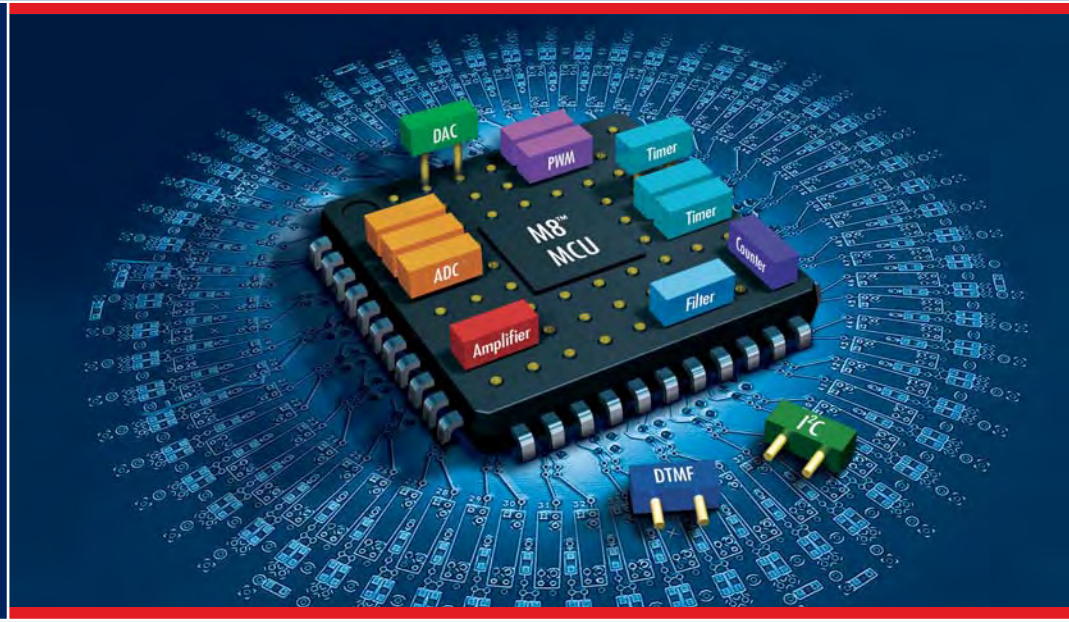
PSoC® The Programmable System-On-Chip™

Empower Your Product



Cypress's revolutionary Programmable System-On-Chip™ (PSoC®) mixed-signal array is a complete system-level solution with configurable digital and analog peripherals, an 8-bit microcontroller and three types of embedded memory. PSoC combines maximum design flexibility with ease of use. It enables you to minimize design time, chip count, board size and cost for products targeting the consumer, computation, communications, automotive and industrial equipment markets.

CYPRESS
PERFORM

PSoC: Programmable System-On-Chip

PSoC is a reconfigurable architecture that replaces traditional ASIC-, ASSP- or microcontroller-based designs. Customers often refer to PSoC as a flash-configurable ASIC that future proofs their designs by allowing last minute design changes.

The PSoC Advantage

The "Old Way"	The PSoC Way
■ Locked into an ASIC, ASSP, or MCU	■ Flexible and Configurable ■ Versatile GPIO ■ Microcontroller Core ■ SONOS Flash Memory ■ SRAM
■ Fixed-Function Peripherals	■ Configurable Analog Blocks ■ Configurable Digital Blocks
Your Challenges	**The PSoC Value**
■ Changing Specifications	■ Configurable Resources and Routing Eliminate Board Changes
■ Pressures to Differentiate	■ Integrate Filters ■ Customize Peripherals
■ Reduce Costs and BOM	■ Integrate up to 100 Components; Save $0.05 to $10.00
■ High Quality and Reliability	■ Component Reduction ■ Last Minute Improvements ■ Field Reconfigurability
■ IP Reuse of Previous Designs	■ Copy and Paste Development Tool GUI
■ Tight Budgets	■ Free, easy-to-use Programming Software ■ Inexpensive Hardware Development Tools

Integrated PSoC Solutions

Programmable Radio-on-Chip
CYWUSB6953

2.4-GHz Wireless, Flash Memory, 50 Meter Range, Small and Highly Integrated, Virtually Unlimited Co-Location, Robust Immunity to Interference.

