +75°C	4,13	400	6.0	400	5000	30	10	
	HA-2541	-55°C to +125°C 0°C to +75°C	5,6	40	4.5	280	6000	16	Unity	New, fast settling
	HA-2542	-55°C to +125°C 0°C to +75°C	7,32	70	5.5	375	6000	30	2	New, high output current
	HA-2544	-55°C to +125°C 0°C to +75°C	14,15,20	50	4.2	150	8000	6	Unity	New, video
	HA-2600	-55°C to +125°C	2,27	12	0.075	7	1	150	Unity	
	HA-2602	-55°C to +125°C	2,27	12	0.075	7	15	150	Unity	
	HA-2605	0°C to +75°C	2,27	12	0.075	7	5	150	Unity	
	HA-2620	-55°C to +125°C	2,20,27	100	0.6	35	1	150	5	
	HA-2622	-55°C to +125°C	2,27	100	0.6	35	5	150	5	
	HA-2625	0°C to +75°C	2,27	100	0.6	35	5	150	5	
	HA-5111	-55°C to +125°C 0°C to +75°C	1,2,20	100	0.8	50	100	1000	10	New, low noise
	HA-5137	-55°C to +125°C 0°C to +75°C	25,26,27	63	0.3	17	8	1800	5	New, precision
	HA-5147	-55°C to +125°C 0°C to +75°C	25,26,27	120	0.5	35	± 15	1500	10	New, precision
	HA-5147A	-55°C to +125°C 0°C to +75°C	25,26,27	120	0.5	35	± 10	1800	10	New, precision
	HA-5160	-55°C to +125°C 0°C to +75°C	19	100	1.0	120	0.02	150	10	J-FET
	HA-5162	-55°C to +125°C 0°C to +75°C	19	100	1.0	70	0.02	100	10	J-FET
HA-5190	-55°C to +125°C	4,13,18	150	6.5	200	5000	30	5	Fast settling	
HA-5195	0°C to +75°C	4,18	150	6.5	200	5000	30	5	Fast settling	
DUALS	HA-5102	-55°C to +125°C 0°C to +75°C	11,12,30	8	0.05	3	130	230	Unity	Low noise
	HA-5112	-55°C to +125°C 0°C to +75°C	11,12,30	60	0.25	20	130	230	10	Low noise
QUADS	HA-2400	-55°C to +125°C	29,31	40	0.5	30	50	150	10	Addressable
	HA-2404	-25°C to +85°C	29	40	0.5	30	50	150	10	Addressable
	HA-2405	0°C to +75°C	29	40	0.5	30	50	150	10	Addressable
	HA-2406	0°C to +75°C	29	30	0.3	20	50	150	10	Addressable
	HA-5104	-55°C to +125°C 0°C to +75°C	23,24	8	0.05	3	130	230	Unity	Low noise
	HA-5114	-55°C to +125°C 0°C to +75°C	23,24	60	0.25	20	130	230	10	Low noise

OPERATIONAL AMPLIFIERS: HIGH SLEW-RATE

	Part Number	Temperature Range	Pinout (See pages 24,25)	Slew Rate (V/ μ s)	Gain Band-Width Product (MHz)	Full Power Bandwidth (MHz)	Bias Current (nA)	Open Loop Gain (KV/V)	Minimum Gain Stable	Comments
SINGLES	HA-2500	-55°C to +125°C	1,2	30	12	0.5	100	30	Unity	
	HA-2502	-55°C to +125°C	1,2,20	30	12	0.5	125	25	Unity	
	HA-2505	0°C to +75°C	1,2	30	12	0.5	125	25	Unity	
	HA-2620	-55°C to +125°C	2,20	35	100	0.6	1	150	5	
	HA-2622	-55°C to +125°C	2,20	35	100	0.6	5	150	5	
	HA-2625	0°C to +75°C	2	35	100	0.6	5	150	5	
	HA-5147	-55°C to +125°C 0°C to +75°C	25,26,27	35	120	0.5	± 15	1500	10	New, precision
	HA-5147A	-55°C to +125°C 0°C to +75°C	25,26,27	35	120	0.5	± 10	1800	10	New, precision
	HA-5111	-55°C to +125°C 0°C to +75°C	1,2,20	50	100	0.8	100	1000	10	New, low noise
	HA-2512	-55°C to +125°C	1,2,20	60	12	1.0	125	15	Unity	
	HA-2515	0°C to +75°C	1,2	60	12	1.0	125	15	Unity	
	HA-2510	-55°C to +125°C	1,2	65	12	1.0	100	15	Unity	
	HA-2529	-55°C to +125°C	1,2,20	150	20	2.6	50	18	3	New
	HA-5162	-55°C to +125°C 0°C to +75°C	19	70	100	1.0	0.02	100	10	J-FET
	HA-5160	-55°C to +125°C 0°C to +75°C	19	120	100	1.0	0.02	150	10	J-FET
	HA-2520	-55°C to +125°C	1,2	120	20	2.0	100	15	3	
	HA-2522	-55°C to +125°C	1,2,20	120	20	1.6	125	15	3	
	HA-2525	0°C to +75°C	1,2	120	20	1.6	125	15	3	
	HA-2544	-55°C to +125°C 0°C to +75°C	14,15,20	150	50	4.2	8000	6	Unity	New, video
	HA-5190	-55°C to +125°C	4,13,18	200	150	6.5	5000	30	5	Fast settling
HA-5195	0°C to +75°C	4,18	200	150	6.5	5000	30	5	Fast settling	
HA-2541	-55°C to +125°C 0°C to +75°C	5,6	280	40	4.5	6000	16	Unity	New, fast settling	
HA-2542	-55°C to +125°C 0°C to +75°C	7,32	375	70	5.5	6000	30	2	New, high output current	
HA-2540	-55°C to +125°C -25°C to +85°C 0°C to +75°C	4,13	400	400	6.0	5000	30	10		
HA-2539	-55°C to +125°C -25°C to +85°C 0°C to +75°C	3,21	600	600	9.5	5000	30	10		
QUADS	HA-5112	-55°C to +125°C 0°C to +75°C	11,12,30	20	60	0.3	130	230	10	Low noise
	HA-2400	-55°C to +125°C	29,31	30	40	0.5	50	150	10	Addressable
	HA-2404	-40°C to +85°C	29	30	40	0.5	50	150	10	Addressable
	HA-2405	0°C to +75°C	29	30	40	0.5	50	150	10	Addressable
	HA-2406	0°C to +75°C	29	20	30	0.3	50	150	10	Addressable
HA-5114	-55°C to +125°C 0°C to +75°C	23,24	20	60	0.3	130	230	10	Low noise	

OPERATIONAL AMPLIFIERS: LOW POWER

	Part Number	Temperature Range	Pinout (See pages 24,25)	Supply Current ($\mu\text{A}/\text{Amplifier}$)	Supply Range (V)	Slew Rate ($\text{V}/\mu\text{s}$) At Indicated Supply Current	Gain Bandwidth Product (kHz) At Indicated Supply Current	Output Swing (V) $\pm 15\text{V}$ Power Supplies	Offset Voltage (mV)	Single Supply Operation	Comments
SINGLES	HA-5135	-55°C to +125°C 0°C to +75°C	17,22,28	1000	$\pm 5/\pm 20$	0.8	2500	± 12	0.01		Precision
	HA-5180	-55°C to +125°C -25°C to +85°C 0°C to +75°C	15,16	700	$\pm 5/\pm 20$	7	2000	± 12	1.0		J-FET Ultra-low bias
	HA-5151	-55°C to +125°C 0°C to +75°C	9,10	200	$\pm 1.5/\pm 15$ + 3/+ 30	4.5	1300	$> \pm 10$	0.5	Yes	New
	HA-5141	-55°C to +125°C 0°C to +75°C	9,10	50	$\pm 1.5/\pm 15$ + 3/+ 30	1	400	0/+4(+5Vs)	2	Yes	Ultra-low power
	HA-2720	-55°C to +125°C	14,15	1.5/15	$\pm 3/\pm 20$	0.1/0.8	120/1200	± 13.5	2.0		Programmable
DUALS	HA-5152	-55°C to +125°C 0°C to +75°C	11,12,30	200	$\pm 1.5/\pm 15$ + 3/+ 30	4.5	1300	$> \pm 10$	0.5	Yes	New
	HA-5142	-55°C to +125°C 0°C to +75°C	11,12,30	50	$\pm 1.5/\pm 15$ + 3/+ 30	1	400	0/+4(+5Vs)	2	Yes	Ultra-low power
QUADS	HA-5134	-55°C to +125°C 0°C to +75°C	23,24	1000	$\pm 5/\pm 20$	1.2	4000		0.025		New, precision
	HA-5154	-55°C to +125°C 0°C to +75°C	23,24	200	$\pm 1.5/\pm 15$ + 3/+ 30	4.5	1300	$> \pm 10$	0.5	Yes	New
	HA-5144	-55°C to +125°C 0°C to +75°C	23,24	50	$\pm 1.5/\pm 15$ + 3/+ 30	1	400	0/+4(+5Vs)	2	Yes	Ultra-low power

OPERATIONAL AMPLIFIERS: PRECISION

Part Number	Temperature Range	Pinout (See pages 24,25)	Offset Voltage (μV)	Offset Voltage Drift ($\mu\text{V}/^\circ\text{C}$)	Bias Current (nA)	Open Loop Gain (KV/V)	1 kHz Noise Current ($\text{pA}/\sqrt{\text{Hz}}$)	1 kHz Noise Voltage ($\text{nV}/\sqrt{\text{Hz}}$)	CMRR (dB)	PSRR (dB)	Supply Current (mA/amp)	Comments
HA-5170	-55°C to +125°C -25°C to +85°C 0°C to +75°C	14,15,20	100	2	0.02	600	0.01	10	100	105	1.9	J-FET
HA-5180	-55°C to +125°C -25°C to +85°C 0°C to +75°C	15,16	1000	5	0.0003	1000	0.01	70	110	105	0.7	J-FET
HA-5134	-55°C to +125°C 0°C to +75°C	23,24	50	2	± 10	3000	1	7	120	116	1.6	New, quad
HA-5135	-55°C to +125°C 0°C to +75°C	17,22,28	10	0.4	1	10,000	0.14	9.0	120	130	1	
HA-5127A	-55°C to +125°C -25°C to +85°C 0°C to +75°C	25,26,27	10	0.2	± 10	1800	0.4	3.0	126	120	3	New
HA-5127	-55°C to +125°C -25°C to +85°C 0°C to +75°C	25,26,27	20	0.3	± 12	1800	0.4	3.0	123	120	3	New
HA-5137A	-55°C to +125°C -25°C to +85°C 0°C to +75°C	25,26,27	10	0.2	± 10	1800	0.4	3.0	126	120	3	New
HA-5137	-55°C to +125°C -25°C to +85°C 0°C to +75°C	25,26,27	20	0.3	± 12	1800	0.4	3.0	123	120	3	New
HA-5147A	-55°C to +125°C -25°C to +85°C 0°C to +75°C	25,26,27	10	0.2	± 10	1800	0.4	3.0	126	114	3.5	New
HA-5147	-55°C to +125°C -25°C to +85°C 0°C to +75°C	25,26,27	30	0.4	± 15	1500	0.4	3.2	120	96	3.5	New

OPERATIONAL AMPLIFIERS: GENERAL PURPOSE

	Part Number	Temperature Range	Pinout (See pages 26,27)	Gain Bandwidth Product (MHz)	Slew Rate (V/ μ s)	Offset Voltage (mV)	Bias Current (nA)	1 kHz Noise Voltage (nV/ $\sqrt{\text{Hz}}$)	Open Loop Gain (KV/V)	Minimum Gain Stable	Supply Current (mA/package)	Comments
SINGLES	HA-2500	-55°C to +125°C	1,2	12	30	2	100	21	30	Unity	4	High slew
	HA-2502	55°C to +125°C	1,2	12	30	4	125	21	25	Unity	4	High slew
	HA-2505	0°C to +75°C	1,2	12	30	4	125	21	25	Unity	4	High slew
	HA-2600	-55°C to +125°C	1,2	12	7	0.5	1	16	150	Unity	3	Wide band
	HA-2602	-55°C to +125°C	1,2	12	7	3	15	16	150	Unity	3	Wide band
	HA-2605	0°C to +75°C	1,2	12	7	3	5	16	150	Unity	3	Wide band
	HA-5101	-55°C to +125°C 0°C to +75°C	14,15	10	10	0.5	100	3.5	1000	Unity	4	New, low noise
	HA-5111	-55°C to +125°C 0°C to +75°C	1,2	100	50	0.5	100	3.5	1000	10	4	New, low noise
QUADS	HA-5102	-55°C to +125°C 0°C to +75°C	11,12,30	8	3	0.5	130	4.3	230	Unity	3	Low noise
	HA-5112	-55°C to +125°C 0°C to +75°C	11,12,30	60	20	0.5	130	4.3	230	10	3	Low noise
DUALS	HA-4741	-55°C to +125°C	23,24	3.5	1.6	0.5	60	9	100	Unity	<5	Quad 741, JI
	HA-4741	0°C to +75°C	24	3.5	1.6	1	60	9	50K	Unity	<7	Quad 741, JI
	HA-5104	-55°C to +125°C 0°C to +75°C	23,24	8	3	0.5	130	4.3	230	Unity	5	Low noise, compensated
	HA-5114	-55°C to +125°C 0°C to +75°C	23,24	60	20	0.5	130	4.3	230	10	5	Low noise, uncompensated
	HA-5134	-55°C to +125°C 0°C to +75°C	23,24	4	1.2	.025	15	7	1000	Unity	4	New, precision

OPERATIONAL AMPLIFIERS: HIGH VOLTAGE

HA-2640, HA-2645		
Features	Applications	
<ul style="list-style-type: none"> • Slew rate: 1 V/μs • Bandwidth: 4 MHz • Input offset voltage: 4 mV • Offset current: 5 nA • Output voltage swing: ± 35 V • Input voltage swing: ± 35 V • Supply range: ± 10 V to ± 40 V • Output overload protection 	<ul style="list-style-type: none"> • Industrial control systems • Power supplies • High-voltage regulators • Resolver excitation • Signal conditioning 	

BUFFERED AMPLIFIERS: VIDEO

HA-5002		
Features	Applications	
<ul style="list-style-type: none"> • Voltage gain: .995 • High slew rate: 1300 V/μs • -3dB bandwidth: 110 MHz • High output current: 200 mA • Pulsed output current: 400 mA • Low supply current: 8.3 mA 	<ul style="list-style-type: none"> • High frequency buffers • High speed line drivers • High power current boosters • High power current sources 	

HA-5004		
Features	Applications	
<ul style="list-style-type: none"> • High slew rate: 1200 V/μs • High output current: ± 100 mA • Unity gain bandwidth: 90 MHz • Gain range: 1 to 10 v/v • Current-mode feedback • Thermal overload protection • Output enable/disable 	<ul style="list-style-type: none"> • Video gain block • Zero insertion loss line driver • Current to voltage converter • High speed buffer 	

BUFFERED AMPLIFIERS: VIDEO

HA-5033		
Features	Applications	Pinout
<ul style="list-style-type: none"> Differential phase error: 0.1° Differential gain error: 0.1% High slew rate: $1300 \text{ V}/\mu\text{s}$ —3dB bandwidth: 250 MHz High output current 	<ul style="list-style-type: none"> Video buffers High frequency buffers High speed line drivers Current boosters 	<p>METAL CAN</p> <p>MINI-DIP</p>

