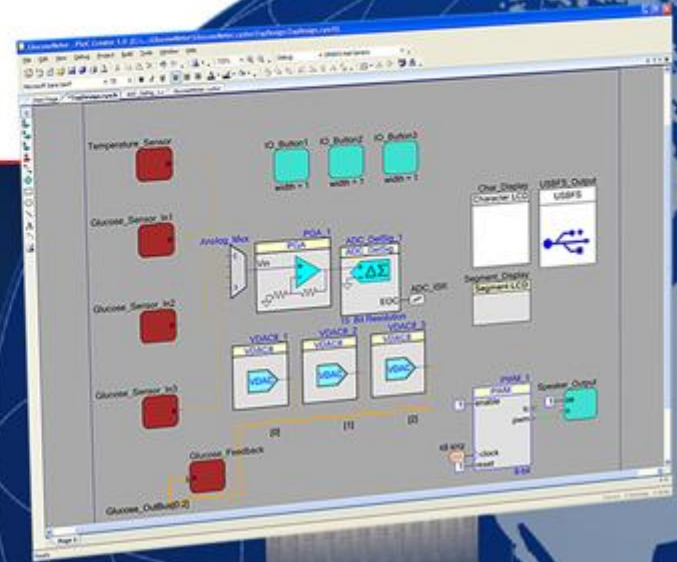


Cypress Product Roadmap

Q1 2015



Roadmap Slide Index

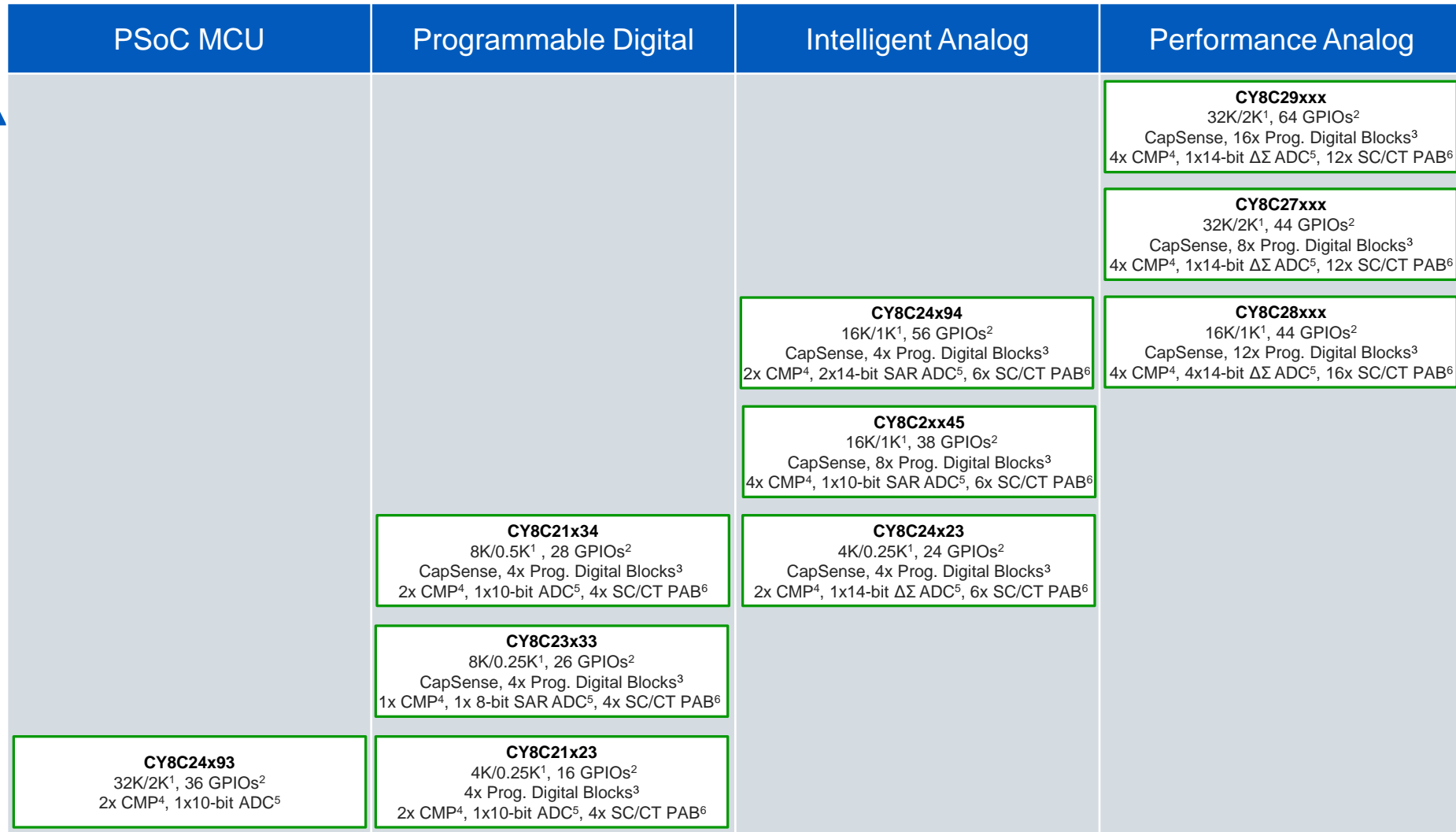


1. [Platform PSoC® Programmable System-on-Chip Solutions](#)
2. [TrueTouch® Touchscreen Controllers](#)
3. [CapSense® Controllers](#)
4. [USB Controllers](#)
5. [Wireless/RF](#)
6. [Asynchronous SRAM](#)
7. [Synchronous SRAM](#)
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9. [Timing Solutions](#)
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12. [Aerospace Memory](#)
13. [Automotive](#)

Platform PSoC[®] Roadmap

PSoC[®] 1 Portfolio

M8C Core | 24 MHz



¹ Flash KB/SRAM KB

² General-purpose input output pins

³ Programmable digital block

⁴ Comparator

⁵ Analog-to-digital converter (incremental, successive approximation (SAR) or Delta-Sigma (ΔΣ))

⁶ Switched capacitor/continuous time programmable analog block

Integration



PSoC[®] 3 Portfolio

8051 | CapSense[®] | DMA | LCD | RTC | 4x Timer/Counter/PWM



	Programmable Digital PSoC 3200	Intelligent Analog PSoC 3400	Performance Analog PSoC 3600	Precision Analog PSoC 3800
Performance ↑	Analog: ΔΣ ADC ¹ , 1x DAC ² , 2x CMP ³ , 0.9% Vref Interfaces: FF ⁴ I ² C	Analog: ΔΣ ADC ¹ , 2x DAC ² , 4x CMP ³ , 2x Opamps, 2x SC/CT PAB ⁵ , 0.9% Vref Interfaces: FF ⁴ I ² C	Analog: ΔΣ ADC ¹ , 2x/4x DAC ² , 0x/2x/4x CMP ³ , 0x/2x/4x Opamps, 0x/2x/4x SC/CT PAB ⁵ , 0.1% Vref Interfaces: USB, FF ⁴ I ² C	Analog: ΔΣ ADC ¹ , 2x/4x DAC ² , 0x/2x/4x CMP ³ , 0x/2x/4x Opamps, 0x/2x/4x SC/CT PAB ⁵ , 0.1% Vref Interfaces: USB, FF ⁴ I ² C
			CY8C3666 67 MHz, 64K/8K/2K ⁶ 0x/1x DFB ⁵ , 12b ADC ¹ 20x/24x UDB ⁸ , CAN ⁹	NEW CY8C3866 67 MHz, 64K/8K/2K ⁶ DFB ⁷ , 20b ADC ¹ 20x/24x UDB ⁸ , CAN ⁹ , 72-CSP ¹⁰
			NEW CY8C3665 67 MHz, 32K/4-8K/1K ⁶ 0x/1x DFB ⁷ , 12b ADC ¹ 16x/20x UDB ⁸ , 72-CSP ¹⁰	CY8C3865 67 MHz, 32K/4-8K/1K ⁶ 0x/1x DFB ⁷ , 20b ADC ¹ 16x/20x UDB ⁸
	NEW CY8C3246 50 MHz, 64K/8K/2K ⁶ 12b ADC ¹ 24x UDB ⁸ , USB, 72-CSP ¹⁰	CY8C3446 50 MHz, 64K/8K/2K ⁶ 12b ADC ¹ 24x UDB ⁸ , USB, CAN ⁹		
	NEW CY8C3245 50 MHz, 32K/4K/1K ⁶ 12b ADC ¹ 20x UDB ⁸ , USB, 72-CSP ¹⁰	CY8C3445 50 MHz, 32K/4K/1K ¹⁰ 12b ADC ¹ 20x UDB ⁸ , USB		
	CY8C3244 50 MHz, 16K/2K/0.5K ⁶ 12b ADC ¹ 16x UDB ⁸	CY8C3444 50 MHz, 16K/2K/0.5K ⁶ 12b ADC ¹ 16x UDB ⁸		

Integration

¹ Delta-Sigma analog-to-digital converter ⁴ Fixed function ⁶ Flash KB/SRAM KB/EEPROM KB ⁹ Controller area network
² Digital-to-analog converter ⁵ Switched capacitor/continuous time programmable analog block ⁵ Digital filter block ¹⁰ Chip scale package Status Production Sampling Development Concept
³ Comparator ⁶ Universal digital block Availability QQYY QQYY

PSoC[®] 4 Portfolio

ARM[®] Cortex[™]-M0 | CapSense[®]



	PSoC MCU PSoC 4000	Intelligent Analog PSoC 4100	Programmable Digital PSoC 4200			Programmable Analog PSoC 4400
			BL = BLE-Series	M = M-Series	L = L-Series	
Performance ↑			CY8C4128-BL ^{Q215} 24 MHz, 256K/32K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , BLE ⁷		NEW CY8C4248-L ^{Q315} 48 MHz, 256K/32K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , UDB ⁸ , CAN ⁹ , USB	CY8C4248-BL ^{Q215} 48 MHz, 256K/32K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , BLE ⁷ , UDB ⁸
		NEW CY8C4127-M ^{Q215} 24 MHz, 128K/16K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , CAN ⁹	NEW CY8C4127-BL 24 MHz, 128K/16K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , BLE ⁷	NEW CY8C4247-M ^{Q215} 48 MHz, 128K/16K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , UDB ⁸ , CAN ⁹	NEW CY8C4247-L ^{Q315} 48 MHz, 128K/16K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , UDB ⁸ , CAN ⁹ , USB	NEW CY8C4247-BL 48 MHz, 128K/16K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , BLE ⁷ , UDB ⁸
		NEW CY8C4126-M ^{Q215} 24 MHz, 64K/8K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶		NEW CY8C4246-M ^{Q215} 48 MHz, 64K/8K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , UDB ⁸	NEW CY8C4246-L ^{Q315} 48 MHz, 64K/8K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , UDB ⁸ , CAN ⁹ , USB	CY8C44x6 48 MHz, 64K/16K ¹ Concept Only Contact Sales
		CY8C4125 24 MHz, 32K/4K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶	CY8C4245 48 MHz, 32K/4K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , UDB ⁸			CY8C44x5 48 MHz, 32K/8K ¹ Concept Only Contact Sales
		CY8C4014 16 MHz, 16K/2K ¹ , CMP ² , I ² C, IDAC ⁵ , TCPWM ⁶	CY8C4124 24 MHz, 16K/4K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶	CY8C4244 48 MHz, 16K/4K ¹ , CMP ² , Opamp, ADC ³ , SCB ⁴ , IDAC ⁵ , TCPWM ⁶ , UDB ⁸		
		CY8C4013 16 MHz, 8K/2K ¹ , CMP ² , I ² C, IDAC ⁵ , TCPWM ⁶				

Integration

- ¹ Flash KB/SRAM KB
- ⁴ Serial communication block programmable as I²C/SPI/UART
- ⁷ Bluetooth Low Energy
- Production Status:
- ² Comparator
- ⁵ Current-output digital-to-analog converter
- ⁸ Universal Digital Block
- Availability:
- ³ Analog-to-digital converter
- ⁶ Timer, counter, PWM block
- ⁹ Controller Area Network

Applications

- MCU and discrete analog replacement
- User interface for button replacement
- User interface for heating, ventilation, air conditioning

Features

32-bit MCU subsystem

- 16-MHz ARM[®] Cortex[™]-M0 CPU
- Up to 16KB flash and 2KB SRAM

Programmable analog

- Two IDACs¹ (7-bit and 8-bit), digitally controlled current source
- One comparator (CMP)

CapSense[®] with SmartSense[™] Auto-tuning

- One Cypress Capacitive Sigma-Delta[™] (CSD) controller
- Capacitive sensing supported on up to 16 pins

Programmable digital

- One configurable 16-bit timer, counter or pulse-width modulator (TCPWM) block
- One I²C master or slave

Packages

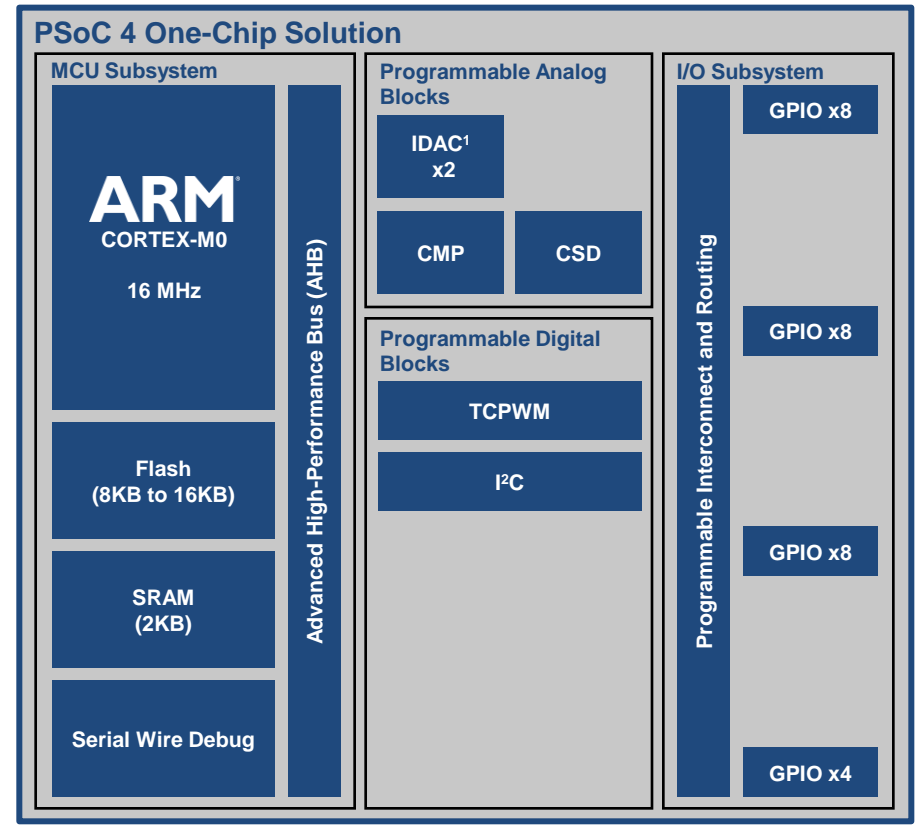
- 8-pin SOIC, 16-pin SOIC, 16-QFN, 24-pin QFN

Collateral

Datasheet: [PSoC 4000](#)

Technical Reference Manual: [PSoC 4000](#)

Block Diagram



Availability

Sampling: Now
 Production: Now

¹ Current-output digital-to-analog converter

Applications

- User interface for home appliances
- Digital and analog sensor hub
- MCU and discrete analog replacement

Features

32-bit MCU Subsystem

- 24-MHz ARM[®] Cortex[™]-M0 CPU
- Up to 32KB flash and 4KB SRAM

CapSense[®] with SmartSense[™] Auto-tuning

- Cypress Capacitive Sigma-Delta[™] (CSD) controller
- CapSense supported on up to 36 pins

Programmable Analog Blocks

- Two comparators (CMPs)
- Two opamps, programmed as PGAs, CMPs, filters, etc.
- One 12-bit, 1-Msps SAR¹ ADC
- Two IDACs² (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

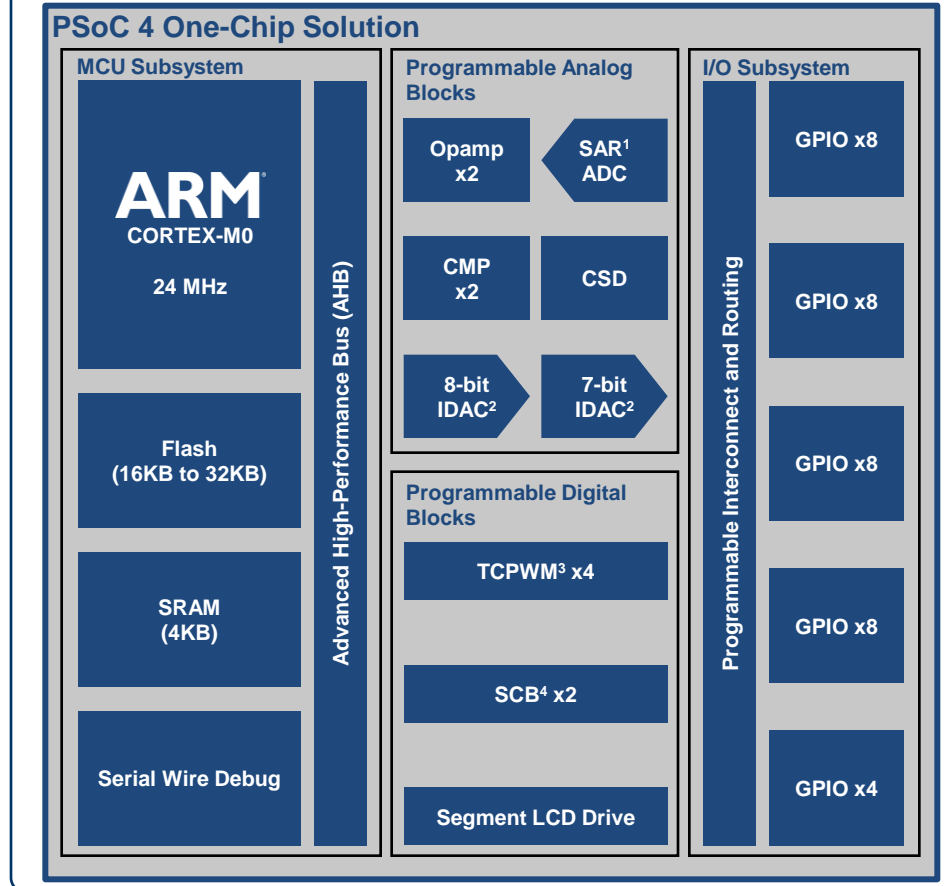
- Four programmable 16-bit TCPWM³ blocks
- Two SCBs⁴: I²C master or slave, SPI master or slave, or UART

Packages: 28-pin SSOP, 40-pin QFN, 44-pin TQFP, 48-pin LQFP

Collateral

- Datasheet: [PSoC 4 \(CY8C4100\)](#)
- Technical Reference Manual: [PSoC 4](#)

Block Diagram



Availability

- Sampling: Now
- Production: Now

¹ Successive approximation register

³ Timer, counter, PWM block

² Current-output digital-to-analog converter

⁴ Serial communication block programmable as I²C/SPI/UART

Applications

- User interface for home appliances
- Digital and analog sensor hub
- MCU and discrete analog replacement

Features

32-bit MCU Subsystem

48-MHz ARM[®] Cortex[™]-M0 CPU
Up to 32KB flash and 4KB SRAM

CapSense[®] with SmartSense[™] Auto-tuning

Cypress Capacitive Sigma-Delta[™] (CSD) controller
CapSense supported on up to 36 pins

Programmable Analog Blocks

Two comparators (CMPs)
Two opamps, programmed as PGAs, CMPs, filters, etc.
One 12-bit, 1-Msps SAR¹ ADC
Two IDACs² (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

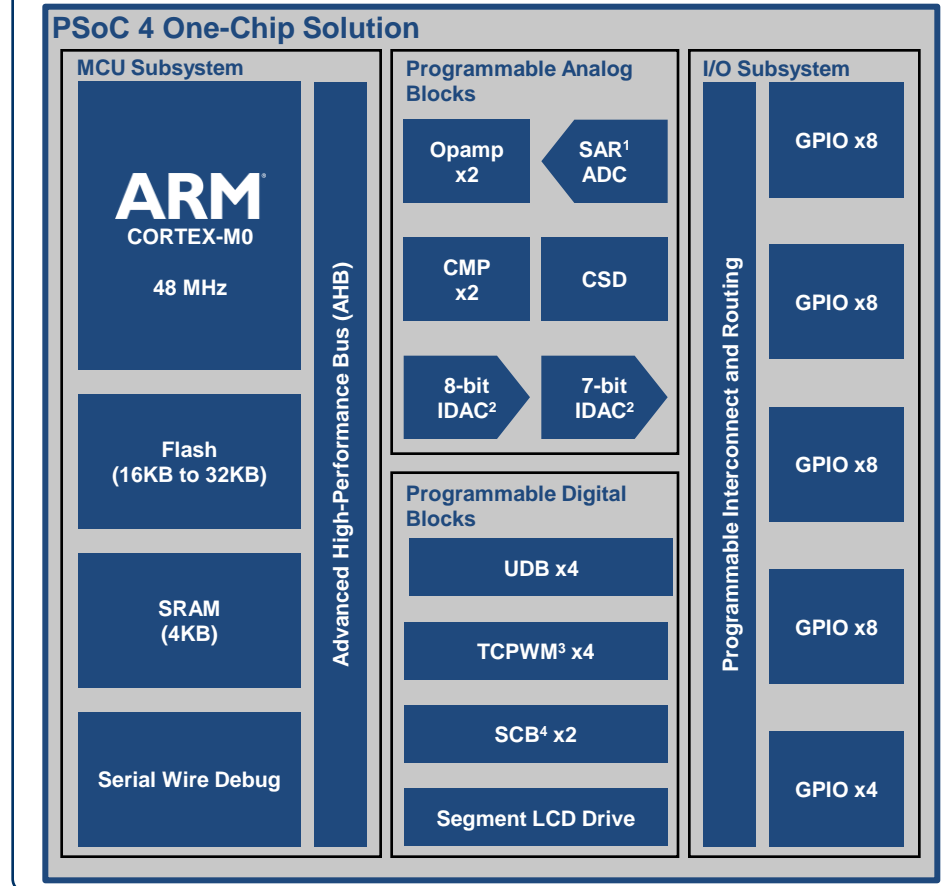
Four Universal Digital Blocks (UDBs): custom digital peripherals
Four programmable 16-bit TCPWM³ blocks
Two SCBs⁴: I²C master or slave, SPI master or slave, or UART

Packages: 28-pin SSOP, 40-pin QFN, 44-pin TQFP, 48-pin LQFP

Collateral

Datasheet: [PSoC 4 \(CY8C4200\)](#)
Technical Reference Manual: [PSoC 4](#)

Block Diagram



Availability

Sampling: Now
Production: Now

¹ Successive approximation register

³ Timer, counter, PWM block

² Current-output digital-to-analog converter

⁴ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4100 BLE-Series

Intelligent Analog Family with Bluetooth Low Energy



Applications

Sports and fitness monitors, wearable electronics, medical devices, home automation solutions, game controllers, sensor-based low-power systems for the Internet of Things (IoT)

Features

32-bit MCU subsystem

24-MHz ARM[®] Cortex[™]-M0 CPU
Up to 256KB flash and 32KB SRAM

Programmable AFE¹

Four opamps, configurable as PGAs, comparators, filters, etc.
One 12-bit, 1-Msps SAR² ADC

CapSense[®] with SmartSense[™] Auto-tuning

One Cypress Capacitive Sigma-Delta[™] (CSD) controller with touchpad capability

Programmable digital logic

Four configurable TCPWM³ blocks: 16-bit timer, counter or PWM
Two configurable serial communication blocks (SCBs⁴):
I²C master or slave, SPI master or slave, or UART

Packages

56-pin QFN, 68-pin CSP

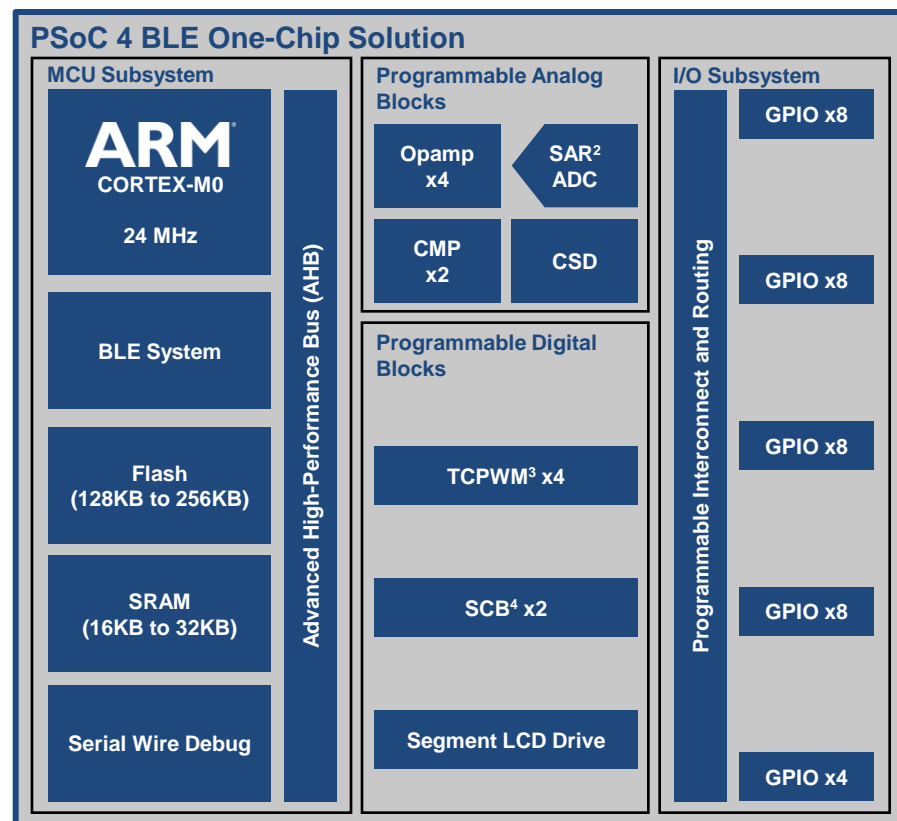
Bluetooth Smart connectivity with Bluetooth 4.1

2.4-GHz BLE radio with integrated Balun

Collateral

Datasheet: [PSoC 4 BLE \(CY8C4XX7 BLE\)](#)

Block Diagram



Availability

Sampling: Now
Production: 128KB Now, 256KB Q2 2015

¹ Analog front end(s)

³ Timer, counter, PWM block

² Successive approximation register

⁴ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4200 BLE-Series

Programmable Digital Family with Bluetooth Low Energy



Applications

Sports and fitness monitors, wearable electronics, medical devices, home automation solutions, game controllers, sensor-based low-power systems for the Internet of Things (IoT)

Features

32-bit MCU subsystem

48-MHz ARM[®] Cortex[™]-M0 CPU
Up to 256KB flash and 32KB SRAM

Programmable AFE¹

Four opamps, configurable as PGAs, comparators, filters, etc.
One 12-bit, 1-Msps SAR² ADC

CapSense[®] with SmartSense[™] Auto-tuning

One Cypress Capacitive Sigma-Delta[™] (CSD) controller with touchpad capability

Programmable digital logic

Four Universal Digital Blocks (UDBs): custom digital peripherals
Four configurable TCPWM³ blocks: 16-bit timer, counter or PWM
Two configurable serial communication blocks (SCBs⁴):
I²C master or slave, SPI master or slave, or UART

Packages

56-pin QFN, 68-pin CSP

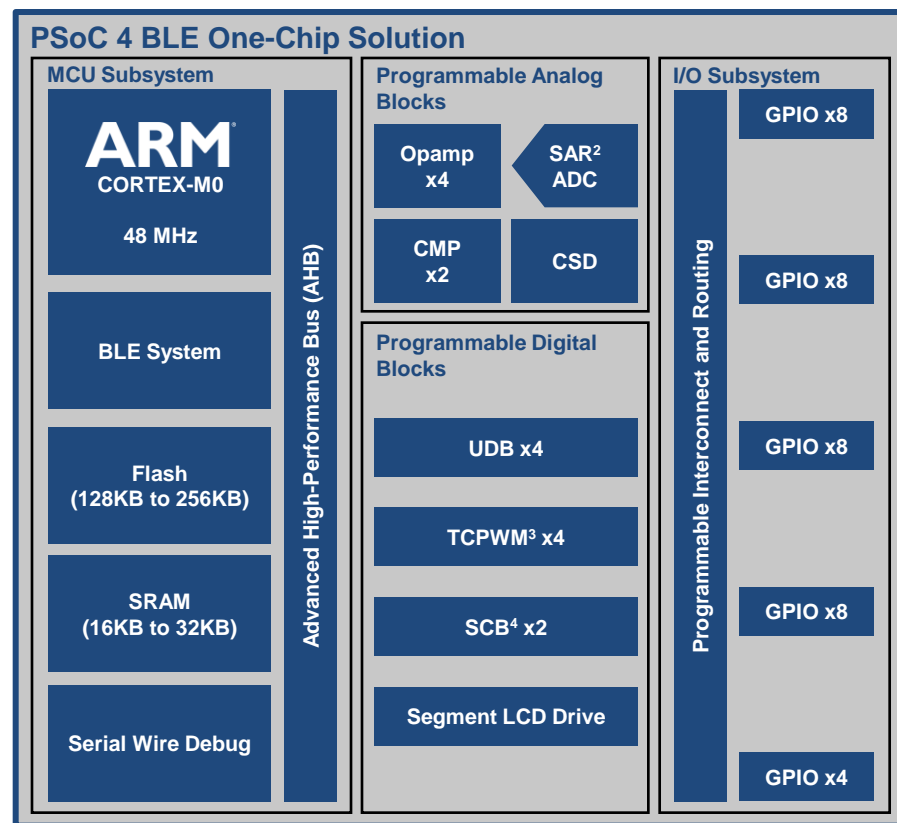
Bluetooth Smart connectivity with Bluetooth 4.1

2.4-GHz BLE radio with integrated Balun

Collateral

Datasheet: [PSoC 4 BLE \(CY8C4XX7 BLE\)](#)

Block Diagram



Availability

Sampling: Now
Production: 128KB Now, 256KB Q2 2015

¹ Analog front end(s)

³ Timer, counter, PWM block

² Successive approximation register

⁴ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4100 M-Series

Intelligent Analog Family



Applications

User interface and host processor for home appliances
 Digital and analog sensor hub
 MCU and discrete analog replacement

Features

32-bit MCU Subsystem

24-MHz ARM[®] Cortex[®]-M0 CPU with a DMA controller and RTC¹
 Up to 128KB flash and 16KB SRAM
 Up to 55 GPIOs supporting analog, digital and CapSense interfaces

CapSense[®] With SmartSense[™] Auto-tuning

Cypress Capacitive Sigma-Delta[™] (CSD) controller

Programmable Analog Blocks

Six comparators (CMP)
 Four opamps, programmable as PGAs, CMPs, filters, etc.
 One 12-bit, 1-Msps SAR² ADC
 Four IDACs³ (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

Eight programmable 16-bit TCPWM⁴ blocks
 Four SCBs⁵: I²C master or slave, SPI master or slave, or UART

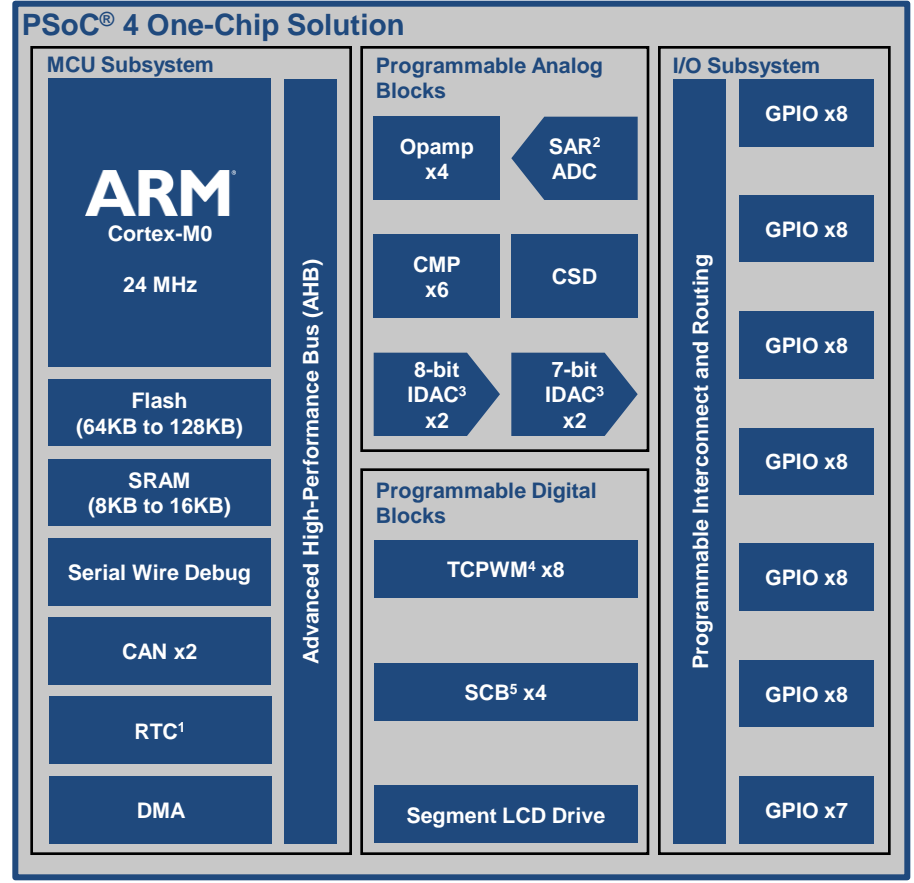
Two Controller Area Network (CAN) Controllers

Packages: 48-pin LQFP, 64-pin TQFP (0.8-mm pitch),
 64-pin TQFP (0.5-mm pitch), 68-pin QFN

Collateral

Datasheet: [PSoC 4100M datasheet](#)

Block Diagram



Availability

Sampling: Now
 Production: Q2 2015

¹ Real-time clock

² Successive approximation register

³ Current-output digital-to-analog converter

⁴ Timer, counter, PWM block

⁵ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4200 M-Series

Programmable Digital Family



Applications

User interface and host processor for home appliances
 Digital and analog sensor hub
 LED control and communication for lighting systems

Features

32-bit MCU Subsystem

48-MHz ARM[®] Cortex[®]-M0 CPU with a DMA controller and RTC¹
 Up to 128KB flash and 16KB SRAM
 Up to 55 GPIOs supporting analog, digital and CapSense interfaces

CapSense[®] With SmartSense[™] Auto-tuning

Cypress Capacitive Sigma-Delta[™] (CSD) controller

Programmable Analog Blocks

Six comparators (CMPs)
 Four opamps, programmable as PGAs, CMPs, filters, etc.
 One 12-bit, 1-Msps SAR² ADC
 Four IDACs³ (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