OPERATIONAL AMPLIFIERS: ADDRESSABLE

HA-2400, HA-2404, HA-2405, HA-2406		
Features	Applications	
<ul style="list-style-type: none"> Four channels addressable High slew rate: $30 \text{ V}/\mu\text{s}$ Wide gain bandwidth product: 40 MHz High gain: 150K TTL compatible 	<ul style="list-style-type: none"> Signal selection/multiplexing Variable gain stages Oscillators Filters Comparators Integrators 	

COMPARATORS

HA-4900, HA-4902, HA-4905		
Features	Applications	
<ul style="list-style-type: none"> Fast response time: 130 ns Low offset voltage: 2 mV Low offset current: 10 nA Single or dual supply Analog and logic supplies separated for easier interface and noise immunity 	<ul style="list-style-type: none"> Threshold detectors Zero crossing detectors Window detectors Interface Oscillators 	

NEW LINEAR PRODUCTS: COMING SOON

Monolithic Power Supply	HV-1205
Features	
<ul style="list-style-type: none"> • Direct 120/240 VAC to 5 VDC • 50 mA at < 50 mVp-p ripple • Switching pre-regulator • Uses Harris' high voltage process 	
Precision High Speed Operational Amplifier	HA-2548
Features	
<ul style="list-style-type: none"> • 150 V/μs slew rate • 300 μV offset voltage • 5 μV/$^{\circ}$C offset drift • 250 ns 0.01% settling time 	
Single and Dual Wideband Operational Amplifiers	HA-5221/5222
Features	
<ul style="list-style-type: none"> • 40 MHz unity gain bandwidth • 750 μV maximum offset voltage • 30 mA output current 	
Precision PRAM Four Channel Programmable Amplifier	HA-2410
Features	
<ul style="list-style-type: none"> • 100 μV low offset voltage • 100 μV offset voltage matching • 140 dB high open loop gain <ul style="list-style-type: none"> • 130 dB high CMRR and PSRR • 150 mW low power consumption • Pin compatible with HA-2400/04/05 	
Ultra High Slew Rate Operational Amplifier	HFA-0001
Features	
<ul style="list-style-type: none"> • 300 MHz unity gain bandwidth • 43 MHz full power bandwidth • 1000 V/μS high slew rate <ul style="list-style-type: none"> • +50 mA high output drive • Monolithic construction 	
Wideband Operational Amplifier	HFA-0002
Features	
<ul style="list-style-type: none"> • 1 GHz wide gain bandwidth product • 150 V/μs high slew rate • 100 dB high open loop gain <ul style="list-style-type: none"> • 1 mV low offset voltage • 150 mW low power consumption • Monolithic construction 	
High Slew Rate Operational Amplifier	HFA-0005
Features	
<ul style="list-style-type: none"> • 250 MHz unity gain bandwidth • 25.8 MHz full power bandwidth • 600 V/μs high slew rate <ul style="list-style-type: none"> • +50 mA high output drive • Monolithic bipolar construction 	
Wideband Two Quadrant Analog Multiplier	HA-2546/2547
Features	
<ul style="list-style-type: none"> • 400 V/μs high speed voltage output • 1.8% low multiplication error • 5 μA input bias currents <ul style="list-style-type: none"> • -52 dB control signal feedthrough • 40 MHz (HA-2546)/100MHz (HA-2547) wide signal bandwidth • 11 MHz wide control bandwidth • 0.10 dB gain tolerance to 5 MHz 	
High Speed/Low Distortion Sample/Hold Operational Amplifier	HA-5340
Features	
<ul style="list-style-type: none"> • 400 ns acquisition time to 0.01% (10V step) • 120 ns hold-mode settling time to 0.01% (10V step) <ul style="list-style-type: none"> • 74 dB signal to noise and distortion (20 Vp-p, 450 KHz) 	

ANALOG MULTIPLEXERS: OVERVOLTAGE-PROTECTED

Part Number	Multiplexer Type	Temperature Range	Package	R _{on} Max, Full Temp (Ω)	Off Output Leakage (nA) Max, Full Temp	Access Time (nS) Typ, 25°C	Settling Time (.1%) Typ, 25°C
H11-0506A-2 H11-0506A-5 H13-0506A-5 H11-0506A-8 H14-0506A-8	Single-ended 16-channel 70 Vp-p input	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	28-pin cerdip 28-pin cerdip 28-pin epoxy dip 28-pin cerdip 28-pin LCC ceramic	1.8K	300	500	1.2 μs
H11-0507A-2 H11-0507A-5 H13-0507A-5 H11-0507A-8 H14-0507A-8	Differential 8-channel 70 Vp-p input	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	28-pin cerdip 28-pin cerdip 28-pin epoxy dip 28-pin cerdip 28-pin LCC ceramic	1.8K	200	500	1.2 μs
H11-0508A-2 H11-0508A-5 H13-0508A-5 H11-0508A-8 H14-0508A-8	Single-ended 8-channel 70 Vp-p input	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 20-pin LCC ceramic	1.8K	200	500	1.2 μs
H11-0509A-2 H11-0509A-5 H13-0509A-5 H11-0509A-8 H14-0509A-8	Differential 4-channel 70 Vp-p input	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 20-pin LCC ceramic	1.8K	100	500	1.2 μs
H11-546-2 H11-546-4 H11-546-5 H13-546-5 H11-546/883 H14-546-8 H14P546-5	Single-ended 16-channel 70 Vp-p input With RON Matching	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	28-pin cerdip 28-pin cerdip 28-pin cerdip 28-epoxy dip 28-pin cerdip 28-pin LCC ceramic 28-pin PLCC epoxy	1.8K	300	500	1.2 μs
H11-547-2 H11-547-4 H11-547-5 H13-547-5 H11-547/883 H14-547-8 H14P547-5	Differential 8-channel 70 Vp-p input With RON Matching	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	28-pin cerdip 28-pin cerdip 28-pin cerdip 28-epoxy dip 28-pin cerdip 28-pin LCC ceramic 28-pin PLCC epoxy	1.8K	200	500	1.2 μs
H11-548-2 H11-548-4 H11-548-5 H13-548-5 H11-548/883 H14-548-8 H14P548-5	Single-ended 8-channel 70 Vp-p input With RON Matching	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	16-pin cerdip 16-pin cerdip 16-pin cerdip 16-epoxy dip 16-pin cerdip 20-pin LCC ceramic 20-pin PLCC epoxy	1.8K	200	500	1.2 μs
H11-549-2 H11-549-4 H11-549-5 H13-549-5 H11-549/883 H14-549-8 H14P549-5	Differential 4-channel 70 Vp-p input With RON Matching	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	16-pin cerdip 16-pin cerdip 16-pin cerdip 16-epoxy dip 16-pin cerdip 20-pin LCC ceramic 20-pin PLCC epoxy	1.8K	100	500	1.2 μs

ANALOG MULTIPLEXERS: GENERAL PURPOSE

Part Number	Multiplexer Type	Temperature Range	Package	RonMax. Full Temp (Ω)	Off Output Leakage (nA) Max. Full Temp	Access Time (nS) Typ. 25°C	Setting Time (.1%) Typ. 25°C
HI1-0506-2 HI1-0506-4 HI1-0506-5 HI3-0506-5 HI1-0506/883 HI4-0506-8 HI4P0506-5	Single-ended 16-channel	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C	28-pin cerdip 28-pin cerdip 28-pin cerdip 28-pin epoxy dip 28-pin cerdip 28-pin LCC ceramic 28-pin PLCC epoxy	400	300	250	1.2μs
HI1-0507-2 HI1-0507-4 HI1-0507-5 HI3-0507-5 HI1-0507/883 HI4-0507-8 HI4P0507-5	Differential 8-channel	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C	28-pin cerdip 28-pin cerdip 28-pin cerdip 28-pin epoxy dip 28-pin cerdip 28-pin LCC ceramic 28-pin PLCC epoxy	400	200	250	1.2μs
HI1-0508-2 HI1-0508-4 HI1-0508-5 HI3-0508-5 HI1-0508/883 HI4-0508-8 HI4P0508-5	Single-ended 8-channel	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 20-pin LCC ceramic 20-pin PLCC epoxy	400	200	250	360ns
HI1-0509-2 HI1-0509-4 HI1-0509-5 HI3-0509-5 HI1-0509/883 HI4-0509-8 HI4P0509-5	Differential 4-channel	-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 20-pin LCC ceramic 20-pin PLCC epoxy	400	100	250	360ns
HI1-1818A-2 HI1-1818A-5 HI3-1818A-5 HI1-1818A-8 HI4P1818-5	Single-ended 8-channel Low-power	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 20-pin PLCC epoxy	500	250	350	1.0μs
HI1-1828A-2 HI1-1828A-5 HI3-1828A-5 HI1-1828A-8 HI4P1828-5	Differential 4-channel Low-power	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 20-pin PLCC epoxy	500	125	350	1.0μs

ANALOG MULTIPLEXERS: HIGH SPEED/MODE PROGRAMMABLE

Part Number	Multiplexer Type	Temperature Range	Package	R _{on} Max, Full Temp (Ω)	Off Output Leakage (nA) Max, Full Temp	Access Time (nS) Typ, 25°C	Settling Time (.1%) Typ, 25°C
HI1-0516-2 HI1-0516-5 HI3-0516-5 HI1-0516-8 HI4-516-8	16-channel/Dual 8	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	28-pin cerdip 28-pin cerdip 28-pin epoxy dip 28-pin cerdip 28-pin LCC ceramic	1.0K	100	130	250 ns
HI1-0518-2 HI1-0518-5 HI3-0518-5 HI1-0518/883 HI4-518-8 HI4P0518-5	8-channel/Dual 4	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C	18-pin cerdip 18-pin cerdip 18-pin epoxy dip 18-pin cerdip 20-pin LCC ceramic 20-pin PLCC epoxy	1.0K	50	130	250 ns

ANALOG MULTIPLEXERS: SPECIAL PURPOSE

Part Number	Multiplexer Type	Temperature Range	Package	R _{on} Max, Full Temp (Ω)	Off Output Leakage (nA) Max, Full Temp	Access Time (nS) Typ, 25°C	Settling Time (.1%) Typ, 25°C
HI1-0524-2 HI1-0524-5 HI3-0524-5 HI1-0524/883 HI4-0524-8 HI4P0524-5	4-channel video with low 10 MHz crosstalk	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C	18-pin cerdip 18-pin cerdip 18-pin epoxy dip 18-pin cerdip 20-pin LCC ceramic 20-pin PLCC epoxy	1.5K	50	150	200 ns
HI1-539-2 HI1-2425-5 HI3-539-5 HI1-539-8 HI4P539	Differential 4-channel, Low-level Matched	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 20-pin PLCC epoxy	1.1K	25 2.5 2.5 25 2.5	250	900 ns (.01%)

SAMPLE-AND-HOLD AMPLIFIERS

Part Number	Sample/Hold Type	Temperature Range	Package*	Acquisition Time, (to .01%) Typ, 25°C	Charge Transfer Typ, 25°C	Aperture Time Typ, 25°C	Gain Bandwidth Product Typ, 25°C
HA1-2420-2 HA1-2425-5 HA1-2420/883 HA3-2425-5 HA4-2420-8 HA4P2425-5	Low droop rate	-55°C to +125°C 0°C to +75°C -55°C to +125°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin epoxy 20-pin LCC ceramic 20-pin PLCC epoxy	3.2 μs (C _H = 1,000 pF)	10 pC	30 ns	2.5 MHz
HA1-5320-2 HA1-5320-5 HA1-5320-8 HA4-5320-8	High speed Low charge transfer Precision Complete—includes hold capacitor	-55°C to +125°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	14-pin cerdip 14-pin cerdip 14-pin cerdip 20-pin LCC ceramic	1 μs (C _H = Internal)	0.1 pC	25 ns	2.0 MHz C _H = 100 pF
HA1-5330-5 HA1-5330-4 HA1-5330-2 HA1-5330/883 HA4-5330/883	Very high speed Precision monolithic Complete—includes hold capacitor	0°C to +75°C -25°C to +85°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip 20-pin LCC ceramic	500 ns (C _H = Internal)	.05 pC	20 ns	4.5 MHz

A/D CONVERTERS: MICROPROCESSOR COMPATIBLE

<p>12-Bit A/D Converter with μP Interface HI-574A</p>	<p>Features</p>
<ul style="list-style-type: none"> • Complete with reference and clock • 150 ns bus access time • 20 μs typical conversion time (full temperature) • ± 12 V to ± 15 V operation • No missing codes over temperature • Minimal set-up time for control signals • Byte enable/short cycle (A_0 input) • Improved alternate source for the AD574A and HS574 • Available in 28-pin cerdip, coming soon in leadless chip carriers 	

Part Number	Resolution Bits	Temperature Range	Linearity Error max, 25°C (LSB)	25°C Differential Nonlinearity, max No Missing Codes	Gain Drift ppm/°C, max Full Temp.	Conversion Speed. (μ s)	
						Max Over Temperature 12 Bits	8 Bits
HI-574AJD-5 HI-574AKD-5 HI-574ALD-5 HI-574ASD-2 HI-574ASD/883 HI-574ATD-2 HI-574ATD/883	12	0°C to +75°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	± 1 $\pm \frac{1}{2}$ $\pm \frac{1}{2}$ ± 1 ± 1 $\pm \frac{1}{2}$ $\pm \frac{1}{2}$	11 bits 12 bits 12 bits 11 bits 11 bits 12 bits 12 bits	± 45 ± 25 ± 10 ± 50 ± 50 ± 25 ± 25	25	17

<p>12-Bit A/D Converter with μP Interface HI-674A</p>	<p>Features</p>
<ul style="list-style-type: none"> • Complete 12 bit A/D converter with reference and clock • Fast conversion -12 μs typical, 15 μs maximum for 12 bits • Selectable 8 or 12 line bus interface to microprocessor • 150 ns bus access time • Same pinout and functions as the HI-574A and AD574A • No missing codes over temperature • Available in 28-pin cerdip 	

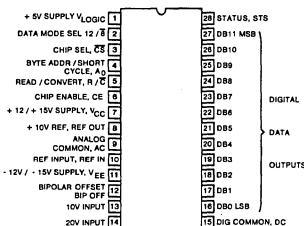
Part Number	Resolution Bits	Temperature Range	Linearity Error max, 25°C (LSB)	25°C Differential Nonlinearity, max No Missing Codes	Gain Drift ppm/°C, max Full Temp.	Conversion Speed. (μ s)	
						Max Over Temperature 12 Bits	8 Bits
HI-674AJD-5 HI-674AKD-5 HI-674ALD-5 HI-674ASD-2 HI-674ASD/883 HI-674ATD-2 HI-674ATD/883	12	0°C to +75°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	± 1 $\pm \frac{1}{2}$ $\pm \frac{1}{2}$ ± 1 ± 1 $\pm \frac{1}{2}$ $\pm \frac{1}{2}$	11 bits 12 bits 12 bits 11 bits 11 bits 12 bits 12 bits	± 45 ± 25 ± 10 ± 50 ± 50 ± 25 ± 25	15	10

A/D CONVERTERS: MICROPROCESSOR COMPATIBLE

12-Bit A/D Converter with μ P Interface HI-774

Features

- Complete with reference and clock
- 8 μ s conversion time
- 150 ns bus access time
- Superior alternate source to the AD574A, HS574 and HI574A
- No missing codes over temperature
- Full 8 or 16-bit μ P interface
- Error correction



Part Number	Resolution Bits	Temperature Range	Linearity Error max, 25°C (LSB)	25°C Differential Nonlinearity, max No Missing Codes	Gain Drift ppm/°C, max Full Temp.	Conversion Speed. (μ s) Max Over Temperature	
						12 Bits	8 Bits
HI1-774JD-5		0°C to +75°C	± 1	11 bits	± 9	11	8.3
HI1-774KD-5		0°C to +75°C	$\pm \frac{1}{2}$	12 bits	± 5		
HI1-774SD-2		-55°C to +125°C	± 1	11 bits	± 20		
HI1-774TD-2		-55°C to +125°C	$\pm \frac{1}{2}$	12 bits	± 10		

D/A CONVERTERS: MONOLITHIC/HIGH PERFORMANCE

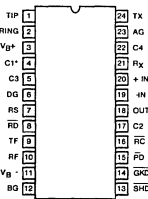
Part No.	Features	Resolution Bits	Temp. Range	Package	Output		Non-linearity Max. 25°C (LSB)	Settling Time to ½ LSB Typ. 25°C
					Current	Voltage		
HI1-5618A-2 HI1-5618A-5 HI3-5618A-5 HI1-5618B-2 HI1-5618B-5 HI3-5618B-5	Very fast settling time Low power CMOS, TTL or DTL compatible Guaranteed monotonic over temperature On-chip resistors for gain and bipolar offset	8	-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	18-pin cerdip 18-pin cerdip 18-pin epoxy dip 18-pin cerdip 18-pin cerdip 18-pin epoxy dip	✓		±¼ ±¼ ±¼ ±½ ±½ ±½	65 ns
HI1-565AJD HI1-565AKD HI1-565ASD HI1-565ATD	+10 V internal reference New industry standard Low power Pin compatible with AD565A Operates with ±12 V supplies	12	0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	24-pin cerdip	✓		±¾ ±¾ ±¾ ±½	150 ns
HI1-5660-2 HI1-5660-5 HI1-5660-8 HI1-5660A-2 HI1-5660A-5	Low cost Similar to AD 566A Excellent power supply rejection Internal cancellation of ground currents	12	-55°C to +125°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C	24-pin cerdip	✓		±½ ±½ ±½ ±¼ ±¼	250 ns
HI1-0562A-2 HI1-0562A-4 HI1-0562A-5 HI1-0562A/883	Low gain drift Similar to AD 562 Monotonic over temperature	12	-55°C to +125°C -25°C to +85°C 0°C to +75°C	24-pin cerdip -55°C to +125°C	✓			300 ns ±¼
HI1-5680I-5 HI1-5680V-5 HI1-5685I-4 HI1-5685V-4 HI1-5685AI-4 HI1-5685AV-4 HI1-5687I-2 HI1-5687V-2 HI1-5697V/883	New industry standard direct replacement for the DAC80/85/87 Complete DAC with reference on-board ±12 V power supply operation Available in either current or voltage output	12	0°C to +75°C 0°C to +75°C -25°C to +85°C -25°C to +85°C -25°C to +85°C -55°C to +125°C -55°C to +125°C -55°C to +125°C	24-pin cerdip	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	±½	300 ns 1.5 μs 300 ns 1.5 μs 300 ns 1.5 μs 300 ns 1.5 μs 1.5 μs
HI1-5690V-5 HI1-5695V-4 HI1-5697V-2 HI1-5697V/883	Improved replacement for the DAC 80/85/87 Two or three supply operation On-board low-noise reference	12	0°C to +75°C -25°C to +85°C -55°C to +125°C -55°C to +125°C	24-pin cerdip		✓ ✓ ✓ ✓	±½	0.75 μs
HI1-DAC16B-5 HI1-DAC16C-5	Low unipolar offset and offset T.C. Low drift Excellent stability TTL/5 V-CMOS compatible	16	0°C to +75°C	40-pin cerdip	✓		±2 ±4	1.0 μs†

*Leadless chip carriers available.

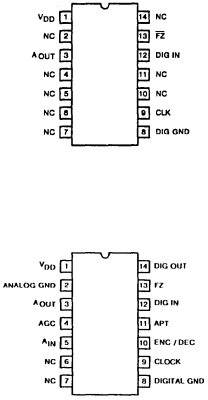
†To ±2 LSB

TELECOMMUNICATIONS PRODUCTS

Subscriber Line Interface Circuit (SLIC) HC-5502A, HC-5504

Features	Applications	
<ul style="list-style-type: none"> • Monolithic integrated device • Bipolar Dielectric Isolation (DI) high-voltage process • Ring generator referenced to ground (5502A) • Ring generator referenced to negative battery supply (5504) • Low standby power • Typical short loop current: 30mA (5502A) 40mA (5504) • Controlled supply of battery feed current for short loops • Overvoltage protection ± 500 V in ceramic ± 1000 V in plastic • Internal ring relay driver. • 5502A: Tip injected ringing. • 5504: Tip/Ring/Balanced • Switch hook, ground key and ring trip detection functions 	<ul style="list-style-type: none"> • Solid-state line interface circuit for analog or digital PBX systems, replacing transformer and hybrid systems • Combine most BORSHT functions on single chip • BORSHT: Battery feed, over-voltage protection, Ring relay driver, Supervision (off-hook, ring trip and ground key detection), Hybrid (2-4 wire/4-2 wire conversions). • Selected denial of power to subscriber loops • Application Note #549 • Available in PLCC packaging 	

Continuously Variable Slope Delta Modulator (CVSD) HC-55536, HC-55564

Features	Applications	
<ul style="list-style-type: none"> • Real time A to D • All digital • Requires few external parts • CMOS low power drain: 1.5 mW from single 3.0 V to 7 V supply • Time constants determined by clock frequency • No calibration or drift problems • Automatic offset adjustment • Half-duplex operation by digital control • Automatic overload recovery • Automatic "Quiet" pattern generation • AGC control signal available (HC-55564) • Commercial and military packaging 	<ul style="list-style-type: none"> • Use with HC-5512 CVSD filter • Voice I/O for digital systems and speech synthesis • Voice encryption/scrambling/security • Audio manipulations: delay lines, time compression, echo generation/echo suppression, and special effects • Voice mail • Voice store and forward • Pagers • Programmable signal generators • Voice/data multiplexers • Satellites • Application Note #607 	

TELECOMMUNICATIONS PRODUCTS

Universal Active Filter HF-10

Features	Applications	
<ul style="list-style-type: none"> • Programmable passband gain, center frequency and Q. Low noise. • Low-power 3 micron analog CMOS • Clock to center frequency ratio accuracy $\pm 2\%$ • Filter cutoff frequency stability directly dependent on external clock quality • Separate highpass (or notch or allpass), bandpass, lowpass outputs. Any three operate simultaneously. • f_{0x} Q range up to 50 kHz minimum • Operates to $f_0 = 20$ kHz • -55°C to $+125^\circ\text{C}$ temperature range operation to industry standard specification. 	<ul style="list-style-type: none"> • Telecom • Transmission • Modems and multiplexers • Speech processing • General purpose filtering 	

PCM/PAM/CVSD Voiceband Filters HC-5512, HC-5512A, HC-5512D

Features	Applications	
<ul style="list-style-type: none"> • Industry standard pinout • CMOS low power consumption: 45 mW (600Ω/0 dBm Load) 30 mW (power amps disabled) • Power down mode: 0.5 mW • ± 5 V power supplies • Gain adjust range: 20 dB • No external anti-aliasing components • SIN x/x correction in receive filter • 50/60 Hz rejection in transmit filter • TTL/CMOS compatible • All input-protected against static discharge due to handling • Exceeds all D3/D4 and CCITT specifications* <p>*Except D version</p>	<ul style="list-style-type: none"> • Transmit and receive filtering for PCM CODECs and PAM applications • Voice filtering in speech synthesis and digital radio • Filtering in modems and multiplexers • HC-5512D is military temp-range and available in LCC packaging 	

ANALOG SWITCHES

Part Number	Switch Type	Temperature Range °C	Package	R _{on} Max, Full Temp	Off Output Leakage Max, Full Temp	Switch ON Time Max, 25°C	Power Dissipation Typ, 25°C
HI1-0301-2		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0301-5		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0301-7		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0301-8		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI2-0301-2		-55°C to +125°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI2-0301-5		0°C to +75°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI2-0301-7		0°C to +75°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI2-0301-8		-55°C to +125°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI3-0301-5		0°C to +75°C	14-pin epoxy dip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0305-2		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI1-0305-5		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI1-0305-7		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI1-0305-8		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI2-0305-2		-55°C to +125°C	TO-100 can	75 Ω	100 nA	250 ns	1.5 mW
HI2-0305-5		0°C to +75°C	TO-100 can	75 Ω	100 nA	250 ns	1.5 mW
HI2-0305-7	0°C to +75°C	TO-100 can	75 Ω	100 nA	250 ns	1.5 mW	
HI2-0305-8	-55°C to +125°C	TO-100 can	75 Ω	100 nA	250 ns	1.5 mW	
HI3-0305-5	0°C to +75°C	14-pin epoxy dip	75 Ω	100 nA	250 ns	1.5 mW	
HI1-0387-2		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0387-5		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0387-7		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0387-8		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI2-0387-2		-55°C to +125°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI2-0387-5		0°C to +75°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI2-0387-7		0°C to +75°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI2-0387-8		-55°C to +125°C	TO-100 can	75 Ω	100 nA	300 ns	1.5 mW
HI3-0387-5		0°C to +75°C	14-pin epoxy dip	75 Ω	100 nA	300 ns	1.5 mW
HI1-5042-2		-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
HI1-5042-5		0°C to +75°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
HI1-5042-7		0°C to +75°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
HI1-5042-8		-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
HI3-5042-5		0°C to +75°C	16-pin epoxy dip	75 Ω	500 nA	370 ns*	1.5 mW
HI1-5050-2		-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
HI1-5050-5	0°C to +75°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-5050-7	0°C to +75°C	16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
HI1-5050-8	-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
HI3-5050-5	0°C to +75°C	16-pin epoxy dip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-0303-2		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0303-5		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0303-7		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0303-8		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI3-0303-5		0°C to +75°C	14-pin epoxy dip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0307-2		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI1-0307-5		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI1-0307-7		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI1-0307-8		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
HI3-0307-5		0°C to +75°C	14-pin epoxy dip	75 Ω	100 nA	250 ns	1.5 mW
HI1-0390-2		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0390-5		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0390-7		0°C to +75°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI1-0390-8		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW
HI3-0390-5		0°C to +75°C	14-pin epoxy dip	75 Ω	100 nA	300 ns	1.5 mW
HI1-5043-2	-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-5043-5	0°C to +75°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-5043-7	0°C to +75°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-5043-8	-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
HI3-5043-5	0°C to +75°C	16-pin epoxy dip	75 Ω	500 nA	370 ns*	1.5 mW	
HI4-5043-8	-55°C to +125°C	0.35" Sq LCC pack	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-5051-2	-55°C to +125°C	16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
HI1-5051-5	0°C to +75°C	16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
HI1-5051-7	0°C to +75°C	16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
HI1-5051-8	-55°C to +125°C	16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
HI3-5051-5	0°C to +75°C	16-pin epoxy dip	50 Ω	500 nA	370 ns*	1.5 mW	

*TYPICAL VALUE

ANALOG SWITCHES

Part Number	Switch Type	Temperature Range °C	Package	R _{on} Max, Full Temp	Off Output Leakage Max, Full Temp	Switch ON Time Max, 25°C	Power Dissipation Typ, 25°C
HI1-5044-2 HI1-5044-5 HI1-5044-7 HI1-5044-8 HI3-5044-5		-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin epoxy dip	75 Ω 75 Ω 75 Ω 75 Ω 75 Ω	500 nA 500 nA 500 nA 500 nA 500 nA	370 ns* 370 ns* 370 ns 370 ns* 370 ns*	1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW
HI1-0381-2 HI1-0381-5 HI1-0381-7 HI1-0381-8 HI2-0381-2 HI2-0381-5 HI2-0381-7 HI2-0381-8 HI3-0381-5		-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip TO-100 can TO-100 can 14-pin cerdip TO-100 can 14-pin epoxy dip	75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω	100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA	300 ns 300 ns 300 ns 300 ns 300 ns 300 ns 300 ns 300 ns 300 ns	1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW
HI1-0200-2 HI1-0200-4 HI1-0200-5 HI1-0200-7 HI1-0200-8 HI2-0200-2 HI2-0200-4 HI2-0200-5 HI2-0200-7 HI2-0200-8 HI3-0200-5		-55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C -55°C to +125°C -25°C to +85°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip TO-100 can TO-100 can TO-100 can TO-100 can TO-100 can TO-100 can 14-pin epoxy dip	100 Ω 100 Ω 100 Ω 100 Ω 100 Ω 100 Ω 100 Ω 100 Ω 100 Ω 100 Ω 100 Ω	500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA	240 ns* 240 ns* 240 ns* 240 ns* 240 ns* 240 ns* 240 ns* 240 ns* 240 ns* 240 ns* 240 ns*	15 mW 15 mW 15 mW 15 mW 15 mW 15 mW 15 mW 15 mW 15 mW 15 mW 15 mW
HI1-0302-2 HI1-0302-5 HI1-0302-7 HI1-0302-8 HI3-0302-5 HI1-0303-7 HI1-0306-2 HI1-0306-5 HI1-0306-7 HI1-0306-8 HI3-0306-5		-55°C to +125°C 0°C to +75°C -55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin epoxy dip 14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin epoxy dip	75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω	100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA 100 nA	300 ns 300 ns 300 ns 300 ns 300 ns 250 ns 250 ns 250 ns 250 ns 250 ns 250 ns	1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW
HI1-0384-2 HI1-0384-5 HI1-0384-7 HI1-0384-8 HI3-0384-5 HI1-5045-2 HI1-5045-5 HI1-5045-7 HI1-5045-8 HI3-5045-5 HI4-5045-8		-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C -55°C to +125°C -55°C to +125°C	14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin cerdip 14-pin epoxy dip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin epoxy dip 0.35" Sq LCC pack	75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω	500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA	370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns*	1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW
HI1-5049-2 HI1-5049-5 HI1-5049-7 HI1-5049-8 HI3-5049-5		-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin epoxy dip	50 Ω 50 Ω 50 Ω 50 Ω 50 Ω	500 nA 500 nA 500 nA 500 nA 500 nA	370 ns* 370 ns* 370 ns* 370 ns* 370 ns*	1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW
HI1-5046-2 HI1-5046-5 HI1-5046-7 HI1-5046-8 HI3-5046-5 HI1-5046A-2 HI1-5046A-5 HI1-5046A-7 HI1-5046A-8 HI3-5046A-5		-55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C -55°C to +125°C -55°C to +125°C 0°C to +75°C 0°C to +75°C -55°C to +125°C 0°C to +75°C	16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin epoxy dip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin cerdip 16-pin epoxy dip	75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 75 Ω 50 Ω 50 Ω 50 Ω 50 Ω 50 Ω	500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA 500 nA	370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns* 370 ns*	1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW 1.5 mW