Four Universal Digital Blocks (UDBs): custom digital peripherals
 Eight programmable 16-bit TCPWM³ blocks
 Four SCBs⁴: I²C master or slave, SPI master or slave, or UART

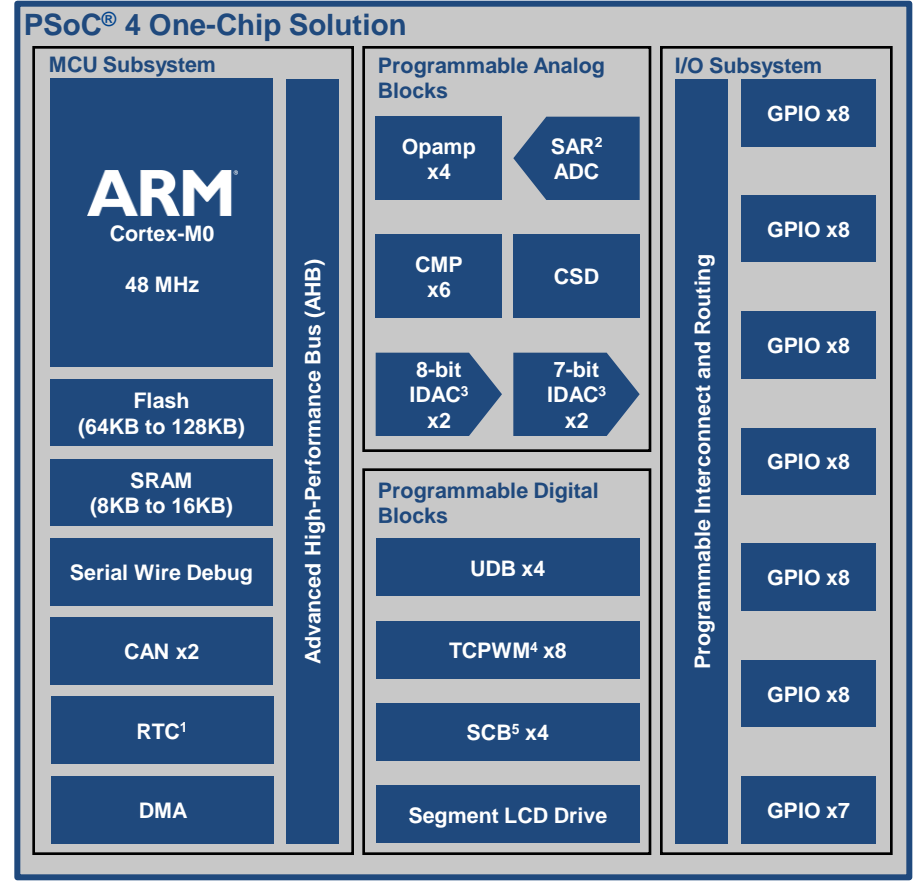
Two Controller Area Network (CAN) Controllers

Packages: 48-pin LQFP, 64-pin TQFP (0.8-mm pitch),
 64-pin TQFP (0.5-mm pitch), 68-pin QFN

Collateral

Datasheet: [PSoC 4200M datasheet](#)

Block Diagram



Availability

Sampling: Now
 Production: Q2 2015

¹ Real-time clock

² Successive approximation register

³ Current-output digital-to-analog converter

⁴ Timer, counter, PWM block

⁵ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4200 L-Series

Programmable Digital Family



Applications

User interface and host processor for home appliances
 Digital and analog sensor hub
 MCU and discrete analog replacement
 LED control and communication for lighting systems

Features

32-bit MCU Subsystem

48-MHz ARM[®] Cortex[®]-M0 CPU with a DMA controller and RTC¹
 Up to 256KB flash and 32KB SRAM
 Up to 98 GPIOs supporting analog and digital interfaces

CapSense[®] With SmartSense[™] Auto-tuning

Two Cypress Capacitive Sigma-Delta[™] (CSD) controllers

Programmable Analog Blocks

Two comparators (CMPs)
 Four opamps, configurable as PGAs, CMPs, filters, etc.
 One 12-bit, 1-Msps SAR² ADC
 Four IDACs³ (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

Eight Universal Digital Blocks (UDBs): custom digital peripherals
 Eight configurable 16-bit TCPWM⁴ blocks
 Four SCBs⁵: I²C master or slave, SPI master or slave, or UART

Full-Speed USB 2.0 Controller and Transceiver

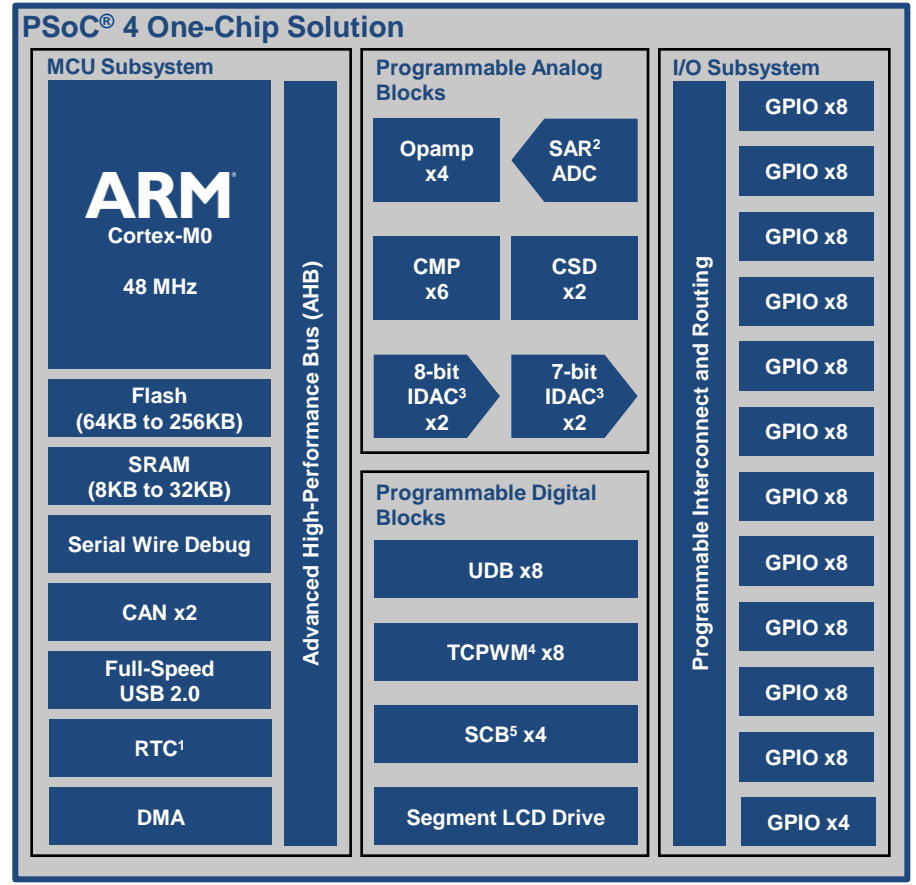
Two Controller Area Network (CAN) Controllers

Packages: 48-pin TQFP, 64-pin TQFP, 68-pin QFN, 124-pin µBGA

Collateral

Preliminary Datasheet: [Contact Sales](#)

Block Diagram



Availability

Sampling: Q3 2015
 Production: Q4 2015

¹ Real-time clock

² Successive approximation register

³ Current-output digital-to-analog converter

⁴ Timer, counter, PWM block

⁵ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 5LP Portfolio

ARM[®] Cortex[™]-M3 | CapSense[®] | DMA | LCD | RTC | 4x Timer/Counter/PWM



	Programmable Digital PSoC 5200	Intelligent Analog PSoC 5400	Performance Analog PSoC 5600	Precision Analog PSoC 5800
	Analog: 1x ADC ¹ , 1x DAC ² , 2x CMP ³ , 0.9% Vref Interfaces: USB, FF ⁴ I ² C	Analog: 1x ADC ¹ , 2x DAC ² , 4x CMP ³ , 2x Opamps, 2x SC/CT PAB ⁵ , 0.9% Vref Interfaces: USB, FF ⁴ I ² C	Analog: 2x ADC ¹ , 4x DAC ² , 4x CMP ³ , 4x Opamps, DFB ⁶ , 4x SC/CT PAB ⁵ , 0.9% Vref Interfaces: USB, FF ⁴ I ² C, CAN ⁷	Analog: 2x/3x ADC ¹ , 4x DAC ² , 4x CMP ³ , 4x Opamps, DFB ⁶ , 4x SC/CT PAB ⁵ , 0.1% Vref Interfaces: USB, FF ⁴ I ² C, CAN ⁷
Performance ↑	NEW CY8C5288 80 MHz, 256K/64K/2K ⁸ 12b SAR ADC ¹ 24x UDB ⁹ , 99-CSP¹⁰	NEW CY8C5488 80 MHz, 256K/64K/2K ⁸ 12b SAR ADC ¹ 24x UDB ⁹ , 99-CSP¹⁰	NEW CY8C5688 80 MHz, 256K/64K/2K ⁸ 2x 12b SAR ADC ¹ 24x UDB ⁹ , 99-CSP¹⁰	NEW CY8C5888 80 MHz, 256K/64K/2K ⁸ 20b ΔΣ ADC ¹¹ , 2x 12b SAR ADC ¹ 24x UDB ⁹ , 99-CSP¹⁰
	CY8C5268 67 MHz, 256K/64K/2K ⁸ 12b SAR ADC ¹ 24x UDB ⁹	CY8C5468 67 MHz, 256K/64K/2K ⁸ 12b SAR ADC ¹ 24x UDB ⁹	CY8C5668 67 MHz, 256K/64K/2K ⁸ 12b ΔΣ ADC ¹¹ , 12b SAR/2x 12b SAR ADC ¹ 24x UDB ⁹	CY8C5868 67 MHz, 256K/64K/2K ⁸ 20b ΔΣ ADC ¹⁰ , 2x 12b SAR ADC ¹ 24x UDB ⁹
	CY8C5267 67 MHz, 128K/32K/2K ⁸ 12b SAR ADC ¹ 24x UDB ⁹	CY8C5467 67 MHz, 128K/32K/2K ⁸ 12b SAR ADC ¹ 24x UDB ⁹	CY8C5667 67 MHz, 128K/32K/2K ⁸ 12b ΔΣ ADC ¹¹ , 12b SAR/2x 12b SAR ADC ¹ 24x UDB ⁹	CY8C5867 67 MHz, 128K/32K/2K ⁸ 20b ΔΣ ADC ¹¹ , 12b SAR ADC ¹ 24x UDB ⁹
	CY8C5266 67 MHz, 64K/16K/2K ⁹ 12b SAR ADC ¹ 20x UDB ¹⁰	CY8C5466 67 MHz, 64K/16K/2K ⁸ 12b SAR ADC ¹ 20x UDB ⁹	CY8C5666 67 MHz, 64K/16K/2K ⁸ 12b ΔΣ ADC ¹¹ , 12b SAR ADC ¹ 20x UDB ⁹	CY8C5866 67 MHz, 64K/16K/2K ⁸ 20b ΔΣ ADC ¹¹ , 12b SAR ADC ¹ 20x UDB ⁹
	CY8C5265 67 MHz, 32K/8K/2K ⁸ 12b SAR ADC ¹ 20x UDB ⁹	CY8C5465 67 MHz, 32K/8K/2K ⁸ 12b SAR ADC ¹ 20x UDB ⁹		

Integration

¹ Analog-to-digital converter ⁴ Fixed function ⁶ Digital filter block ⁹ Universal digital block
² Digital-to-analog converter ⁵ Switched capacitor/continuous time programmable analog block ⁷ Controller area network ¹⁰ Chip scale package
³ Comparator ⁸ Flash KB/SRAM KB/EEPROM KB ¹¹ Delta-Sigma ADC

Status: Production Sampling Development Concept

Availability: QYY QYY

PSoC Platform Packages



Package	LQFP	PDIP			QFN								SOIC			
Pins	48	8	20	28	16	24	32	40	48	56	68	8	16	20	28	
PSoC 1		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
PSoC 3									✓		✓					
PSoC 4	✓				✓	✓		✓		✓	✓	✓	✓			
PSoC 5LP											✓					
CapSense					✓	✓	✓		✓			✓	✓			
Package	SSOP							TQFP				WLCSP			μBGA	
Pins	8	16	20	24	28	32	48	44	64	100	30	68	72	99	124	
PSoC 1	✓	✓	✓	✓	✓	✓	✓	✓		✓						
PSoC 3							✓			✓			✓			
PSoC 4					✓			✓	✓			✓			✓	
PSoC 5LP										✓				✓		
CapSense			✓				✓				✓					

TrueTouch[®] Roadmap

TrueTouch® Portfolio



8"-12" →

3"-8" →

Wearables	Mobile Phones (Full-feature/Low-cost)	Mobile Phones (Advanced Features)	E-readers, Tablets, Digital Still Cameras, Printers, GPS, Industrial
			NEW CYTT41XXX-88 Q215 88 I/O, 12.7", 10 F ¹ , 120-Hz RR ² DualSense™ ³ , H ₂ O ⁴ , 15-Vpp CA ⁵ Active Stylus, 1-mm Passive Stylus
	CYTMA448 58 I/O, 8.3", 10 F ¹ , 110-Hz RR ² DualSense ³ , H ₂ O ⁴ , 35-Vpp CA ⁵ SLIM ⁶ , AMS ⁷ , Glove	CYTMA568 58 I/O, 8.3", 10 F ¹ , 110-Hz RR ² DualSense ³ , H ₂ O ⁴ , 60-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Passive Stylus, Glove, Hover	CYTMA568 58 I/O, 8.3", 10 F ¹ , 110-Hz RR ² DualSense ³ , H ₂ O ⁴ , 60-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Passive Stylus, Glove, Hover
	NEW CYTT21XXX-48 Q115 48 I/O, 7", 10 F ¹ , 100-Hz RR ² DualSense ³ , H ₂ O ⁴ , 15-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Glove, Face Detect	NEW CYTT31XXX-48 Q115 48 I/O, 7", 10 F ¹ , 100-Hz RR ² DualSense ³ , H ₂ O ⁴ , 15-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Passive Stylus, Glove	CYTMA448 58 I/O, 8.3", 10 F ¹ , 110-Hz RR ² DualSense ³ , H ₂ O ⁴ , 35-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Glove
CYTMA525 25 I/O, 3.6", 4 F ¹ , 100-Hz RR ² DualSense ³ , H ₂ O ⁴ , 60-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Passive Stylus, Glove, Hover	NEW CYTT21XXX-36 Q115 36 I/O, 5.2", 10 F ¹ , 120-Hz RR ² DualSense ³ , H ₂ O ⁴ , 35-Vpp CA ⁵ SLIM ⁶ , AMS ⁷ , Glove, Face Detect	CYTMA545 36 I/O, 5.2", 10 F ¹ , 100-Hz RR ² DualSense ³ , H ₂ O ⁴ , 60-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Passive Stylus, Glove, Hover	NEW CYTT31XXX-48 Q115 48 I/O, 7", 10 F ¹ , 100-Hz RR ² DualSense ³ , H ₂ O ⁴ , 15-Vpp CA ⁵ , SLIM ⁶ AMS ⁷ , Passive Stylus, Glove
NEW CYTMA525A Q115 24 I/O, 3.0", 4 F ¹ , 120-Hz RR ² DualSense ³ , H ₂ O ⁴ , 35-Vpp CA ⁵ SLIM ⁶ , AMS ⁷ , Glove	CY8CTST241/42 and CY8CTMG240 32 I/O, 3.6", 1 or 2 F ¹ 100-Hz RR ² , Self-Capacitance ³ Low-Cost Backgammon Sensor		NEW CYTT21XXX-36 Q115 36 I/O, 5.2", 10 F ¹ , 120-Hz RR ² DualSense ³ , H ₂ O ⁴ , 35-Vpp CA ⁵ SLIM ⁶ , AMS ⁷ , Glove
CY8CTST241/42 and CY8CTMG240 32 I/O, 3.6", 1 or 2 F ¹ 100-Hz RR ² , Self-Capacitance ³ Low-Cost Backgammon Sensor			CY8CTST241/42 and CY8CTMG240 32 I/O, 3.6", 1 or 2 F ¹ 100-Hz RR ² , Self-Capacitance ³ Low-Cost Backgammon Sensor

Market Segments

¹ Number of finger locations reported

² Refresh rate

³ Self-Capacitance (capacitance of a row or column in a Touchscreen Sensor) + Mutual-Capacitance (capacitance of the intersection between a row or column of a Touchscreen Sensor)

⁴ Water rejection and wet-finger tracking

⁵ Charger Armor™: Cypress proprietary Charger Noise mitigation technology

⁶ Low-cost Single-Layer Independent Multi-Touch sensor

⁷ Automatic Mode Switching

⁸ A type of sensor stack-up in which the touch sensor is inside the LCD module under the color-filter glass

Status	Production	Sampling	Development	Concept
Availability	□	□	□	□

CY8CTST241/242 and CY8CTMG240

Lowest-cost Solution



Applications

Mobile phones
Digital cameras
Wearables
Printers

Features

Low-Cost User Interface

Low-cost “backgammon” sensor (U.S. Patent No. 8,121,283)
Two-finger “zoom” gestures decoded on chip (TST242)
Single-click, double-click and pan gestures decoded on chip
Waterproofing: No false touches with water droplets
Supports capacitive and virtual buttons

Proprietary Analog Front End¹

Low-noise self-capacitance sensing (Patented analog multiplexer: U.S. patent no. 8,067,948)

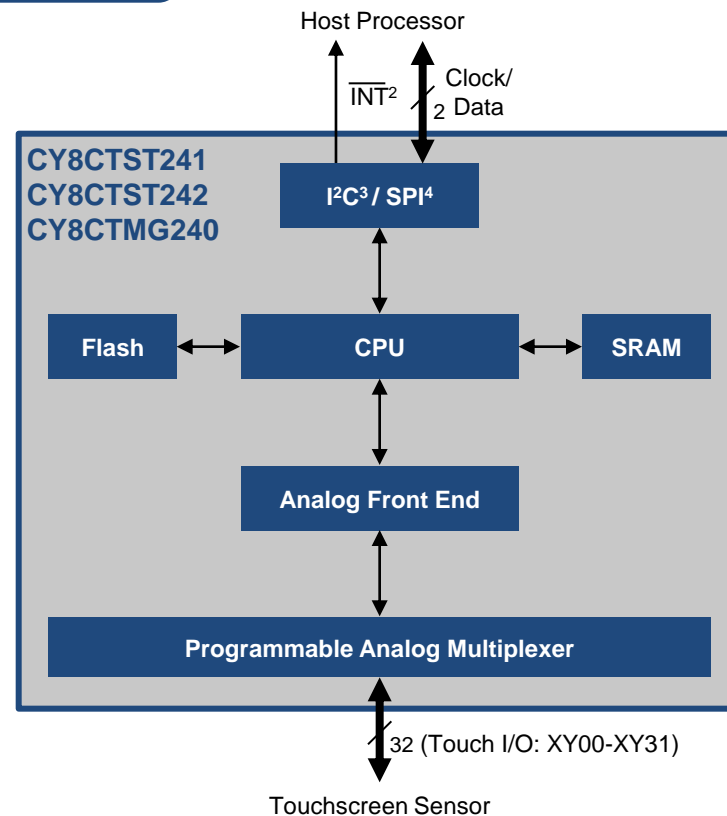
System Solutions

Lowest-cost capacitive touchscreen available
Manufacturing test kits for production testing
Tiny 2.2-mm x 2.32-mm WLCSP package
Operates from single supply: 1.71-5.5 V
Ultra-low power: 3.6 mW in active mode

Collateral

Datasheets and Design Guides:
[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Full production

¹ Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor)

² Interrupt

³ Inter-integrated circuit

⁴ Serial peripheral interface



CYTT21XXX-36

Lowest-cost Multi-touch Solution (Up to 5.2" Touchscreens)



Applications

Mass Market mobile phones
Digital cameras
Mass Market tablets

Features

Advanced User Interface

Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505 and 8,067,948)

10-finger tracking with 1-mm-thick gloves

2-finger tracking with 5-mm-thick gloves

Face detection: Infrared proximity sensor replacement

Automatic Mode Switching for advanced sensing modes

Proprietary Analog Front End¹ with Charger Armor™²

True 5-V TX-Boost™ with 24 multi-phase transmit lines (reduces noise by 5x compared to single-phase transmit line)

35-Vpp charger noise immunity (1-500 kHz, 9-mm finger)

Display synchronization

System Solutions

Android and Windows Phone operating systems

Wireless tuning with a TrueTouch Host Emulator mobile tuner

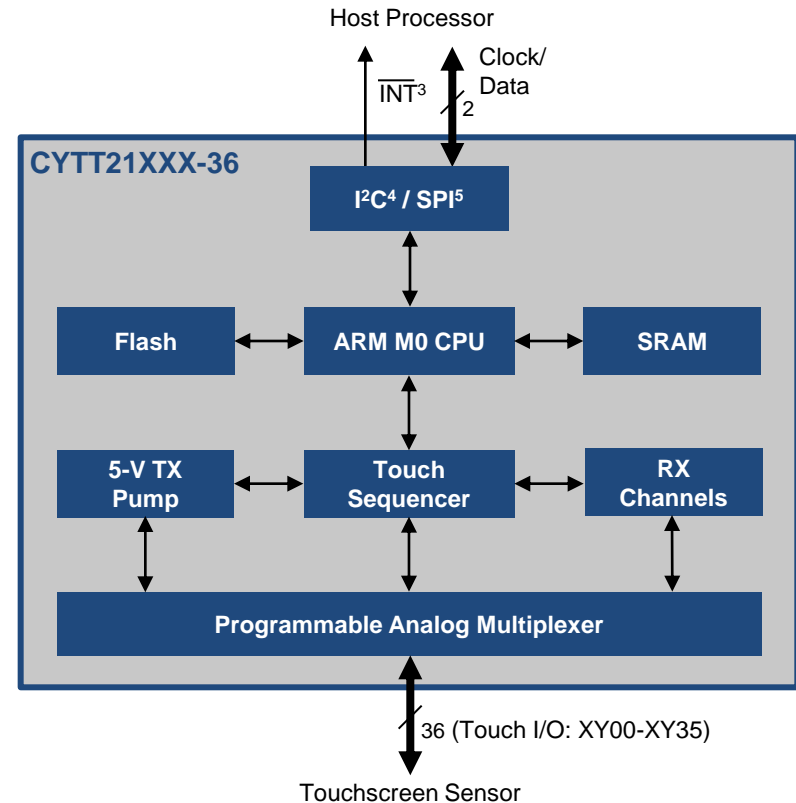
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Sampling: Q1 2015

Production: Q2 2015

³ Interrupt

⁴ Inter-integrated circuit

⁵ Serial peripheral interface

¹ Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor) and mutual-capacitance (capacitance of the intersection between a row or column of a touchscreen sensor)

² Cypress proprietary charger noise mitigation technology

CYTT21XXX-48

Full-feature Solution (Up to 7" Touchscreens)



D + C

Applications

Mass Market mobile phones
Mass Market tablets

Features

Advanced User Interface

Face Detection: Infrared Proximity Sensor replacement
Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505; and 8,067,948)

Automatic Mode Switching (AMS) for advanced sensing modes
10-finger tracking with 1-mm-thick gloves
2-finger tracking with 5-mm-thick gloves

Proprietary Analog Front End¹ with ChargerArmor™²

True 5-V TX-Boost™ with 8 multi-phase transmit lines (reduces noise by 3x compared to single-phase transmit line)
15-Vpp Charger Noise immunity (1-500 kHz, 9-mm finger)

System Solutions

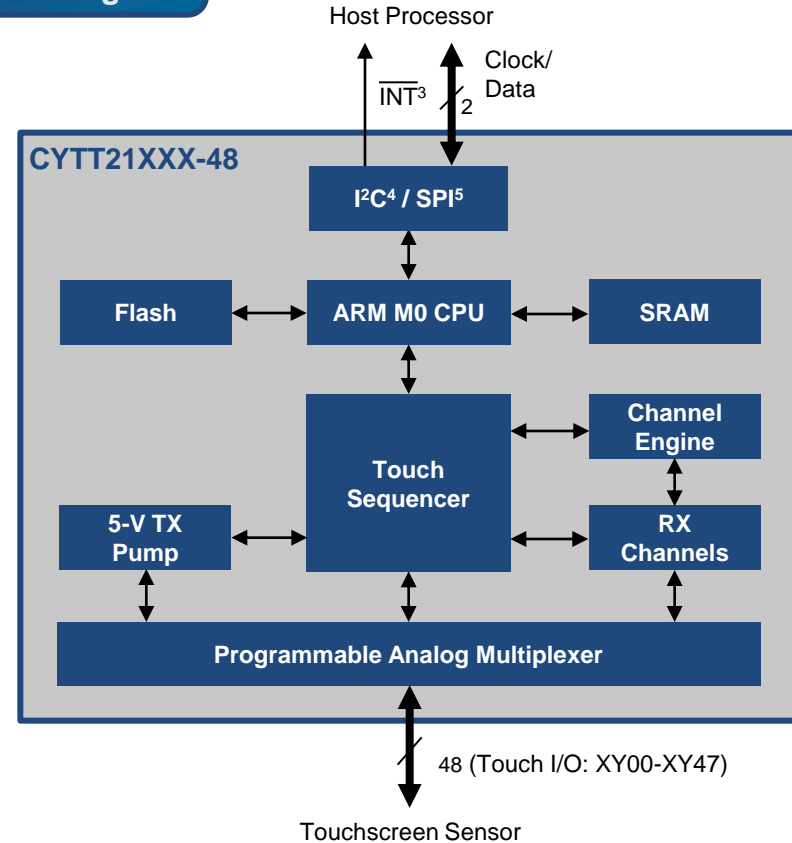
Android and Windows Phone operating systems
Wireless tuning with a TrueTouch Host Emulator mobile tuner
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Sampling: Q1 2015
Production: Q2 2015

³ Interrupt

⁴ Inter-integrated circuit

⁵ Serial peripheral interface

¹ Analog circuit in the touchscreen controller used to measure Self-Capacitance (capacitance of a row or column in a Touchscreen Sensor) and Mutual-Capacitance (capacitance of the intersection between a row or column of a Touchscreen Sensor)

² Cypress proprietary Charger Noise mitigation technology



CYTT31XXX-48

Advanced Features Solution (Up to 7" Touchscreens)



D + C

Applications

Premium Market mobile phones
E-readers

Features

Advanced User Interface

Passive Stylus support with palm rejection and AMS
Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505; and 8,067,948)
Automatic Mode Switching (AMS) for advanced sensing modes
10-finger tracking with 1-mm-thick gloves
2-finger tracking with 5-mm-thick gloves

Proprietary Analog Front End¹ with ChargerArmor™²

True 5-V TX-Boost™ with 8 multi-phase transmit lines (reduces noise by 3x compared to single-phase transmit line)
15-Vpp Charger Noise immunity (1-500 kHz, 9-mm finger)

System Solutions

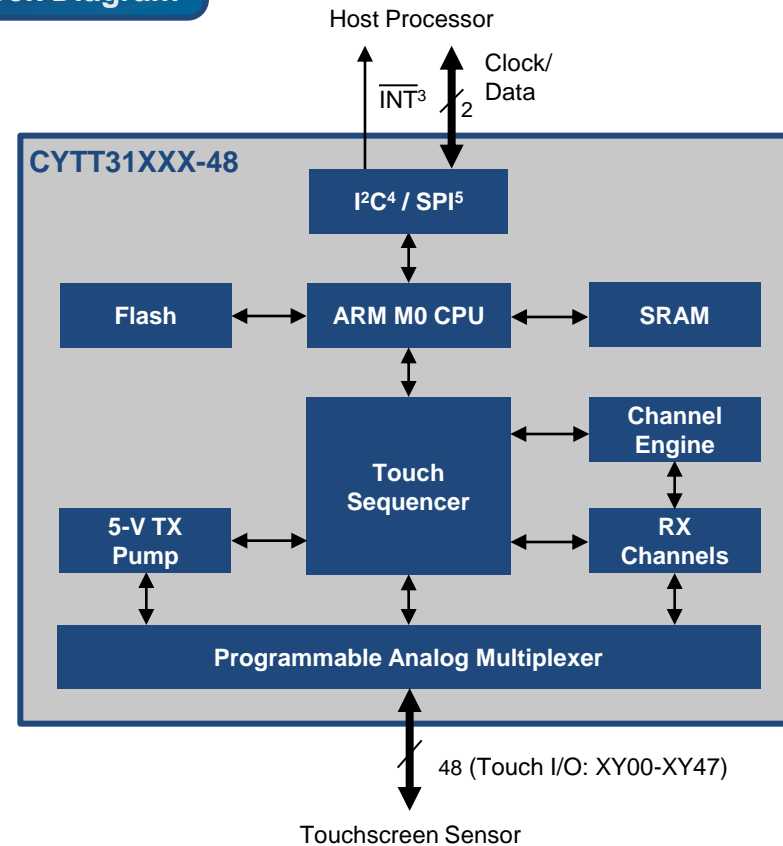
Android and Windows Phone operating systems
Wireless tuning with a TrueTouch Host Emulator mobile tuner
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Sampling: Q1 2015
Production: Q2 2015

³ Interrupt

⁴ Inter-integrated circuit

⁵ Serial peripheral interface

¹ Analog circuit in the touchscreen controller used to measure Self-Capacitance (capacitance of a row or column in a Touchscreen Sensor) and Mutual-Capacitance (capacitance of the intersection between a row or column of a Touchscreen Sensor)

² Cypress proprietary Charger Noise mitigation technology



CYTMA448

Full-feature Solution (Up to 8.3" Touchscreens)



Applications

Mobile phones
Tablets

Features

Advanced User Interface

Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505 and 8,067,948)
10-finger tracking with 1-mm-thick gloves
2-finger tracking with 5-mm-thick gloves
Automatic Mode Switching for advanced sensing modes

Proprietary Analog Front End¹ with 35-V Charger Armor™²

True 10-V TX-Boost™ with 37 multi-phase transmit lines
(reduces noise by 6x compared to single-phase transmit line)
35-Vpp charger noise immunity (1-500 kHz, 9-mm finger)
Display synchronization

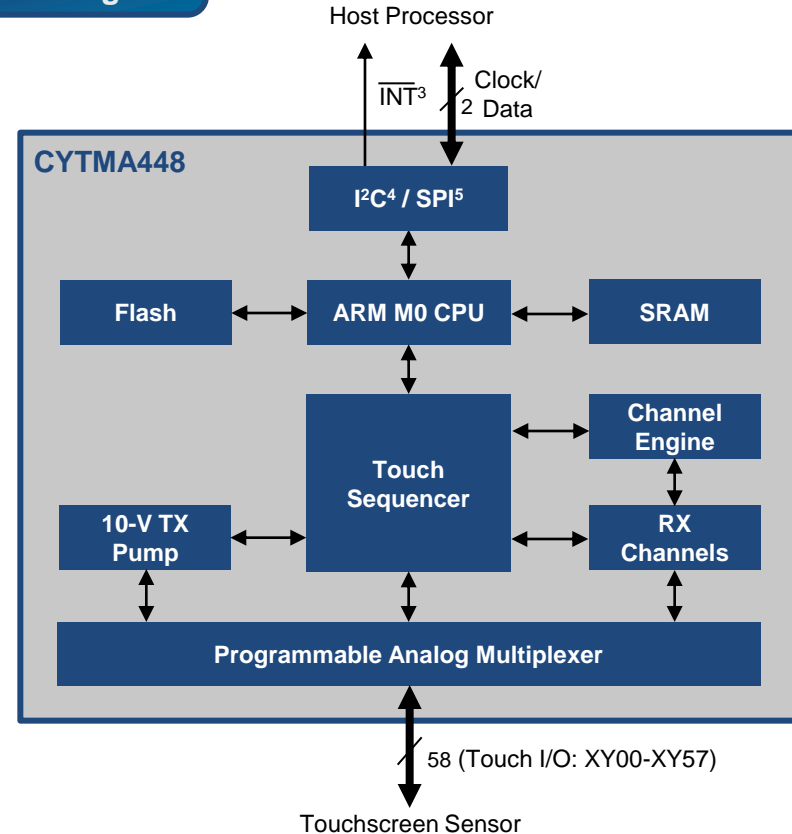
System Solutions

Android and Windows Phone operating systems
Wireless tuning with TrueTouch Host Emulator mobile tuner
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:
[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Full production

³ Interrupt

⁴ Inter-integrated circuit

⁵ Serial peripheral interface

¹ Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor) and mutual-capacitance (capacitance of the intersection between a row or column of a touchscreen sensor)

² Cypress proprietary charger noise mitigation technology

CYTMA525

Advanced Features Solution for On-cell and SLIM^{®1} (Up to 3.6" Touchscreens)



Applications

Wearables

Features

Advanced User Interface

Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505 and 8,067,948)

Passive stylus support with palm rejection

Low-power look-for-touch scan mode

Multiple gloved-finger tracking; works with 5-mm-thick ski gloves

Hover sensing: Tracks a hovering finger above the touchscreen

Proprietary Analog Front End² with 60-V Charger Armor™³

True 10-V TX-Boost™ with 8 multi-phase transmit lines (reduces noise by 3x compared to single-phase transmit line)

60-Vpp charger noise immunity (1-500 kHz, 9-mm finger)

System solutions

Supports on-cell and direct-laminated ITO⁴ stackups;
SLIM¹ and metal mesh sensors

Android and Windows Phone operating systems

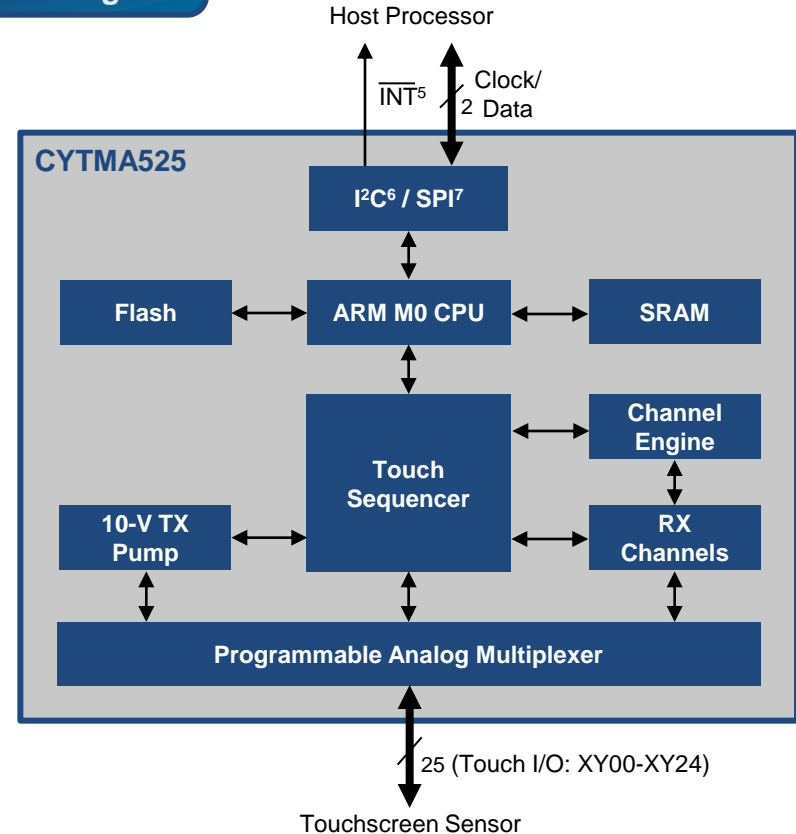
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Full production