*TYPICAL VALUE

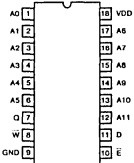
ANALOG SWITCHES

Part Number	Switch Type	Temperature Range °C	Package	R _{ON} Max, Full Temp	Off Output Leakage Max, Full Temp	Switch ON Time Max, 25°C	Power Dissipation Typ, 25°C
HI1-5047-2 HI1-5047-5 HI1-5047-7 HI1-5047-8 HI3-5047-5		-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
0°C to +75°C		16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin cerdip	75 Ω	500 nA	370 ns	1.5 mW	
-55°C to +125°C		16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin epoxy dip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-5047A-2 HI1-5047A-5 HI1-5047A-7 HI1-5047A-8 HI3-5047A-5		-55°C to +125°C	16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW
0°C to +75°C		16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin cerdip	50 Ω	500 nA	370 ns	1.5 mW	
-55°C to +125°C		16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin epoxy dip	50 Ω	500 nA	370 ns*	1.5 mW	
HI1-0201-2 HI1-0201-4 HI1-0201-5 HI1-0201-7 HI1-0201-8 HI3-0201-5 HI4-0201-8		-55°C to +125°C	16-pin cerdip	100 Ω	500 nA	185 ns*	15 mW
-25°C to +85°C		16-pin cerdip	100 Ω	250 nA	185 ns*	15 mW	
0°C to +75°C		16-pin cerdip	100 Ω	250 nA	185 ns*	15 mW	
0°C to +75°C		16-pin cerdip	100 Ω	250 nA	185 ns*	15 mW	
-55°C to +125°C		16-pin cerdip	100 Ω	500 nA	185 ns*	15 mW	
0°C to +75°C		16-pin epoxy dip	100 Ω	250 nA	185 ns*	15 mW	
HI1-0201 HS-2 HI1-0201 HS-4 HI1-0201 HS-5 HI1-0201 HS-8 HI3-0201 HS-4 HI3-0201 HS-5 HI4-0201 HS-5		-55°C to +125°C	16-pin cerdip	75 Ω	100 nA	50 ns	120 mW
-25°C to +85°C		16-pin cerdip	75 Ω	50 nA	50 ns	120 mW	
0°C to +75°C		16-pin cerdip	75 Ω	50 nA	50 ns	120 mW	
-55°C to +125°C		16-pin cerdip	75 Ω	100 nA	50 ns	120 mW	
-25°C to +85°C		16-pin epoxy dip	75 Ω	50 nA	50 ns	120 mW	
0°C to +75°C		16-pin cerdip	75 Ω	50 nA	50 ns	120 mW	
0°C to +75°C		16-pin epoxy dip	75 Ω	50 nA	50 ns	120 mW	
HI1-5040-2 HI1-5040-5 HI1-5040-7 HI1-5040-8 HI3-5040-5		-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
0°C to +75°C		16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
-55°C to +125°C		16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin epoxy dip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-0222-2 HI1-0222-4 HI1-0222-5 HI1-0222-7 HI1-0300-2 HI1-0300-5 HI1-0300-7 HI1-0300-8 HI2-0300-2 HI2-0300-5 HI2-0300-7 HI2-0300-8 HI3-0300-5		-55°C to +125°C	14-pin cerdip	60 Ω	200 nA	150 ns	120 mW
-25°C to +85°C		14-pin cerdip	60 Ω	200 nA	150 ns	120 mW	
0°C to +75°C		14-pin cerdip	40 Ω	200 nA	150 ns	120 mW	
0°C to +75°C		14-pin cerdip	40 Ω	200 nA	150 ns	120 mW	
-55°C to +125°C		14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW	
0°C to +75°C		14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW	
0°C to +75°C		14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW	
-55°C to +125°C		14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW	
0°C to +75°C		TO-100 can	75 Ω	100 nA	300 ns	1.5 mW	
0°C to +75°C		TO-100 can	75 Ω	100 nA	300 ns	1.5 mW	
0°C to +75°C		14-pin cerdip	75 Ω	100 nA	300 ns	1.5 mW	
-55°C to +125°C		TO-100 can	75 Ω	100 nA	300 ns	1.5 mW	
0°C to +75°C		TO-100 can	75 Ω	100 nA	300 ns	1.5 mW	
0°C to +75°C		14-pin epoxy dip	75 Ω	100 nA	300 ns	1.5 mW	
HI1-0304-2 HI1-0304-5 HI1-0304-7 HI1-0304-8 HI2-0304-2 HI2-0304-5 HI2-0304-7 HI2-0304-8 HI3-0304-5		-55°C to +125°C	14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW
0°C to +75°C		14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW	
0°C to +75°C		14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW	
-55°C to +125°C		14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW	
-55°C to +125°C		TO-100 can	75 Ω	100 nA	250 ns	1.5 mW	
0°C to +75°C		TO-100 can	75 Ω	100 nA	250 ns	1.5 mW	
0°C to +75°C		14-pin cerdip	75 Ω	100 nA	250 ns	1.5 mW	
-55°C to +125°C		TO-100 can	75 Ω	100 nA	250 ns	1.5 mW	
0°C to +75°C		TO-100 can	75 Ω	100 nA	250 ns	1.5 mW	
0°C to +75°C		14-pin epoxy dip	75 Ω	100 nA	250 ns	1.5 mW	
HI1-5041-2 HI1-5041-5 HI1-5041-7 HI1-5041-8 HI3-5041-5		-55°C to +125°C	16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW
0°C to +75°C		16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin cerdip	75 Ω	500 nA	370 ns	1.5 mW	
-55°C to +125°C		16-pin cerdip	75 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin epoxy dip	75 Ω	500 nA	370 ns*	1.5 mW	
HI1-5048-2 HI1-5048-5 HI1-5048-8 HI3-5048-5		-55°C to +125°C	16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW
0°C to +75°C		16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
-55°C to +125°C		16-pin cerdip	50 Ω	500 nA	370 ns*	1.5 mW	
0°C to +75°C		16-pin epoxy dip	50 Ω	500 nA	370 ns*	1.5 mW	

*TYPICAL VALUE

RAD-HARD CMOS STATIC RAMs 1K, 4K

**4096 x 1 — 4K
HS-6504RH**

Features	Radiation Effects	
<ul style="list-style-type: none"> • Specifically designed for radiation hardness • Low standby power (max): — 1100 μW • Low operating power (max): — 38.5 mW/MHz • TTL compatible output • Three-state output • On-chip address register • Standard JEDEC pinout • Full military temperature range 	<ul style="list-style-type: none"> • Each lot screened for total dose hardness • Parametrics guaranteed to 1×10^5 RADs (Si) • Post rad standby current (max): — 200 μA • Post rad access time (typical): 120 ns (max): 200 ns • Latch-up free $> 1 \times 10^{12}$ RADs (Si)/sec • Upset: $> 10^8$ RADs (Si)/sec • SEU immune option available 	

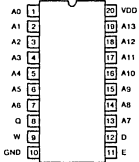
RAD-HARD CMOS STATIC RAMs 4K & 16K

1024 x 4 — 4K HS-6514RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Low standby power (max): — 1100 μW Low operating power (max): — 38.5 mW/MHz TTL compatible output Three-state output Common data in/out Standard JEDEC pinout Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Post rad standby current (typ): — 6 μA Post rad access time: (typical): 120 ns (max): 225 ns Latch-up free $> 1^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec SEU immune option available 	

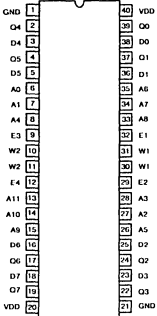
(2048 x 8)—16K HS-65C162RH, HS-65T162RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Asynchronous operation CMOS or TTL compatible input/output Low standby power (max): CMOS: 1100 μW Low operating current (max): 40 mA + 4mA/MHz Three-state outputs Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for radiation hardness Parametrics guaranteed to 2×10^5 RADs (Si) Functional to 1×10^6 RADs (Si) Access time (max., CMOS): 120 ns Access time (typ., CMOS): 80 ns Access time (typ., TTL): 100 ns Transient upset $> 1 \times 10^9$ RADs (Si)/s Latch-up free $> 1 \times 10^{12}$ RADs (Si)/s SEU immune option available 	

RAD-HARD CMOS STATIC RAMs/RAM MODULES 16K & 64K

(16384 x 1) 16K
HS-65C262RH, HS-65T262RH

Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Asynchronous TTL/CMOS compatible input/output Low standby power (CMOS): 1 mW max. Low operating power (max): 2.8 mW + 33 mW/MHz Three-state output Standard JEDEC pinout Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for radiation hardness Parametrics guaranteed to 2×10^5 RADs (Si) Access time (CMOS input): 150ns max., 80ns (typ) Access time (TTL inputs): 175ns max., 100ns typ. Data upset $> 5 \times 10^9$ RADs (Si)/sec Latch-up free $> 1 \times 10^{12}$ RADs (Si)/sec SEU hardening option available 	 <p>Pinout diagram for HS-65C262RH/HS-65T262RH showing a 16-pin package with pins labeled A0 through GND.</p>

LCC RAM Module — 16384 x 4 or 8192 x 8 — 64K
HS-6564RH

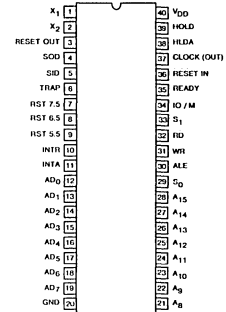
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Low standby power (max): $8.8 \mu W$ Low operating power (max): 308 mW/MHz TTL compatible input/output Three-state output On-chip address register Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Total dose guaranteed to 1×10^5 RADs (Si) Post rad standby current (typ): $96 \mu A$ Post rad access time (max): 250ns Latch-up free $> 10^{12}$ RADs (Si)/sec Upset $> 10^9$ RADs (Si)/sec 	 <p>Pinout diagram for HS-6564RH showing a 24-pin LCC package with pins labeled GND, DA, CA, DS, A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, GND.</p>

RAD-HARD CMOS PROM — 16K

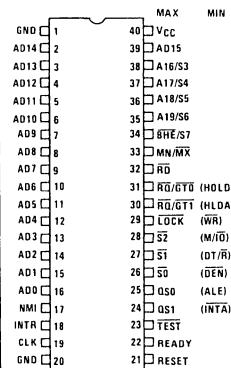
(2048 x 8) — 16K HS-6617RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> • Specifically designed for radiation hardness • Low standby power (max): — 550 μW • Low operating power (max): — 37.5 mW/MHz • TTL compatible input/output • Synchronous Operation • On-chip address latches • Three-state output • NiChrome fuse links • Full military temperature range 	<ul style="list-style-type: none"> • Each lot screened for total dose hardness • Total dose guaranteed to 1×10^5 RADs (Si) • Access time (max): — 120ns • Latch-up free $> 10^{12}$ RADs (Si)/sec 	

RAD-HARD CMOS MICROPROCESSOR PRODUCTS

8-Bit Microprocessor HS-80C85RH	
Features	Radiation Effects
<ul style="list-style-type: none"> Specifically designed for radiation hardness Low standby power: 2.7 mW max. Low operating power: 26 mW/MHz max. Multiplexed address/data bus 5 Volt operation Software and pin compatibility with Intel 8085 Equivalent to Sandia SA3000 Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free $> 10^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec



16-Bit Microprocessor HS-80C86RH	
Features	Radiation Effects
<ul style="list-style-type: none"> Specifically designed for radiation hardness Pin compatible with Harris 80C86 Completely static design <ul style="list-style-type: none"> ▶DC to 5 MHz Low-power operation <ul style="list-style-type: none"> ▶ICCSB = 500 μA maximum ▶ICCOP = 12 mA/MHz max. 1 Mbyte of direct memory addressing capability 24 operand addressing modes Bit, byte, word, and block move operations 8 and 16-bit signed/unsigned arithmetic <ul style="list-style-type: none"> ▶Binary or decimal ▶Multiply and divide Single 5V power supply Military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free Upset: $> 10^8$ RADs (Si)/sec



RAD-HARD CMOS MICROPROCESSOR PRODUCTS

8-Bit Bidirectional CMOS/TTL Level Converter HS-3374RH

Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Static operation for low power consumption Non-inverting outputs Low propagation delay Full military temperature range Equivalent to Sandia SA2996 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free $> 10^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec 	

3-Line to 8-Line Decoder/Demultiplexer HS-54C138RH

Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Static operation for low power consumption High noise immunity Active low outputs 5 Volt operation Full military temperature range Equivalent to Sandia SA2995 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free $> 10^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec 	

2K (256x8) RAM with I/O and Timer HS-81C55RH, HS-81C56RH

Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Static operation for low power consumption Pin compatible with Intel 8155/56 Equivalent to Sandia SA3001 5 Volt operation 3 programmable I/O ports 14-Bit programmable timer Multiplexed address and data bus Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free $> 10^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec 	

RAD-HARD CMOS MICROPROCESSOR PRODUCTS

8-Bit Bus Transceiver HS-82C08RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Static operation for low power consumption Bidirectional three-state input/outputs Low propagation delay 5 Volt operation Full military temperature range Equivalent to Sandia SA2997 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free $> 10^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec Increased tolerance to cosmic radiation 	<p>Pinout diagram for HS-82C08RH showing 20 pins: A₀ [1], A₁ [2], A₂ [3], A₃ [4], A₄ [5], A₅ [6], A₆ [7], A₇ [8], OE [9], GND [10], VDD [20], B₀ [19], B₁ [18], B₂ [17], B₃ [16], B₄ [15], B₅ [14], B₆ [13], B₇ [12], T/R [11].</p>

8-Bit Input/Output Port HS-82C12RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Static operation for low power consumption Asynchronous register clear 8-bit data register and buffer Service request flip-flop Three-state outputs Full military temperature range Equivalent to Sandia SA3026 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free $> 10^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec 	<p>Pinout diagram for HS-82C12RH showing 24 pins: DS₁ [1], MD [2], DI₀ [3], DO₀ [4], DI₁ [5], DO₁ [6], DI₂ [7], DO₂ [8], DI₃ [9], DO₃ [10], STB [11], GND [12], VDD [24], INT [23], DI₇ [22], DO₇ [21], DI₆ [20], DI₅ [19], DO₅ [18], DI₄ [17], DO₄ [16], CLN [15], OS₂ [14].</p>

RAD-HARD CMOS MICROPROCESSOR PRODUCTS

Programmable DMA Controller HS-82C37ARH		
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Pin compatible with Harris 82C37A High-speed data transfers up to 2.5 MBPS with 5 MHz clock Four independent maskable channels with autoinitialization capability Expandable to any number of channels Memory-to-memory transfer capability Software-accessible internal registers Single 5V power supply Low power consumption >IDDOP = 20 mA/MHz maximum >IDDSB = 20 μA maximum Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free Upset: $> 10^8$ RADs (Si)/sec Functional after 1×10^6 RADs (Si) total dose 	

Serial Controller Interface HS-82C52RH		
Features	Radiation Effects	
<p>COMING SOON</p> <ul style="list-style-type: none"> Specifically designed for radiation hardness Pin compatible with Harris 82C52 Uses either parallel mode crystal circuit or external frequency source DC to 16 MHz operation (DC to 1M Baud rate) Microprocessor bus oriented interface Modem interface Line break generation and detection Loopback and echo modes Interrupt mode with mask capability TTL/CMOS compatible inputs/outputs Single 5V supply Low power consumption: 1 mA/MHz typical Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free Upset: $> 10^8$ RADs (Si)/sec Total dose capabilities above look RADs available; contact factory for details 	

RAD-HARD CMOS MICROPROCESSOR PRODUCTS

Programmable Interval Timer HS-82C54RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Pin compatible with Harris 82C54A and NMOS 8254A High speed, no "wait state" operation with 5MHz HS-80C86RH Three independent 16 bit counters Six programmable counter modes Binary or BCD counting Status read back command Fully TTL compatible Single 5V power supply Low power consumption >IDDSB = 20 μA >IDDOP = 10 mA/MHz Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free Upset: $> 10^8$ RADs (Si)/sec Functional after 1×10^6 RADs (Si) total dose 	

Programmable Peripheral Interface HS-82C55ARH		
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Pin compatible with Harris 82C55A and NMOS 8255A High speed, no "wait state" operation with 5 MHz HS-80C86 RH Fully TTL compatible 24 programmable I/O pins Direct bit set/reset capability Enhanced control word read capability Single 5V power supply 2.0 mA drive capability on all I/O port outputs Low standby power >ICCSB = 10 μA Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free Upset: $> 10^8$ RADs (Si)/sec Functional after 1×10^6 RADs (Si) total dose 	

RAD-HARD CMOS MICROPROCESSOR PRODUCTS

Programmable Interrupt Controller HS-82C59ARH

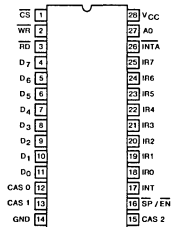
COMING
SOON

Features

- Specifically designed for radiation hardness
- Pin compatible with Harris 82C59A and NMOS 8259A
- High speed, no "wait state" operation with 5 MHz HS-80C86RH
- Eight level priority controller
- Expandable to 64 priority levels
- Fully TTL compatible
- Programmable interrupt modes
- HS-80C85RH and HS-80C86RH compatible operation
- Individual request mask capability
- Fully static design
- Single 5V power supply
- Low standby power 20 μ A
- Full military temperature range

Radiation Effects

- Each lot screened for total dose hardness
- Parametrics guaranteed to 1×10^5 RADs (Si)
- Latch-up free
- Upset: $> 10^8$ RADs (Si)/sec



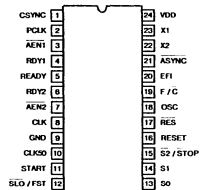
Static Clock Controller/Generator HS-82C85RH

Features

- Specifically designed for radiation hardness
- Pin compatible with Harris 82C85
- Generates system clocks for microprocessors and peripherals
- Complete control over system clock operation for very low system power
 - ▶ Stop-oscillator
 - ▶ Stop-clock
 - ▶ Low-frequency (slo) mode
 - ▶ Full-speed operation
- DC to 15 MHz operation (DC to 5 MHz system clock)
- Uses either parallel mode crystal circuit or external frequency source
- TTL/CMOS compatible inputs/outputs
- Single 5V power supply
- Very low power consumption
- Full military temperature range

Radiation Effects

- Each lot screened for total dose hardness
- Parametrics guaranteed to 1×10^5 RADs (Si)
- Latch-up free
- Upset: $> 10^8$ RADs (Si)/sec
- Functional after 1×10^6 RADs



RAD-HARD CMOS MICROPROCESSOR PRODUCTS

16K (2Kx8) ROM with I/O Ports HS-83C55RH

Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Static operation for low power consumption Pin compatible with Intel 8355 Equivalent to Sandia SA3002 5 Volt operation 2 programmable I/O ports Multiplexed address and data bus Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free $> 10^{12}$ RADs (Si)/sec Upset: $> 10^8$ RADs (Si)/sec 	

Radiation Hardened CMOS 16 Bit Microprocessor HS-80C86RRH

Features	Radiation Effects	
<ul style="list-style-type: none"> Pin compatible with NMOS 8086 and Harris 80C86 Radiation hardened (guaranteed) <ul style="list-style-type: none"> Latch up free Epi-CMOS Total dose $> 100K$ Rad(Si) Transient upset $> 10^8$ Rad(Si)/sec Single event upset hardened Completely static design <ul style="list-style-type: none"> DC to 5MHz Low power operation <ul style="list-style-type: none"> ICCSB = 500µA maximum ICCP = 12 mA/MHz typical 1 Mbyte of direct memory addressing capability 	<ul style="list-style-type: none"> 24 Operand Addressing Modes Bit, byte, word, and block move operations 8 and 16 bit signed/unsigned arithmetic <ul style="list-style-type: none"> Binary or decimal Multiply and divide Bus-hold circuitry eliminates pull-up resistors for CMOS Interfacing Hardened field, self aligned, Junction Isolated CMOS Process Single 5V power supply Military temperature range 	

RAD-HARD ANALOG OPERATIONAL AMPLIFIERS, COMPARATOR, AND REGULATOR

High Slew Rate/Wide band Operational Amplifier HS-3516RH

Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness High slew rate: <ul style="list-style-type: none"> $\geq \pm 22$ V/µs Fast settling time: <ul style="list-style-type: none"> ≤ 450 ns Unity gain bandwidth: <ul style="list-style-type: none"> 12 MHz Low offset voltage @ 25°C: <ul style="list-style-type: none"> $\leq \pm 5$ mV Short circuit protection Full military temperature range 	<ul style="list-style-type: none"> Dielectric Isolation technology Each lot screened for total dose hardness Parametrics guaranteed to 1×10^6 RADs (Si) Latch-up free Tolerant to neutron fluence $> 5 \times 10^{12}$ n/cm² (E ≥ 10 KeV) Tolerant to gamma rate $> 1 \times 10^9$ RADs (Si)/sec 	

RAD-HARD OPERATIONAL AMPLIFIERS, COMPARATOR AND REGULATOR

Low-Power/Programmable Operational Amplifier HS-3530RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> • Specifically designed for radiation hardness • Wide range AC programming: <ul style="list-style-type: none"> — Slew rate: 0.06 to 3 V/μs — Gain x bandwidth: 100 kHz to 5 MHz • Wide range DC programming: <ul style="list-style-type: none"> — Power supply: ± 1.5 to ± 18 V — Supply current: 10 μA to 1.2 mA • Short circuit protection • Full military temperature range 	<ul style="list-style-type: none"> • Dielectric Isolation technology • Each lot screened for total dose hardness • Parametrics guaranteed to 1×10^6 RADs (Si) • Latch-up free • Tolerant to neutron fluence $> 5 \times 10^{12}$ n/cm² (E ≥ 10 KeV) • Tolerant to gamma rate $> 1 \times 10^9$ RADs (Si)/sec 	

High Performance Quad Operational Amplifier HS-5104RH		
Features	Radiation Effects	
<ul style="list-style-type: none"> • Specifically designed for radiation hardness • Low offset voltage: ≤ 3.0 mV • High slew rate: ≥ 1.0 V/μs • Unity gain bandwidth 6.5 MHz • Single 5V supply capability • Short circuit protection • Full military temperature range 	<ul style="list-style-type: none"> • Dielectric Isolation technology • Each lot screened for total dose hardness • Parametrics guaranteed to 1×10^5 RADs (Si) • Latch-up free • Tolerant to neutron fluence $> 5 \times 10^{12}$ n/cm² (E ≥ 10 KeV) • Tolerant to gamma rate $> 1 \times 10^9$ RADs (Si)/sec 	

RAD-HARD CMOS ANALOG MULTIPLEXERS

8-Channel Multiplexer — Overvoltage Protection HS-508ARH

Features	Radiation Effects	
<ul style="list-style-type: none"> • Specifically designed for radiation hardness • Analog/digital overvoltage protection • Fail-safe with power loss (no latch-up) • Break-before-make switching • DTL/TTL/CMOS compatible • Analog signal range: — ± 15 V • Access time (typical): — 500 ns • Supply current @ 1 MHz address toggle (typical): — 4 mA • Standby power (typical): — 7.5 mW • Full military temperature range 	<ul style="list-style-type: none"> • Dielectric Isolation technology • Each lot screened for total dose hardness • Parametrics guaranteed to 1×10^5 RADs (Si) • Latch-up free • Tolerant to neutron fluence $> 1 \times 10^{13}$ n/cm² ($E \geq 10$ KeV) • Tolerant to gamma rate $> 1 \times 10^9$ RADs (Si)/sec 	

16-Channel Multiplexer-High-Z Analog Input Protection HS-1840RH

Features	Radiation Effects	
<ul style="list-style-type: none"> • Analog signal range: -5 V to +15 V • Specifically designed for radiation hardness • High analog input impedance during power loss (open): — 500 MΩ • Low standby power consumption (typical): — 600 μW • Access time (typical): — 500 ns • Excellent in hi-rel redundant systems • Full military temperature range • Break-before-make switching 	<ul style="list-style-type: none"> • Dielectric Isolation technology • Each lot screened for total dose hardness • Parametrics guaranteed to 2×10^5 RADs (Si) • Latch-up free • Tolerant to neutron fluence $> 1 \times 10^{13}$ n/cm² ($E \geq 10$ KeV) • Tolerant to gamma rate $> 1 \times 10^9$ RADs (Si)/sec 	

RAD-HARD CMOS ANALOG SWITCHES

Radiation Hardened CMOS Analog Switches HS-302RH, HS-303RH, HS-306RH, HS-307RH, HS-384RH, HS-390RH

Features	Radiation Effects
<ul style="list-style-type: none"> Pin for pin compatible with Harris HI-3XX series analog switches Analog signal range: ± 15 V Low leakage (pre RAD typical at 25°C): 90 pA Low R_{ON} (pre RAD typical at 25°C): 30Ω Break-before-make delay (typical): 65 ns Full military temperature range Low operating power 	<ul style="list-style-type: none"> Dielectric Isolation technology Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free Tolerant to neutron fluence $> 5 \times 10^{13}$ n/cm² ($E \geq 10$ KeV) Tolerant to gamma rate $> 1 \times 10^9$ RADs (Si)/sec
<p>The diagrams show the internal circuitry of four different CMOS analog switch models: HS-302/306RH (DUAL DPST), HS-303/307RH (DUAL SPDT), HS-384RH (DUAL DPST), and HS-390RH (DUAL SPDT). Each diagram illustrates the connection of input (IN), signal (S), and output (D) pins to the internal switch transistors. A separate pinout diagram shows a 24-pin package with pins labeled: 1 VV, 2 ESC, 3 TD, 4 SDO, 5 DC, 6 BZI, 7 LBI, 8 DC, 9 C/D, 10 DR, 11 GND, 12 VDD, 13 EC, 14 SCI, 15 SD, 16 SS, 17 EE, 18 SBI, 19 EOD, 20 BI, 21 RBS, 22 -6 OUT, 23 MR, 24 GND.</p>	

RAD-HARD CMOS COMMUNICATION PRODUCTS

Manchester Encoder/Decoder (MED) HS-15530RH

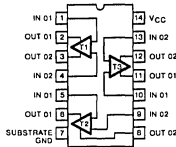
Features	Radiation Effects	
<ul style="list-style-type: none"> Specifically designed for radiation hardness Support of MIL-STD-1553 1.0 Mbit/sec data rate Sync identification and lock-in Clock recovery Manchester II encode, decode Separate encode and decode Low operating power: 50 mW @ 5 V Full military temperature range 	<ul style="list-style-type: none"> Each lot screened for total dose hardness Parametrics guaranteed to 1×10^5 RADs (Si) Latch-up free Upset: $> 10^8$ RADs (Si)/sec 	<p>The pinout diagram shows a 24-pin package with the following connections: 1 VALID WORD, 2 ENCODER SHIFT CLK, 3 TAKE DATA, 4 SERIAL DATA OUT, 5 DECODER CLK, 6 BIPOlar ZERO IN, 7 BIPOlar ONE IN, 8 UNIPOLAR DATA IN, 9 DECODER SHIFT CLK, 10 COMMAND / DATA SYNC, 11 DECODER RESET, 12 GND, 13 VDD, 14 ENCODER CLK, 15 SEND CLK IN, 16 SEND DATA, 17 SYNC SELECT, 18 ENCODER ENABLE, 19 SERIAL DATA IN, 20 BIPOlar ONE OUT, 21 CDSHFT / INHIBIT, 22 BIPOlar ZERO OUT, 23 -6 OUT, 24 MASTER RESET.</p>

RAD-HARD CMOS COMMUNICATION PRODUCTS

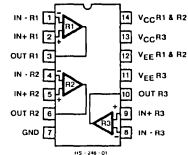
HS-245 Triple Line Transmitter, HS-246/249 Triple Line Receivers, HS-248 Triple Party-Line Receiver

Features

- High speed: 15 MHz with 50-ft. cable, 2 MHz with 1,000-ft. cable
- Tolerates -2.0 V to +20.0 V ground differential (transmitter with respect to receiver)
- Current mode operation
- High common mode rejection
- Transmitter and receiver party-line capability
- Transmitter input/receiver output TTL/DTL compatible
- Low power dissipation
- Low EMI generation
- High noise immunity
- Replaces HD-245/246/248/249



HS-245 Transmitter



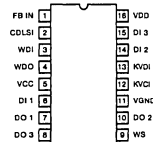
HS-246/248/249 Receivers

SECURE DATA COMMUNICATIONS

CYPHER-I™ CMOS DATA ENCRYPTION DEVICE HS-3447

Features

- Endorsed by National Security Agency for protecting unclassified national security related information (UNSR)
- Per DoD drawing ON304455
- Alternative to WD 2001/2002 and MC6859 NMOS devices
- Uses single 5V power supply
- Operating range -55°C to +125°C
- Lower power operation 250 mW at 10 MHz
- Maximum transfer rate:
 - 20 MHz at 7 Volts
 - 10 MHz at 5 Volts
 - 20 MHz at 5 Volts (-55°C to +85°C)
- Encrypts/decrypts via serial data stream
- Available to Class B and Class S equiv. screening
- Inputs TTL compatible
- Key variable stored on chip is not externally accessible
- Available in special configurations

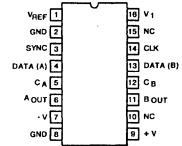


SPECIALIZED PRODUCTS

ARINC 429 Bus Interface Line Driver Circuit HS-3182

Features

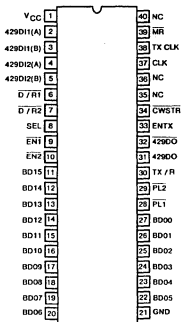
- Inputs TTL and CMOS compatible
- Adjustable rise and fall times via two external capacitors
- Programmable output differential range via voltage reference input (V_{REF})
- Outputs are inhibited (0 V) if data (A) and data (B) inputs are both in the "logic one" state
- Can operate up to a 100-Kbit data rate
- Output short circuit proof and contains overvoltage protection
- Data "A" and Data "B" signals are "AND'D" with clock and sync signals
- Full military temperature range



ARINC 429 Bus Interface Circuit HS-3282

Features

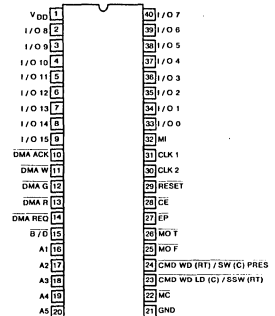
- ARINC specification 429 compatible
- Data rates of 100 Kbits or 12.5 Kbits
- Separate receiver and transmitter section
- Dual and independent receivers, connecting directly to ARINC bus
- Serial to parallel receiver data conversion
- Parallel to serial transmitter data conversion
- Word lengths of 25 or 32 bits
- Parity status of received data
- Generate parity of transmitter data
- Automatic word gap timer
- Single 5 V supply
- Low power dissipation
- Full military temperature range



MIL-STD-1553B Bus Interface Circuit HS-3273

Features

- MIL-STD-1553C compatible
- Up to 5 MHz data rate for non-MIL-STD-1553C applications
- Parallel to serial transmitter data conversion
- 8/16 bits host I/O interface
- Error interception and recognition
- DMA capability
- Single 5 V power supply
- Full military temperature range



SEMICUSTOM CELL LIBRARY

HSC1000RH Radiation Hardened Dual Level Metal CMOS Standard Cell Library

Features

- Low power CMOS process
- 2.0 micron channel lengths (1.25 micron effective)
- Dual level metal interconnect
- Guaranteed hardened against radiation
 - > Total dose. > 2×10^5 RAD-Si
 - > Data upset. > 1×10^9 RAD-Si/s
 - > Latch-Up free to. > 1×10^{12} RAD-Si/s
 - > Functional after 10^6 total dose radiation
- 800ps typical 2-input nand gate delay with a fanout = 2
- 100MHz Flip-Flop Toggle Frequency
- Supports gate counts to 13K
- Over 200 primitive and macrocell functions
- Complex function megacells
- Supported on Harris Architect™, Daisy™ and Mentor Graphics™ Design Systems
- CMOS/TTL compatible I/O's
- Military temperature ranges
- Proven reliable and manufacturable process
- Extensive packaging options
- Screening and qualification to Mil-Std-883C Method 5004/5005, Class B
- Space lend class 'S' screens and qualifications
- Function compatible with the HSC1000 Non-Radiation Hardened Library

Dual Level Metal CMOS Standard Cell Library HSC1000

Features

- Low power CMOS process
- 1.5 micron channel lengths (1.0 micron effective)
- Dual level metal interconnect
- 800ps typical 2-input nand gate delay with a fanout = 2
- 100MHz flip-flop toggle frequency
- Supports gate counts to 25K
- Over 200 primitive and macrocell functions
- Complex function megacells
- RAM and ROM Module Compilers
- Supported on Harris Architect™, Daisy™ and Mentor Graphics® Design Systems
- CMOS/TTL compatible I/O's
- Commercial-Industrial-Military Temperature Ranges
- Proven reliable and manufacturable process
- Extensive packaging options
- Screening and qualification to Mil-Std-883C Method 5004/5005, Class B
- Space lend class 'S' screens and qualifications
- Function compatible with the HSC 1000RH Radiation Hardened Library

SEMICUSTOM CELL LIBRARY

CMOS/Analog/Digital Cell Library

Features

- Fast turn, low risk ASIC with high performance
- High level of integration provides "system on a chip" capability
- Switched-capacitor methods provide wide variety of analog circuit functions.
- Low power — CMOS technology
- ± 5 volt or 0-10 volt power supply operation
- Available now for Custom Applications
- CMOS and TTL inputs and outputs
- 32 analog cells — operational amplifiers, comparators, voltage references and bias circuits, switch cells
- Multiple packaging options
- Military Class B or S equivalent flow

HARRIS SEMICONDUCTOR CICD

Harris Custom/Semicustom IC capabilities are outlined in this section for your high performance systems designs.