¹ Low-cost Single-Layer Independent Multi-Touch sensor

² Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor) and mutual-capacitance (capacitance of the intersection between a row or column of a touchscreen sensor)

³ Cypress proprietary charger noise mitigation technology

⁴ Indium tin oxide

⁵ Interrupt

⁶ Inter-integrated circuit

⁷ Serial peripheral interface



CYTMA525A

Advanced Features Solution for On-cell and SLIM^{®1} (Up to 3.0" Touchscreens)



Applications

Wearables

Features

Advanced User Interface

Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505 and 8,067,948)

Low-power look-for-touch scan mode

Multiple gloved-finger tracking; works with 5-mm-thick ski gloves

Proprietary Analog Front End² with Charger Armor™³

True 5-V TX-Boost™ with 24 multi-phase transmit lines (reduces noise by 5x compared to single-phase transmit line)

35-Vpp charger noise immunity (1-500 kHz, 9-mm finger)

System solutions

Supports on-cell and direct-laminated ITO⁴ stackups;
SLIM¹ and metal mesh sensors

Android and Windows Phone operating systems

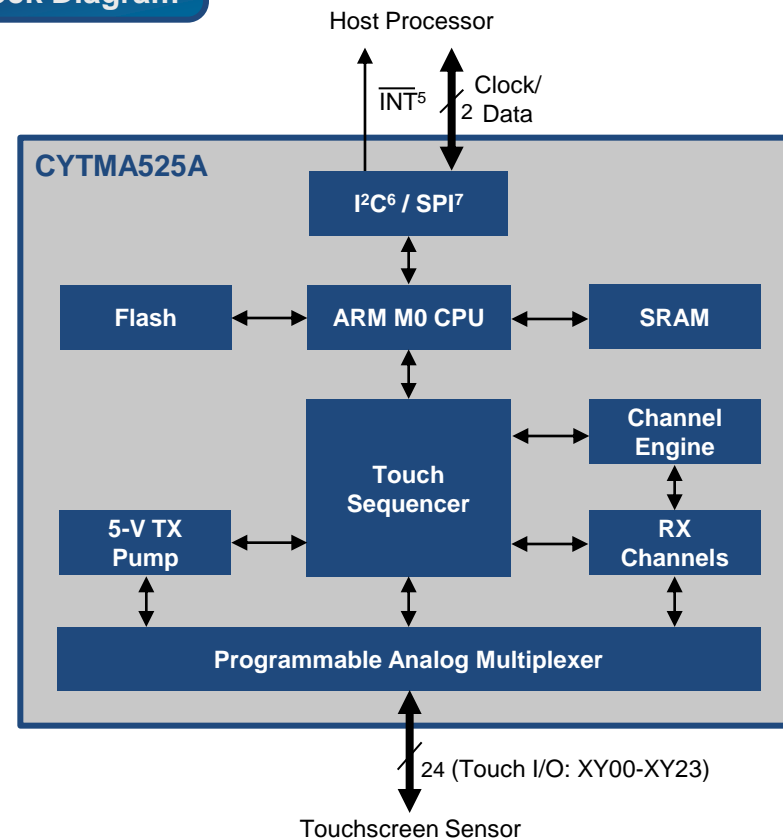
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Sampling: Q1 2015

Production: Q2 2015

¹ Low-cost Single-Layer Independent Multi-Touch sensor

² Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor) and mutual-capacitance (capacitance of the intersection between a row or column of a touchscreen sensor)

³ Cypress proprietary charger noise mitigation technology

⁴ Indium tin oxide

⁵ Interrupt

⁶ Inter-integrated circuit

⁷ Serial peripheral interface



CYTMA545

Advanced Features Solution for On-cell and SLIM^{®1} (Up to 5.2" Touchscreens)



Applications

Mobile phones

Features

Advanced User Interface

Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505 and 8,067,948)

Passive stylus support with palm rejection

Multiple gloved-finger tracking; works with 5-mm-thick ski gloves

Hover sensing: Tracks a hovering finger above the touchscreen

Proprietary Analog Front End² with 60-V Charger Armor™³

True 10-V TX-Boost™ with 8 multi-phase transmit lines (reduces noise by 3x compared to single-phase transmit line)

60-Vpp charger noise immunity (1-500 kHz, 9-mm finger)

System Solutions

Supports on-cell and direct-laminated ITO⁴ stack-ups;
SLIM^{®1} and metal mesh sensors

Android and Windows Phone operating systems

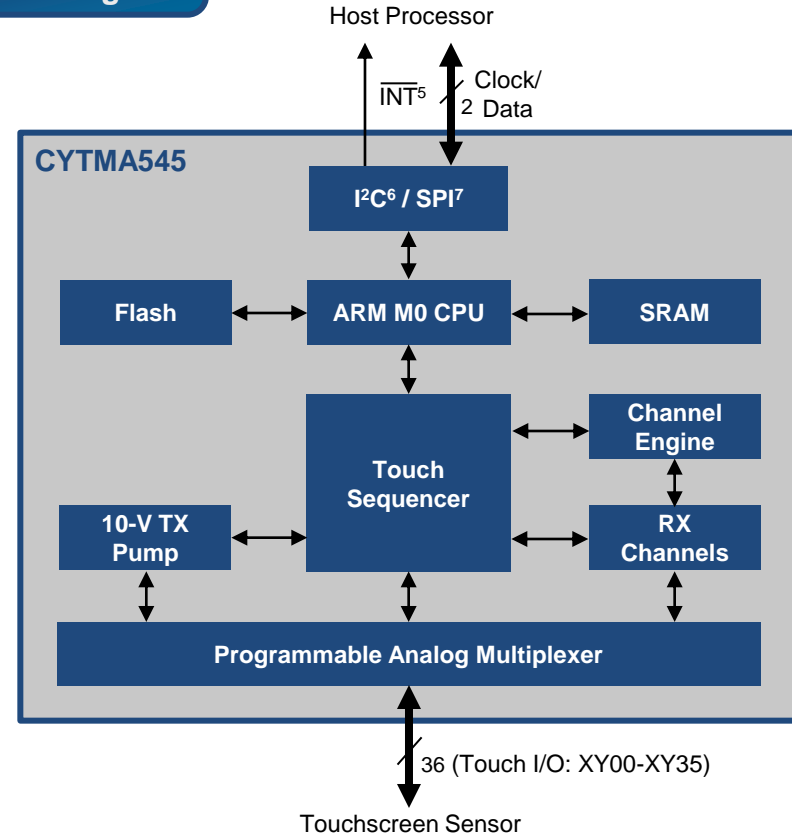
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or [truetouch@cypress.com](mailto:truetouch@ Cypress.com)

Block Diagram



Availability

Full production

¹ Low-cost Single-Layer Independent Multi-Touch sensor

² Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor) and mutual-capacitance (capacitance of the intersection between a row or column of a touchscreen sensor)

³ Cypress proprietary charger noise mitigation technology

⁴ Indium tin oxide

⁵ Interrupt

⁶ Inter-integrated circuit

⁷ Serial peripheral interface



CYTMA568

Advanced Features Solution for In-cell and On-cell (Up to 8.3" Touchscreens)



Applications

Mobile phones
Tablets

Features

Advanced User Interface

Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505 and 8,067,948)
Multiple gloved-finger tracking; works with 5-mm-thick ski gloves
Passive stylus support with palm rejection
Hover sensing: Tracks a hovering finger above the touchscreen

Proprietary Analog Front End¹ with 60-V Charger Armor™²

True 10-V TX-Boost™ with 37 multi-phase transmit lines
(reduces noise by 6x compared to single-phase transmit line)

60-Vpp charger noise immunity (1-500 kHz, 9-mm finger)

System Solutions

Supports in-cell³, on-cell and direct-laminated ITO⁴ stackups and metal mesh sensors

Android and Windows Phone operating systems

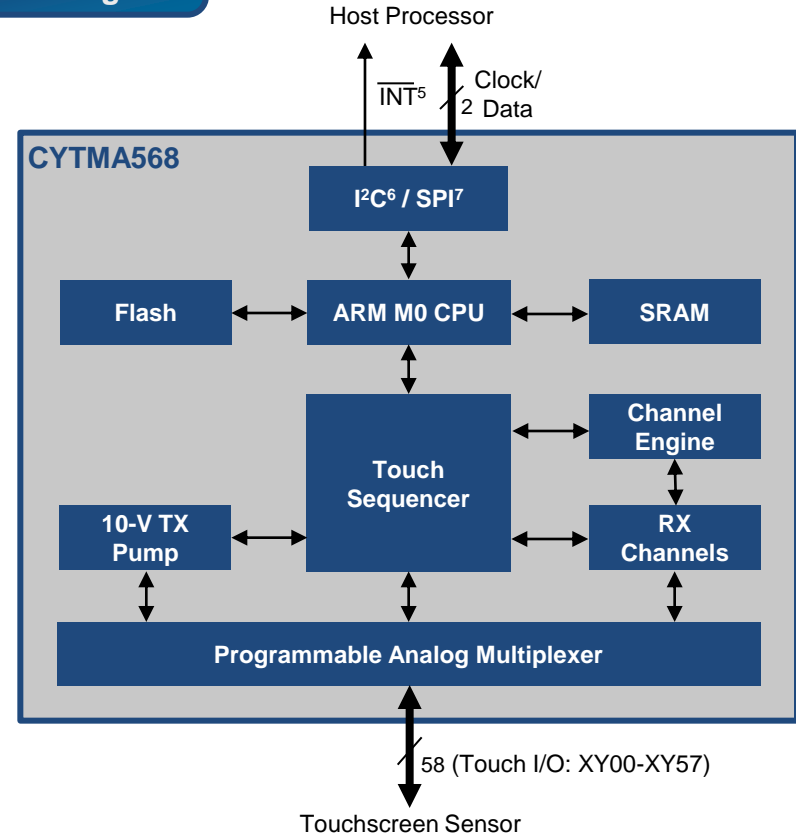
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Full production

¹ Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor) and mutual-capacitance (capacitance of the intersection between a row or column of a touchscreen sensor)

² Cypress proprietary charger noise mitigation technology

³ A type of sensor stack-up in which the touch sensor is inside the LCD module under the color-filter glass

⁴ Indium tin oxide

⁵ Interrupt

⁶ Inter-integrated circuit

⁷ Serial peripheral interface



CYTT41XXX-88

Advanced Features Solution with Active Stylus (Up to 10.1" Touchscreens)

Applications

Android tablets

Features

Advanced User Interface

1-mm passive and active stylus support with palm rejection
Tracking with 5-mm-thick gloves
Automatic Mode Switching for advanced sensing modes
Waterproofing and wet-finger tracking with DualSense™
(U.S. patents 8,358,142; 8,319,505 and 8,067,948)

Proprietary Analog Front End¹ with ChargerArmor™²

True 5-V TX-Boost™ with multi-phase transmit (reduces noise compared to single-phase transmit line)
15-Vpp charger noise immunity (1-500 kHz, 9-mm finger)

System Solutions

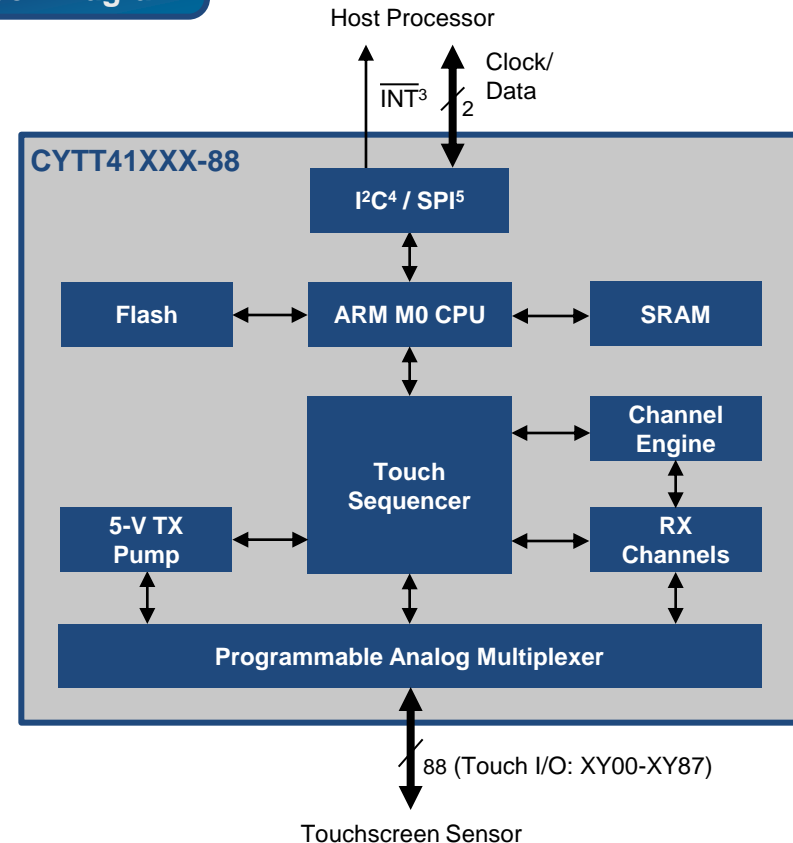
Android operating system
Wireless tuning with a TrueTouch Host Emulator mobile tuner
Manufacturing test kits for production testing

Collateral

Datasheets and Design Guides:

[Contact Sales](#) or truetouch@cypress.com

Block Diagram



Availability

Sampling: Q2 2015
Production: Q3 2015

³ Interrupt
⁴ Inter-integrated circuit
⁵ Serial peripheral interface

¹ Analog circuit in the touchscreen controller used to measure self-capacitance (capacitance of a row or column in a touchscreen sensor) and mutual-capacitance (capacitance of the intersection between a row or column of a touchscreen sensor)

² Cypress proprietary charger noise mitigation technology

CapSense® Roadmap

CapSense® Portfolio



	CapSense Express™		CapSense Plus™		PSoC®	
	Configurable Controllers ¹		Programmable Controllers ²		Programmable System-on-Chip ²	
Performance ↑	CY8CMBR3106S 11 Buttons, 2 Sliders Proximity, Liquid Tolerance SmartSense_EMCplus ³	CY8CMBR3116 16 Buttons, 8 LEDs Proximity, Liquid Tolerance SmartSense_EMCplus ³		CY8C28xx 44 Buttons, 8 Sliders 16KB Flash Proximity, Liquid Tolerance SmartSense™ Auto-tuning	NEW CY8C4246/7-L Q315 96 Buttons, 19 Sliders 256KB Flash, Proximity, Liquid Tolerance SmartSense_EMCplus ³	CY8C56xx/58xx 62 Buttons, 12 Sliders 64, 128, 256KB Flash Proximity, Liquid Tolerance SmartSense_EMCplus ³
	CY8CMBR3108 8 Buttons, 4 LEDs Proximity, Liquid Tolerance SmartSense_EMCplus ³	CY8CMBR3110 10 Buttons, 5 LEDs Proximity, Liquid Tolerance SmartSense_EMCplus ³		CY8C20xx7 31 Buttons, 6 Sliders 16, 32KB Flash Proximity, Liquid Tolerance SmartSense Auto-tuning	NEW CY8C4246/7-M Q215 55 Buttons, 11 Sliders 128KB Flash, Proximity, Liquid Tolerance SmartSense_EMCplus ³	CY8C36xx/38xx 62 Buttons, 12 Sliders 32, 64KB Flash Proximity, Liquid Tolerance SmartSense_EMCplus ³
	CY8CMBR3102 2 Buttons, Proximity SmartSense_EMCplus ³	CY8CMBR2110 10 Buttons, 10 LEDs SmartSense Auto-tuning		CY8C20xx6A/S 33 Buttons, 6 Sliders 16, 32KB Flash, 2KB SRAM SmartSense Auto-tuning	CY8C52xx/54xx 62 Buttons, 12 Sliders 32, 64, 128, 256KB Flash Proximity, Liquid Tolerance SmartSense_EMCplus ³	NEW CY8C4xx8-BL Q115 36 Buttons, 7 Sliders 256KB Flash, BLE ⁴ Proximity, Liquid Tolerance SmartSense_EMCplus ³
	CY8CMBR310XLP 4 Buttons, Low Power NDA Required Contact Sales	CY8CMBR2016 16 Buttons SmartSense Auto-tuning	CY8C20xx6H 25 Buttons, 5 Sliders 8, 16KB Flash SmartSense Auto-tuning Haptics	CY8C21x34/B 24 Buttons, 4 Sliders 8KB Flash Proximity, Liquid Tolerance SmartSense Auto-tuning	CY8C32xx/34xx 62 Buttons, 12 Sliders 16, 32, 64KB Flash Proximity, Liquid Tolerance SmartSense_EMCplus ³	NEW CY8C4xx7-BL 36 Buttons, 7 Sliders 128KB Flash, BLE ⁴ Proximity, Liquid Tolerance SmartSense_EMCplus ³
	CY8CMBR2044 4 Buttons, 4 LEDs SmartSense Auto-tuning	CY8CMBR2010 10 Buttons, 10 LEDs SmartSense Auto-tuning		CY8C20x36A 33 Buttons, 6 Sliders 8KB Flash SmartSense Auto-tuning	CY8C41xx/42xx 36 Buttons, 7 Sliders 16, 32KB Flash Proximity, Liquid Tolerance SmartSense_EMCplus ³	
	CY8CMBR3002 2 Buttons, 2 LEDs SmartSense_EMCplus ³	CY8C201xx 10 Buttons, 5 LEDs 2 Sliders	CY8C20x34 25 Buttons, 6 Sliders 8KB Flash		CY8C40xx 16 Buttons, 3 Sliders 8, 16KB Flash Proximity, Liquid Tolerance SmartSense_EMCplus ³	

Integration

¹ Standard products that are configured for target applications with a graphical user interface

² Microcontroller-based products that can be freely programmed to implement additional functions

³ SmartSense Electromagnetic Compatible = SmartSense Auto-tuning + high noise immunity

⁴ Bluetooth Low Energy



CY8CMBR3xxx Family



Applications

Industrial control panels
 White goods, small home appliances
 Keypads
 Elevator controls
 TVs, monitors
 Music players
 Mobile phones, tablets

Features

Up to 16 buttons, or 8 buttons and 8 LEDs
 Up to two 5-segment sliders
 SmartSense™ Auto-tuning eliminates manual tuning
 Proximity sensing distance of up to 30 cm
 LED control
 Buzzer output
 Liquid tolerance¹
 Register-configurable with EZ-Click™ software tool
 Wide operating voltage: 1.7-5.5 V
 Packages: 8-pin SOIC, 16-pin QFN, 16-pin SOIC, 24-pin QFN

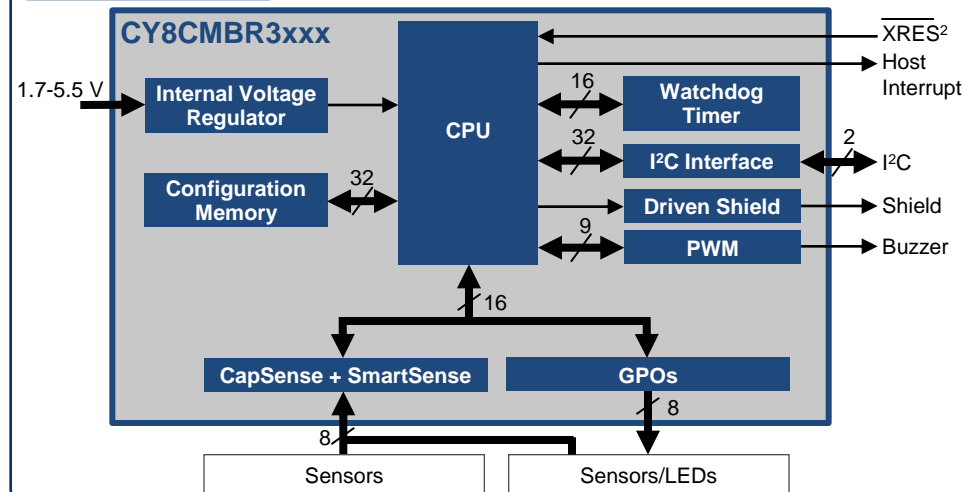
Collateral

Datasheet: [CY8CMBR3xxx](#)
 Design Guide: [CY8CMBR3xxx](#)

Family Table

MPN	CapSense Buttons	GPOs	Proximity Sensors	Communication Interface	Buzzer
CY8CMBR3002-SX1I	2	2	-	GPO	N
CY8CMBR3102-SX1I	2	1	2	I ² C	N
CY8CMBR3108-LQXI	8	4	2	I ² C	Y
CY8CMBR3110-SX2I	10	5	2	I ² C	Y
CY8CMBR3106S-LQXI	11	0	2	I ² C	Y
CY8CMBR3116-LQXI	16	8	2	I ² C	Y

Block Diagram



Availability

Sampling: Now
 Production: Now

¹ The ability of a capacitive sensing solution to work in the presence of water droplets or mist

² External reset

Applications

- MCU and discrete analog replacement
- User interface for button replacement
- User interface for heating, ventilation, air conditioning

Features

32-bit MCU subsystem

16-MHz ARM[®] Cortex[™]-M0 CPU
Up to 16KB flash and 2KB SRAM

Programmable analog

Two IDACs¹ (7-bit and 8-bit), digitally controlled current source
One comparator (CMP)

CapSense[®] with SmartSense[™] Auto-tuning

One Cypress Capacitive Sigma-Delta[™] (CSD) controller
Capacitive sensing supported on up to 16 pins

Programmable digital

One configurable 16-bit timer, counter or pulse-width modulator (TCPWM) block
One I²C master or slave

Packages

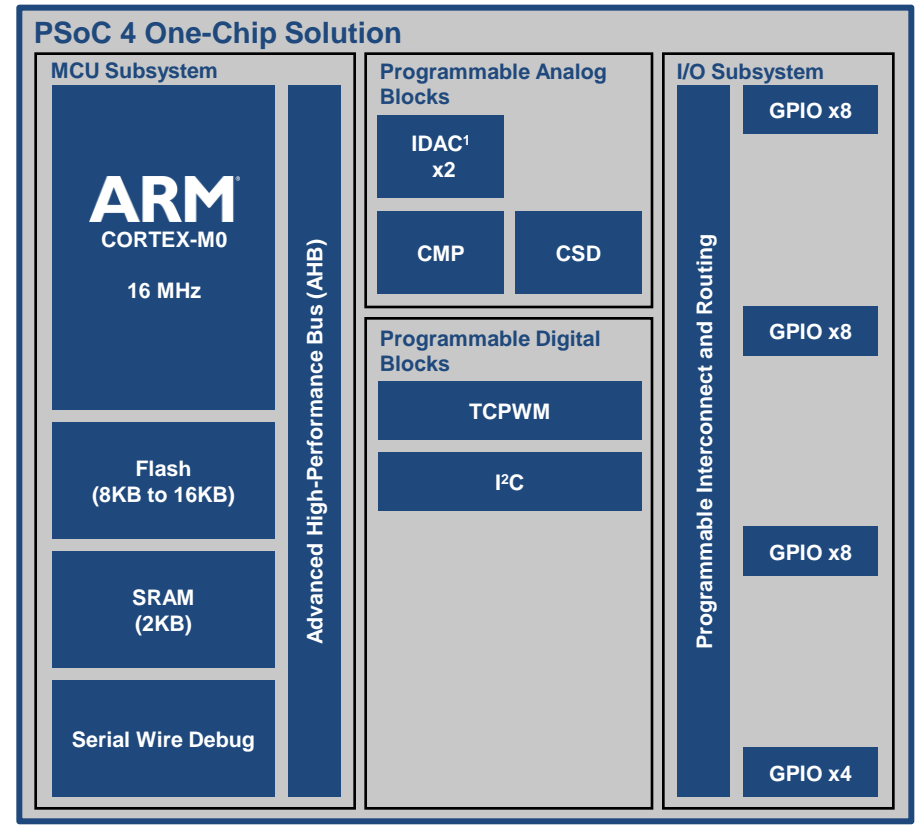
8-pin SOIC, 16-pin SOIC, 16-QFN, 24-pin QFN

Collateral

Datasheet: [PSoC 4000](#)

Technical Reference Manual: [PSoC 4000](#)

Block Diagram



Availability

Sampling: Now
Production: Now

¹ Current-output digital-to-analog converter

Applications

- User interface for home appliances
- Digital and analog sensor hub
- MCU and discrete analog replacement

Features

32-bit MCU Subsystem

- 24-MHz ARM[®] Cortex[™]-M0 CPU
- Up to 32KB flash and 4KB SRAM

CapSense[®] with SmartSense[™] Auto-tuning

- Cypress Capacitive Sigma-Delta[™] (CSD) controller
- CapSense supported on up to 36 pins

Programmable Analog Blocks

- Two comparators (CMPs)
- Two opamps, programmed as PGAs, CMPs, filters, etc.
- One 12-bit, 1-Msps SAR¹ ADC
- Two IDACs² (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

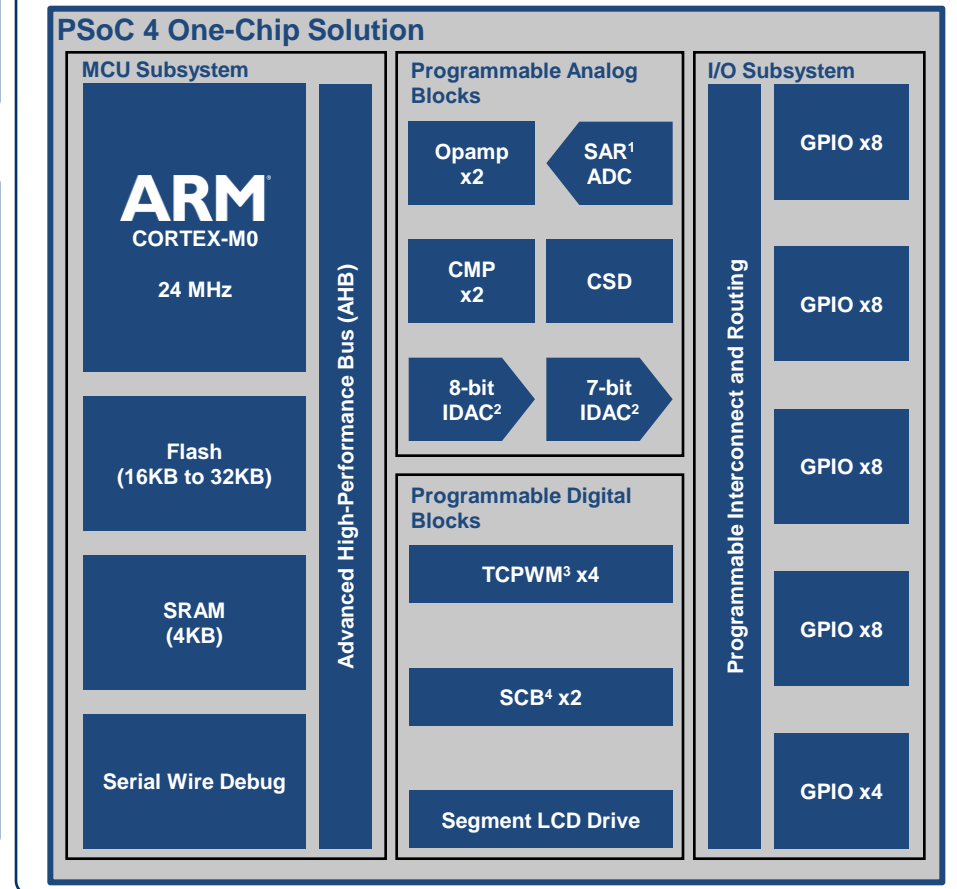
- Four programmable 16-bit TCPWM³ blocks
- Two SCBs⁴: I²C master or slave, SPI master or slave, or UART

Packages: 28-pin SSOP, 40-pin QFN, 44-pin TQFP, 48-pin LQFP

Collateral

- Datasheet: [PSoC 4 \(CY8C4100\)](#)
- Technical Reference Manual: [PSoC 4](#)

Block Diagram



Availability

- Sampling: Now
- Production: Now

¹ Successive approximation register

³ Timer, counter, PWM block

² Current-output digital-to-analog converter

⁴ Serial communication block programmable as I²C/SPI/UART

Applications

- User interface for home appliances
- Digital and analog sensor hub
- MCU and discrete analog replacement

Features

32-bit MCU Subsystem

48-MHz ARM[®] Cortex[™]-M0 CPU
Up to 32KB flash and 4KB SRAM

CapSense[®] with SmartSense[™] Auto-tuning

Cypress Capacitive Sigma-Delta[™] (CSD) controller
CapSense supported on up to 36 pins

Programmable Analog Blocks

Two comparators (CMPs)
Two opamps, programmed as PGAs, CMPs, filters, etc.
One 12-bit, 1-Msps SAR¹ ADC
Two IDACs² (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

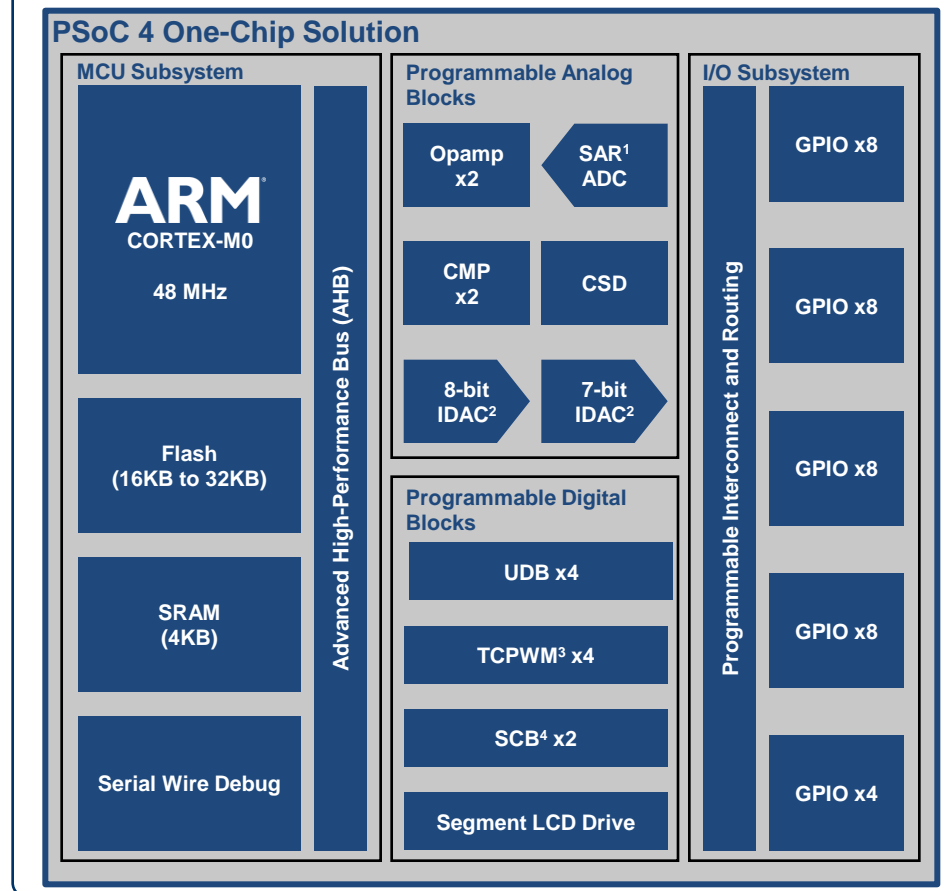
Four Universal Digital Blocks (UDBs): custom digital peripherals
Four programmable 16-bit TCPWM³ blocks
Two SCBs⁴: I²C master or slave, SPI master or slave, or UART

Packages: 28-pin SSOP, 40-pin QFN, 44-pin TQFP, 48-pin LQFP

Collateral

Datasheet: [PSoC 4 \(CY8C4200\)](#)
Technical Reference Manual: [PSoC 4](#)

Block Diagram



Availability

Sampling: Now
Production: Now

¹ Successive approximation register

³ Timer, counter, PWM block

² Current-output digital-to-analog converter

⁴ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4100 BLE-Series

Intelligent Analog Family with Bluetooth Low Energy



Applications

Sports and fitness monitors, wearable electronics, medical devices, home automation solutions, game controllers, sensor-based low-power systems for the Internet of Things (IoT)

Features

32-bit MCU subsystem

24-MHz ARM[®] Cortex[™]-M0 CPU
Up to 256KB flash and 32KB SRAM

Programmable AFE¹

Four opamps, configurable as PGAs, comparators, filters, etc.
One 12-bit, 1-Msps SAR² ADC

CapSense[®] with SmartSense[™] Auto-tuning

One Cypress Capacitive Sigma-Delta[™] (CSD) controller with touchpad capability

Programmable digital logic

Four configurable TCPWM³ blocks: 16-bit timer, counter or PWM
Two configurable serial communication blocks (SCBs⁴):
I²C master or slave, SPI master or slave, or UART

Packages

56-pin QFN, 68-pin CSP

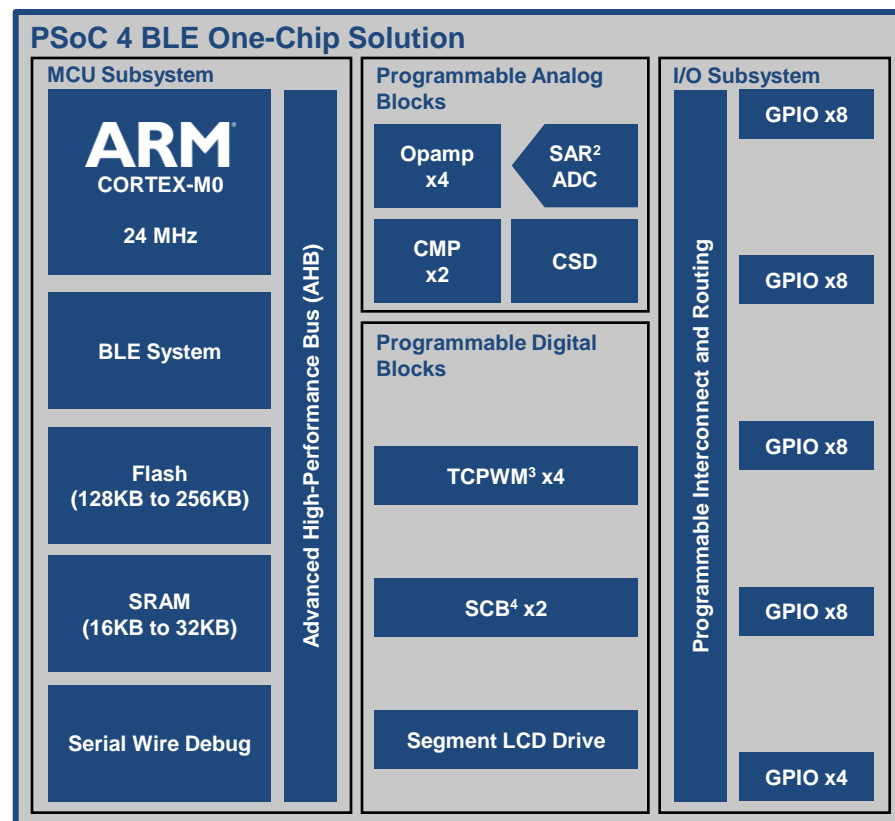
Bluetooth Smart connectivity with Bluetooth 4.1