FOCUS

- Serve the high-rel strategic and tactical government ASIC systems, high-performance commercial and industrial systems, and commercial secure communications systems.

LEADERSHIP

- Top supplier of custom and semicustom analog and digital rad hard and non-rad hard ICs
- Stable government supplier with long-term commitment to served markets. Part of Harris Corporation, major vertically integrated defense contractor
- Authority on military standards, certification, and testing issues — class “B” and class “S” facilities — QML support
- Radiation Hardened Custom/Semicustom Leader
- Secure Communications leader
- Proven knowledge-based, front-to-back CAE tools based on open system framework concept, as well as Daisy™, Mentor™, CAE systems
- Macros for 8- and 16-bit Intel families, non-future: RISC, ARINC
- SOI process leadership - next generation hardness technology
- VHSIC process capabilities
- Mixed analog/digital for custom/semicustom applications
- Multiple CMOS, Bipolar and BIMOS processing capabilities
- Leadership in strategic programs — value engineering program management
- High-performance commercial ASICS — high voltage, high temperature, harsh environment experience

Contact CICD Marketing for more information (407) 729-4570

SEMICUSTOM DESIGN TOOLS

Toolkit for Daisy™

Features

- Compatible with standard Daisy platforms — supports standard Daisy Tools
- Supports Harris Standard Cell, Gate Array* and Compiled Functions*
- Schematic capture, simulation and netlisting for SSI, MSI, LSI Macrofunctions and RAM/ROM Compilers
- 1.5 micron Non-rad Hard (HSC1000) and 2.0 micron Rad Hard (HSC1000RH) Libraries are available today
- Simulation capabilities include min/typ/max delays for all functions. Post radiation simulation supported for HSC1000RH
- Back annotation of fanout and routed delays
- Supports DED II and ACE Schematic Capture — DeMorgan Symbols for many functions
- Additional Harris tools enhance Daisy productivity
 - > Chip Statistics
 - > Design Plotting
 - > Som Maker
 - > Fanout Checker
 - > PinLister
 - > TCAL
- Classified design area with Daisy available at Harris

*Gate Array support planned for Q2, CY 1989, Compiler Support provided as a Harris custom service.

Toolkit For Mentor Graphics®

Features

- Supports Harris Standard Cell, Gate Array* and Compiled Functions*
- Schematic capture, simulation and netlisting for SSI, MSI, LSI Macrofunctions and RAM/ROM Compilers
- Accurate, efficient behavioral models
- Ability to integrate with Mentor Graphics Board-Level Simulations
- 1.5 micron Non-rad Hard (HSC1000) and 2.0 micron Rad Hard (HSC1000RH) Libraries are available today
- Simulation capabilities include min/typ/max delays for all functions
- Post radiation simulation supported for HSC1000RH
- Back annotation of fanout delays
- Additional Harris Design Management Tools enhance Mentor Graphics productivity:
 - > Comprehensive Electrical Rule Checking (ERCs)
 - > Design Statistics Generation
 - > Design Status (Audit Trail)
 - > Tester Interface
 - > Design Transfer

*Gate Array support planned for Q2, CY 1989, Compiler Support provided as a Harris custom service.

CUSTOM/SEMICUSTOM CIRCUIT TECHNOLOGY

Process	Minimum Feature Size (Drawn Microns)	Rad Tol/Rad-Hard	Levels of Metal
MOS			
PMOS (Digital)	7.5		1
MGCMOS (metal gate)(Digital)	7.5		1
SAJI I (Digital)	5.0	RT/RH	1
SAJI IV (Digital)	3.0	RT/RH	1
Scaled SAJI IV (Digital)	2.5	RT/RH	1
SAJI VH (Digital)	2.0	RH	2
SAJI IVA (Analog/Digital)	3.0	RT	1
RH-7 (VHSIC-LIKE) (Analog/Digital)	1.2	RH	2
L7	1.5	RT	2
Gamma III (Digital)	1.2	RH	2
S7 (Digital)	1.2	RT	2
BIPOLAR			
High Freq. Process (HFP) (Analog)	5.0	RH	1
Linear ALPS (Analog)	4.0	RH	1
High Current Linear (HCL) (Analog)	5.0	RH	1
Advanced Low Power Schottky (Digital)	4.0	RH	1
BIMOS* (Digital)	2.0		1
Very High Freq. Process (VHFP) (Analog/Digital)	4.0	RH	2
GaAs			
DIGI-1,-11	1.0		
MMIC	.5		

CUSTOM BIPOLAR ANALOG PROCESSES

CUSTOM BIPOLAR LINEAR PROCESSES									
Process	Type	h _{fe}		F _T (MHz)		BV _{CEO}		Rad-Hard Option	Applications
		NPN	PNP	NPN	PNP	NPN	PNP		
Junction Isolation	—	150	50	300	2	40	40	No	<ul style="list-style-type: none"> Low-to-medium frequency amplifiers Low Speed, non-saturated logic
Dielectric Isolation	Switching NPN	50	—	500	—	7	—	Yes	<ul style="list-style-type: none"> Mixed digital/analog switching Sense amplifiers Line drivers Line receivers
Dielectric Isolation	BIFET*	150	100	600	300	40	40	Yes	<ul style="list-style-type: none"> Analog switches Operational amplifiers Sample-and-holds
Dielectric Isolation	High Frequency	150	100	600	300	40	40	Yes	<ul style="list-style-type: none"> High-frequency amplifiers Rad-hard amplifiers Comparators
Dielectric Isolation	High Current	150	100	500	250	40	40	Yes	<ul style="list-style-type: none"> Power relay drivers Clock drivers Voltage regulators
Dielectric Isolation	High Voltage	225	50	200	25	100	90	Yes	<ul style="list-style-type: none"> High-voltage amplifiers
Dielectric Isolation	CMOS/Bipolar	150	100	600	300	35†	35**	Yes	<ul style="list-style-type: none"> Analog switches High-performance amplifiers Data conversion Pin diode driver
Dielectric Isolation	NPN Schottky	50	—	500	—	8	—	Yes	<ul style="list-style-type: none"> Flash converters Sense amplifiers
Dielectric Isolation	VHFP	100	100	1.5 GHz	1.0 GHz	15V	15V	Yes	<ul style="list-style-type: none"> High Speed amplifiers Mixed analog/digital

*V_p = 1V to 2V, BV_{DSS} = 20V, **V_{TP} = 1V to 3V, BV_{DSS} = 40V, †V_{TN} = 1V to 3V, BV_{DSS} = 40V

CUSTOM INTERFACE PROCESSES

CUSTOM INTERFACE PROCESSES						
Process	Features	Isolation	Operating Voltage	Output Drive	Rad-Hard Option	Applications
SLIC	NPN; PNP	Dielectric	>65 Volts	25MA	Yes	<ul style="list-style-type: none"> Subscriber Line Interface Ckts.
High-Current Linear	NPN; PNP NiCr Resistors Schottky Diodes	Dielectric	>40 Volts	500MA	Yes	<ul style="list-style-type: none"> Power Mosfet Driver Bubble Memory Function Driver Voltage Regulators
Std. Lin.	NPN; PNP NiCr Resistors	Dielectric	>35 Volts	50MA	Yes	<ul style="list-style-type: none"> Current Booster
JF JFET	NPN; PNP JFETs NiCr Resistors	Junction	>35 Volts	50MA	Yes	<ul style="list-style-type: none"> Amp. with JFET input
High Freq. Linear	NPN; PNP NiCr Resistors JFETs	Dielectric	>30 Volts	100MA	Yes	<ul style="list-style-type: none"> Amplifiers Precision J-FET Op-Amps
MSIA (Gold Doped)	NPN; NiCr Resistors	Dielectric	>20 Volts	200MA	Yes	<ul style="list-style-type: none"> CCD clock driver
LCMOS	P-Channel P-Channel	Dielectric	>30 Volts	80MA	Yes	<ul style="list-style-type: none"> Interface Switches Analog Multiplexers
BIPMOS	N-Channel P-Channel NPN; PNP	Dielectric	>35 Volts	50MA	Yes	<ul style="list-style-type: none"> Op-Amps Comparators Sample and Hold
CMOS Si-Gate	N-Channel P-Channel NPN; PNP NiCr Resistors	Dielectric	>25 Volts	25MA	Yes	<ul style="list-style-type: none"> Analog Multiplexer D-to-A Converters

HARRIS ARCHITECT DESIGN SYSTEM

CMOS Digital Design Package

Features

- Supports Harris Standard Cell, Gate Array* and Compiled Functions*
- Schematic capture and simulation for SSI, MSI, LSI Macrofunctions and RAM/ROM Compilers available now
- Complete system including place and route and layout verification planned for 1989
- Based on the CADENCE Design Framework™, providing consistent, menu-driven interfaces for all tools
- 1.5 Micron (HSC1000) and 2.0 Micron Rad Hard (HSC1000RH) Libraries are available today
- CADAT™ Logic and fault Simulation capabilities include min/typ/max delays for all functions. Post radiation simulation supported for HSC1000RH
- Back annotation of fanout and routed delays
- Harris-customized CADENCE Design Framework™ allows use on most UNIX platforms
- Scheduled for QML (Generic Qualification) in calendar year 1990
- Supports EDIF netlist input

CMOS Analog Design Package

Features

- Provides a path to quick-turn, high confidence Analog ASICs
- Supports switched capacitor design techniques allowing a wide range of analog functions
- Supported by the Harris HCAD 10-volt Analog and Digital Cell Family
- SWITCAP™ and SLICE™ simulations allow accurate prediction of final circuit performance
- Typical level of integration is 50 Op-Amps
- Available as a Harris Custom Capability
- Harris-customized CADENCE Design Framework™ allows use on most UNIX platforms

Bipolar Analog Design Package

Features

- Full custom bipolar transistor-level Analog IC design capability
- Runs on industry standard workstation platforms
- Menu-driven Interface
- Hierarchical Schematic Capture
- Coupled electrical and physical design features
- Electrical design rules checking and layout vs. schematic checking
- Continuously variable diffused and thin film resistors
- Automatic device model parameter determination
- Self-contained statistical process/device data bases
- A variety of high performance bipolar analog processes
- Continuously variable transistor geometries
- Based on the CADENCE Design Framework™
- Powerful electrical statistical simulation capability
- Automatic layout generation
- Layout modifications and parasitics automatically back annotated to schematics
- Unprobed wafers with untested packaged prototypes
- Tested dice
- Tested packaged parts
- All wafers delivered in unprobed circuit form are probed for conformance to process/device parameter limits
- Complementary vertical bipolar transistors
 - Dielectrically isolated
 - Various diffused resistors
 - High quality capacitor
- P Channel JFET
- Laser trimmable NiCr Resistors
- Double level metal interconnect

GaAs FET PRODUCTS

Products And Services	GaAs FET Products
<p>Gallium Arsenide-based standard and custom products are available from Harris Microwave Semiconductor (HMS), located in Milpitas, CA.</p> <p>Standard products include:</p> <ol style="list-style-type: none"> 1. GaAs Field Effect Transistors (GaAs FETs) for RF and microwave applications. 2. GaAs Monolithic Microwave Integrated Circuits (MMICs) for broadband amplification of RF and microwave signals in receive, transmit, and IF stage applications. <p>Custom design and fabrication services are available whereby customers can design or specify specialized MMIC or FET products for manufacture at HMS. Analysis, testing, packaging, and screening options are available for all standard and custom products.</p>	<p>Microwave GaAs FETs from Harris Microwave Semiconductor have been designed and built for performance, reliability and consistency. To achieve these objectives, Harris employs extremely low defect gallium arsenide substrates of its own manufacture, ion implantation, a Ti/Pt/Au metallization system, large cross-section "T" gate structure and integral dielectric scratch and short circuit protection.</p> <p>Each wafer undergoes an extensive reliability and performance qualification procedure exceeding the element evaluation requirements of MIL-STD-883C, Method 5008, Class B. Each die is DC tested and visually inspected prior to packaging and shipment. To accommodate specialized requirements, Harris can provide selections tailored to meet these needs. High-reliability screening and qualification testing are available on all Harris GaAs FET Products.</p>

HIGH GAIN FET PRODUCTS

P/N HMF-	MAG* (dB)		PMAG (dBm)	G ₁ dB (dB)	P ₁ dB* (dBm)		FREQ (GHz)	BIAS V _{DS} .I _{DS}	APPLICATION/ DESCRIPTION
	MIN	TYP			MIN	TYP			
03100-100	6.0	7.5	11	4.5	13	15	18	4 V, 20 mA	2-20 GHz Low Noise
03100-200	6.0	7.5	13.5	4.5	18	19	18	6 V, 50% I _{DS}	2.20 GHz Gain/Drive
03100-300	6.0	7.5	14.5	4.5	20	21	18	6 V, 50% I _{DS}	2-20 GHz Drive
0330	—	7.5	13.5	5.0	—	14	18	4 V, 20 mA	2-20 GHz Low Noise, Low Current
0610	5.0	6.0	19.5	4.0	21.5	23.5	18	6 V, 50% I _{DS}	2-20 GHz Power
0620	—	10	17	7.0	—	20	12	4 V, 50% I _{DS}	2-14 GHz High Transconductance
1210	—	6.0	22	4.0	—	25	18	6 V, 50% I _{DS}	2-20 GHz Power

HIGH POWER FET PRODUCTS

P/N HMF-	G _{1dB} (dB)	P _{1dB} * (dBm)		η (%)	FREQ (GHz)	MAG* (dB)		PMAG (dBm)	FREQ (GHz)	BIAS V _{DS} , I _{DS}	APPLICATION/ DESCRIPTION
		MIN	TYP			MIN	TYP				
0300	8.5	—	21.5	35	8	—	12	18	8	8 V, 50% I _{DSS}	2-18 GHz, 125 mW
0600	8	—	24.5	35	8	—	10	22	8	8 V, 50% I _{DSS}	2-18 GHz, 250 mW
12000-100	7.5	25.5	27	30	8	9	10	25.0	8	8 V, 50% I _{DSS}	2-16 GHz, 500 mW
12000-200	7.5	27.5	28.5	35	8	8	9	25.5	8	8 V, 50% I _{DSS}	2-16 GHz, 650 mW
24000-100	5.0	28.5	29.5	25	8	6.0	8.0	27.0	8	8 V, 50% I _{DSS}	2-14 GHz, 800 mW
24000-200	5.0	30.0	31.0	30	8	6.0	8.0	28.5	8	8 V, 50% I _{DSS}	2-14 GHz, 1.2 mW

*Compliance with microwave performance limits for MAG and P_{1dB} is confirmed by qualifying wafers on sample evaluation basis.

GaAs MMIC STANDARD PRODUCTS

HMM Series

Our half-micron (gate length) family of fully integrated MMIC amplifiers is intended for broadband applications where noise figure, gain or output power are key specifications in a system design.

HMM Product Family — Electrical Specifications

Model No.	Frequency Band (GHz)	Small Signal Gain (dB)		Gain Flatness (Over full BW) (dB) Max	1dB Gain Compression Output Power (dBm) Typ	Noise Figure (dB) Typ	VSWR	
		Min	Typ				Input	Max
HMM-10610 HMM-10620	2 — 6 2 — 6 (Low Current)	10	12 11.5	± .5	+ 19 + 13	6 5.5	Input Output	2:1 1.75:1 1.75:1
HMM-11810 HMM-11820	6 — 18 6 — 18 (Low Current)	4.5	5 5	± .75	+ 16.5 + 12	6.5 5.5	Input Output	2:1 2:1 2:1

V_{DD} = 5V, I_{DD} = 120 mA (typical/HMM-10610)/ 100 mA (typical/HMM-11810)

HMR Series

For lower frequency application, specify the Harris HMR one-micron (gate length) MMIC family. Distributed as gain blocks throughout your system, they often permit relaxing the specifications of other cost-critical components.

HMR Product Family — Electrical Specifications

Model No.	Frequency Band (GHz)	Small Signal Gain (dB) Typ	Gain Flatness (Over full BW) (dB) Max	1dB Gain Compression Output Power (dBm) Typ	Noise Figure (dB) Typ	VSWR	
						Typ	Max
HMR-10502	0.5 — 5	9.5	± .75	+ 10	7	1.7:1	2:1
HMR-10503	1 — 5	9.5	± .75	+ 10	7	1.7:1	2:1

V_{DD} = 10V, I_{DD} = 100 mA

GaAs Custom MMIC Programs

Custom and Fabrication Services	
KEY FEATURES	MMIC PROGRAM OPTIONS
<ul style="list-style-type: none"> • Fully Documented Design Rule Book Includes Microwave and Physical Layout Rules • 0.5 Micron Plated "T"-Gate Technology Based Upon Our Line of Discrete FETs (HMF-0310, -0610, etc.) • Reliable Ti/Pt/Au Metallization • Ion Implantation Processing for Uniformity, Consistency • Circuit Elements <ul style="list-style-type: none"> ▶ "n+" Type (Low Sheet RHO) Resistors ▶ "n" Type (High Sheet RHO) Resistors ▶ Diodes ▶ FETs ▶ Dual Gate FETs ▶ Transmission Lines ▶ Inductors ▶ Capacitors ▶ Through Substrate Via Holes 	<ul style="list-style-type: none"> • Gain, Power or Low Current FET Models and Processing • Circuit Design from Customer Specs • "Layout" from Customer-Supplied Design • Computer Simulation of Design • Generation of Digitized Data From Customer Drawing • RF Screening of Selected Parts (<i>i.e.</i>, #/Wafer) • Special Packaging/Assembly • Specialized DC Testing • Volume Quotations on Qualified Wafers • High Reliability Screening • Supplementary Consultation/Training

TABLE 2. PROCESSES FOR CUSTOM MMICs

PROCESS TYPE (GATE LENGTH)	PRATICAL OPERATING FREQUENCIES	f_t	f_{max}	PROCESS OPTIONS
0.5 Micron	0.5 to 20 GHz	18 GHz	40 GHz	High Gain, Low Current High Power
1.0 Micron	0.1 to 12 GHz	12 GHz	26 GHz	High Gain

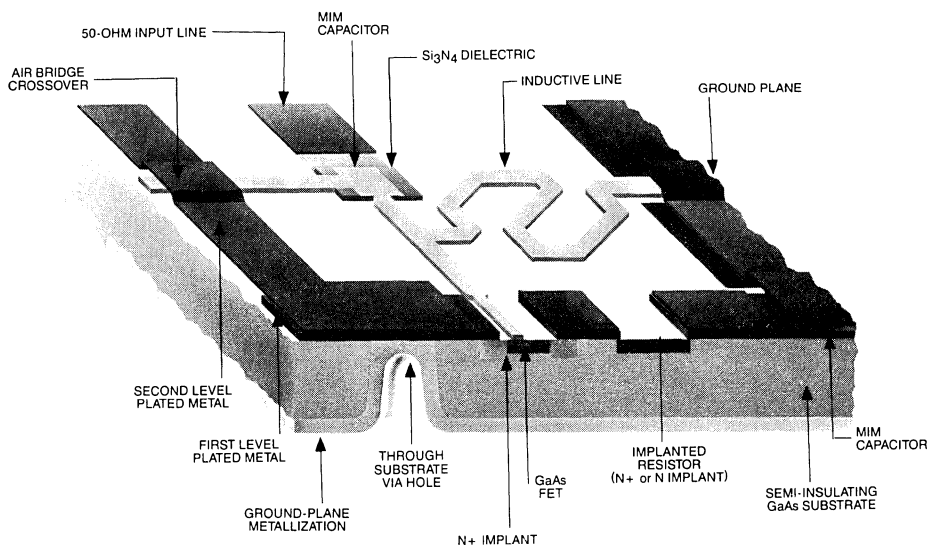
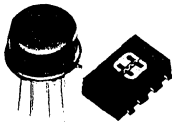


FIGURE 2. FEATURES OF A TYPICAL MMIC CHIP

Give your industrial controls a lift with our high-performance analog ICs.



When you put industry-proven Harris linear and data acquisition ICs into your control designs, you always come out ahead — in design time, cost, and product performance.

Just specify the functions you need. If it's industrial, we're in control. With a complete line of op amps — high-speed, low-power, precision or general purpose. Comparators. And analog switches.

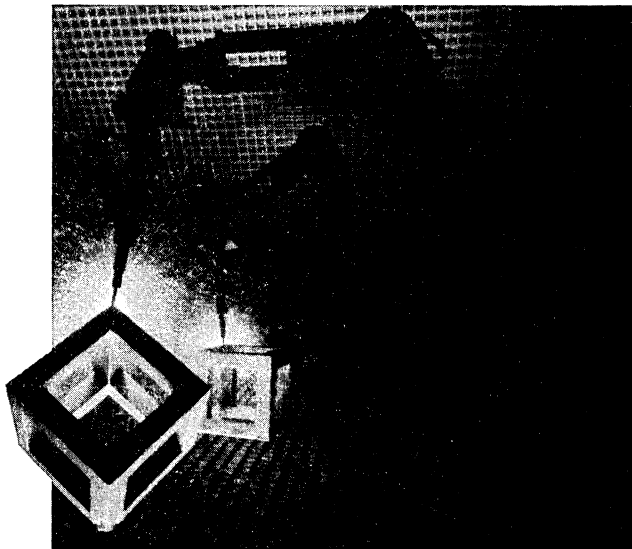
For data acquisition, choose our A/D and

D/A converters, sample-and-hold amplifiers, and analog multiplexers.

Our Dielectric Isolation (DI) process means no latch-up, plus higher speed and performance characteristics.

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*"What makes
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much more reliable?"*

*"Industrial
strength!"*



USER'S GUIDE

LINEAR, DATA ACQUISITION AND TELECOM PRODUCTS

Manufacturer	Part Number	Harris Pin-for-Pin Replacement	Harris Closest Replacement	Harris Advantages
AMD	AM118 AM1408 AM1508 AM318 AM6012 AM6420 LF198 LF398 SSS1408 SSS1508		HA-2510 HI-5618-5 HI-5618-2 HA-2515 HI-562A HI-5660 HA-5320 HA-5330 HA-2420 HA-2425 HI-5618-5 HI-5618-2	Unity gain stable Faster, application resistors Faster, application resistors Unity gain stable Faster, application resistors, int. linearity Int. linearity, application resistors Improved performance Improved performance Faster, application resistors Faster, application resistors
ANALOG DEV	52 AD1408 AD1508 AD380,AD382 AD381 AD389 AD507 AD509 AD515 AD518 AD542L AD545 AD547J AD562 AD563 AD565 AD565A AD566 AD566A AD574A AD582 AD583K AD611 AD667 AD7501 AD7502 AD7503 AD7506 AD7507 AD7511 AD7512 ADADC80 ADADC84/85 ADDAC 08 DAC 80 DAC 85 DAC 87 ADG200 ADLH0032 HOS050 HOS100	HA-2620 HA-2520 HA-2510 HI-565A HI-565A HI-574A,HI-674A HA-2425-5 HI-1828A HI-1818A HI-506 HI-507 HI-5680,HI-5690 HI-5685,HI-5695 HI-5687,HI-5697	HA-5180 HI-5618-5 HI-5618-2 HA-2542 HA-2541 HA-5320 HA-2529 HA-5180 HA-5170 HA-5180 HA-5170 HI-562A HI-5660 HI-565A HI-5660 HI-562 HI-5660 HI-562A HA-2425 HA-5320 HI-5811 HI-508 HI-201 HI-5043 HI-574A HI-674A HI-674A HI-5618 HI-200 HA-5190,HA-2542 HA-2542 HA-5033	Monolithic Faster, application resistors Faster, application resistors Monolithic Monolithic Faster, monolithic Identical Identical Monolithic Better AC Monolithic Better AC Faster Faster Faster Faster Digital timing, 674A is 2.3 times faster Acquisition time Identical Faster, better accuracy DI process DI process DI process DI process DI process Power, smaller pkg. Faster, power, smaller pkg. Power, smaller pkg. Faster, application resistors 5690 is 2.67 times faster 5695 is 2.67 times faster 5697 is 2.67 times faster Monolithic Monolithic Monolithic
ANALOGIC	MN4708 MP1812A MP250M MP260 MP261 MP270/271		HI-508 HI-1818A HI-5680V HA-2420/25 HA-2420/25 HA-2420 HA-5320	Faster, monolithic, power, smaller pkg. Faster, monolithic, smaller Monolithic, smaller pkg. Monolithic, smaller pkg. Monolithic, smaller pkg.
BECKMAN	7556 7580	HI-5690	HI-574A HI-5680	Faster, smaller pkg. Faster, monolithic
BURR-BROWN	3500 3503 3506 3507 3508	HA-2505 HA-2605 HA-2525 HA-2625	HA-2600 HA-2529	Better AC Identical Identical Identical Identical

USER'S GUIDE

LINEAR, DATA ACQUISITION AND TELECOM PRODUCTS

Manufacturer	Part Number	Harris Pin-for-Pin Replacement	Harris Closest Replacement	Harris Advantages
DATEL (cont.)	DAC71/72 DAC85 DAC85C DAC87 DACHP16B DACHR16B DACHZ12B DACC10B DACC8B MV1606 MV808 MVD409 MVD807 MX1606 MX1616 MX808 MX818 MXD409 MXD807 SHM1 C-1 SHM1 C-1M SHM20 SHM6M SHM9M SHMLM-2	HI-5685, HI-5695 HI-5680, HI-5690 HI-5687, HI-5697 HI-5690/95/97 HI-506 HI-1818A HI-1828A HI-507 HI-546 HI-516 HI-548 HI-518 HI-549 HI-547 HA-2425 HA-2420 HA-5320	HI-DAC16 HI-DAC16 HI-DAC16 HI-5680/85/87 HI-5610 HI-5618 HA-5320 HA-5330 HA-2420 HA-2420	Monolithic Faster, monolithic, power Monolithic, power, 5690 is 2 times faster Faster, monolithic, power Monolithic Monolithic, smaller pkg. Faster, monolithic Faster, application resistors Faster, application resistors Identical Identical Identical Identical Identical Identical Identical Identical Identical Identical Identical Identical Identical Identical Identical Monolithic, smaller pkg. Faster, monolithic, smaller pkg. Faster, monolithic, smaller pkg. Faster
ELANTEC	EHA2500 EHA2502 EHA2505 EHA2510 EHA2512 EHA2515 EHA2520 EHA2522 EHA2525 EHA2600 EHA2602 EHA2605 EHA2620 EHA2622 EHA2625 ELH0002 ELH0002C ELH0033 ELH0033C ELH0041 ELH0041C	HA-2500 HA-2502 HA-2505 HA-2510 HA-2512 HA-2515 HA-2520 HA-2522 HA-2525 HA-2600 HA-2602 HA-2605 HA-2620 HA-2622 HA-2625	HA-5002-2 HA-5002-5 HA-5033-2 HA-5033-5 HA-2542-2 HA-2542-5	Monolithic Monolithic Monolithic Monolithic Monolithic Monolithic
EXAR	XR4212 XR3417 XR3418 XR3517 XR3518		HA-4741 HC-55536 or HC-55564	Lower power Fewer external components Military pkg.
FAIRCHILD	μ A0801/02 μ A1458 μ A1558 μ A198 μ A398 μ A565 μ A702 μ A709 μ A714 μ A715 μ A727 μ A740 μ A741 μ A747 μ A748 μ A776	HI-565A	HI-5618 HA-5102 HA-5102 HA-2420 HA-2425 HA-2620 HA-2620 HA-5135 HA-2520, HA-2529 HA-5135 HA-5170 HA-2600 HA-5102 HA-2600 HA-2720	Faster, application resistors Better AC, lower noise Better AC, lower noise Improved performance Improved performance Better DC Better AC Better DC Better AC Better AC Lower noise Better AC Better AC, lower noise
HITACHI	HA17408		HI-5618	Faster, application resistors