2.4-GHz BLE radio with integrated Balun

Collateral

Datasheet: [PSoC 4 BLE \(CY8C4XX7 BLE\)](#)

Block Diagram



Availability

Sampling: Now
Production: 128KB Now, 256KB Q2 2015

¹ Analog front end(s)

³ Timer, counter, PWM block

² Successive approximation register

⁴ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4200 BLE-Series

Programmable Digital Family with Bluetooth Low Energy



Applications

Sports and fitness monitors, wearable electronics, medical devices, home automation solutions, game controllers, sensor-based low-power systems for the Internet of Things (IoT)

Features

32-bit MCU subsystem

48-MHz ARM[®] Cortex[™]-M0 CPU
Up to 256KB flash and 32KB SRAM

Programmable AFE¹

Four opamps, configurable as PGAs, comparators, filters, etc.
One 12-bit, 1-Msps SAR² ADC

CapSense[®] with SmartSense[™] Auto-tuning

One Cypress Capacitive Sigma-Delta[™] (CSD) controller with touchpad capability

Programmable digital logic

Four Universal Digital Blocks (UDBs): custom digital peripherals
Four configurable TCPWM³ blocks: 16-bit timer, counter or PWM
Two configurable serial communication blocks (SCBs⁴):
I²C master or slave, SPI master or slave, or UART

Packages

56-pin QFN, 68-pin CSP

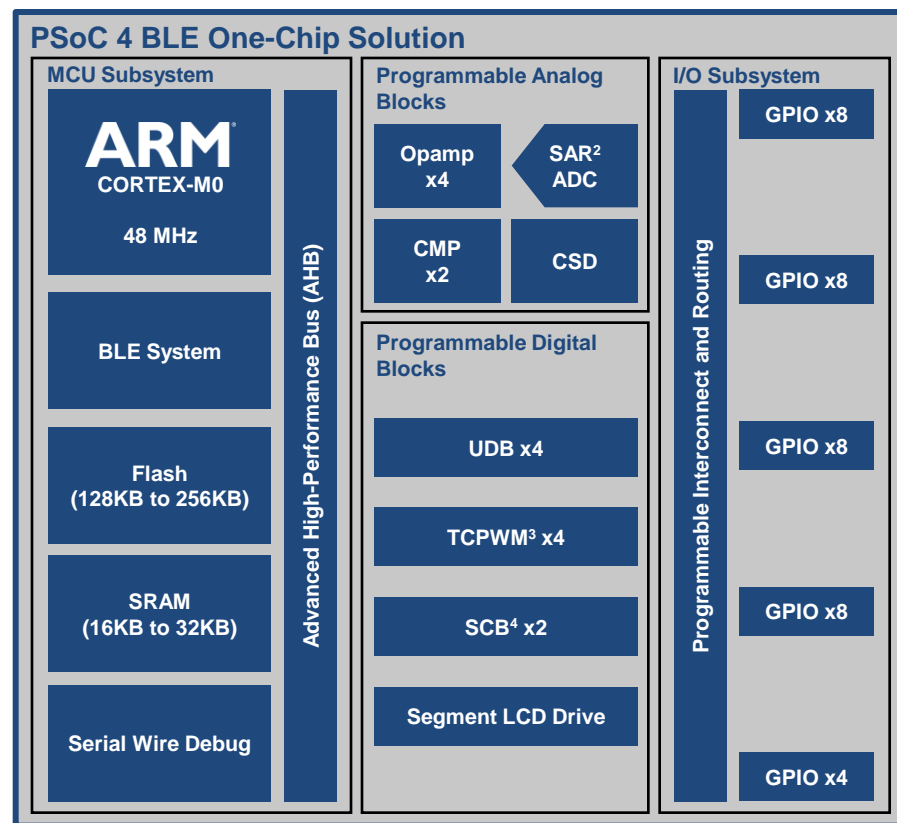
Bluetooth Smart connectivity with Bluetooth 4.1

2.4-GHz BLE radio with integrated Balun

Collateral

Datasheet: [PSoC 4 BLE \(CY8C4XX7 BLE\)](#)

Block Diagram



Availability

Sampling: Now
Production: 128KB Now, 256KB Q2 2015

¹ Analog front end(s)

³ Timer, counter, PWM block

² Successive approximation register

⁴ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4100 M-Series

Intelligent Analog Family



Applications

User interface and host processor for home appliances
 Digital and analog sensor hub
 MCU and discrete analog replacement

Features

32-bit MCU Subsystem

24-MHz ARM[®] Cortex[®]-M0 CPU with a DMA controller and RTC¹
 Up to 128KB flash and 16KB SRAM
 Up to 55 GPIOs supporting analog, digital and CapSense interfaces

CapSense[®] With SmartSense[™] Auto-tuning

Cypress Capacitive Sigma-Delta[™] (CSD) controller

Programmable Analog Blocks

Six comparators (CMP)
 Four opamps, programmable as PGAs, CMPs, filters, etc.
 One 12-bit, 1-Msps SAR² ADC
 Four IDACs³ (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

Eight programmable 16-bit TCPWM⁴ blocks
 Four SCBs⁵: I²C master or slave, SPI master or slave, or UART

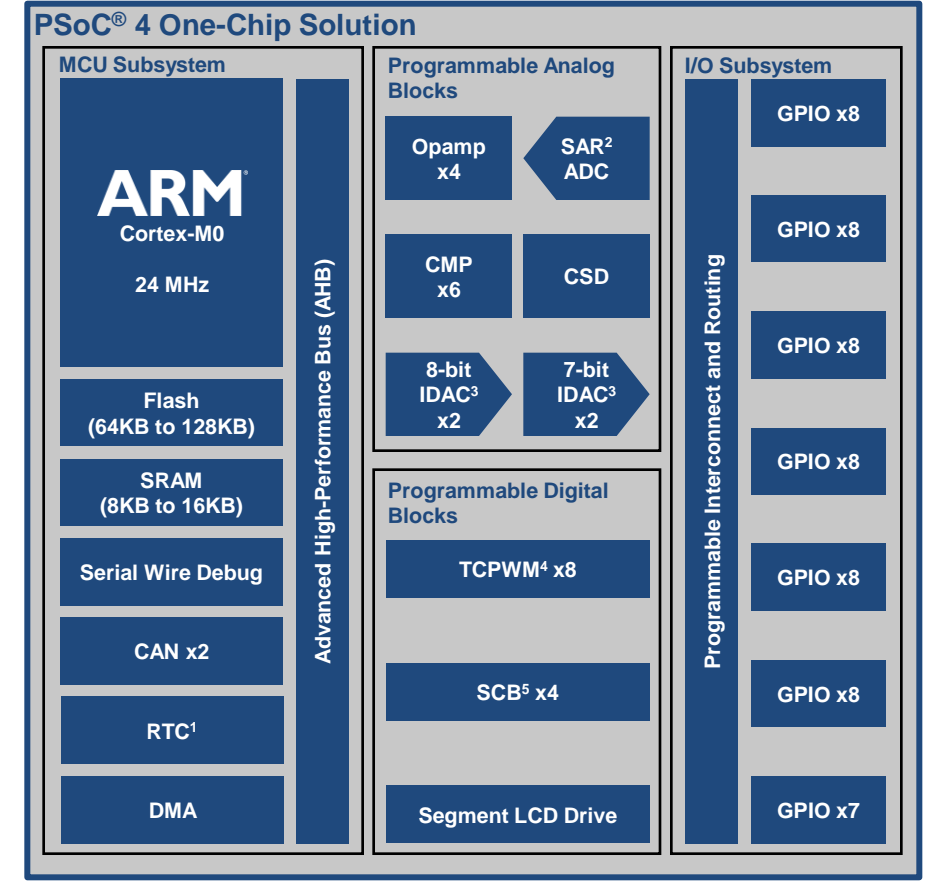
Two Controller Area Network (CAN) Controllers

Packages: 48-pin LQFP, 64-pin TQFP (0.8-mm pitch),
 64-pin TQFP (0.5-mm pitch), 68-pin QFN

Collateral

Datasheet: [PSoC 4100M datasheet](#)

Block Diagram



Availability

Sampling: Now
 Production: Q2 2015

¹ Real-time clock

² Successive approximation register

³ Current-output digital-to-analog converter

⁴ Timer, counter, PWM block

⁵ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4200 M-Series

Programmable Digital Family



Applications

User interface and host processor for home appliances
 Digital and analog sensor hub
 LED control and communication for lighting systems

Features

32-bit MCU Subsystem

48-MHz ARM[®] Cortex[®]-M0 CPU with a DMA controller and RTC¹
 Up to 128KB flash and 16KB SRAM
 Up to 55 GPIOs supporting analog, digital and CapSense interfaces

CapSense[®] With SmartSense[™] Auto-tuning

Cypress Capacitive Sigma-Delta[™] (CSD) controller

Programmable Analog Blocks

Six comparators (CMPs)
 Four opamps, programmable as PGAs, CMPs, filters, etc.
 One 12-bit, 1-Msps SAR² ADC
 Four IDACs³ (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

Four Universal Digital Blocks (UDBs): custom digital peripherals
 Eight programmable 16-bit TCPWM³ blocks
 Four SCBs⁴: I²C master or slave, SPI master or slave, or UART

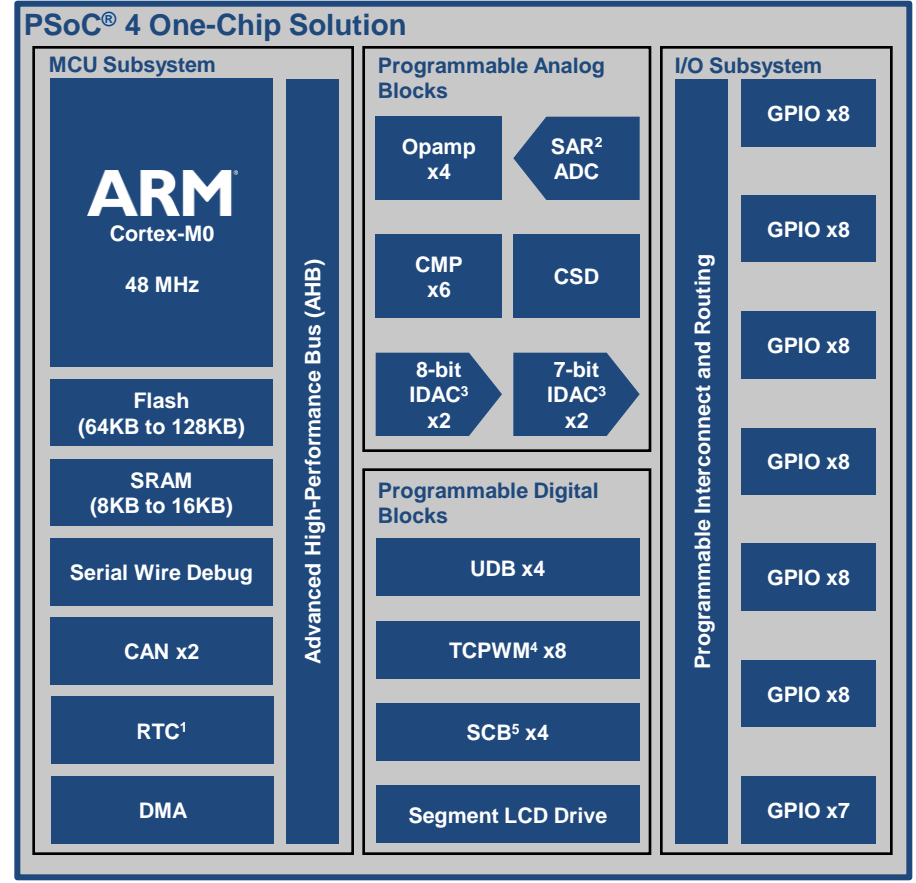
Two Controller Area Network (CAN) Controllers

Packages: 48-pin LQFP, 64-pin TQFP (0.8-mm pitch),
 64-pin TQFP (0.5-mm pitch), 68-pin QFN

Collateral

Datasheet: [PSoC 4200M datasheet](#)

Block Diagram



Availability

Sampling: Now
 Production: Q2 2015

¹ Real-time clock

² Successive approximation register

³ Current-output digital-to-analog converter

⁴ Timer, counter, PWM block

⁵ Serial communication block programmable as I²C/SPI/UART

PSoC[®] 4200 L-Series

Programmable Digital Family



Applications

User interface and host processor for home appliances
 Digital and analog sensor hub
 MCU and discrete analog replacement
 LED control and communication for lighting systems

Features

32-bit MCU Subsystem

48-MHz ARM[®] Cortex[®]-M0 CPU with a DMA controller and RTC¹
 Up to 256KB flash and 32KB SRAM
 Up to 98 GPIOs supporting analog and digital interfaces

CapSense[®] With SmartSense[™] Auto-tuning

Two Cypress Capacitive Sigma-Delta[™] (CSD) controllers

Programmable Analog Blocks

Two comparators (CMPs)
 Four opamps, configurable as PGAs, CMPs, filters, etc.
 One 12-bit, 1-Msps SAR² ADC
 Four IDACs³ (2x 8-bit, 2x 7-bit)

Programmable Digital Blocks

Eight Universal Digital Blocks (UDBs): custom digital peripherals
 Eight configurable 16-bit TCPWM⁴ blocks
 Four SCBs⁵: I²C master or slave, SPI master or slave, or UART

Full-Speed USB 2.0 Controller and Transceiver

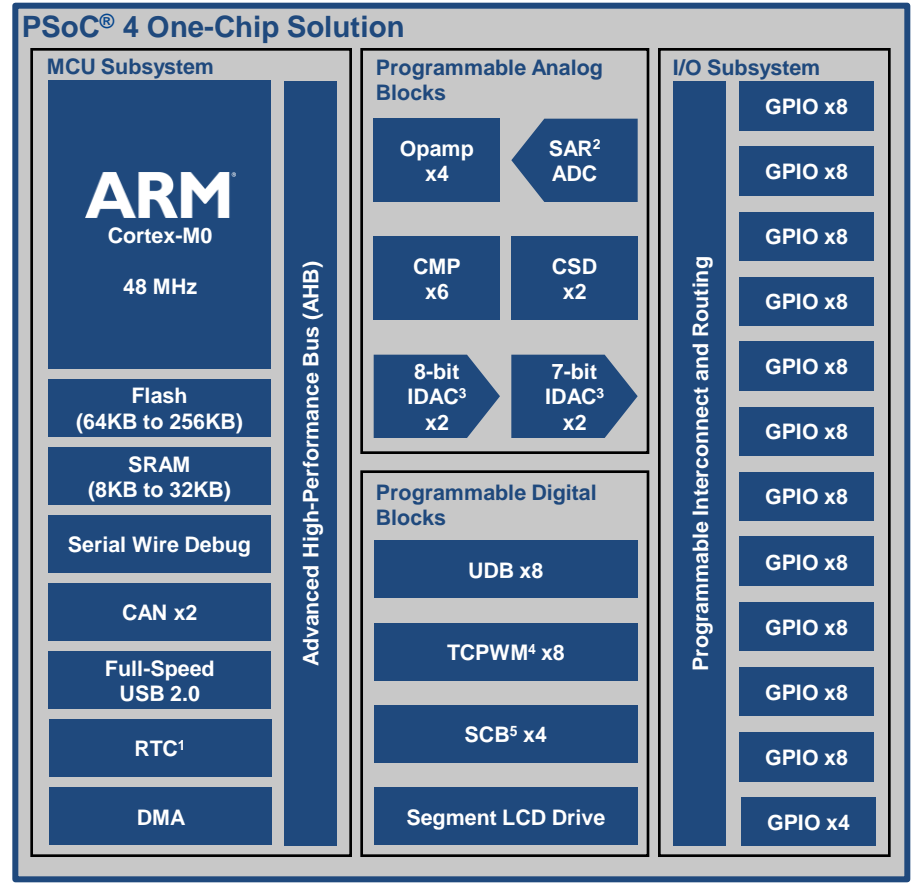
Two Controller Area Network (CAN) Controllers

Packages: 48-pin TQFP, 64-pin TQFP, 68-pin QFN, 124-pin µBGA

Collateral

Preliminary Datasheet: [Contact Sales](#)

Block Diagram



Availability

Sampling: Q3 2015
 Production: Q4 2015

¹ Real-time clock

² Successive approximation register

³ Current-output digital-to-analog converter

⁴ Timer, counter, PWM block

⁵ Serial communication block programmable as I²C/SPI/UART

PSoC Platform Packages



Package	LQFP	PDIP			QFN							SOIC			
Pins	48	8	20	28	16	24	32	40	48	56	68	8	16	20	28
PSoC 1		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
PSoC 3									✓		✓				
PSoC 4	✓				✓	✓		✓		✓	✓	✓	✓		
PSoC 5LP											✓				
CapSense					✓	✓	✓		✓			✓	✓		
Package	SSOP							TQFP			WLCSP				μBGA
Pins	8	16	20	24	28	32	48	44	64	100	30	68	72	99	124
PSoC 1	✓	✓	✓	✓	✓	✓	✓	✓		✓					
PSoC 3							✓			✓			✓		
PSoC 4					✓			✓	✓			✓			✓
PSoC 5LP										✓				✓	
CapSense			✓				✓				✓				

USB Roadmap

USB Portfolio



	Device	Hub	Bridge	Host	Storage	Type-C
USB 3.0	CYUSB301x FX3 32-Bit Bus to USB 3.0 ARM9, 512KB RAM	CYUSB33xx HX3 4 Ports, Shared Link™ ¹ BC 1.2 ² , Ghost Charge™ ³	CYUSB306x CX3 CSI-2 ⁴ to USB 3.0 4 CSI-2 ⁴ Lanes, 1 Gbps/Lane NEW DX3 USB 3.0 to DSI ⁸ TX Contact Sales NEW GX3 USB 3.0 to Gigabit Ethernet Contact Sales		CYUSB303x FX3S 16-Bit Bus to USB 3.0 RAID ⁵ , Dual SDXC ⁶ /eMMC ⁷ CYUSB302x SD3 SDXC ⁶ /eMMC ⁷ to USB 3.0 RAID ⁵	NEW CYPD1xxx Q115 CCG1 USB Type-C Port Controller 2 PD Ports, 5 Profiles, 100 W NEW CCG2 Q115 USB Type-C Cable Controller Contact Sales
	CY7C6801x/53 FX2LP 16-Bit Bus to USB 2.0 8051, 16KB RAM	CY7C656x4 HX2VL 4 Ports 4 Transaction Translators		CYWB016xBB Bay™ HS USB OTG Dual SDXC ⁶ /eMMC ⁷	CYWB0x2xABS Arroyo™, Astoria™ 16-Bit Bus to USB 2.0 8051, Dual SD/eMMC ⁷	Type-C product applies to any USB speed
	CY7C68003 TX2UL ULP ⁹ PHY 13, 19.2, 24, 26 MHz	CY7C656x1 HX2LP 4 Ports, Industrial Grade 1 Transaction Translator			CY7C6803x NX2LP NAND Flash to USB 2.0 8051, 15KB RAM CY7C683xx AT2LP Parallel ATA to USB 2.0 8051	
CY7C638xx enCoRe™ II M8C MCU, 20 GPIOs SPI, 8KB Flash		CY7C6521x USB-Serial UART/SPI/I ² C to USB 2 Channels, CapSense®	SL811HS FS USB Host/Device 256Byte RAM			
CY7C64215 enCoRe III M8C MCU, 50 GPIOs, ADC I ² C/SPI, 16KB Flash		CY7C65213 USB-to-UART (Gen 2) 3 Mbps, 8 GPIOs	CY7C67300 EZ-Host 4 Ports, FS USB OTG 32 GPIOs			
CY7C643xx enCoRe V M8C MCU, 36 GPIOs, ADC I ² C/SPI, 32KB Flash		CY7C64225 USB-to-UART (Gen 1) 230 Kbps	CY7C67200 EZ-OTG™ 2 Ports, FS USB OTG 25 GPIOs			

¹ Simultaneous USB 2.0 and USB 3.0 traffic on the same port
² Battery Charging specification v1.2

³ Enables USB charging without host connection
⁴ Camera Serial Interface v2.0

⁵ Redundant array of independent disks
⁶ SD extended capacity

⁷ Embedded MultiMedia Card
⁸ Display Serial Interface
⁹ UTMI low-pin interface

Status: Production Sampling Development Concept
 Availability: QQYY QQYY

CCG1: USB Type-C Port Controller

Applications

Notebooks, tablets, monitors, docking stations, power adapters, Type-C EMCA and dongles

Features

32-bit MCU subsystem

48-MHz ARM® Cortex™-M0 CPU with 32KB flash and 4KB SRAM

Integrated analog blocks

12-bit, 1-Msps ADC for V_{BUS} voltage and current monitoring
Dynamic Overcurrent and Overvoltage Protection

Integrated digital blocks

Two configurable 16-bit TCPWM¹ blocks
One SCB²: I²C master or slave, SPI master or slave, or UART
Up to 8 GPIOs

Type-C Support

Integrated Transceiver, supporting up to two Type-C ports
Controls routing of all protocols to an external MUX

PD 2.0 Support

Supports Provider and Consumer roles and all power profiles

Low-power operation

1.71-5.5 V operation
Sleep: 1.3 mA, Deep Sleep: 1.3 μ A, Hibernate: 150 nA, Stop: 20 nA

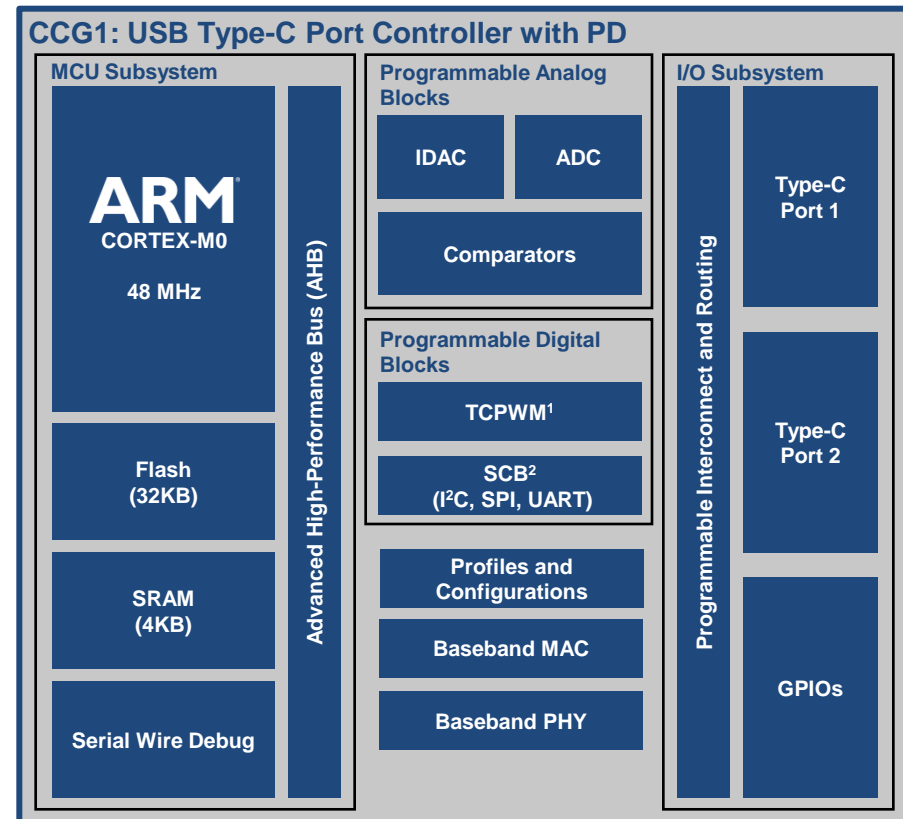
Packages

40-pin QFN (36 mm²), 28-pin SSOP (80 mm²),
35-ball CSP (6.8 mm²), 16-pin SOIC (60 mm²)

Collateral

Preliminary Datasheet: [Contact Sales](#)

Block Diagram



Availability

Samples: Now Production: March 2015

¹ Timer, counter, pulse-width modulation block

² Serial communication block configurable as UART, SPI or I²C

CX3: MIPI¹ CSI-2 to USB 3.0 Bridge

Applications

Industrial, medical and machine vision cameras
1080p Full HD and 4K Ultra HD (UHD) camera
Document scanners, fingerprint scanners
Game consoles
Videoconferencing systems
Notebook PCs, tablets
Image acquisition systems

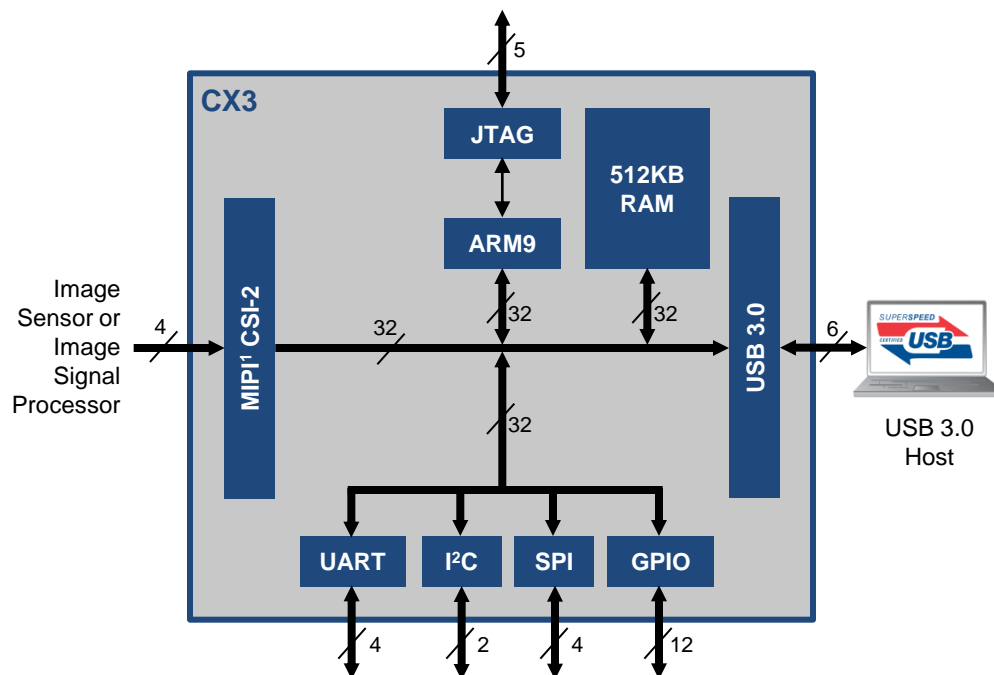
Features

USB 3.0-compliant video-class controller
Four-lane MIPI¹ Camera Serial Interface v2.0 (CSI-2) input
Camera Control Interface (CCI) for image sensor configuration
Supports industry-standard video data formats:
RAW8/10/12/14², YUV422/444³, RGB888/666/565⁴
Supports uncompressed streaming video:
4K UHD at 15 fps, 1080p at 30 fps, 720p at 60 fps
On-chip ARM9 with 512KB RAM for data processing
Supports I²C, I²S, SPI, UART and 12 GPIOs
121-BGA (10 x 10 x 1.7 mm)

Collateral

Datasheet: [CX3 Datasheet](#)
Reference Design Kit: [CX3 RDK](#)
Software Development Kit: [EZ-USB SDK](#)

Block Diagram



Availability

Production: Now

¹ Mobile Industry Processor Interface

² Video format for raw video data

³ Video format for luminance and chrominance components

⁴ Video format for red, green and blue pixel components

HX3: USB 3.0 Hub

Applications

Docking stations for notebook PCs and tablets
 PC motherboards, servers
 Digital TV, monitors
 Retail hub boxes
 Printers, scanners
 Set-top boxes, home gateways, routers, game consoles

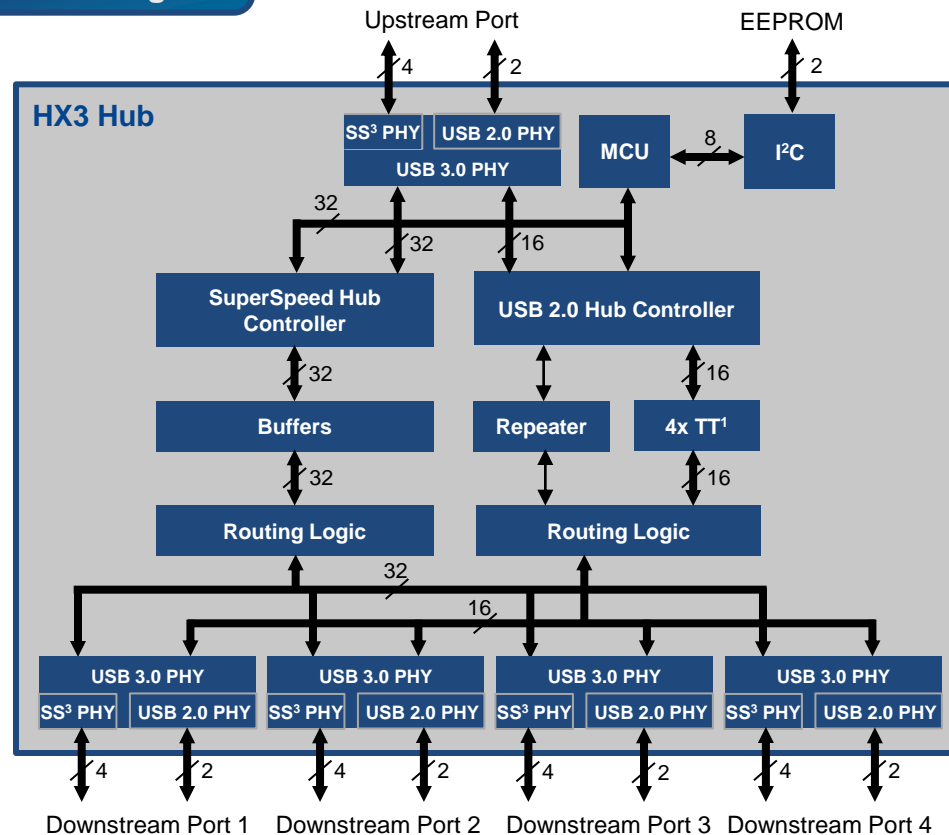
Features

USB 3.0-compliant four-port Hub Controller
 USB-IF certified (Test ID: 330000047)
 WHQL certified for Windows 7, Window 8, Windows 8.1
 Shared Link™: Supports simultaneous USB 2.0 and SuperSpeed Devices on the same port
 Ghost Charge™: Enables USB charging while the Hub is disconnected from a USB Host
 Charging Standard support:
 USB-IF Battery Charging v1.2
 Apple Charging Standard
 Charging an OTG Host in an ACA-Dock
 Programming of external EEPROM via USB
 Configurable USB 3.0 & USB 2.0 PHY. Drives 11" trace
 68-QFN (8 x 8 x 1.0 mm), 88-QFN (10 x 10 x 1.0 mm),
 100-BGA (6 x 6 x 1.0 mm)

Collateral

Datasheet: [HX3 Datasheet](#)
 Application Note: [HX3 Hardware Design Guide](#)
 Kits: [CY4609, CY4603, CY4613](#)
 Configuration Utility: [Blaster Plus](#)²

Block Diagram



Availability

Production: Now

¹ Transaction translator

² A Cypress GUI-based PC application for setting HX3 configuration parameters

³ SuperSpeed

USB-Serial Bridge Controller

Applications

- USB-to-RS232 cables
- Portable medical devices (e.g., blood glucose meters)
- Barcode readers, point-of-sale (POS) terminals
- NFC card readers, fingerprint scanners
- Temperature, current and energy measurement systems
- Servers and networking switches, home gateways
- GPS dongles, set-top boxes, Smart UPSs, industrial meters
- Precision trackpad (PTP) bridge

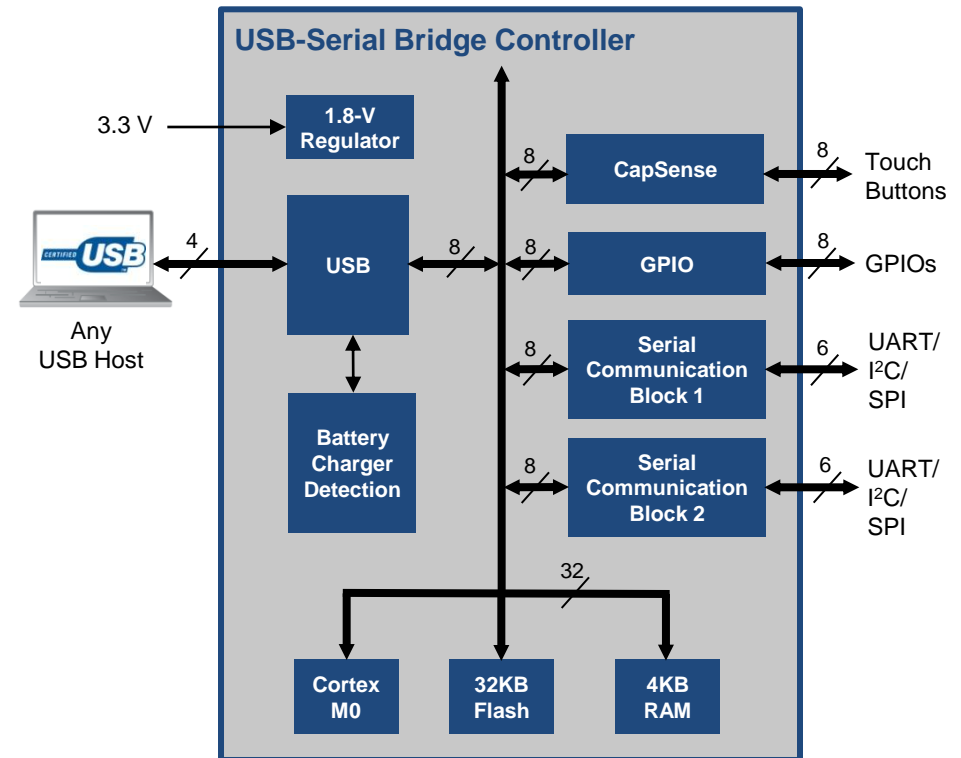
Features

- Dual-channel UART/I²C/SPI to full-speed USB bridge
- CapSense® for eight touch buttons
- USB Battery Charging Detection revision 1.2
- Integrated regulator, oscillator and termination resistors
- Customizable bridge for different serial interface standards (UART, I²C or SPI) and voltage domains (1.8 V to 5 V)
- Driver support for major operating systems:
 - Windows Vista, Windows CE, Windows XP, Windows 7, Windows 8, Mac OS X 10.6/7, Linux kernel 2.6.35 and later, Android Gingerbread and later
- Software utility to program product ID and vendor ID and to configure serial interfaces
- 24-QFN (4 x 4 x 0.55 mm), 32-QFN (5 x 5 x 1.0 mm), 28-SSOP (10 x 7.5 x 1.65 mm)