USER'S GUIDE

LINEAR, DATA ACQUISITION AND TELECOM PRODUCTS

Manufacturer	Part Number	Harris Pin-for-Pin Replacement	Harris Closest Replacement	Harris Advantages
HYBRID SYSTEM	ADC550 ADC581 DAC3281-16 DAC335-12 DAC346C-12 DAC347LP-12 DAC372 DAC3721-8 DAC395-8 HS346 HS5200 HS574 HS730 HSDAC80 HSDAC87 MUX201 SH725	HI-574A, HI-674A HI-5680, HI-5690 HI-5687, HI-5697 HI-1818A	HI-574A HI-574A HI-674A HI-DAC16 HI-5687V HI-5680V HI-5687V HI-5680 HI-5618 HI-5618 HA-5320 HI-674A HA-5320 HA-5330 HA-2420	Faster, smaller pkg., power Faster Monolithic, smaller pkg. Faster, monolithic Faster, monolithic Faster, monolithic Monolithic Faster, monolithic Monolithic, smaller pkg. Faster, monolithic Digital timing, 674 is 2 times faster Monolithic, smaller pkg. Faster, monolithic, smaller pkg. Faster, monolithic, power, 5690 is 5.56 times faster Faster, monolithic, power Lower power, smaller pkg. Faster, monolithic, smaller pkg.
INTECH	1048BIN-P 416 BIN A3103 A3155 A880/880-2 A881 A882/884 ADC111 ADC2812 ASH240/250 ASH271 CYAAD12QM		HI-574A HI-674A HI-DAC16 HI-674A HI-574A HI-674A HA-5320 HA-5320 HA-2420/25 HI-574A HI-674A HI-547A HI-674A HA-2420/25 HA-5320 HI-574A HI-674A	Smaller pkg., power Faster, smaller pkg., power Smaller pkg. Smaller pkg., power Smaller pkg., power Faster, smaller pkg., power Faster, monolithic, power Monolithic, smaller pkg., power Faster, monolithic, power Smaller pkg., power Faster, smaller pkg., power Smaller pkg., power Faster, smaller pkg., power Monolithic, smaller pkg., power Monolithic, smaller pkg., power Smaller pkg., power Faster, smaller pkg., power
INTEL	D2912 D2912A SBC 86/05 NMOS	HC-5512 HC-5512 HC-5512A/12D HBO-986C05		Lower power, lower noise Lower power, lower noise Lower power, lower noise CMOS micro components. Lower power 16K static RAM w/full mercury back-up
INTERSIL	DG200 DG201 ICL7541 ICL7611 ICL7615 ICL7621 ICL7642 ICL8017 ICL8021 ICL8075 ICL8211 IH201 IH5040 IH5041 IH5042 IH5043 IH5044 IH5045 IH5046 IH5047 IH5048 IH5049 IH5050 IH5051 IH5108 IH5110/11 IH5112/13 IH5114/15 IH5200 IH5201 IH5208 IH6108	HI-200 HI-201 HI-201 HI-5040 HI-5041 HI-5042 HI-5043 HI-5044 HI-5045 HI-5046 HI-5047 HI-5048 HI-5049 HI-5050 HI-5051 HI-548 HI-200 HI-201 HI-509A HI-508	HA-5141 HA-5141 HA-5142 HA-5144 HA-2520, HA-2529 HA-5141 HA-2420/25 HA-2420/25 HA-2420/25	Dielectric Isolation Dielectric Isolation Identical Lower noise Better AC, lower noise Better AC, lower noise Better AC, lower noise Better AC More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. More stable over temp. Signal range, same pinout Constant Ron Constant Ron Vin range, same pinout Ron, DI, same pinout

USER'S GUIDE

LINEAR, DATA ACQUISITION AND TELECOM PRODUCTS

Manufacturer	Part Number	Harris Pin-for-Pin Replacement	Harris Closest Replacement	Harris Advantages
NATIONAL SEMICONDUCTOR (cont.)	LF347 LF353 LF355 LF355A LF356 LF356A LF357 LF357A LF398 LF412 LF412A LF441 LF442 LF444 LH0002 LH0003 LH0004 LH0005 LH0022 LH0032 LH0033 LH0042 LH0052 LH0062 LM108 LM108A LM118 LM124 LM143 LM144 LM146 LM148 LM208 LM208A LM308 LM308A LM308A LM318 LM324 LM343 LM344 LM348 LM4250 TP3040 TP3040A	HC-5512 HC-5512A HC-5512D	HA-5170 HA-5170 HA-5170 HA-5170 HA-5160 HA-5160 HA-2425 HA-5102 HA-5102 HA-5141 HA-5142 HA-5144 HA-5002 HA-2520,HA-2529 HA-2640 HA-2620 HA-5180 HA-2542 HA-5033 HA-5180 HA-5180 HA-5160 HA-5135 HA-5135 HA-2510 HA-4741 HA-2640 HA-2640 HA-2740 HA-4741 HA-5135 HA-5135 HA-5135 HA-5135 HA-5135 HA-2510 HA-4741 HA-2640 HA-2640 HA-4741 HA-5141	Better DC Better DC Better DC Better DC Better DC Better DC Improved performance Lower noise Monolithic, better AC and DC Monolithic Monolithic Monolithic Monolithic, better AC and DC Monolithic Monolithic, better DC Monolithic, better AC and DC Monolithic, better AC Monolithic, better AC Better DC and AC Better DC and AC Unity gain stable Better AC Higher supply voltage Better AC Better AC Better DC and AC Better DC and AC Better DC and AC Better DC and AC Better DC and AC Unity gain stable Better AC Higher supply voltage Better AC Lower noise Identical Identical Military spec
PMI	PM-155 PM-156 PM-157 OP-15 OP-16 OP-17 OP-42 OP-43 OP-77 OP-227 OP-400 OP-470		HA-5180 HA-5170 HA-5160 HA-5170 HA-5160 HA-5160 HA-5170 HA-5177 HA-5102 HA-5134 HA-5104	
PRECISION MONOLITHICS	DAC-08 DAC-1408 DAC-1508 DAC-312 DMX-88 GAP01 MUX-08 MUX-16 MUX-24 MUX-28 MUX-88 OP01 OP05 OP11 OP20 OP220	HI-508 HA-508 HI-506 HI-509 HI-507 HI-508	HI-5618 HI-5618-5 HI-5618-2 HI-562A HA-2400 HA-2500 HA-5135 HA-4741 HA-5141 HA-5142	Faster, application resistors Faster, application resistors Faster, application resistors Int. linearity, application resistors VIN range, lower power 4 channels IN range, lower power VIN range, lower power VIN range, lower power VIN range, lower power VIN range, lower power VIN range, lower power Better AC Better AC and DC Better AC Better AC

USER'S GUIDE

LINEAR, DATA ACQUISITION AND TELECOM PRODUCTS

Manufacturer	Part Number	Harris Pin-for-Pin Replacement	Harris Closest Replacement	Harris Advantages
TELEDYNE PHILBRICK (cont.)	4189 4551 4552 4553 4554 4853 4854 4856 4857 4866 DAC80I/V TP5210 TP565A TP574A TPADC85/87	HI-547 HI-546 HI-549 HI-548 HA-2420/25 HA-5320 HI-5680I/V HI-565A HI-574A, HI-674A	 HA-5320 HA-2420 HA-5320 HI-674A	Identical Identical Identical Identical Monolithic, smaller pkg. Faster, monolithic, smaller pkg. Identical Monolithic, smaller pkg., power Identical Identical Identical Identical, 674A is 1.67 times faster
TEXAS INSTRUMENTS	MC1458 MC1558 TCM2912A TCM4212+ TCM4201+ TCM4208= 3 chip set TL022 TL044 TL061 TL062 TL064 TL072 TL074 TL082 TL084	HC-5512	HA-5102 HA-5102 HC-5502A or HC-5504 HA-5142 HA-5144 HA-5141, HA-5151 HA-5142, HA-5152 HA-5144, HA-5154 HA-5102 HA-5104 HA-5102 HA-5104	Lower noise Lower noise Lower noise, lower cross talk, lower power Fewer external components Better DC Better DC Better DC, lower noise MIL range available MIL range available MIL range available MIL range available MIL range available MIL range available
TRANSITRON	TOA7709 TOA8709	HA-2600 HA-2605		

USER'S GUIDE: 80C86 FAMILY COMMUNICATION CIRCUITS

UART Cross-Reference List

HARRIS	Intersil	RCA	Speed	Temp. Range	Voltage
HD1-6402R-8	IM6402-1MDL/88313	—	2.0MHz	-55°C TO +125°C	5.0V ± 10%
HD1-6402R-2	IM6402-1MDL	CDP6402CD	2.0MHz	-55°C TO +125°C	5.0V ± 10%
HD1-6402R-9	IM6402-1IDL	CDP6402CD	2.0MHz	-40°C TO +85°C	5.0V ± 10%
HD3-6402R-9	IM6402-1IPL	CDP6402CE	2.0MHz	-40°C TO +85°C	5.0V ± 10%
HD1-6402B-8	—	—	8.0MHz	-55°C TO +125°C	5.0V ± 10%
HD1-6402B-2	—	—	8.0MHz	-55°C TO +125°C	5.0V ± 10%
HD1-6402B-9	—	—	8.0MHz	-40°C TO +85°C	5.0V ± 10%
HD3-6402B-9	—	—	8.0MHz	-40°C TO +85°C	5.0V ± 10%

Bit Rate Generator Cross-Reference List

HARRIS	Fairchild	Intersil	Temp. Range	Voltage
HD1-4702-8	4702BDMQB	—	-55°C TO +125°C	5.0V ± 10%
HD1-4702-2	4702BDM	—	-55°C TO +125°C	5.0V ± 10%
HD1-4702-9	4702BDC	IM4702IJE	-40°C TO +85°C	5.0V ± 10%
HD3-4702-8	4702BPC	IM4702IPE	-40°C TO +85°C	5.0V ± 10%

HARRIS/INTEL Cross-Reference Guide

HARRIS	INTEL	NEC	OKI	MITSUBISHI	VLSI	OTHER
80C86	80C86	uPD70116D-5	MSM80C86A			
80C88	80C88	uPD70108D-5	MSM80C88A			
80C86-2	80C86-2	uPD70116D-8	MSM80C86A-2			
80C88-2	80C88-2	uPD70108D-8	MSM80C88A-2			
80C286-10	80286-10					AMD 80286-10
80C286-12	80286-12					AMD 80286-12
80C286-16						AMD80286-16
82C37A-5			MSM82C37A-5	M5M82C37A -4,-5	VL82C37-4 -5	
82C37A			MSM82C37A		VL82C37A-8	
82C50A					VL82C50A	INS82C50A WD82C50A
82C52						
82C54	82C54	uPD71054	MSM82C54	M5M82C54 -6	VL82C54-8	AM82C54
82C55A-5			MSM82C55A-5	M5M82C55A-5		
82C55A	82C55A-2	uPD71055	MSM82C55A-2			AM82C55A-2
82C59A-5				M5M82C59A		
82C59A	82C59A-2	uPD71059	MSM82C59A-2		VL82C59A-8	AM82C59A
82C82		uPD71082				MMI82C82
82C83H		uPD71083				MMI82C83
82C84A	82C84A 82C84A-5	uPD71084	MSM82C84A -5,-2		VL82C84A-8	
82C85						
82C86H		uPD71086				MMI82C86
82C87H		uPD71087				MMI82C87
82C88	82C88	uPD71088	MSM82C88,-2		VL82C88-8	

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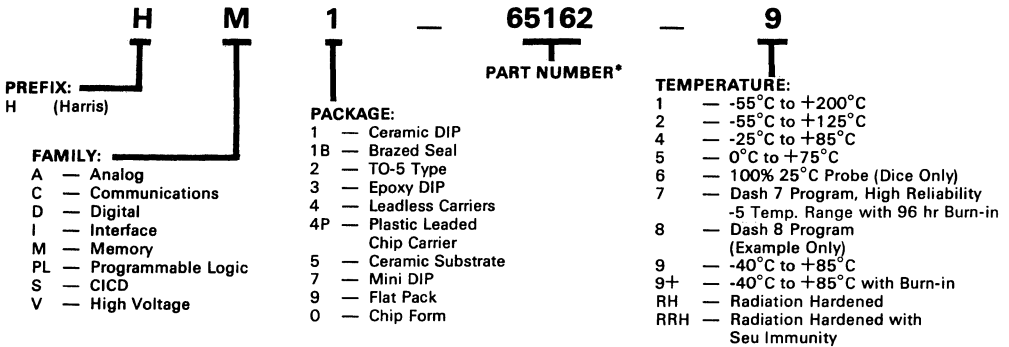
Memory Cross-Reference List

Description	Harris	AMD	AMI	Fujitsu	Hitachi	IDT	Intersil	MPS	Mitsubishi
1Kx1, 16 pin Synchronous	HM-6508		6508	8401			6508	6508	
1Kx1, 18 pin Synchronous	HM-6518		6518				6518		
256x4, 22 pin Synchronous	HM-6551						6551		
256x4, 18 pin Synchronous	HM-6561						6561		
4Kx1, 18 pin Synchronous	HM-6504	92L44	6504	8404	4315 6147		6504	6504	
1Kx4, 18 pin Synchronous	HM-6514	91L14 91L24	6514	8414	4334 6148		6514	6514	58981
2Kx8, 24 pin Synchronous	HM-6516								
2Kx8, 24 pin Asynchronous	HM-65162			8416	6116	6116			5117
16Kx1, 20 pin Asynchronous	HM-65262			8167	6167	6167			
8Kx8, 28 pin Asynchronous	HM-65642 HM-8808A	99C88		8464	6264	7M864			5164
32Kx8, 28 pin Asynchronous	HM-8832				62256	7M856			5256

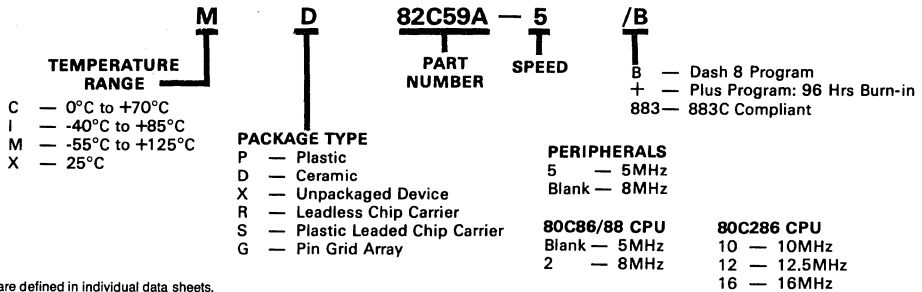
Description	Harris	Motorola	National	NEC	OKI	RCA	SMOS	Toshiba	NMOS, OTHER
1Kx1, 16 pin Synchronous	HM-6508	6508	6508 74C929	443		6508 1821		5508	2125, 4015
1Kx1, 18 pin Synchronous	HM-6518	6518	6518 74C930						
256x4, 22 pin Synchronous	HM-6551		6551 74C920			1822 5101		5101	2101
256x4, 18 pin Synchronous	HM-6561								2111
4Kx1, 18 pin Synchronous	HM-6504	6504	6504		5104		6504	5504	2141, 2147 315D, 4104 4404
1Kx4, 18 pin Synchronous	HM-6514	6514	6514	444	5114 5115	5114	6514	5514	2114, 2148 2149, 4045 314A
2Kx8, 24 pin Synchronous	HM-6516		6516						
2Kx8, 24 pin Asynchronous	HM-65162	65116	6116	446	5128	6116	2016	5517	4802, 2116 2016, 4016
16Kx1, 20 pin Asynchronous	HM-65262								2167, 8167 1400
8Kx8, 28 pin Asynchronous	HM-65642 HM-8808A	6164	6164	4464		6264	2064	5564 5565	
32Kx8, 28 pin Asynchronous	HM-8832			43256				55256	

Component Ordering Information

Harris Part Number



80CXXX Family Product Number



* Alpha suffix parts are defined in individual data sheets.

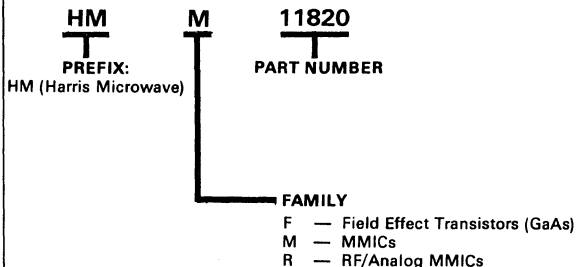
Ordering Information

Harris products are designated by Product Code™. When ordering, please refer to products by the full code. Harris products will always begin with H, except in the case of Chip products or products which are branded with industry standard part numbers, such as 80C86. Specific device numbers will always be isolated by hyphens. Industry standard part numbers should be ordered as stated in this schedule.

Component Ordering Information

Harris Microwave Products

(Gallium Arsenide)



Harris Sales Locations

For a complete listing of all Harris sales locations throughout the world, or to receive more detailed literature on any Harris product described herein, please call (407) 724-3739.

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West Germany 49-89-63813-0
(Munich)
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(Hamburg)
49-711-454001-04
(Stuttgart)
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