Collateral

- Datasheets: [USB-Serial Datasheets](#)
- Product Overview: [USB-Serial Overview](#)
- Evaluation Kits: [USB-Serial Kits](#)
- Software Development Kit: [USB-Serial SDK](#)

Block Diagram



Availability

Production: Now

Wireless/RF Roadmap

Wireless/RF Portfolio



	2.4-GHz RF Transceiver	Programmable Radio-on-Chip (P _{RoC} TM)			Programmable System-on-Chip (P _{SoC} TM)	
		MCU	CapSense [®]	TrueTouch ^{®1}	Intelligent Analog	Programmable Digital
BLE ²		NEW CYBL1016x P _{RoC} BLE CM03, 2 SCB4 36 GPIOs, 128KB Flash	NEW CYBL1046x P _{RoC} BLE CM03, 2 SCB4, CapSense 36 GPIOs, 128KB Flash	NEW CYBL1056x P _{RoC} BLE CM03, 2 SCB4, 2-Finger ¹ 36 GPIOs, 128KB Flash	NEW CY8C41x7-BL P _{SoC} 4 BLE CM03, 2 SCB4, 2-Finger ¹ CMP5, Opamp 36 GPIOs, 128KB Flash	NEW CY8C42x7-BL P _{SoC} 4 BLE CM03, 2 SCB4, 2-Finger ¹ CMP5, Opamp, 4 UDBs ⁶ 36 GPIOs, 128KB Flash
		NEW CYBL1017x P _{RoC} BLE CM0 ³ , 2 SCB ⁴ 36 GPIOs, 256KB Flash	NEW CYBL1047x P _{RoC} BLE CM0 ³ , 2 SCB ⁴ , CapSense 36 GPIOs, 256KB Flash	NEW CYBL1057x P _{RoC} BLE CM0 ³ , 2 SCB ⁴ , 2-Finger ¹ 36 GPIOs, 256KB Flash	NEW CY8C41x8-BL P _{SoC} 4 BLE CM0 ³ , 2 SCB ⁴ , 2-Finger ¹ CMP ⁵ , Opamp 36 GPIOs, 256KB Flash	NEW CY8C42x8-BL P _{SoC} 4 BLE CM0 ³ , 2 SCB ⁴ , 2-Finger ¹ CMP ⁵ , Opamp, 4 UDBs ⁶ 36 GPIOs, 256KB Flash
GFSK ³	CYRF8935 WUSB [®] -NL 1 Mbps Tx 18 mA, Rx 18 mA	CYRF89135 P _{RoC} TM -Embedded WUSB [®] -NL, M8C ⁹ 35 GPIOs, 32KB Flash	CYRF89435 P _{RoC} -CS WUSB [®] -NL, M8C ⁹ 35 GPIOs, 32KB Flash	CYRF89535 P _{RoC} -TT WUSB [®] -NL, M8C ⁹ , 2-Finger ¹ 35 GPIOs, 32KB Flash		
	CYRF9935 WUSB [®] -NX 2 Mbps Tx 12 mA, Rx 15 mA	CYRF89235 P _{RoC} -USB WUSB [®] -NL, M8C ⁹ , USB 13 GPIOs, 32KB Flash				
GFSK ³ + DSSS ⁶	CYRF6936 WUSB [®] -LP 1 Mbps Tx 26 mA, Rx 21 mA	CYRF69103 P _{RoC} -LP WUSB [®] -LP, M8C ⁹ 14 GPIOs, 8KB Flash				
		CYRF69213 P _{RoC} -LP WUSB [®] -LP, M8C ⁹ , USB 14 GPIOs, 8KB Flash				

Integration →

¹ Touch-sensing technology with 2-finger gestures
² Bluetooth Low Energy, also known as Bluetooth Smart
³ ARM[®] CortexTM-M0
⁴ Serial communication block

⁹ Cypress proprietary 8-bit MCU
¹⁰ Direct sequence spread spectrum

Status: Production Sampling Development Concept

Availability:

PRoC™-TT (CYRF89535)

Programmable Radio-on-Chip with TrueTouch® Touch Sensing



Applications

- Wireless touch mice
- Wireless keyboards with trackpads
- Wireless trackpads
- RF remote controls with trackpads

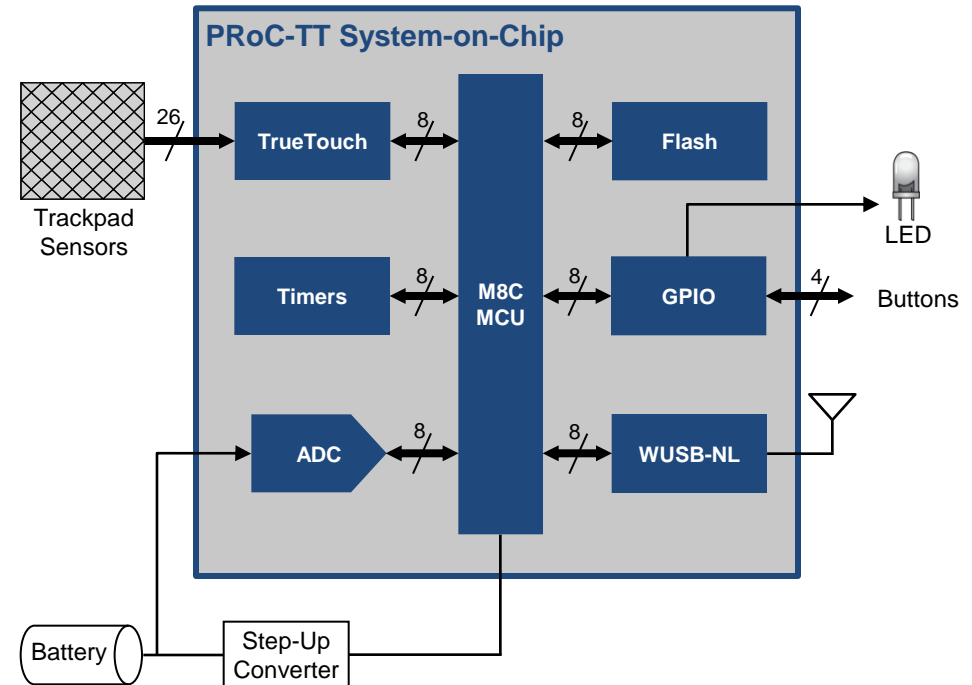
Features

- One-chip solution for wireless human interface devices (HIDs) with TrueTouch touch sensing
- Cypress M8C, a proprietary 8-bit MCU subsystem
- 32KB flash, 2KB SRAM, 35 GPIOs
- Three 16-bit programmable timers
- 10-bit ADC for battery monitoring
- I²C master/slave, SPI master/slave
- TrueTouch capacitive touch module:
 - On-chip library for one- and two-finger gestures
 - 26 X/Y sensor inputs
- Cypress's WUSB-NL: On-chip, low-power, 2.4-GHz radio
- AgileHID™ protocol for interference immunity¹
- 68 QFN (8 x 8 x 1.0 mm)

Collateral

Datasheet: [Contact Sales](#)
Development Kit: [Contact Sales](#)

Block Diagram



Availability

Production: Now

¹ Cypress's proprietary 2.4-GHz protocol for human interface devices (HIDs)

WUSB-NX (CYRF9935)

WirelessUSB™ Proprietary 2.4-GHz Radio



Applications

Wireless mice
 Wireless touch mice
 Wireless keyboards
 Wireless trackpads
 Wireless keyboards with trackpads
 RF remote controls

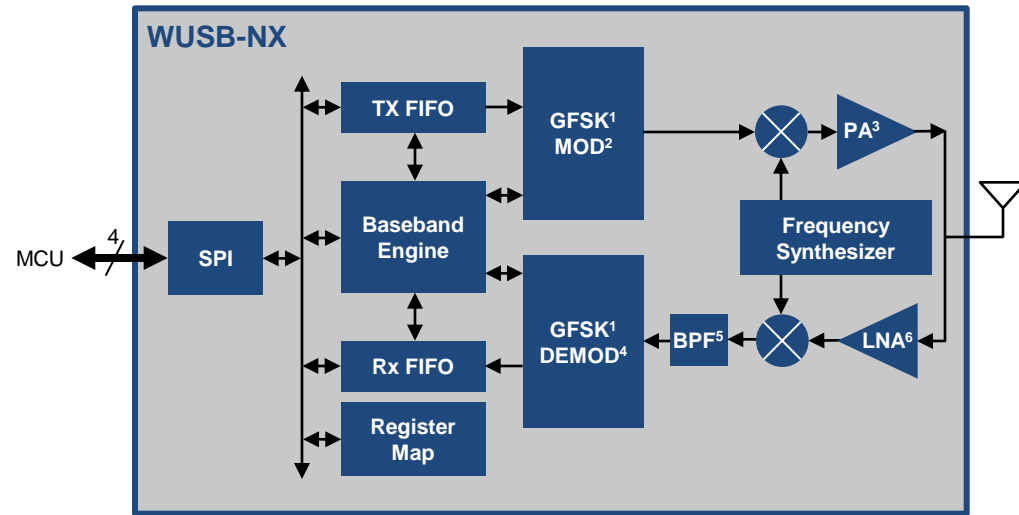
Features

Ultra-low-power, 2.4-GHz radio
 Low current consumption:
 Sleep current: 900 nA
 Idle current: 26 μ A
 Transmit current: 12 mA
 Receive current: 15 mA
 Programmable data rates: 2 Mbps, 250 Kbps
 Maximum link budget: +97 dB for 30-meter range
 Max transmit power: +4 dBm
 Min receive sensitivity: -93 dBm at 250 Kbps
 MCU interface: SPI slave
 Package: 24-QFN (4 x 4 x 0.55 mm)

Collateral

Datasheet: [CYRF9935](#)
 Development Kit: [Contact Sales](#)

Block Diagram



Availability

Production: Now

¹ Gaussian frequency shift keying
² Modulator
³ Power amplifier

⁴ Demodulator
⁵ Band-pass filter
⁶ Low-noise amplifier

PRoC™ BLE (CYBL101x/4x/5xx)

Programmable Radio-on-Chip with Bluetooth Low Energy



Applications

- Wireless touch mice
- Wireless keyboards with trackpads
- Wireless trackpads
- Wireless remote control with trackpads
- BLE connectivity
- Wireless toys

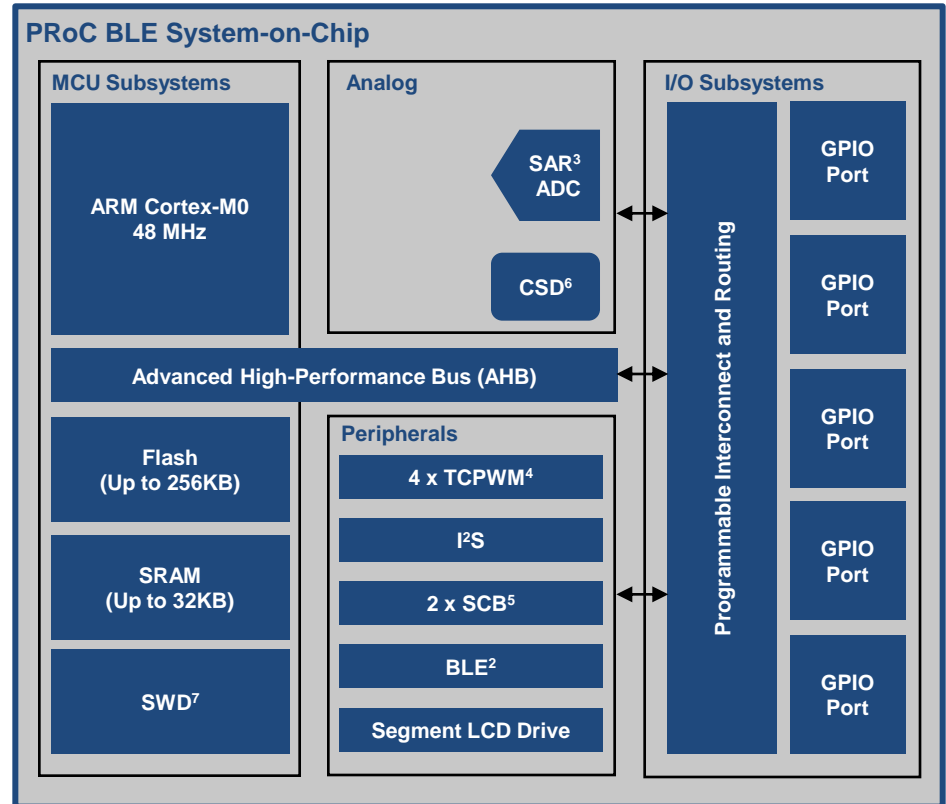
Features

- 48-MHz ARM® Cortex™-M0 MCU
- Up to 256KB Flash, 32KB SRAM, 36 programmable GPIOs¹
- Bluetooth Smart connectivity with Bluetooth 4.1:
 - 2.4-GHz BLE² radio and baseband with integrated Balun
 - 92-dBm Rx sensitivity, +3-dBm Tx output power
- Modes: 1.3-µA Deep-Sleep, 150-nA Hibernate, 60-nA Stop
- Analog and digital peripherals:
 - One 12-bit, 1-Msps SAR³ ADC
 - Four 16-bit TCPWM⁴ blocks
 - Two SCBs⁵, configurable as I²C, SPI or UART
 - I²S for audio input
 - Flexible mapping onto GPIOs
- Integrated library support for one- and two-finger gestures
- 56-QFN (7 x 7 x 0.6 mm), 68-ball CSP (3.9 x 3.5 x 0.55 mm)

Collateral

- [Datasheet](#)
- [Application Notes](#)

Block Diagram



Availability

- Sampling: Now
- Production: Now

⁷ Serial wire debug communication protocol

¹ General-purpose input/output (configurable)

² Bluetooth Low Energy, also known as Bluetooth Smart

³ Successive approximation register

⁴ Timer, counter, pulse-width modulator

⁵ Serial communication blocks

⁶ Capacitive Sigma-Delta controller

PSoC 4 BLE (CY8C4xx7-BL)

Applications

Sports and fitness monitors, wearable electronics, medical devices, home automation solutions, game controllers, sensor-based low-power systems for IoT

Features

32-bit MCU Subsystem

48-MHz ARM[®] Cortex[™]-M0 CPU
Up to 256KB flash and 32KB SRAM

Programmable AFE¹

Four opamps, configurable as PGAs, comparators, filters, etc.
One 12-bit, 1-Msps SAR² ADC

CapSense[®] with SmartSense[™] Auto-tuning

One Cypress Capacitive Sigma-Delta[™] (CSD) controller with touchpad capability

Programmable Digital Logic

Four Universal Digital Blocks (UDBs): custom digital peripherals
Four configurable TCPWM³ blocks: 16-bit timer, counter or PWM
Two configurable serial communication blocks (SCBs):
I²C master or slave, SPI master or slave, or UART

Packages

56-pin QFN, 68-pin CSP

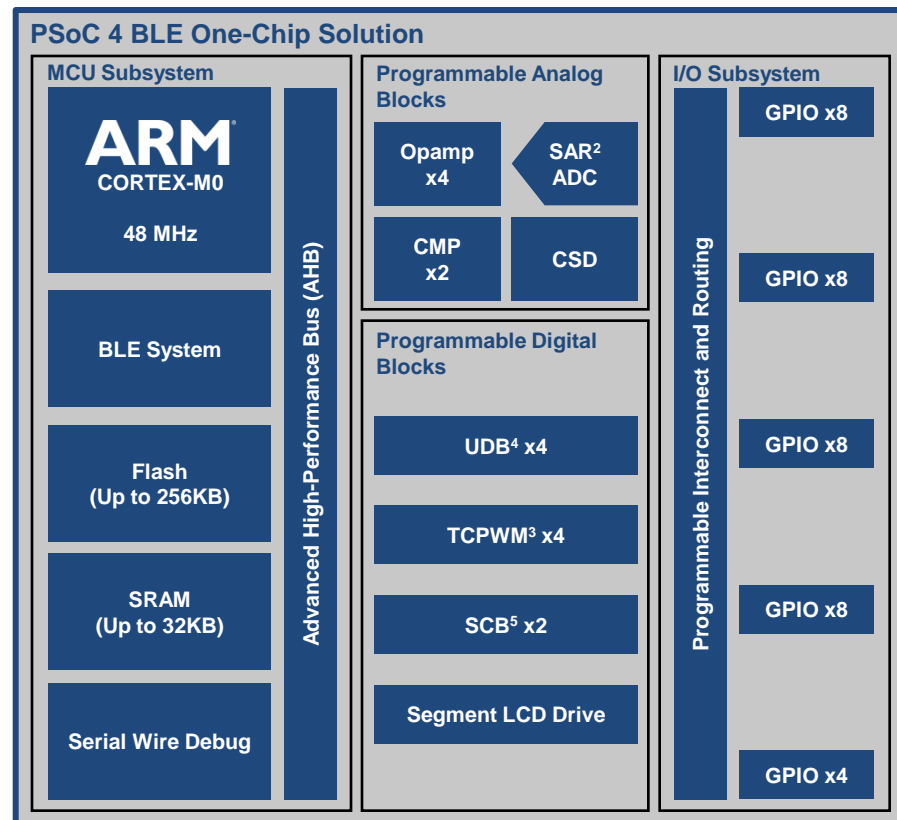
Bluetooth Smart Connectivity with Bluetooth 4.1

2.4-GHz BLE radio with integrated Balun

Collateral

[Datasheet](#)
[Application Notes](#)

Block Diagram



Availability

Sampling: Now
Production: Now

¹ Analog front end(s)

³ Timer, counter, pulse-width modulator; configurable as 16-bit timer, counter, pulse-width modulator blocks

² Successive approximation register

⁴ Universal digital block

⁵ Serial communication block configurable as I²C/SPI/UART

Asynchronous SRAM Roadmap

Asynchronous SRAM Portfolio

High Density | Wide Voltage Range | Automotive A, E^{1,2} | On-chip ECC³



Fast SRAM		Low-Power SRAM (MoBL [®] : More Battery Life)		PowerSnooze ^{™4}	Serial SRAM
Non-ECC		ECC ³	Non-ECC	ECC ³	Quad-SPI, ECC ³
32Mb-128Mb		Other Densities NDA Required Contact Sales	CY6218x 64Mb; 2.5, 3.0 V 55 ns; x8, x16 Ind ⁵	Other Densities NDA Required Contact Sales	Other Densities NDA Required Contact Sales
	CY7C107x 32Mb; 3.3 V 12 ns; x8, x16 Ind ⁵		CY6217x 32Mb; 2.5, 3.0, 5.0 V 55 ns; x8, x16 Ind ⁵		
	CY7C106x 16Mb; 1.8, 3.3 V 10 ns; x8, x16, x32 Ind ⁵	CY7C106x Q115 16Mb; 1.8-5.0 V 10 ns; x8, x16, x32 Ind ⁵ , Auto E ²	CY6216x 16Mb; 1.8, 3.0, 5.0 V 45 ns; x8, x16 Ind ⁵ , Auto A ¹	CY6216x Q115 16Mb; 1.8-5.0 V 45 ns; x8, x16, x32 Ind ⁵ , Auto E ²	CY7S106x Q115 16Mb; 1.8-5.0 V 10 ns; x8, x16, x32 Ind ⁵ , Auto E ²
2Mb-16Mb	CY7C105x 8Mb; 3.3 V 10 ns; x8, x16 Ind ⁵		CY6215x 8Mb; 1.8, 3.0, 2.5-5V 45 ns; x8, x16 Ind ⁵ , Auto A ¹ , E ²		
	CY7C1012 12Mb; 3.3 V 10 ns; x24 Ind ⁵				
	CY7C104x 4Mb; 3.3, 5.0 V 10 ns; x4, x8, x16 Ind ⁵ , Auto A ¹ , E ² , RH ⁶	CY7C1034 6Mb; 3.3 V 10 ns; x24 Ind ⁵	CY7C104x Q215 4Mb; 1.8-5.0 V 10 ns; x8, x16 Ind ⁵ , Auto E ²	CY6214x 4Mb; 1.8, 3.0, 2.5-5V 45 ns; x8, x16 Ind ⁵ , Auto A ¹ , E ²	CY6214x Q215 4Mb; 1.8-5.0 V 45 ns; x8, x16 Ind ⁵ , Auto E ²
CY7C1010/11 2Mb; 3.3 V 10 ns; x8, x16 Ind ⁵ , Auto A ¹ , E ²	CY7C1024 3Mb; 3.3 V 10 ns; x24 Ind ⁵		CY6213x 2Mb; 1.8, 2.5-5.0 V 45 ns; x8, x16 Ind ⁵ , Auto A ¹ , E ²		
64Kb-1Mb	CY7C1020 512Kb; 2.6, 3.3, 5.0V 10 ns; x16 Ind ⁵ , Auto E ²	CY7C1019/21/100x 1Mb; 2.6, 3.3, 5.0 V 10 ns; x4, x8, x16 Ind ⁵ , Auto A ¹ , E ²²	CY6212x 1Mb; 1.8, 2.5-5.0 V 45 ns; x8, x16 Ind ⁵ , Auto A ¹ , E ²		
	CY7C185 64Kb; 5.0 V 15 ns; x8 Ind ⁵	CY7C19x/1399 256Kb; 3.3, 5.0 V 10 ns; x4, x8 Ind ⁵ , Auto A ¹	CY6264 64Kb; 5.0 V 55 ns, 70 ns; x8 Ind ⁵	CY62256 256Kb; 1.8, 3.0, 5.0V 55 ns; x8 Ind ⁵ , Auto A ¹ , E ²	

¹ AEC-Q100 -40°C to +85°C

² AEC-Q100 -40°C to +125°C

³ Error-correcting code

⁴ Fast SRAM with low-power sleep mode

⁵ Industrial grade -40°C to +85°C

⁶ Radiation hardened, military grade -55°C to +125°C

Status: Production Sampling Development Concept
 Availability: QQYY QQYY

Fast SRAM with ECC

Applications

Switches and routers
 IP phones
 Test equipment
 Automotive
 Computation servers
 Military and aerospace systems

Features

Access time: 10 ns or 12 ns (see Family Table)
 Multiple bus-width configurations: x8, x16 and x32
 Wide operating voltage range: 1.8-5.0 V
 Available in industrial and automotive temperature grades
 Industry-standard, RoHS-compliant packages
 Error-correcting code (ECC) to detect/correct single-bit errors
 Bit-interleaving to avoid multi-bit errors
 Error indication (ERR) pin to indicate single-bit errors

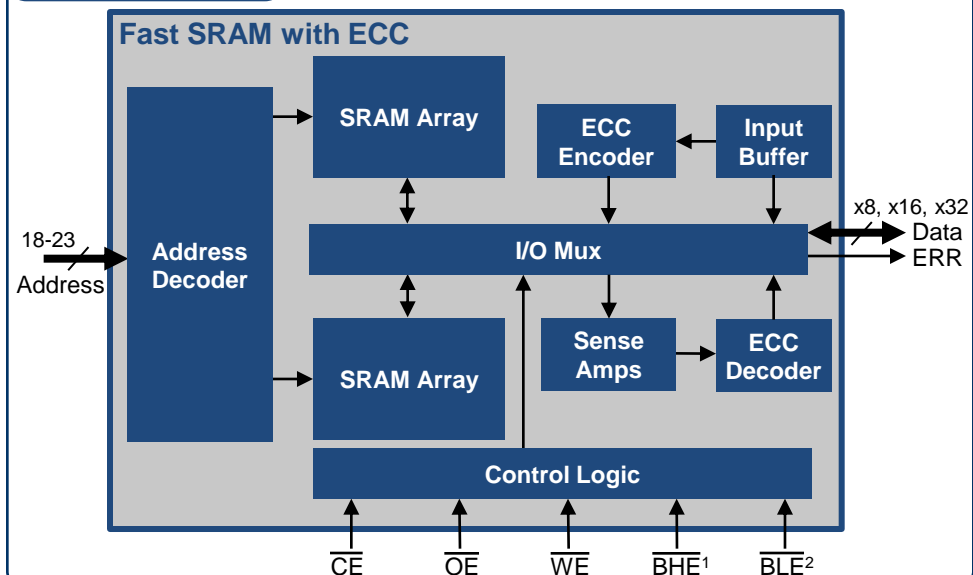
Collateral

Preliminary Datasheet: [Contact Sales](#)

Family Table

Density	MPN	Access Time	Supply Current (Max. at 85°C)
4Mb	CY7C104x	10 ns	45 mA
8Mb	CY7C105x	10 ns	60 mA
16Mb	CY7C106x	10 ns	110 mA
32Mb	CY7C107x	12 ns	150 mA

Block Diagram



Availability

Sampling: Now (16Mb), Q2 2015 (4Mb)
 Production: Q1 2015 (16Mb), Q4 2015 (4Mb)

¹ Byte high enable

² Byte low enable

MoBL^{®3} SRAM with ECC



Applications

Programmable logic controllers
Handheld devices
Multifunction printers
Automotive
Implantable medical devices
Computation servers

Features

Standby current: 16 μ A for 16Mb (see Family Table)
Multiple bus-width configurations: x8, x16 and x32
Wide operating voltage range: 1.8-5.0 V
Available in industrial and automotive temperature grades
Industry-standard, RoHS-compliant packages
Error-correcting code (ECC) to detect/correct single-bit errors
Bit-interleaving to avoid multi-bit errors
Error indication (ERR) pin to indicate single-bit errors

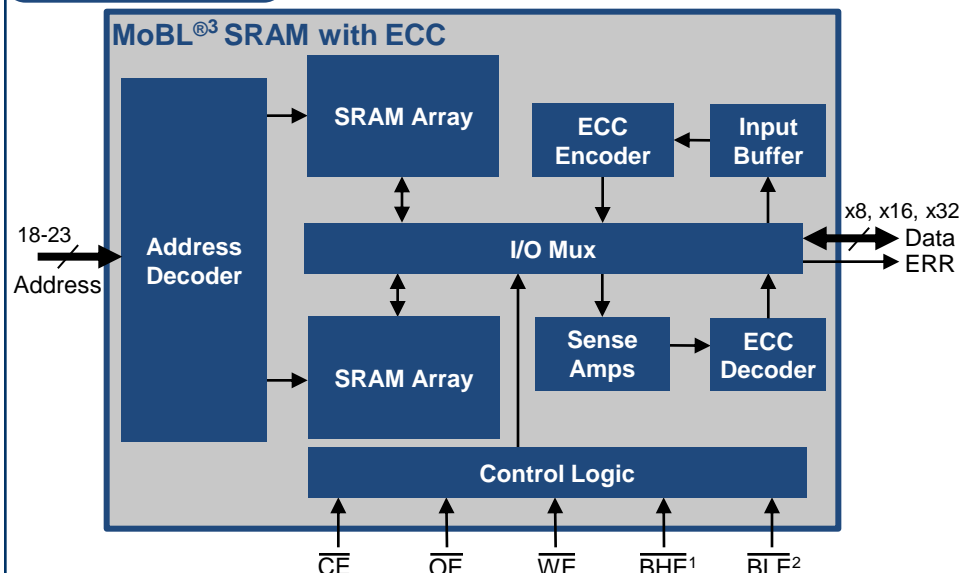
Collateral

Preliminary Datasheet: [Contact Sales](#)

Family Table

Density	MPN	Standby Current (Max. at 85°C)	Standby Current (Typ. at 25°C)
4Mb	CY6214x	8.7 μ A	3.7 μ A
8Mb	CY6215x	9 μ A	5.3 μ A
16Mb	CY6216x	16 μ A	5.3 μ A
32Mb	CY6217x	60 μ A	8.5 μ A
64Mb	CY6218x	60 μ A	8.5 μ A
128Mb	CY6219x	120 μ A	17.0 μ A

Block Diagram



Availability

Sampling: Now (16Mb), Q2 2015 (4Mb)
Production: Q1 2015 (16Mb), Q4 2015 (4Mb)

¹ Byte high enable

² Byte low enable

³ More Battery Life

Fast SRAM With PowerSnooze™



Applications

- Programmable logic controllers
- Handheld devices
- Multifunction printers
- Automotive
- Computation servers

Features

- Access time: 10 ns or 12 ns (see Family Table)
- PowerSnooze™: Additional power-savings (deep-sleep) mode
- Deep-sleep current: 23 µA for 16Mb (see Family Table)
- Multiple bus-width configurations: x8, x16 and x32
- Wide operating voltage range: 1.8-5.0 V
- Available in industrial and automotive temperature grades
- Industry-standard, RoHS-compliant packages
- Error-correcting code (ECC) to detect/correct single-bit errors
- Bit-interleaving to avoid multi-bit errors

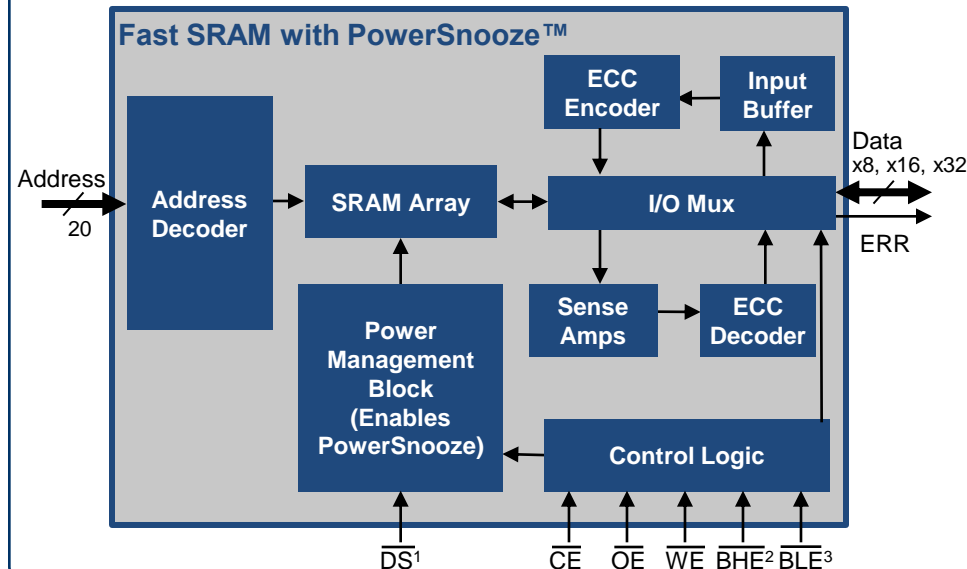
Collateral

Preliminary Datasheet: [Contact Sales](#)

Family Table

Density	MPN	Access Time	Deep Sleep Current (Max. at 85°C)
4Mb	CY7S104x	10 ns	10 µA
8Mb	CY7S105x	10 ns	22 µA
16Mb	CY7S106x	10 ns	22 µA
32Mb	CY7S107x	12 ns	92 µA

Block Diagram



Availability

Sampling: Now (16Mb), Q2 2015 (4Mb)
Production: Q1 2015 (16Mb), Q4 2015 (4Mb)

¹ Deep sleep

² Byte high enable

³ Byte low enable

Synchronous SRAM Roadmap

Synchronous SRAM Portfolio

High Random Transaction Rate (RTR)¹ | Low Latency | High Bandwidth



Standard Sync and NoBL™	Standard Sync and NoBL™ with ECC ²	QDR® -II/ DDR-II	QDR-II+/ DDR-II+	QDR-II+X/ DDR-II+X	QDR-IV
Max RTR ¹ : 250 MT/s Max BW: 18 Gbps Latency: 1 Cycle Pipeline and Flow-through Modes	Max RTR ¹ : 250 MT/s Max BW: 18 Gbps Latency: 1 Cycle Pipeline and Flow-through Modes	Max RTR ¹ : 666 MT/s Max BW: 47.9 Gbps Latency: 1.5 Cycles CIO ³ and SIO ⁴	Max RTR ¹ : 666 MT/s Max BW: 79.2 Gbps Latency: 2 or 2.5 Cycles CIO ³ and SIO ⁴ , ODT ⁵	Max RTR ¹ : 900 MT/s Max BW: 91.1 Gbps Latency: 2.5 Cycles SIO ⁴ , ODT ⁵	Max RTR ¹ : 2.1 GT/s Max BW: 153.5 Gbps Latency: 5 or 8 Cycles Dual-Port Bidirectional ODT ⁵
<p>CY7C147/8xB 72Mb; 133-250 MHz 2.5, 3.3 V; x18, x36</p> <p>CY7C144/6xA 36Mb; 133-250 MHz 2.5, 3.3 V; x36, x72</p> <p>CY7C137/8xD 18Mb; 100-250 MHz 3.3 V; x18, x32, x36</p> <p>CY7C135/6xC 9Mb; 100-250 MHz 3.3 V; x18, x32, x36 Auto E⁷</p> <p>CY7C134/2xG 2,4Mb; 100-250 MHz 3.3 V; x18, x32, x36</p>	<p>NEW 72Mb with ECC² 133-250 MHz 2.5, 3.3 V; x18, x36, x72 Contact Sales</p> <p>NEW 36Mb with ECC² 133-250 MHz 2.5, 3.3 V; x18, x36 Contact Sales</p> <p>NEW 18Mb with ECC² 100-250 MHz 2.5, 3.3 V; x18, x36 Contact Sales</p>	<p>CY7C161/2xKV18 144Mb; 250-333 MHz 1.8 V; x9, x18, x36 Burst 2, 4</p> <p>CY7C151/2xKV18 72Mb; 250-333 MHz 1.8 V; x9, x18, x36 Burst 2, 4</p> <p>CY7C141/2xKV18 36Mb; 250-333 MHz 1.8 V; x8, x9, x18, x36 Burst 2, 4</p> <p>CY7C131/2/9xKV18 18Mb; 250-333 MHz 1.8 V; x8, x18, x36 Burst 2, 4</p> <p>CY7C1911xKV18 18Mb; 250-333 MHz 1.8 V; x9 Burst 2, 4</p>	<p>CY7Cx4/5/6/7xKV18 144Mb; 300-550 MHz 1.8 V; x18, x36 Burst 2, 4</p> <p>CY7Cx54/5/6/7KV18 72Mb; 250-550 MHz 1.8 V; x18, x36 RH⁶; Burst 2, 4</p> <p>CY7Cx24/5/6/7xKV18 36Mb; 400-550 MHz 1.8 V; x18, x36 Burst 2, 4</p> <p>CY7Cx14/5/6/7xKV18 18Mb; 400-550 MHz 1.8 V; x18, x36 Burst 2, 4</p>	<p>CY7C156/7xXV18 72Mb; 366-633 MHz 1.8 V; x18, x36 Burst 2, 4</p> <p>CY7C126/7x 36Mb; 366-633 MHz 1.8 V; x18, x36 Burst 2, 4</p>	<p>NEW CY7C41xKV13 144Mb; 667-1066 MHz 1.3 V; x18, x36 Burst 2</p> <p>NEW CY7C40xKV13 72Mb; 667-1066 MHz 1.3 V; x18, x36 Burst 2</p>

Density ↑

Random Transaction Rate

¹ Rate of truly random accesses to memory, expressed in transactions per second (MT/s, GT/s)

² Error-correcting code

³ Common I/O

⁴ Separate I/O

⁵ On-die termination; parts are CY7C2x

⁶ Radiation hardened, military grade

⁷ AEC-Q100 -40°C to +125°C

Status	Production	Sampling	Development	Concept
Availability				
	QQYY	QQYY		

QDR-IV Product Overview



Applications

Switches and routers
 High-performance computing
 Military and aerospace systems
 Test and measurement

Features

Available in two options: QDR-IV HP (RTR 1,334 MT/s) and QDR-IV XP (RTR 2,132 MT/s)
 Two independent, bidirectional DDR¹ data ports
 Error-correcting code (ECC) to reduce soft error rate to less than 0.01 Failure-in-Time (FIT) per megabit
 Bus inversion to reduce simultaneous switching I/O noise
 On-die termination (ODT) to reduce board complexity
 De-skew training to improve signal-capture timing
 I/O levels: 1.2-1.25 V (HSTL/SSTL), 1.1-1.2 V (POD²)
 Package: 361-pin FCBGA³
 Bus widths: x18, x36

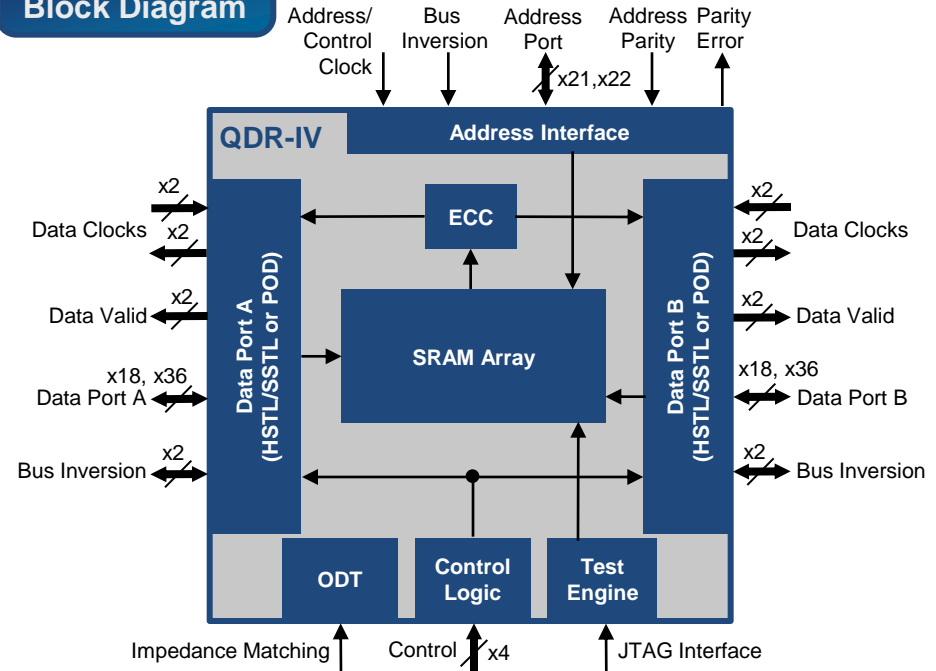
Collateral

Preliminary Datasheet: [Contact Sales](#)

Family Table

Option	Density	MPN	Max Freq	RTR
QDR-IV HP	72Mb 144Mb	CY7C40x1KV13 CY7C41x1KV13	667 MHz	1,334 MT/s
QDR-IV XP	72Mb 144Mb	CY7C40x2KV13 CY7C41x2KV13	1,066 MHz	2,132 MT/s

Block Diagram



Availability

Sampling: Now
 Production: Now

¹ Double Data Rate: two data transfers per clock cycle

² Pseudo open drain: Signaling interface that uses strong pull-down and weak pull-up drive strength

³ Flip-chip ball grid array

Nonvolatile RAM Roadmap

nvSRAM Portfolio

High Density | High Speed



Parallel nvSRAM

SPI nvSRAM

I²C nvSRAM

512Kb - 16Mb

	CY14V116F/G 16Mb; 3.0, 1.8 V I/O 30 ns; ONFI ³ 1.0 x8, x16; Ind ¹	CY14B116R/S 16Mb; 3.0 V 25, 45 ns; x32; Ind ¹ RTC ²	Higher Densities DDRx ⁶ nvSRAM NDA Required Contact Sales
CY14B108K/L 8Mb; 3.0 V 25, 45 ns; x8; Ind ¹ RTC ²	CY14B108M/N 8Mb; 3.0 V 25, 45 ns; x16; Ind ¹ RTC ²	CY14B116K/L 16Mb; 3.0 V 25, 45 ns; x8; Ind ¹ RTC ²	CY14B116M/N 16Mb; 3.0 V 25, 45 ns; x16; Ind ¹ RTC ²
CY14B104K/LA 4Mb; 3.0 V 25, 45 ns; x8; Ind ¹ RTC ²	CY14V104LA 4Mb; 3.0, 1.8 V I/O 25, 45 ns; x8; Ind ¹	CY14B104M/NA 4Mb; 3.0 V 25, 45 ns; x16; Ind ¹ RTC ²	CY14V104NA 4Mb; 3.0, 1.8 V I/O 25, 45 ns; x16; Ind ¹
CY14B101KA/LA 1Mb; 3.0 V 25, 45 ns; x8; Ind ¹ RTC ²	CY14V101LA 1Mb; 3.0, 1.8 V I/O 25, 45 ns; x8; Ind ¹	CY14B101MA/NA 1Mb; 3.0 V 25, 45 ns; x16; Ind ¹ RTC ²	CY14V101NA 1Mb; 3.0, 1.8 V I/O 25, 45 ns; x16; Ind ¹

Higher Densities QSPI ⁵ nvSRAM NDA Required Contact Sales	
NEW CY14V101PS 1Mb; 3.0, 1.8 V I/O 108 MHz QSPI ⁵ ; Ind ¹ Ext. Ind ⁷ ; RTC ²	NEW CY14V101QS 1Mb; 3.0, 1.8 V I/O 108 MHz QSPI ⁵ ; Ind ¹ Ext. Ind ⁷
CY14B101P 1Mb; 3.0 V 40 MHz SPI; Ind ¹ RTC ²	CY14B512P 512Kb; 3.0 V 40 MHz SPI; Ind ¹ RTC ²

CY14B101I 1Mb; 3.0 V 3.4 MHz I ² C; Ind ¹ RTC ²
CY14B512I 512Kb; 3.0 V 3.4 MHz I ² C; Ind ¹ RTC ²

64Kb - 256Kb

CY14B256KA/LA 256Kb; 3.0 V 25, 45 ns; x8; Ind ¹ RTC ²	CY14V/U256LA 256Kb; 3.0, 1.8V I/O 35 ns; x8; Ind ¹
CY14E256LA 256Kb; 5.0 V 25, 45 ns; x8; Ind ¹	STK14C88-5 256Kb; 5.0 V 35, 45 ns; x8; Mil ⁴
STK11C68-5 64Kb; 5.0 V 35, 55 ns; x8; Mil ⁴	STK12C68-5 64Kb; 5.0 V 35, 55 ns; x8; Mil ⁴

CY14B256P 256Kb; 3.0 V 40 MHz SPI; Ind ¹ RTC ²
CY14B064P 64Kb; 3.0 V 40 MHz SPI; Ind ¹ RTC ²

CY14B256I 256Kb; 3.0 V 3.4 MHz I ² C; Ind ¹ RTC ²
CY14B064I 64Kb; 3.0 V 3.4 MHz I ² C; Ind ¹ RTC ²

¹ Industrial grade -40°C to +85°C

⁴ Military grade -55°C to +125°C

⁷ Extended Industrial grade -40°C to +105°C

² Real-time clock

⁵ Quad serial peripheral interface

³ Open NAND flash interface

⁶ Double Data Rate

Status		Production		Sampling		Development		Concept	
Availability									

F-RAM Portfolio

Low Power | High Endurance



512Kb - 8Mb

4Kb - 256Kb

SPI F-RAM	I ² C F-RAM	Processor Companion	Wireless Memory	Parallel F-RAM	
FM25H20/V20 2Mb; H20: 2.7-3.6 V V20: 2.0-3.6 V 40 MHz SPI; Ind ¹	NEW CY15B104Q 4Mb; 2.0-3.6 V 40 MHz SPI; Ind ¹			FM22L16/LD16 4Mb; 2.7-3.6 V 55 ns; x8; Ind ¹	
NEW CY15B102Q 2Mb; 2.0-3.6 V 25 MHz SPI; Auto E ³	FM25V10/VN10 1Mb; 2.0-3.6 V 40 MHz SPI; Ind ¹ , Auto A ²	FM24V10/VN10 1Mb; 2.0-3.6 V 3.4 MHz I ² C; Ind ¹		FM28V102A 1Mb; 2.0-3.6 V 60 ns; x16; Ind ¹	FM28V202A 2Mb; 2.0-3.6 V 60 ns; x16; Ind ¹
FM25V05 512Kb; 2.0-3.6 V 40 MHz SPI; Ind ¹ , Auto A ²	FM24V05 512Kb; 2.0-3.6 V 3.4 MHz I ² C; Ind ¹			NEW CY15B101N 1Mb; 2.0-3.6 V 60 ns; x16; Auto A ²	NEW CY15B102N 2Mb; 2.0-3.6 V 60 ns; x16; Auto A ²
FM25V02/W256 256Kb; V02: 2.0-3.6 V W256: 2.7-5.5 V 40 MHz SPI; Ind ¹ , Auto A ²	FM24V02/W256 256Kb; V02: 2.0-3.6 V W256: 2.7-5.5 V 3.4 MHz I ² C; Ind ¹ , Auto A ²	FM33256 256Kb; 3.3V; 16 MHz SPI Ind ¹ ; RTC ⁴ ; Power Fail Watchdog; Counter	Wireless Memory NDA Required Contact Sales	FM28V020 256Kb; 2.0-3.6 V 70 ns; x8; Ind ¹	FM18W08 256Kb; 2.7-5.5 V 70 ns; x8; Ind ¹
FM25V01 128Kb; 2.0-3.6 V 40 MHz SPI; Ind ¹ , Auto A ²	FM24V01 128Kb; 2.0-3.6 V 3.4 MHz I ² C; Ind ¹ , Auto A ²	FM31256/31(L)278 256Kb; 3.3, 5.0V; 1 MHz I ² C; Ind ¹ ; RTC ⁴ ; Power Fail; Watchdog; Counter		FM1808B 256Kb; 5.0 V 70 ns; x8; Ind ¹	FM16W08 64Kb; 2.7-5.5 V 70 ns; x8; Ind ¹
FM25640/CL64 64Kb; 3.3, 5.0 V 20 MHz SPI; Ind ¹ , Auto E ³	FM24C64/CL64 64Kb; 3.3, 5.0 V 1 MHz I ² C; Ind ¹ , Auto E ³	FM3164/31(L)276 64Kb; 3.3, 5.0 V; 1 MHz I ² C; Ind ¹ ; RTC ⁴ ; Power Fail; Watchdog; Counter			
FM25C160/L16 16Kb; 3.3, 5.0 V 20 MHz SPI; Ind ¹ , Auto E ³	FM24C16/CL16 16Kb; 3.3, 5.0 V 1 MHz I ² C; Ind ¹				
FM25040/L04 4Kb; 3.3, 5.0 V 20 MHz SPI; Ind ¹ , Auto E ³	FM24C04/CL04 4Kb; 3.3, 5.0 V 1 MHz I ² C; Ind ¹				

¹ Industrial grade -40°C to +85°C

⁴ Real-time clock

² AEC-Q100 -40°C to +85°C

³ AEC-Q100 -40°C to +125°C

Status: Production
 Sampling
 Development
 Concept
 Availability: QQYY
 QQYY

16Mb Parallel nvSRAM

Applications

- Industrial automation
- Programmable logic controllers
- Gaming machines
- Industrial data logging
- Networking and storage
- Telecom equipment

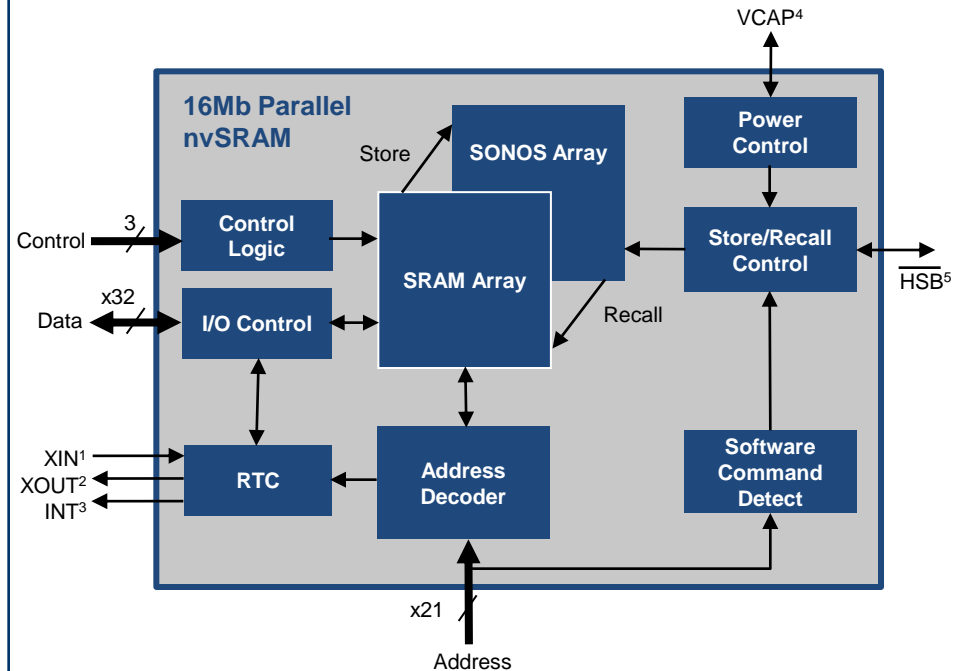
Features

- Fast access time (25 ns)
- Available in parallel and Open NAND Flash Interface (ONFI) version 1.0 interfaces
- Unlimited write endurance
- One million store cycles on power fail
- Twenty-year data retention at 85°C
- Optional real-time clock (RTC) functionality
- Industrial temperature range: -40° C to +85° C
- Packages: 44-TSOP II, 48-TSOP I, 54-TSOP II, 165-FBGA

Collateral

Final Datasheets: [16Mb nvSRAM Datasheets](#)

Block Diagram



Availability

Sampling: Now
Production: Now

¹ Crystal connection input

² Crystal connection output

³ Interrupt output/calibration/square wave

⁴ External capacitor connection

⁵ Hardware STORE bus

1Mb Quad SPI nvSRAM

Applications

Computing and networking
Industrial automation
RAID storage

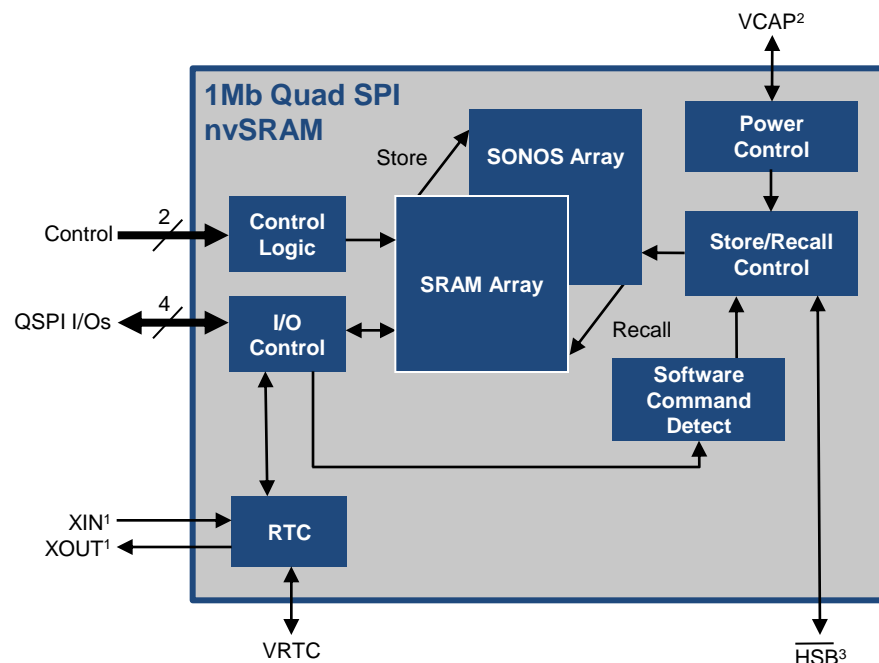
Features

Quad SPI interface: 108 MHz
Unlimited write endurance
One million store cycles on power fail
Data retention of 20 years at 85° C
Operating voltages: 3.0 V, 1.8-V I/O
Low standby (280- μ A) and sleep (10- μ A) currents
Industrial temperature range: -40° C to +85° C
Extended Industrial temperature range: -40° C to +105° C
Integrated, high-accuracy real-time clock (RTC)
Package: 16-SOIC

Collateral

Preliminary Datasheet: [Contact Sales](#)

Block Diagram



Availability

Sampling: Q2 2015
Production: Q3 2015

¹ Crystal connections

² External capacitor connection

³Hardware store busy

4Mb SPI Serial F-RAM

Applications

- Multifunction printers
- Industrial controls and automation
- Medical wearables
- Test and measurement equipment
- Smart meters

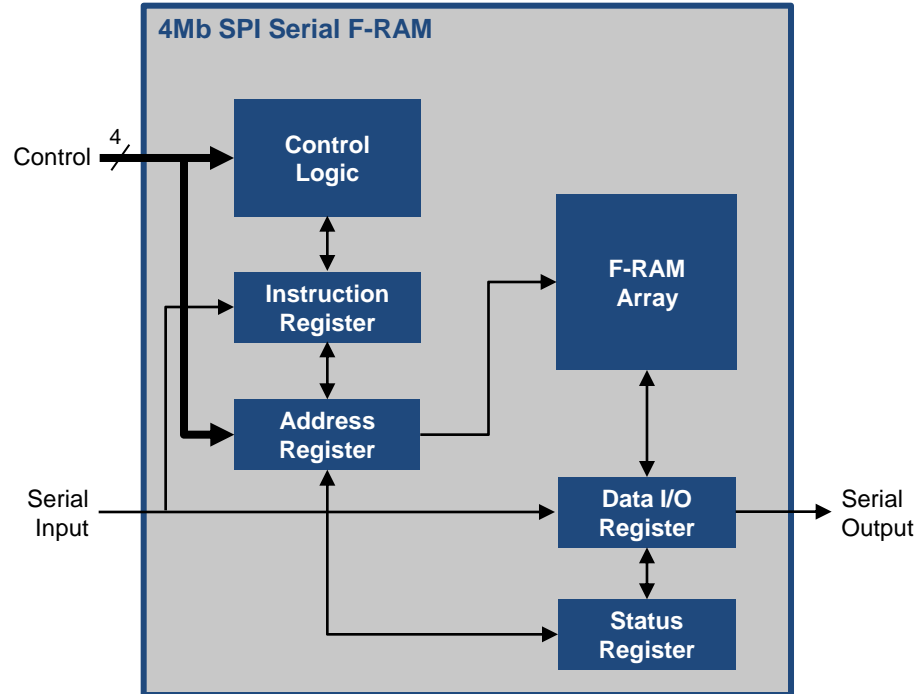
Features

- 40-MHz SPI interface
- 100-trillion read/write cycle endurance
- Operating voltage range: 2.0-3.6 V
- Low (8- μ A) sleep current
- 100-year data retention
- Industrial temperature range: -40° C to +85° C
- Packages: 8-pin TDFN, 8-pin SOIC

Collateral

Preliminary Datasheet: [Contact Sales](#)

Block Diagram



Availability

Sampling: Q2 2015
Production: Q4 2015

Timing Solutions Roadmap

Timing Solutions Portfolio

Programmable | High-Performance | EMI Reduction | Automotive



		Clock Generators		Clock Buffers	
		EMI Reduction	Non-EMI Reduction	Zero Delay Buffer (ZDB)	Non-Zero Delay Buffer (NZDB)
High Performance	NEW	4-PLL Clock Generator Max. Frequency: 700 MHz 0.7-ps RMS Jitter ¹ Contact Sales	NEW Programmable XO/VCXO Max. Frequency: 2.1 GHz 0.15-ps RMS Jitter ¹ NDA Required; Contact Sales		
	NEW	2-PLL Clock Generator Max. Frequency: 700 MHz 0.7-ps RMS Jitter ¹ Contact Sales	CY2Xx (FleXO™) Max. Frequency: 690 MHz 1 output; Frequency Margining 0.6-ps RMS Jitter ¹ ; Ind ²		CY2DLx/DMx/DPx/CPx Max. Frequency: 1.5 GHz 2-10 outputs; LVDS, LVPECL, CML 0.05-ps RMS Jitter ¹ ; Ind ²
Standard Performance		CY254x/CY251x Max. Frequency: 166 MHz 3-9 outputs; 1-4 PLL; I ² C 100-ps CCJ ³ ; Ind ²	CY2239x/CY229x/CY2238x Max. Frequency: 200 MHz 3-6 outputs; 3-4 PLL; I ² C 400-ps CCJ ³ ; Ind ² ; Auto E ⁴		
		CY22800/801 Max. Frequency: 166 MHz 3 outputs; 1 PLL 250-ps CCJ ³ ; Ind ²	CY22050/150 Max. Frequency: 200 MHz 3-6 outputs; 1 PLL 250-ps CCJ ³ ; Ind ²	CY230x/EP0x Max. Frequency: 220 MHz 5-9 outputs; LVCMOS 22-ps CCJ ³ ; Ind ² ; Auto A ⁵	CY230xNZ Max. Frequency: 133 MHz 4-18 outputs; LVCMOS 250-ps CCJ ³ ; Ind ²
Application Specific	NEW	PCIe 3.0 Clock Generator Max. Frequency: 700 MHz 0.7-ps RMS Jitter ¹ Contact Sales		CY23FS04/08 Max. Frequency: 200 MHz 4-8 outputs; Fail Safe ⁶ 200-ps CCJ ³ ; Ind ²	
	NEW	CY24293A Q115 Max. Frequency: 200 MHz 2 outputs; 1 PLL; PCIe 1.1 75-ps CCJ ³ ; Auto A ⁵		CY23S02/05/08/09/FP12 Max. Frequency: 200 MHz 2-12 outputs; Spread Aware 200-ps CCJ ³ ; Ind ²	
		CY2429x Max. Frequency: 200 MHz 2-4 outputs; PCIe 1.1 75-ps CCJ ³ ; Ind ²		CY7B99x (RoboClock™) Max. Frequency: 200 MHz 8-18 outputs; Configurable Skew 50-ps CCJ ³ ; Ind ²	

¹ Integrated phase noise across 12-kHz to 20-MHz offset

² Industrial grade -40°C to +85°C

³ Cycle-to-cycle jitter

⁴ AEC-Q100: -40°C to +125°C

⁵ AEC-Q100: -40°C to +85°C

⁶ Automatic clock switching on failure of a clock source

Status				
Availability				

PCI Express Clock AEC-Q100 (CY24293A)



Applications

Automotive infotainment systems

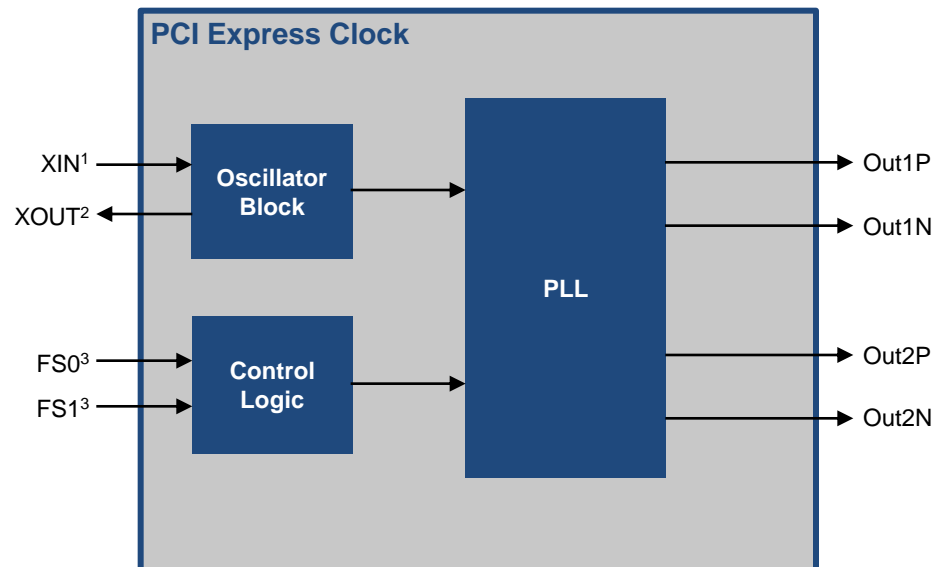
Features

- Two sets of differential PCIe 1.1 clocks
- Pin-selectable output frequencies
- Two HCSL outputs
- Spread-spectrum capability
- Cycle-to-cycle jitter <75 ps

Collateral

Preliminary Datasheet: [Contact Sales](#)

Block Diagram



Availability

Sampling: Now
Production: Q1 2015

¹ Crystal input
² Crystal output
³ Frequency select inputs

Specialty Memory Roadmap

Specialty Memory Portfolio

Intelligent Memory | High Density | High Throughput



Dual-Port SRAM		FIFO	
Asynchronous	Synchronous	Asynchronous	Synchronous
2 Mb-72 Mb		CYFB0072V⁴ 72Mb; 1.8, 3.3 V 133 MHz x36; Ind ¹	
		CYD02/9/18/36SxxV18 2Mb, 9Mb, 18Mb, 36Mb; 1.8 V 167 MHz, 200 MHz x18, x36, x72; Ind ¹	
128 Kb-1 Mb		CY7C083x/5x 2Mb, 4Mb, 9Mb, 18Mb; 3.3 V 100 MHz, 133 MHz, 167 MHz x18, x36, x72; Ind ¹	
		CY7C09279/289/389/579 512Kb, 1Mb; 3.3 V 7, 9, 12 ns; 83 MHz, 100 MHz x8, x16, x18, x36; Ind ¹	
2 Kb-64 Kb		CY7C024/144 64Kb; 3.3, 5.0 V 15 ns, 20 ns, 25 ns, 55 ns x8, x16, x18; Ind ¹	
		CY7C09159/349 64Kb; 3.3 V 9 ns, 12 ns x9, x18; Comm ²	
		CY7C421 4Kb; 5.0 V 15 ns, 20 ns x9; Ind ¹	
		CY7C4201/11 2Kb, 4Kb; 3.3 V 67 MHz x9; Ind ¹	

¹ Industrial grade: -40°C to +85°C

² Commercial grade: 0°C to +70°C

³ Programmable bus width

⁴ CYFB denotes Video Frame Buffer products

Status: Production
 Sampling
 Development
 Concept

Availability: QQYY
 QQYY

Trackpad Module Roadmap

Cypress Module Portfolio



	Windows Trackpad Modules	Chrome Trackpad Modules	Modules for Embedded Systems
Mutual Capacitance	<div style="border: 1px solid green; padding: 5px; margin-bottom: 5px;"> Gen5 Windows PTP¹ Module 5-Finger Detection/Communication PS2/I²C 60-Vpp² Charger Armor³ </div> <div style="border: 1px solid black; padding: 5px;"> Gen5 Windows Module NDA Required Contact Sales </div>	<div style="border: 1px solid green; padding: 5px; margin-bottom: 5px;"> Gen5 Chrome Module 5-Finger Detection/Communication I²C 60-Vpp² Charger Armor³ </div> <div style="border: 1px solid orange; padding: 5px;"> Gen6 Chrome Module Q215 5-Finger Detection/Communication I²C 35-Vpp² Charger Armor³ </div>	<div style="border: 1px solid green; padding: 5px; margin-bottom: 5px;"> Gen6 Trackpad Module 5-Finger Gesture⁴ I²C Max Size⁵: 120 x 75 mm </div> <div style="border: 1px solid green; padding: 5px; margin-bottom: 5px;"> Gen4 + KB⁶ + RF⁷ Module 5-Finger Gesture⁴ and KB⁶ Scan I²C Max Size⁵: 125 x 125 mm </div> <div style="border: 1px solid black; padding: 5px;"> Gen4 + KB⁶ + BLE⁸ Module NDA Required Contact Sales </div>
Self Capacitance			<div style="border: 1px solid green; padding: 5px;"> Gen2 Module 2-Finger Gesture⁴ I²C Max Size⁵: 90 x 50 mm </div>
Software	<div style="border: 1px solid green; padding: 5px;"> Windows Driver 5-Finger Gesture⁴ Windows XP/7/8/8.1 Compatible User Configuration GUI⁹ </div>	<div style="border: 1px solid green; padding: 5px;"> Chrome Driver 5-Finger Detection/Communication MT-B Compliant, Linux </div>	
Wireless Modules			<div style="border: 1px solid orange; padding: 5px;"> EZ-BLE Module Q115 Bluetooth 4.1 Certified FCC, CE, KC, TELEC, IC Certified I²C, SPI, UART, CapSense Size: 10 x 10 x 1.8 mm </div>

¹ Microsoft Precision Touchpad

⁴ Gesture processing

⁷ Radio frequency (2.4-GHz wireless)

Production

Sampling

Development

Concept

² Noise voltage peak to peak

⁵ Maximum active sensing area

⁸ Bluetooth Low Energy, also known as Bluetooth Smart

Status
Availability

QQYY

QQYY

³ System noise detection and reduction

⁶ Keyboard

⁹ Graphical user interface

Gen5 Chrome Module

Application

Chromebook PCs

Features

Mechanical Construction

- Maximum active sensing area of 125 mm x 70 mm
- Minimum of 1.3 mm total module thickness
- Clickpad¹ and standard² configurations
- Overlay assembly and lamination available

Advanced Processing

- 60-Vpp³ charger noise immunity (1-500 kHz, 9-mm finger)
- 32-bit ARM[®] Cortex™-M0 core for more processing power
- I²C communication interface
- Report rates up to 150 Hz
- Five-finger detection and communication
- Low-power, look-for-touch active mode
- Google-qualified multi-touch Cypress driver
- Compatible with Google Multi-touch Protocol B (MT-B)

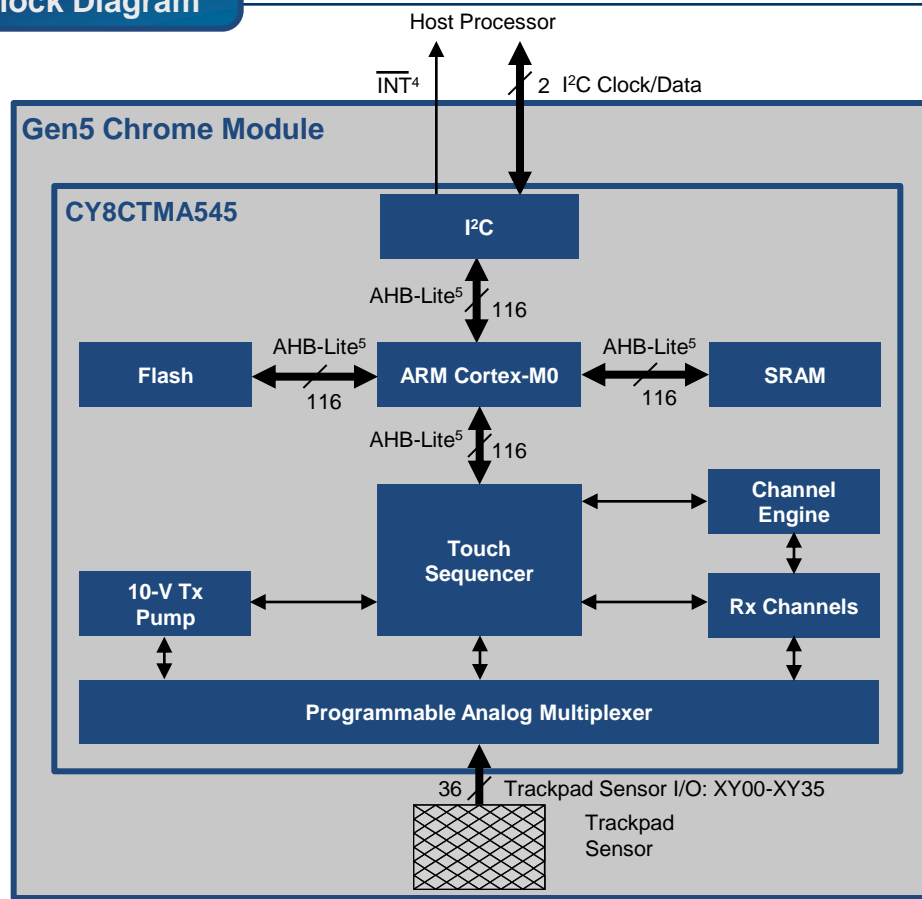
Product Support

- On-site support for customer product introduction available
- Incoming/outgoing test equipment available to customers

Collateral

Datasheet: [Contact Sales](#)

Block Diagram



Availability

Production: Now

¹ Trackpad with integrated mechanical button
² Trackpad with support for external mechanical button inputs
³ Noise voltage peak to peak

⁴ Interrupt
⁵ Advanced High-Performance Bus Lite

Gen6 Chrome Module

Application

Chromebook PCs

Features

Mechanical Construction

- Maximum active sensing area of 120 mm x 75 mm
- Minimum of 1.3 mm total module thickness
- Clickpad¹ and standard² configurations
- Overlay assembly and lamination available

Advanced Processing

- 35-Vpp³ charger noise immunity (1-500 kHz, 9-mm finger)
- 32-bit ARM[®] Cortex™-M0 core for more processing power
- I²C communication interface
- Report rates up to 150 Hz
- Five-finger detection and communication
- Low-power, look-for-touch active mode
- Google-qualified multi-touch Cypress driver
- Compatible with Google Multi-touch Protocol B (MT-B)

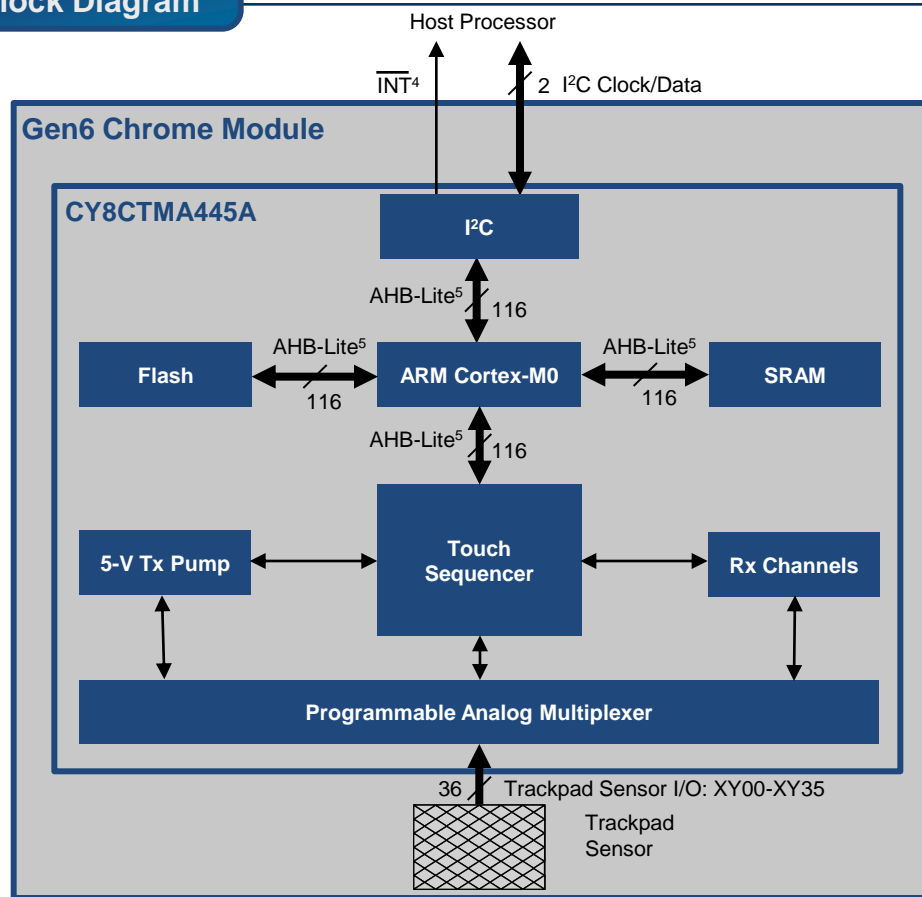
Product Support

- On-site support for customer product introduction available
- Incoming/outgoing test equipment available to customers

Collateral

Preliminary Datasheet: [Contact Sales](#)

Block Diagram



Availability

Sampling: Q2 2015
Production: Q3 2015

⁴ Interrupt

⁵ Advanced High-Performance Bus Lite

¹ Trackpad with integrated mechanical button

² Trackpad with support for external mechanical button inputs

³ Noise voltage peak to peak

Gen5 Windows PTP¹ Module

Application

Windows PCs

Features

Mechanical Construction

Maximum active sensing area of 125 mm x 70 mm
Minimum of 1.3 mm total module thickness
Clickpad² and standard³ configurations
Overlay assembly and lamination available

Advanced Processing

60-Vpp⁴ charger noise immunity (1-500 kHz, 9-mm finger)
32-bit ARM Cortex-M0 core for more processing power
Dual bus interface PS2 and I²C/PTP¹
Report rates of up to 150 Hz
Enhanced palm rejection
Five-finger detection and communication
Low-power, look-for-touch active mode
Windows driver support for XP/Vista/7/8/8.1

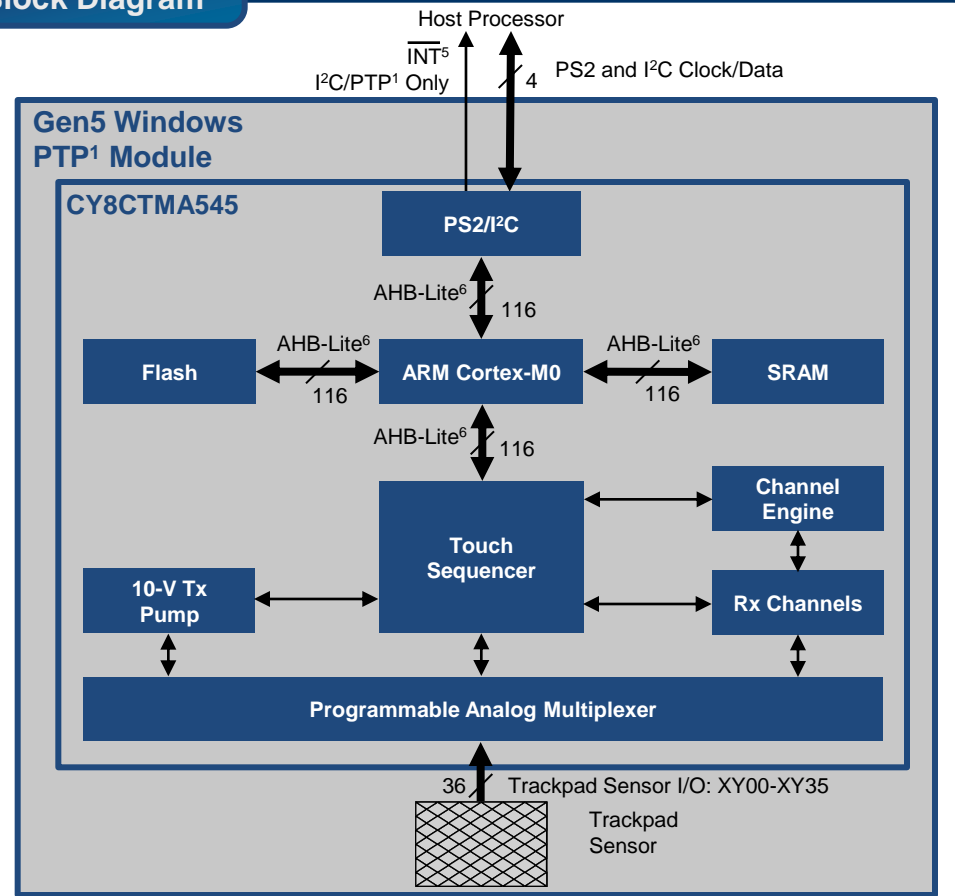
Product Support

On-site support for customer product introduction available
Incoming/outgoing test equipment available to customers

Collateral

Datasheet: [Contact Sales](#)

Block Diagram



Availability

Production: Now

¹ Microsoft Precision Touchpad

² Trackpad with integrated mechanical button

³ Trackpad with support for external mechanical button inputs

⁴ Noise voltage peak to peak

⁵ Interrupt

⁶ Advanced High-Performance Bus Lite

Gen4 + KB¹ + RF² Module

Wireless Trackpad + Keyboard Solution

Applications

- External keyboard and trackpad
- Standalone trackpad
- Remote control and trackpad
- Tablet keyboard dock and trackpad

Features

Mechanical Construction

- Maximum active sensing area of 125 mm x 125 mm
- Clickpad³ and standard⁴ configurations
- Overlay assembly and lamination available

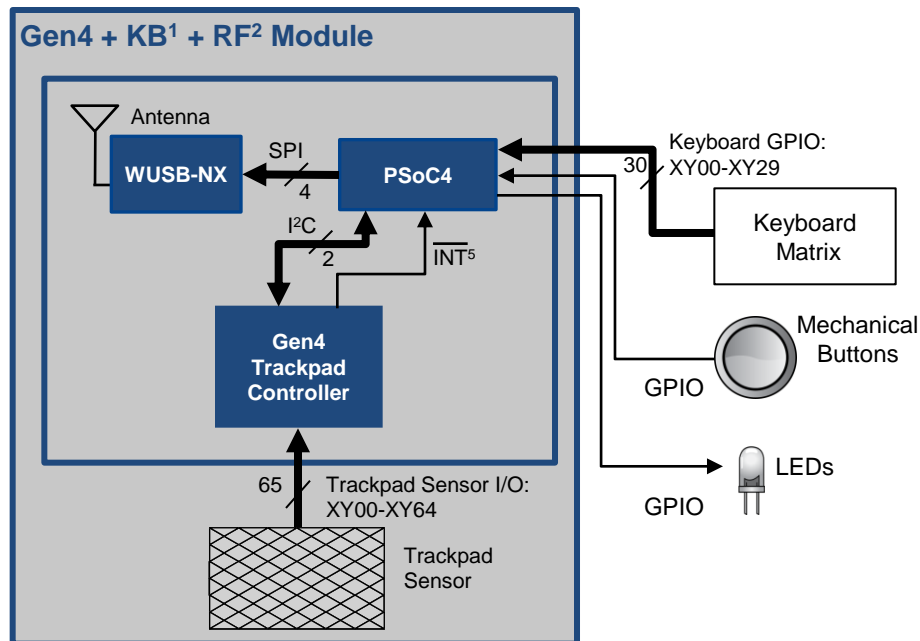
Advanced Processing

- 32-bit ARM Cortex-M0 core for more processing power
- Five-finger detection and communication
- Software-free solution allowing fast time-to-market
- Embedded gesture detection
- Six configurable power modes
- 2.4-GHz wireless communication
- Cypress PSoC4A supporting keyboard scan
- Optional LED control

Product Support

- Simplification of OEM/ODM supply chains
- Incoming/outgoing test equipment available to customers

Block Diagram



Collateral

Datasheet: [Contact Sales](#)

Availability

Production: Now

¹ Keyboard
² Radio frequency (2.4-GHz wireless)
³ Trackpad with integrated mechanical button

⁴ Trackpad with support for external mechanical button inputs
⁵ Interrupt

EZ-BLE

Bluetooth Low Energy Module using PSoC BLE

Applications

BLE¹ connectivity
Medical
Industrial
PC Accessories
Toys
Smartphone Accessories

Features

Qualification and Certification

Bluetooth SIG certified QDID²
FCC³, CE⁴, KC⁵, TELEC⁶ and IC⁷

Small Footprint

10 mm x 10 mm X 1.8 mm, 21-pad LGA (including shield)

Bluetooth Smart connectivity with Bluetooth 4.1

2.4-GHz BLE radio and baseband
-91-dBm Rx sensitivity, +3-dBm Tx output power

Power Modes

1.3- μ A Deep-Sleep, 150-nA Hibernate, 60-nA Stop

Highly Integrated Solution

2 crystals, chip antenna, passives, shield

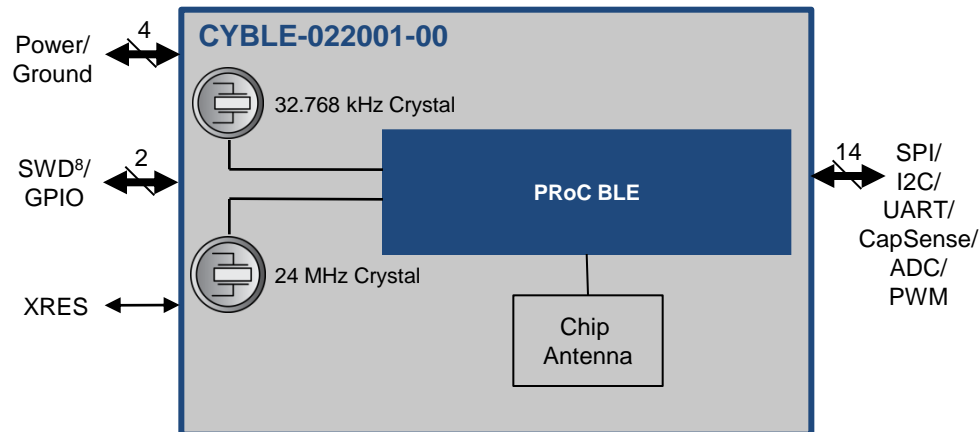
Adapter board interface to CY8CKIT-042-BLE Pioneer kit

Enables testing of CapSense, buttons, GPIOs, OTA

Availability

Sampling: Mar 2015
Production: Q2 2015

Block Diagram



Collateral

EZ-BLE Module Datasheet:

Coming February

PSoC BLE Datasheet:

[Click here](#)

Getting Started Application Note:

February

PSoC Creator:

[Click here](#)

PSoC Programmer:

[Click here](#)

CySmart Windows Host Emulation Tool:

[Click here](#)

CySmart iOS and Android apps:

[Click here](#)

¹ Bluetooth Low Energy, also known as Bluetooth Smart

² Bluetooth Special Interest Group Qualification Design ID

³ Federal Communications Commission

⁴ Conformité Européenne (Europe)

⁵ Korea Certification

⁶ Telecom Engineering Center (Japan)

⁷ Industry Canada

⁸ Serial wire debug communication protocol

Aerospace Memory Roadmap

Aerospace Memory Portfolio

Radiation Hardened | Latch-up Immune | QML-V¹ Certified



	Fast Async SRAM		Sync SRAM	Nonvolatile SRAM	FRAM	
	Non-ECC ²	ECC ²	QDR®-II+	Parallel I/O	Serial I/O	Parallel I/O
128 Mb - 144 Mb		CYRS109x 128Mb; 1.8-5.0 V 12 ns; x8, x16, x32	CYRS264x 144Mb; 1.8 V; 450 MHz x18, x36; Burst 2,4			
16 Mb - 72 Mb		CYRS108x 64Mb; 1.8-5.0 V 12 ns; x8, x16, x32	CYRS154x 72Mb; 1.8 V; 250 MHz x18, x36; Burst 2,4	CYRS14x164 64Mb; 1.8-5.0 V 35 ns; x16, x32		
		CYRS106x 16Mb; 1.8-5.0 V 10 ns; x8, x16, x32		NEW CYRS14x116 Q316 16Mb; 1.8-5.0 V 35 ns; x16, x32		
2 Mb - 4 Mb	CYRS104x 4Mb; 3.3 V 12 ns; x8				CYRS15x102 2Mb; 2.0-3.6 V 40 MHz; SPI	CYRS15x102 2Mb; 2.0-3.6 V 60 ns; x16

¹ Qualified Manufacturers List Level V, per military specification MIL-PRF-38535

² Error-correcting code

Status: Production Sampling Development Concept
 Availability: QQYY QQYY

72Mb QDR®-II+ SRAM with RadStop™¹



Applications

- Payload processing
- Reconfigurable computing platforms

Features

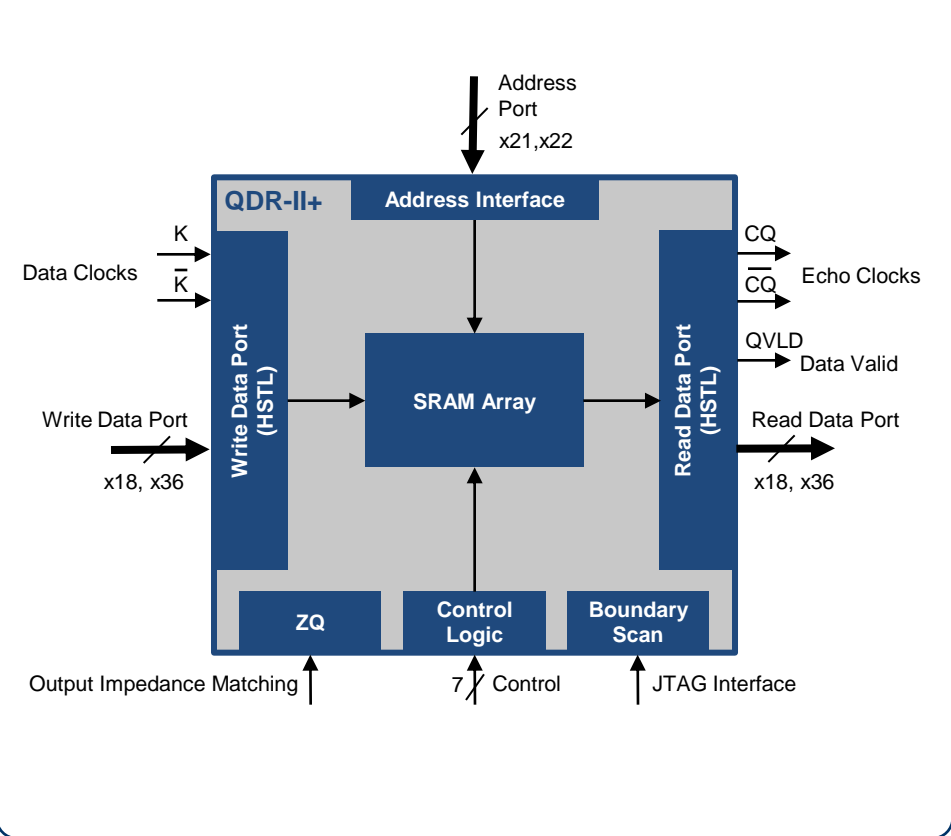
- Max frequency of operation/throughput: 250 MHz/36 Gb/s
- Burst sizes: 2, 4
- Bus-width configurations: x18, x36
- Military temperature grade: -55°C to +125°C
- Two independent unidirectional data ports for read and write enable concurrent transactions
- Maximum throughput with double data rate (DDR) data ports
- Output impedance matching input (ZQ): Matches the device outputs to system data bus impedance
- Bit-interleaving to eliminate multi-bit errors
- I/O signaling standards: 1.5-1.8 V (HSTL)
- Controller available for Xilinx and Microsemi FPGAs
- Total ionizing dose: 300 Krad
- Heavy-ION SEL²: 120 LET³ MeV-cm sq/mg
- Heavy-ION SEU⁴: 1.34E-07 (Geosynchronous) Error/Bit-day
- QML-V⁵ qualified (DSCC⁶ part number: 5962F11201/202VXA)

Collateral

Datasheets : [72-Mbit SRAMs w/ RadStop™ Technology](#)
 Request FPGA controller via email: radstop@cypress.com

¹ Cypress's proprietary design and process technology that increases radiation-resistance
² Single-event latch-up
³ Linear energy transfer

Block Diagram



Availability

Non-space-qualified prototypes (CYPT154x):	Now
QML-V ⁵ space-qualified devices (CYRS154x):	Now

⁴ Single-event upset
⁵ Qualified Manufacturers List Level V, per military specification MIL-PRF-38535
⁶ Defense Supply Center, Columbus, is an inventory control point of the Defense Logistics Agency

4Mb Fast SRAM with RadStop™¹



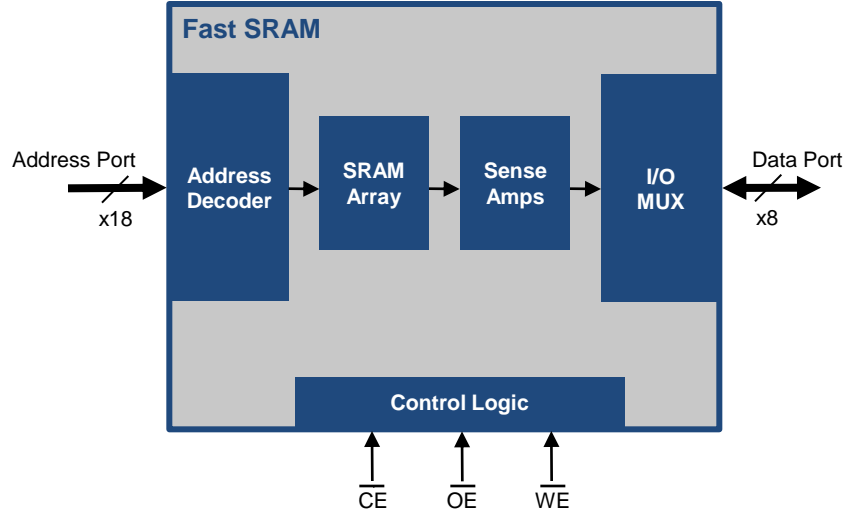
Applications

- Payload processing
- Sensors and switches

Features

- Access time: 10 ns (85°C), 12 ns (125°C)
- Bus-width configuration: x8
- Operating voltage: 3.3 V
- Military temperature grade: -55°C to +125°C
- Bit-interleaving to eliminate multi-bit errors
- Package: 36-pin ceramic flat pack (CFP)
- Total ionizing dose: 300 Krad
- Heavy-ION SEL²: 120 LET³ MeV-cm sq/mg
- Heavy-ION SEU⁴: 5.0E-08 (Geosynchronous) Error/Bit-day
- QML-V⁵ qualified (DSCC⁶ part number: 5962F11235VXA)

Block Diagram



Collateral

- Cypress Datasheet: [4-Mbit SRAM w/ RadStop™ Technology](#)
- DSCC Datasheet: [4-Mbit SRAM w/ RadStop™ Technology](#)

Availability

- Non-space-qualified prototypes (CYPT1049): Now
- QML-V⁵ space-qualified devices (CYRS1049): Now

¹ Proprietary Cypress design and process technology that increases radiation-resistance
² Single-event latch-up
³ Linear energy transfer

⁴ Single-event upset
⁵ Qualified Manufacturers List Level V, per military specification MIL-PRF-38535
⁶ Defense Supply Center, Columbus, is an inventory control point of the Defense Logistics Agency

Automotive Roadmap

Automotive TrueTouch[®] Roadmap

Automotive Portfolio: TrueTouch®



	Gen1	Gen3	Gen4	Gen5
>9" Screens		CY8CTMA884 60 I/O, 10 F ¹ , 65-Hz RR ² Gestures, Mutual-Capacitance ³ Grades: A ⁴ and E ⁵	NEW CY8CTMA1036 65 I/O, 10 F ¹ , 80-Hz RR ² , AA ⁶ Gestures, DualSense™ ⁷ Glove Touch, H ₂ O ⁸ Grades: A ⁴ and S ⁹	
6"-9" Screens		CY8CTMA616 50 I/O, 10 F ¹ , 65-Hz RR ² Gestures, Mutual-Capacitance ³ Grades: A ⁴ and E ⁵	NEW CY8CTMA768 56 I/O, 10 F ¹ , 80-Hz RR ² , AA ⁶ Gestures, DualSense ⁷ Glove Touch, H ₂ O ⁸ Grades: A ⁴ and S ⁹	CYTMA568 54 I/O, 10 F ¹ , AA ⁶ Gestures, DualSense ⁷ , In-Cell ¹⁰ AMS ¹¹ , Glove Touch, H ₂ O ⁸ Contact Sales
3"-8" Screens	CY8CTMG120 43 I/O, 1 or 2 F ¹ , 50-Hz RR ² Gestures, Self-Capacitance ¹² Grade: A ⁴	CY8CTMA340 32 I/O, 4 F ¹ , 60-Hz RR ² DualSense ⁷ , H ₂ O ⁸	CY8CTMA461 48/43 I/O ¹³ , 10 F ¹ , AA ⁶ DualSense ⁷ , Thick Overlay Glove Touch, H ₂ O ⁸ Contact Sales	CYTMA545 36 I/O, 10 F ¹ , 120-Hz RR ² DualSense ⁷ , SLIM ¹⁴ AMS ¹¹ , Glove Touch, H ₂ O ⁸ , Hover
	CY8CTMA120 32 I/O, 10 F ¹ , 50-Hz RR ² Mutual-Capacitance ³ Grade: A ⁴	CY8CTMA140 32 I/O, 4 F ¹ , 60-Hz RR ² Mutual-Capacitance ³	NEW CY8CTMA460 48/43 I/O ¹⁵ , 10 F ¹ , 100-Hz RR ² , AA ⁶ Gestures, DualSense ⁷ Glove Touch, H ₂ O ⁸ Grades: A ⁴ and S ⁹	CYTMA445A 36 I/O, 10 F ¹ , 120-Hz RR ² DualSense ⁷ , SLIM ¹⁴ , 35-Vpp CA ¹⁶ AMS ¹¹ , Glove Touch, H ₂ O ⁸ Face Detect

¹ Number of finger locations reported

² Refresh rate

³ The capacitance of the intersection between a row or column of a touchscreen sensor

⁴ AEC-Q100: -40°C to +85°C

⁵ AEC-Q100: -40°C to +125°C

⁶ AutoArmor™: Enables compliance with chip-level emission, immunity and system-level specifications

⁷ Self-capacitance + mutual-capacitance

⁸ Waterproofing and wet-finger tracking

⁹ AEC-Q100: -40°C to +105°C

¹⁰ A type of sensor stack-up in which the touch sensor is inside the LCD module under the color-filter glass

¹¹ Automatic Mode Switching

¹² The capacitance of a row or column in a touchscreen sensor

¹³ 43 I/Os: 56-QFN, 48 I/Os: 100-TQFP

¹⁴ Low-cost Single-Layer Independent Multi-Touch sensor

¹⁵ 43 I/Os: 56-QFN Development, 48 I/Os: 100-TQFP Production

¹⁶ Charger Armor™: Cypress proprietary charger noise mitigation technology

	Production	Sampling	Development	Concept
Industrial				
Automotive				
Availability	QQYY	QQYY		

Automotive Portfolio: TrueTouch® Software¹



Software	MPN	PSoC® Designer™	TrueTouch® Host Emulator ²	TrueTouch Driver for Android ³	Manufacturing Test Kit ⁴
Current Version		5.4 CP1	3.3	3.4	1.6.5
Gen 1	CY8CTMA120	Production			
	CY8CTMG120	Production			
Gen 3	CY8CTMA616		Production	Legacy Driver Rev4-2M-28 Production	Production
	CY8CTMA884		Production		Production
Gen 4	CY8CTMA460		Production	2.4 Production	Production
	CY8CTMA768		Production		Production
	CY8CTMA1036		Production		Production
	CY8CTMA461		Q1 2015	Q2 2015	Q2 2015
Gen 5	CYTMA568		Q3 2015	3.4 Production	Q3 2015

Contact sales for the latest TrueTouch software, drivers and tools

¹ PSoC Designer, TTHE and MTK releases are backward compatible. The latest version is recommended for new designs.

² **TrueTouch Host Emulator** (TTHE) is a front-end tool used to configure, tune, debug and demonstrate TrueTouch devices

³ **TrueTouch Driver for Android** (TTDA) is the driver for Android that translates touch information into Linux/Android events

⁴ **TrueTouch Manufacturing Test Kit** (MTK) enables customers and ITO partners to test touch panels that use Cypress TrueTouch controllers through the manufacturing flow

CY8CTMA460/768/1036

Automotive TrueTouch® Gen4 Family



Applications

Touchscreens
Trackpads

Features

Advanced User Interface

Waterproofing: Works with water droplets, condensation, sweat and wet-finger tracking

Glove Touch: Tracks 10 fingers with 1-mm gloves

Precise touch tracking: 0.8-mm accuracy and 0.6-mm linearity

Proprietary Analog Front End

True 10-V Tx-Boost™ with four multiphase Tx lines, providing equivalent signal-to-noise ratio to 20-V Tx lines

DualSense™: Self- and mutual-capacitance analog front end (U.S. patents 8,358,142; 8,319,505; and 8,067,948)

System Solutions

Supports thin ITO¹ stackups and metal mesh sensors

AutoArmor™ enables compliance with chip-level emission (IEC 61967), immunity (IEC 62132) and system-level (CISPR 25) specifications

Android driver support

Manufacturing test kits for production testing

Packages

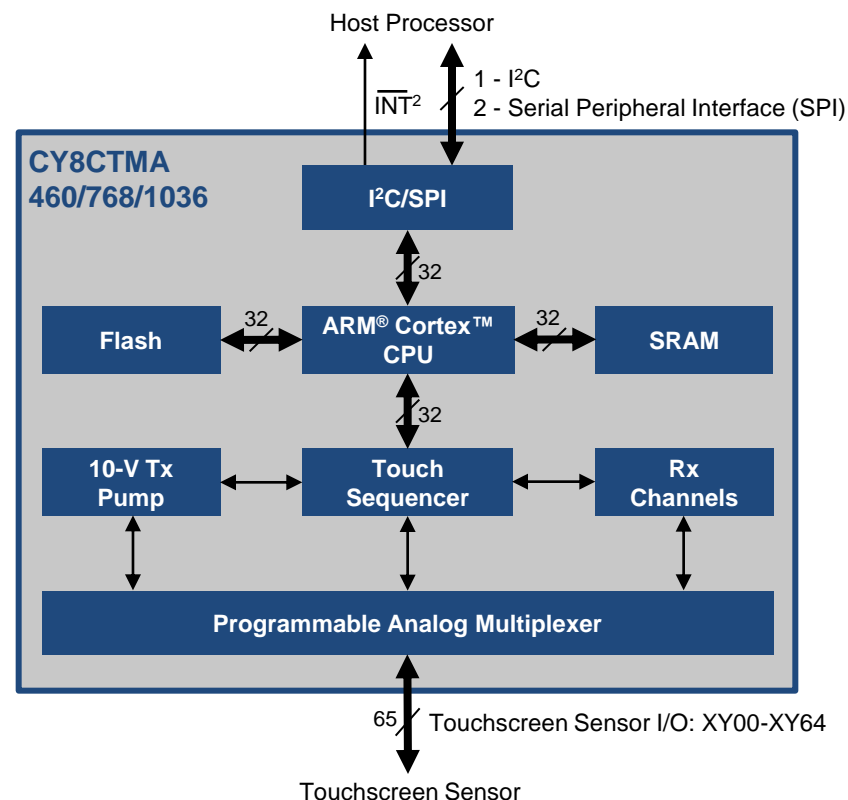
100-pin TQFP, 56-pin QFN (TMA460 only)

Collateral

Datasheets, Design Guides and Evaluation Kit:

[Contact Sales](#) or automotive@cypress.com

Block Diagram



Availability

Sampling: 56-pin QFN Automotive ES: Q1 2015

Production: 100-pin TQFP: Now

56-pin QFN: Q2 2015

¹Indium tin oxide

²Interrupt

Automotive CapSense® Roadmap

Automotive Portfolio: CapSense®



	CapSense Express™		CapSense Plus™		PSoC®	
	Configurable ¹		Programmable ²		Programmable System-on-Chip	
Performance ↑	CY8CMBR3106S 11 Buttons, 2 Sliders SmartSense_EMCplus™ ³ Proximity, Water Tolerance Grades: A ⁴ and S ⁵	CY8CMBR3116 16 Buttons, 8 LEDs SmartSense_EMCplus™ ³ Proximity, Water Tolerance Grades: A ⁴ and S ⁵	CY8C20xx7/S 31 Buttons, 6 Sliders 16, 32KB Flash; 2KB SRAM Proximity, Water Tolerance Glove, Stylus Support		CY8C4246/7-M 51 Buttons, 10 Sliders 64, 128KB Flash Proximity, Water Tolerance Contact Sales	
	CY8CMBR3108 8 Buttons, 4 LEDs Proximity, Water Tolerance SmartSense_EMCplus™ ³	CY8CMBR3110 10 Buttons, 5 LEDs SmartSense_EMCplus™ ³ Proximity, Water Tolerance Grades: A ⁴ and S ⁵				CY8C36xx/38xx 62 Buttons, 12 Sliders 32, 64KB Flash Proximity, Water Tolerance Grades: A ⁴ and E ⁶
Value ↓	CY8CMBR3102 2 Buttons, Proximity SmartSense_EMCplus™ ³	CY8CMBR2110 10 Buttons, 10 LEDs SmartSense™ Auto-tuning	CY8C20236A 10 Buttons, 2 Sliders 8KB Flash, 1KB SRAM SmartSense Auto-tuning Grade: A ⁴		CY8C41xx/42xx 24 Buttons, 4 Sliders 16, 32KB Flash Proximity, Water Tolerance Grades: A ⁴ and S ⁵	CY8C32xx/34xx 62 Buttons, 12 Sliders 16-64KB Flash Proximity, Water Tolerance Grades: A ⁴ and E ⁶
	CY8CMBR310XLP 1-4 Buttons, Low Power Contact Sales	CY8CMBR2016 16 Buttons SmartSense Auto-tuning	CY8C21x34 20 Buttons, 4 Sliders 8KB Flash, 512Byte SRAM Proximity, Water Tolerance Grades: A ⁴ and E ⁶	CY8C20xx6H 25 Buttons, 5 Sliders 8, 16KB Flash; 1, 2KB SRAM SmartSense Auto-tuning Haptics	CY8C21x12 20 Buttons, 4 Sliders 8KB Flash, 512Byte SRAM Proximity, Water Tolerance Grades: A ⁴ and E ⁶	
Entry ↓	CY8CMBR2044 4 Buttons, 4 LEDs SmartSense Auto-tuning	CY8CMBR2010 10 Buttons, 10 LEDs SmartSense Auto-tuning	CY8C24x94 43 Buttons, 8 Sliders 16KB Flash, 1KB SRAM Grade: A ⁴		CY8C2xx45 36 Buttons, 7 Sliders 16KB Flash, 1KB SRAM Grades: A ⁴ and E ⁶	
	CY8CMBR3002 2 Buttons, 2 LEDs SmartSense_EMCplus™ ³	CY8C201xx 10 Buttons, 5 LEDs 2 Sliders	CY8C20234 10 Buttons, 2 Sliders 8KB Flash, 512Byte SRAM Grade: A ⁴		NEW CY8C40xx Q115 16 Buttons, 3 Sliders 16KB Flash, 2KB SRAM Proximity, Water Tolerance Grades: A ⁴ and S ⁵	

Integration

¹ Standard products are configured for target applications with a graphical user interface
² Microcontroller-based products can be freely programmed to implement additional functions
³ SmartSense Electromagnetic Compatible = SmartSense Auto-tuning + high noise immunity

⁴ AEC-Q100: -40°C to +85°C
⁵ AEC-Q100: -40°C to +105°C
⁶ AEC-Q100: -40°C to +125°C

	Production	Sampling	Development	Concept
Industrial				
Automotive				
Availability				

Automotive Portfolio: CapSense® Software¹



Software	PSoC® Creator™ ²	PSoC Designer™ ³	PSoC Programmer ⁴	EZ-Click™ ⁵
Current Version	3.1	5.4	3.22	2.0
PSoC 1		Production	Production	
PSoC 3	Production		Production	
PSoC 4	Production		Production	
CapSense Plus™			Production	
CapSense Express™				Production

Download the latest PSoC software version [here](#)

¹ All software and tool releases are backward compatible. The latest versions are recommended for new designs

² **PSoC Creator** is an Integrated Design Environment (IDE) that allows concurrent hardware and firmware design of PSoC 3 and PSoC 4 systems

³ **PSoC Designer** is an IDE that enables firmware design using a library of precharacterized peripherals for PSoC 1 systems

⁴ **PSoC Programmer** can be used with PSoC Designer and PSoC Creator to program and debug any design onto a PSoC device

⁵ **EZ-Click** is a Windows® GUI-based tool that enables development of CapSense MBR solutions. It allows you to set up sensor configuration, apply global system properties, monitor real-time sensor output, and run production-line system diagnostics

Automotive CapSense Packages



Package	QFN		SOIC	SSOP			TQFP
Pins	24	56	16	20	28	48	100
PSoC 1		✓		✓	✓	✓	
PSoC 3						✓ ¹	✓
PSoC 4	✓		✓				

¹48-SSOP PSoC 3 concept only

Automotive PSoC[®] Roadmap

Automotive Portfolio: PSoC[®] 1

M8C Core | 24 MHz



PSoC MCU	Programmable Digital	Intelligent Analog	Performance Analog	
Analog: 2x CMP ¹ Interfaces: I ² C, SPI, USB ²	Analog: 1x/2x CMP ¹ , 4xSC/CT PAB ³ Interfaces: I ² C, SPI, UART	Analog: 2x/4x CMP ¹ , 6xSC/CT PAB ³ , PGA ⁴ Interfaces: I ² C, SPI, UART, USB ²	Analog: 4x CMP ¹ , 12x/16x SC/CT PAB ³ , PGA ⁴ Interfaces: I ² C, SPI, UART, USB ²	
↑ Performance			CY8C29x66 32K/2K ⁵ , 44 GPIOs ⁶ 1x14-bit Del-Sig ADC ⁷ Grades: A ⁸ and E ⁹	
			CY8C27x43 32K/2K ⁵ , 44 GPIOs ⁶ CapSense, 1x14-bit Del-Sig ADC ⁷	
			CY8C28xxx 16K/1K ⁵ , 44 GPIOs ⁶ CapSense, 4x14-bit Del-Sig ADC ⁷	
			CY8C24894 16K/1K ⁵ , 56 GPIOs ⁶ CapSense, 2x14-bit SAR ADC ⁷ Grade: A ⁸	
			CY8C2xx45 16K/1K ⁵ , 38 GPIOs ⁶ CapSense, 1x10-bit SAR ADC ⁷ Grades: A ⁸ and E ⁹	
		CY8C21x34 8K/0.5K ⁵ , 28 GPIOs ⁶ CapSense, 1x10-bit ADC ⁷ Grades: A ⁸ and E ⁹	CY8C24x23 4K/0.25K ⁵ , 24 GPIOs ⁶ CapSense, 1x14-bit Del-Sig ADC ⁷ Grades: A ⁸ and E ⁹	
	CY8C24x93 32K/2K ⁵ , 36 GPIOs ⁶ 1x10-bit ADC ⁷	CY8C21x23 4K/0.25K ⁵ , 16 GPIOs ⁶ 1x10-bit ADC ⁷		

Integration →

¹ Comparator
² Full-Speed USB
³ Switched capacitor/continuous time programmable analog block
⁴ Programmable gain amplifier
⁵ Flash KB/SRAM KB

⁶ General-purpose input/output pins
⁷ Analog-to-digital converter: Includes incremental, successive approximation register (SAR) or Delta-Sigma (Del-Sig) ADCs
⁸ AEC-Q100: -40°C to +85°C
⁹ AEC-Q100: -40°C to +125°C

	Production	Sampling	Development	Concept
Industrial				
Automotive				
Availability	QYYY	QYYY		

Automotive Portfolio: PSoC[®] 3

8051 | CapSense[®] | DMA | LCD | RTC | 4x Timer/Counter/PWM



	Programmable Digital PSoC 3200	Intelligent Analog PSoC 3400	Performance Analog PSoC 3600	Precision Analog PSoC 3800	
	Analog: Del-Sig ADC ¹ , 1x DAC ² , 2x CMP ³ , 0.9% Vref	Analog: ADC ¹ , 2x DAC ² , 4x CMP ³ , 2x Opamps, 2x SC/CT PAB ⁵ , 0.9% Vref	Analog: ADC ¹ , 2x/4x DAC ² , 0x/2x/4x CMP ³ , 0x/2x/4x Opamps, 0x/2x/4x SC/CT PAB ⁵ , 0.1% Vref	Analog: ADC ¹ , 2x/4x DAC ² , 0x/2x/4x CMP ³ , 0x/2x/4x Opamps, 0x/2x/4x SC/CT PAB ⁵ , 0.1% Vref	
	Interfaces: FF ⁴ I ² C	Interfaces: FF ⁴ I ² C	Interfaces: USB ⁶ , FF ⁴ I ² C	Interfaces: USB ⁶ , FF ⁴ I ² C	
Performance ↑			CY8C3666 67 MHz, 64K/8K/2K ⁷ 0x/1x DFB, 12-bit ΔΣ ADC ¹ 20x/24x UDB ⁸ , CAN ⁹ Grades: A ¹⁰ and E ¹¹	CY8C3866 67 MHz, 64K/8K/2K ⁷ DFB, 20-bit ΔΣ ADC ¹ 20x/24x UDB ⁸ , CAN ⁹ Grades: A ¹⁰ and E ¹¹	
			CY8C3665 67 MHz, 32K/4K/1K ⁷ 0x/1x DFB ¹² , 12-bit ΔΣ ADC ¹ 16x/20x UDB ⁸ Grades: A ¹⁰ and E ¹¹	CY8C3865 67 MHz, 32K/4-8K/1K ⁷ 0x/1x DFB ¹² , 20-bit ΔΣ ADC ¹ 16x/20x UDB ⁸ Grades: A ¹⁰ and E ¹¹	
		CY8C3246 50 MHz, 64K/8K/2K ⁷ 12-bit ΔΣ ADC ¹ 24x UDB ⁸ , USB ⁶ Grades: A ¹⁰ and E ¹¹	CY8C3446 50 MHz, 64K/8K/2K ⁷ 12-bit ΔΣ ADC ¹ 24x UDB ⁸ , USB ⁶ , CAN ⁹ Grades: A ¹⁰ and E ¹¹		
		CY8C3245 50 MHz, 32K/4K/1K ⁷ 12-bit ΔΣ ADC ¹ 20x UDB ⁸ , USB ⁶ Grades: A ¹⁰ and E ¹¹	CY8C3445 50 MHz, 32K/4K/1K ⁷ 12-bit ΔΣ ADC ¹ 20x UDB ⁸ , USB ⁶ Grades: A ¹⁰ and E ¹¹		
		CY8C3244 50 MHz, 16K/2K/0.5K ⁷ 12-bit ΔΣ ADC ¹ 16x UDB ⁸ Grades: A ¹⁰ and E ¹¹	CY8C3444 50 MHz, 16K/2K/0.5K ⁷ 12-bit ΔΣ ADC ¹ 16x UDB ⁸ Grades: A ¹⁰ and E ¹¹		

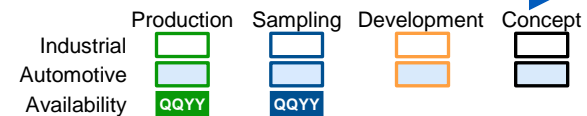
Integration

- ¹ Delta-Sigma analog-to-digital converter
- ² Digital-to-analog converter
- ³ Comparator
- ⁴ Fixed function

- ⁵ Switched capacitor/continuous time programmable analog block
- ⁶ Full-Speed USB
- ⁷ Flash KB/SRAM KB/EEPROM KB

- ⁸ Universal digital block
- ⁹ Controller area network
- ¹⁰ AEC-Q100: -40°C to +85°C
- ¹¹ AEC-Q100: -40°C to +125°C

- ¹² Digital filter block



Automotive Portfolio: PSoC[®] 4

ARM[®] Cortex[™]-M0 | CapSense[®] | Timer/Counter/PWM



PSoC MCU PSoC 4000	Intelligent Analog PSoC 4100	Programmable Digital PSoC 4200	Programmable Analog PSoC 4400
Analog: CMP ¹ , IDAC ² Interfaces: I ² C	Analog: CMP ¹ , IDAC ² , ADC ³ , Op amp Interfaces: SCB ⁴	Analog: CMP ¹ , IDAC ² , ADC ³ , Op amp Interfaces: SCB ⁴	Concept Only Contact Sales
	<div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;"> CY8C4128-BL 24 MHz, 256K/32K⁵ BLE⁶ </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;"> CY8C4127-M 24 MHz, 128K/16K⁵ Grades: A⁸ and S⁹ Contact Sales </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;"> CY8C4127-BL 24 MHz, 128K/16K⁵ BLE⁶ </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> CY8C4248-L 48 MHz, 256K/32K⁵ UDB⁷, CAN¹⁰, USB¹¹ Contact Sales </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> CY8C4247-M 48 MHz, 128K/16K⁵ UDB⁷, CAN¹⁰ Grades: A⁸ and S⁹ Contact Sales </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> CY8C4247-L 48 MHz, 128K/16K⁵ UDB⁷, CAN¹⁰, USB¹¹ Contact Sales </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> CY8C4247-BL 48 MHz, 128K/16K⁵ BLE⁶, UDB⁷ </div>	
	<div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;"> CY8C4126-M 24 MHz, 64K/8K⁵ Grades: A⁸ and S⁹ Contact Sales </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;"> NEW CY8C4125 24 MHz, 32K/4K⁵ Grades: A⁸ and S⁹ </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> CY8C4246-M 48 MHz, 64K/8K⁵ UDB⁷ Grades: A⁸ and S⁹ Contact Sales </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> CY8C4246-L 48 MHz, 64K/8K⁵ UDB⁷, USB¹¹ Contact Sales </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;"> NEW CY8C4245 48 MHz, 32K/4K⁵ UDB⁷ Grades: A⁸ and S⁹ </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> CY8C44x6 48 MHz, 64K/16K⁵ Concept Only Contact Sales </div> <div style="border: 1px solid black; padding: 5px;"> CY8C44x5 48 MHz, 32K/8K⁵ Concept Only Contact Sales </div>
<div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;"> NEW CY8C4014 Q414 16 MHz, 16K/2K⁵ Grades: A⁸ and S⁹ </div> <div style="border: 1px solid green; padding: 5px;"> CY8C4013 16 MHz, 8K/2K⁵ </div>	<div style="border: 1px solid orange; padding: 5px;"> NEW CY8C4124 24 MHz, 16K/4K⁵ Grades: A⁸ and S⁹ </div>	<div style="border: 1px solid orange; padding: 5px;"> NEW CY8C4244 48 MHz, 16K/4K⁵ UDB⁷ Grades: A⁸ and S⁹ </div>	

Integration

- | | | | | |
|--|--|--|---|---|
| <p>¹ Comparator</p> <p>² Current-output digital-to-analog converter</p> <p>³ Analog-to-digital converter</p> <p>⁴ Serial communication block programmable as I²C/SPI/UART/LIN slave</p> | <p>⁵ Flash KB/SRAM KB</p> <p>⁶ Bluetooth Low Energy</p> <p>⁷ Universal digital block</p> <p>⁸ AEC-Q100: -40°C to +85°C</p> | <p>⁹ AEC-Q100: -40°C to +105°C</p> <p>¹⁰ Controller area network</p> <p>¹¹ Full-Speed USB</p> | <p>Industrial </p> <p>Automotive </p> <p>Availability QQYY</p> | <p>Production </p> <p>Sampling </p> <p>Development </p> <p>Concept </p> |
|--|--|--|---|---|

Automotive Portfolio: PSoC[®] Software¹



Software	PSoC Creator™ ²	PSoC Designer™ ³	PSoC Programmer ⁴	EZ-Click™ ⁵
Current Version	3.1	5.4	3.22	2.0
PSoC 1		Production	Production	
PSoC 3	Production		Production	
PSoC 4	Production		Production	

Download the latest PSoC software version [here](#)

¹ All software and tool releases are backward compatible. The latest versions are recommended for new designs

² **PSoC Creator** is an Integrated Design Environment (IDE) that allows concurrent hardware and firmware design of PSoC 3 and PSoC 4 systems

³ **PSoC Designer** is an IDE that enables firmware design using a library of precharacterized peripherals for PSoC 1 systems

⁴ **PSoC Programmer** can be used with PSoC Designer and PSoC Creator to program and debug any design onto a PSoC device

⁵ **EZ-Click** is a Windows[®] GUI-based tool that enables development of CapSense MBR solutions. It allows you to set up sensor configuration, apply global system properties, monitor real-time sensor output, and run production-line system diagnostics

Automotive PSoC Packages



Package	QFN		SOIC	SSOP			TQFP
Pins	24	56	16	20	28	48	100
PSoC 1		✓		✓	✓	✓	
PSoC 3						✓ ¹	✓
PSoC 4	✓		✓				

¹ 48-SSOP PSoC 3 concept only

Automotive Portfolio: Asynchronous SRAM



	Fast SRAM		Low-Power SRAM (MoBL ^{®1})		PowerSnooze™ ² SRAM	
	Non-ECC ³	ECC ³	Non-ECC ³	ECC ³	ECC ³	
32Mb-128Mb	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C107x 32Mb; 3.3 V 12 ns; x8, x16 </div>		<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY6218x 64Mb; 2.5, 3.0 V 55 ns; x8, x16 </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Other densities Contact Sales </div>		
	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C106x 16Mb; 1.8, 3.3 V 10 ns; x8, x16, x32 </div>		<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7C106x 16Mb; 1.8-5.0 V 10 ns; x8, x16, x32 Grade: E⁵ </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY6216x 16Mb; 3.0 V 45 ns; x8, x16 Grade: A⁶ </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY6216x 16Mb; 1.8-5.0 V 45 ns; x8, x16, x32 Grade: E⁵ </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7S106x 16Mb; 1.8-5.0 V 10 ns; x8, x16, x32 Grade: E⁵ </div>
2Mb-16Mb	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C105x 8Mb; 3.3 V 10 ns; x8, x16 </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C1012 12Mb; 3.3 V 10 ns; x24 </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7C105x 8Mb; 1.8-5.0 V 10 ns; x8, x16, x32 Grade: E⁵ </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY6215x 8Mb; 3.0, 5.0 V 45 ns; x16 Grades: A⁶ and E⁵ </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7S105x 8Mb; 1.8-5.0 V 10 ns; x8, x16, x32 Grade: E⁵ </div>	
	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C104x 4Mb; 3.3, 5.0 V 10 ns; x8, x16 Grades: A⁶ and E⁵ </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C1034 6Mb; 3.3 V 10 ns; x24 </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7C104x 4Mb; 1.8-5.0 V 10 ns; x8, x16 Grade: E⁵ </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY6214x 4Mb; 3.0, 5.0 V 45 ns; x8, x16 Grades: A⁶ and E⁵ </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY6214x 4Mb; 1.8-5.0 V 45 ns; x8, x16 Grade: E⁵ </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7S104x 4Mb; 1.8-5.0 V 10 ns; x8, x16 Grade: E⁵ </div>
	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C1011 2Mb; 3.3 V 10 ns; x16 Grades: A⁶ and E⁵ </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C1024 3Mb; 3.3 V 10 ns; x24 </div>	<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7C101x 2Mb; 1.8-5.0 V 10 ns; x8, x16 Grade: E⁵ </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY6213x 2Mb; 3.0 V 45 ns; x8, x16 Grades: A⁶ and E⁵ </div>		<div style="border: 1px solid orange; padding: 5px; text-align: center;"> NEW CY7S101x 2Mb; 1.8-5.0 V 10 ns; x8, x16 Grade: E⁵ </div>
	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C1020 512Kb; 2.6, 3.3 V 15 ns; x16 Grade: E⁵ </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C1019/21 1Mb; 2.6, 3.3, 5.0 V 10 ns; x8, x16 Grades: A⁶ and E⁵ </div>		<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY6212x 1Mb; 3.0, 5.0 V 45 ns; x8, x16 Grades: A⁶ and E⁵ </div>		
64Kb-1Mb	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C185 64Kb; 5.0 V 15 ns; x8 </div>	<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY7C199 256Kb; 5.0 V 12 ns; x8 Grades: A⁶ and E⁵ </div>		<div style="border: 1px solid green; padding: 5px; text-align: center;"> CY62256 256Kb; 5.0 V 55 ns; x8 Grades: A⁶ and E⁵ </div>		

¹ More Battery Life™

² Fast SRAM with low-power sleep mode

³ Error-correcting code

⁴ Serial peripheral interface

⁵ AEC-Q100: -40°C to +125°C

⁶ AEC-Q100: -40°C to +85°C

	Production	Sampling	Development	Concept
Industrial	<div style="border: 1px solid green; width: 15px; height: 10px; display: inline-block;"></div>	<div style="border: 1px solid blue; width: 15px; height: 10px; display: inline-block;"></div>	<div style="border: 1px solid orange; width: 15px; height: 10px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 15px; height: 10px; display: inline-block;"></div>
Automotive	<div style="border: 1px solid green; width: 15px; height: 10px; display: inline-block;"></div>	<div style="border: 1px solid blue; width: 15px; height: 10px; display: inline-block;"></div>	<div style="border: 1px solid orange; width: 15px; height: 10px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 15px; height: 10px; display: inline-block;"></div>
Availability	<div style="border: 1px solid green; width: 15px; height: 10px; display: inline-block;"></div> QQYY	<div style="border: 1px solid blue; width: 15px; height: 10px; display: inline-block;"></div> QQYY		

Fast SRAM with ECC

Applications

- Infotainment systems
- Driver assistance
- Driver information
- Powertrain
- Telematics

Features

- Bus-width configurations: x8, x16, x32
- Wide operating voltage range: 1.65-5.5 V
- Available in automotive temperature (A¹ and E²) grades
- Industry-standard, RoHS-compliant packages
- Error-correcting code (ECC) to detect/correct single-bit errors
- Bit-interleaving to avoid multi-bit errors
- Error-indication (ERR) pin to indicate single-bit errors
- Packages: 48-pin VFBGA, 48-pin TSOP1

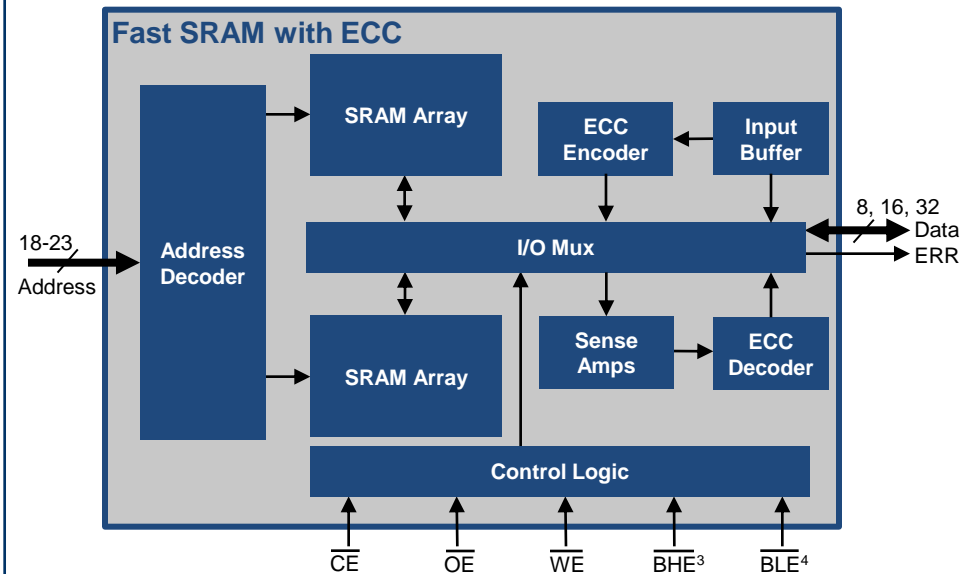
Collateral

Preliminary Datasheet: [Contact Sales](#)

Family Table

Density	MPN	Access Time	Supply Current (Max. at 85°C)
4Mb	CY7C104x	10 ns	45 mA
8Mb	CY7C105x	10 ns	60 mA
16Mb	CY7C106x	10 ns	110 mA

Block Diagram



Availability

[Contact Sales](#)

¹ AEC-Q100: -40°C to +85°C

² AEC-Q100: -40°C to +125°C

³ Byte high enable

⁴ Byte low enable

Automotive Asynchronous SRAM

MoBL^{®1} SRAM with ECC



Applications

Infotainment systems
Telematics

Features

Access time: 45 ns for 16Mb
Standby current: 16 μ A for 16Mb
Multiple bus-width configurations: x8, x16 and x32
Wide operating voltage range: 1.65-5.5 V
Available in automotive temperature (A² and E³) grades
Industry-standard, RoHS-compliant packages
Error-correcting code (ECC) to detect/correct single-bit errors
Bit-interleaving to avoid multi-bit errors
Error-indication (ERR) pin to indicate single-bit errors
Packages: 48-pin VFBGA, 48-pin TSOP1

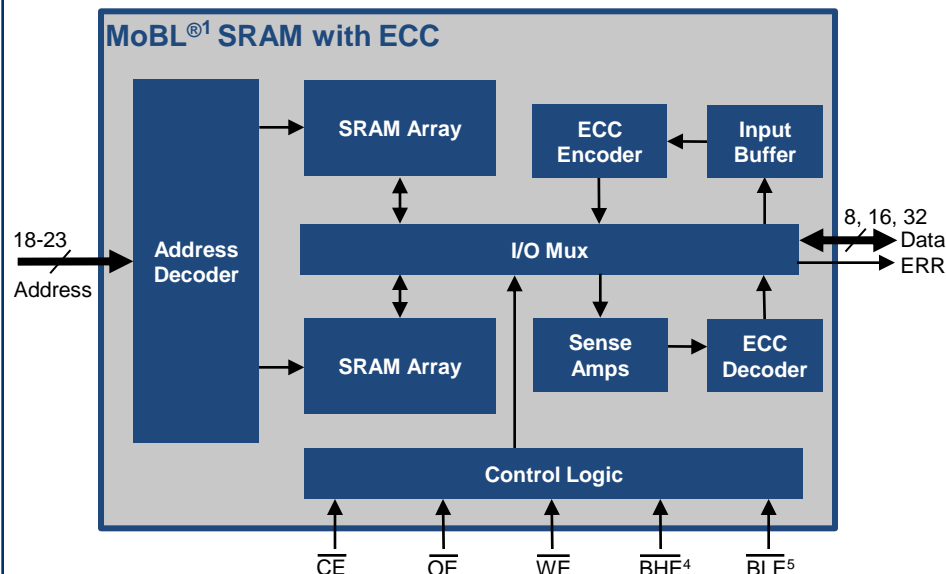
Collateral

Preliminary Datasheet: [Contact Sales](#)

Family Table

Density	MPN	Standby Current (Max. at 85°C)	Standby Current (Typ. at 25°C)
4Mb	CY6214x	8 μ A	2.5 μ A
8Mb	CY6215x	9 μ A	3.0 μ A
16Mb	CY6216x	16 μ A	4.6 μ A
32Mb	CY6217x	58 μ A	9.0 μ A
64Mb	CY6218x	58 μ A	9.0 μ A

Block Diagram



Availability

[Contact Sales](#)

¹ More Battery Life™

² AEC-Q100: -40°C to +85°C

³ AEC-Q100: -40°C to +125°C

⁴ Byte high enable

⁵ Byte low enable

Automotive Synchronous SRAM

Automotive Portfolio: Synchronous SRAM

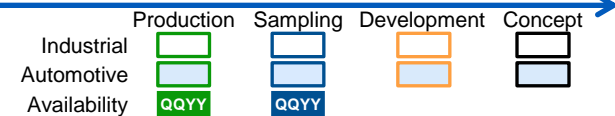


High Random Transaction Rate (RTR)¹ | Low Latency | High Bandwidth

Standard Sync and NoBL™	Standard Sync and NoBL™ with ECC ²	QDR® -II/ DDR-II	QDR-II+/ DDR-II+	QDR-II+X/ DDR-II+X	QDR-IV
Max RTR ¹ : 250 MT/s Max BW: 18 Gbps Latency: 1 Cycle Pipeline and Flow-through Modes	Max RTR ¹ : 250 MT/s Max BW: 18 Gbps Latency: 1 Cycle Pipeline and Flow-through Modes	Max RTR ¹ : 666 MT/s Max BW: 47.9 Gbps Latency: 1.5 Cycles CIO ³ and SIO ⁴	Max RTR ¹ : 666 MT/s Max BW: 79.2 Gbps Latency: 2 or 2.5 Cycles CIO ³ and SIO ⁴ , ODT ⁵	Max RTR ¹ : 900 MT/s Max BW: 91.1 Gbps Latency: 2.5 Cycles SIO ⁴ , ODT ⁵	Max RTR ¹ : 2.1 GT/s Max BW: 153.5 Gbps Latency: 5 or 8 Cycles Dual-Port Bidirectional ODT ⁵
		CY7C161/2xKV18 144Mb; 250-333 MHz 1.8 V; x9, x18, x36 Burst 2, 4	CY7Cx4/5/6/7xKV18 144Mb; 300-550 MHz 1.8 V; x18, x36 Burst 2, 4		CY7C41xKV13 144Mb; 667-1066 MHz 1.3 V; x18, x36 Burst 2
CY7C147/8xB 72Mb; 133-250 MHz 2.5, 3.3 V; x18, x36	72Mb with ECC² Contact Sales	CY7C151/2xKV18 72Mb; 250-333 MHz 1.8 V; x9, x18, x36 Burst 2, 4	CY7Cx54/5/6/7KV18 72Mb; 250-550 MHz 1.8 V; x18, x36 RH ⁶ ; Burst 2, 4	CY7C156/7xXV18 72Mb; 366-633 MHz 1.8 V; x18, x36 Burst 2, 4	CY7C40xKV13 72Mb; 667-1066 MHz 1.3 V; x18, x36 Burst 2
CY7C144/6xA 36Mb; 133-250 MHz 2.5, 3.3 V; x36, x72	36Mb with ECC² Contact Sales	CY7C141/2xKV18 36Mb; 250-333 MHz 1.8 V; x8, x9, x18, x36 Burst 2, 4	CY7Cx24/5/6/7xKV18 36Mb; 400-550 MHz 1.8 V; x18, x36 Burst 2, 4	CY7C126/7x 36Mb; 366-633 MHz 1.8 V; x18, x36 Burst 2, 4	
CY7C137/8xD 18Mb; 100-250 MHz 3.3 V; x18, x32, x36	18Mb with ECC² Contact Sales	CY7C131/2/9xKV18 18Mb; 250-333 MHz 1.8 V; x8, x18, x36 Burst 2, 4	CY7Cx14/5/6/7xKV18 18Mb; 400-550 MHz 1.8 V; x18, x36 Burst 2, 4		
NEW CY7C136xC 9Mb; 100 MHz 3.3 V; x18, x36 Grade: E ⁷		CY7C1911xKV18 18Mb; 250-333 MHz 1.8 V; x9 Burst 2, 4			
NEW CY7C134xxG 4Mb; 100 MHz 3.3 V; x36 Grade: E ⁷					

Density ↑

Random Transaction Rate



¹ Rate of truly random accesses to memory, expressed in transactions per second (MT/s, GT/s)

² Error-correcting code
³ Common I/O
⁴ Separate I/O

⁵ On-die termination; parts are CY7C2x
⁶ Radiation hardened, military grade
⁷ AEC-Q100: -40°C to +125°C

Automotive Nonvolatile RAM

Automotive Portfolio: F-RAM

Low Power | High Endurance



	SPI F-RAM	I ² C F-RAM	Processor Companion	Wireless Memory	Parallel F-RAM	
512Kb-8Mb	FM25H20/V20 2Mb; H20: 2.7-3.6 V V20: 2.0-3.6 V 40 MHz SPI	CY15B104Q 4Mb; 2.0-3.6 V 40 MHz SPI			FM22L16/LD16 4Mb; 2.7-3.6 V 55 ns; x8	
	NEW CY15B102Q 2Mb; 2.0-3.6 V 25 MHz SPI Grade: E ¹	FM25V10/VN10 1Mb; 2.0-3.6 V 40 MHz SPI Grade: A ²	FM24V10/VN10 1Mb; 2.0-3.6 V 3.4 MHz I ² C		FM28V102A 1Mb; 2.0-3.6 V 60 ns; x16	FM28V202A 2Mb; 2.0-3.6 V 60 ns; x16
	FM25V05 512Kb; 2.0-3.6 V 40 MHz SPI Grade: A ²	FM24V05 512Kb; 2.0-3.6 V 3.4 MHz I ² C			NEW CY15B101N 1Mb; 2.0-3.6 V 60 ns; x16 Grade: A ²	NEW CY15B102N 2Mb; 2.0-3.6 V 60 ns; x16 Grade: A ²
4Kb-256Kb	FM25V02/W256 256Kb; V02: 2.0-3.6 V W256: 2.7-5.5 V 40 MHz SPI; Grade: A ²	FM24V02/W256 256Kb; V02: 2.0-3.6 V W256: 2.7-5.5 V 3.4 MHz I ² C; Grade: A ²	FM33256 256Kb; 3.3 V; 16 MHz SPI Ind ¹ ; RTC ³ ; Power Fail Watchdog; Counter	Wireless Memory Contact Sales	FM28V020 256Kb; 2.0-3.6 V 70 ns; x8	FM18W08 256Kb; 2.7-5.5 V 70 ns; x8
	FM25V01 128Kb; 2.0-3.6 V 40 MHz SPI Grade: A ²	FM24V01 128Kb; 2.0-3.6 V 3.4 MHz I ² C Grade: A ²	FM31256/31(L)278 256Kb; 3.3, 5.0 V; 1 MHz I ² C; Ind ¹ ; RTC ³ ; Power Fail; Watchdog; Counter		FM1808B 256Kb; 5.0 V 70 ns; x8	FM16W08 64Kb; 2.7-5.5 V 70 ns; x8
	FM25640/CL64 64Kb; 3.3, 5.0 V 20 MHz SPI Grade: E ³	FM24C64/CL64 64Kb; 3.3, 5.0 V 1 MHz I ² C Grade: E ¹	FM3164/31(L)276 64Kb; 3.3, 5.0 V; 1 MHz I ² C; Ind ¹ ; RTC ³ ; Power Fail; Watchdog; Counter			
	FM25C160/L16 16Kb; 3.3, 5.0 V 20 MHz SPI Grade: E ¹	FM24C16/CL16 16Kb; 3.3, 5.0 V 1 MHz I ² C				
	FM25040/L04 4Kb; 3.3, 5.0 V 20 MHz SPI Grade: E ¹	FM24C04/CL04 4Kb; 3.3, 5.0 V 1 MHz I ² C				

¹ AEC-Q100 -40°C to +125°C

² AEC-Q100 -40°C to +85°C

³ Real-time clock

	Production	Sampling	Development	Concept
Industrial				
Automotive				
Availability				

Automotive USB

Automotive Portfolio: USB



	Device	Hub	Bridge	Host	Storage	Type-C
USB 3.0	FX3: CYUSB301x 32-Bit Bus to USB 3.0 ARM9, 512KB RAM	HX3: CYUSB33xx 4 Ports, Shared Link™ ¹ BC 1.2 ² , Ghost Charge™ ³ Grades: A ⁴ and S ⁵	CX3: CYUSB306x CSI-2 ⁶ to USB 3.0 4 CSI-2 ⁶ Lanes, 1 Gbps/Lane		FX3S™: CYUSB303x 16-Bit Bus to USB 3.0 RAID ⁷ , Dual SDXC ⁸ /eMMC ⁹ Grades: A ⁴ and S ⁵	Type-C Port Controller Contact Sales
			Display TX Bridge Contact Sales		SD3: CYUSB302x SDXC ⁸ /eMMC ⁹ to USB 3.0 RAID ⁷	Type-C Cable Controller Contact Sales
			Gigabit Ethernet Bridge Contact Sales			
USB 2.0	FX2LP: CY7C6801x/53 16-Bit Bus to USB 2.0 8051, 16KB RAM	HX2VL: CY7C656x4 4 Ports 4 Transaction Translators		Bay™: CYWB016xBB HS USB OTG Dual SDXC ⁷ /eMMC ⁹	Astoria™: CYWB022xABS 16-Bit Bus to USB 2.0 8051, Dual SD/eMMC ⁹	Type-C product applies to any USB speed
	TX2UL: CY7C68003 ULPI ¹⁰ PHY 13, 19.2, 24, 26 MHz	HX2LP: CY7C656x1 4 Ports, 1 Transaction Translator			NX2LP: CY7C6803x NAND Flash to USB 2.0 8051, 15KB RAM	
					AT2LP: CY7C683xx PATA ¹¹ to USB 2.0 8051	
USB 1.1	enCoRe™ II: CY7C638xx M8C MCU, 20 GPIOs SPI, 8KB Flash		USB-Serial: CY7C6521x UART/SPI/I ² C to USB 2 Channels, CapSense [®]	SL811HS FS USB Host/Device 256Byte RAM		
	enCoRe III: CY7C64215 M8C MCU, 50 GPIOs, ADC I ² C/SPI, 16KB Flash		USB-to-UART: CY7C65213 3 Mbps, 8 GPIOs	EZ-Host: CY7C67300 4 Ports, FS USB OTG 32 GPIOs Grade: A ⁵		
	enCoRe V: CY7C643xx M8C MCU, 36 GPIOs, ADC I ² C/SPI, 32KB Flash		USB-to-UART: CY7C64225 230 Kbps	EZ-OTG™: CY7C67200 2 Ports, FS USB OTG 25 GPIOs		

¹ Simultaneous USB 2.0 and USB 3.0 traffic on the same port

² Battery Charging specification v1.2

³ Enables USB charging without host connection

⁴ AEC-Q100: -40°C to +85°C

⁵ AEC-Q100: -40°C to +105°C

⁶ Camera Serial Interface v2.0

⁷ Redundant array of independent disks

⁸ SD extended capacity

⁹ Embedded MultiMedia Card

¹⁰ UTMI low-pin interface

¹¹ Parallel ATA

	Production	Sampling	Development	Concept
Industrial				
Automotive				
Availability	QYYY	QYYY		

Automotive Timing Solutions

Automotive Portfolio: Timing Solutions



		Clock Generators		Clock Buffers	
		EMI Reduction	Non-EMI Reduction	Zero Delay Buffer (ZDB)	Non-Zero Delay Buffer (NZDB)
High Performance		4-PLL Clock Generator Contact Sales	Programmable XO/VCXO Contact Sales		
		2-PLL Clock Generator Contact Sales	CY2Xx (FleXO™) Max. Frequency: 690 MHz 1 Output; Frequency Margining 0.6-ps RMS Jitter ¹		CY2DLx/DMx/DPx/CPx Max. Frequency: 1.5 GHz 2-10 Outputs; LVDS, LVPECL, CML 0.05-ps RMS Jitter ¹
Standard Performance			NEW CY2239x Max. Frequency: 166 MHz 6 Outputs, 3 PLL, I ² C, Freq Select 400-ps CCJ ² ; Grades: A ³ and E ⁴		
		CY254x/CY251x Max. Frequency: 166 MHz 3-9 Outputs; 1-4 PLL; I ² C 100-ps CCJ ²	CY229x/CY2238x Max. Frequency: 200 MHz 3-6 Outputs, 3-4 PLL, I ² C, Freq Select 400-ps CCJ ²		
		CY22800/801 Max. Frequency: 166 MHz 3 Outputs; 1 PLL 250-ps CCJ ²	CY22050/150 Max. Frequency: 200 MHz 3-6 Outputs; 1 PLL 250-ps CCJ ²	CY230x/EP0x Max. Frequency: 220 MHz 5-9 Outputs; LVCMOS 22-ps CCJ ² ; Grade: A ³	CY230xNZ Max. Frequency: 133 MHz 4-18 Outputs; LVCMOS 250-ps CCJ ²
Application Specific		PCIe 3.0 Clock Generator Contact Sales		CY23FS04/08 Max. Frequency: 200 MHz 4-8 Outputs; Fail Safe ⁵ 200-ps CCJ ²	
		NEW CY24293A Max. Frequency: 200 MHz 2 outputs; 1 PLL; PCIe 1.1 75-ps CCJ ² ; Grade: A ³		CY23S02/05/08/09/FP12 Max. Frequency: 200 MHz 2-12 Outputs; Spread Aware 200-ps CCJ ²	
		CY2429x Max. Frequency: 200 MHz 2-4 Outputs; PCIe 1.1 75-ps CCJ ²		CY7B99x (RoboClock™) Max. Frequency: 200 MHz 8-18 Outputs; Configurable Skew 50-ps CCJ ²	

¹ Integrated phase noise across 12-kHz to 20-MHz offset

⁴ AEC-Q100: -40°C to +125°C

² Cycle-to-cycle jitter

⁵ Automatic clock switching on failure of a clock source

³ AEC-Q100: -40°C to +85°C

	Production	Sampling	Development	Concept
Industrial				
Automotive				
Availability	QYYY	QYYY		