Wireless Solution: PSoC + WirelessUSB = PRoC

The configurability and flexibility of PSoC combined with WirelessUSB's interference immunity and co-location provides an integrated, space-saving and low-cost 2.4-GHz wireless solution for HID, consumer electronics, and home/industrial automation applications such as automated remote monitoring systems.

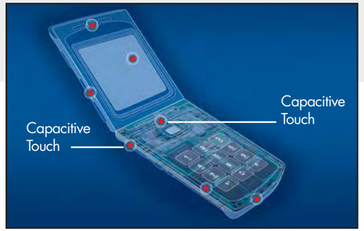
PSoC with USB 2.0
CY8C24x94

Four Unidirectional Endpoints, One Bidirectional Endpoint, Dedicated 256 Byte Buffer, Integrated Clock Oscillator

PSoC with USB 2.0 Solution: Integrated Serial Interface Engine

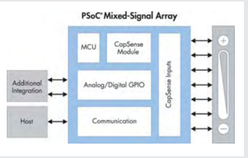
- Shorter design cycles
- Reduced component count and BOM cost
- Less board space
- Lower power consumption

Handset Solutions



PSoC with Capacitive Touch enables a clean user interface in handsets for navigation pads, key-pads, and other mechanical buttons and sliders.

PSoC CapSense



Implementation with two buttons and a slider using a single PSoC device.

Capacitive Sensing Solution: The Cypress CapSense Advantage

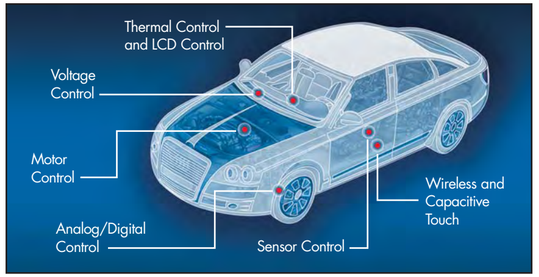
Bring economy, elegance, and functionality to your designs. Our PSoC-based capacitive sensing solution provides:

- Single-chip integration of multiple buttons, sliders, touchpads and proximity detectors, requiring no external components for sensing
- Flexible implementation vs. hard coded ASICs or fixed-function modules
- Easy serial communications with I^2C, SPI and USB interfaces
- Easy-to-use tools for system-level embedded design with quick time-to-market

PSoC is Everywhere™

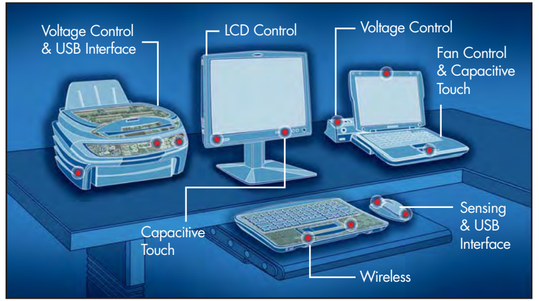
PSoC devices reduce design time, chip count, board size and cost for products ranging from cell phones, digital still cameras, PC peripherals and gaming systems to toys, appliances and automotive electronics.

Automotive Solutions



Automotive-grade PSoC devices implement sensor, thermal, voltage, and motor control functions on a single chip.

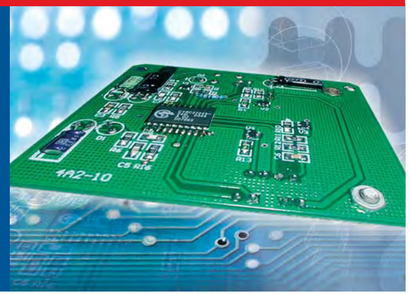
PC Peripheral Solutions



PSoC's flexibility and functionality can be applied in virtually all PC peripheral applications: printers, LCD displays, docking stations, mice and keyboards, webcams, etc.

PSoC: What's Inside

The configurability of PSoC provides limitless design flexibility and component integration.



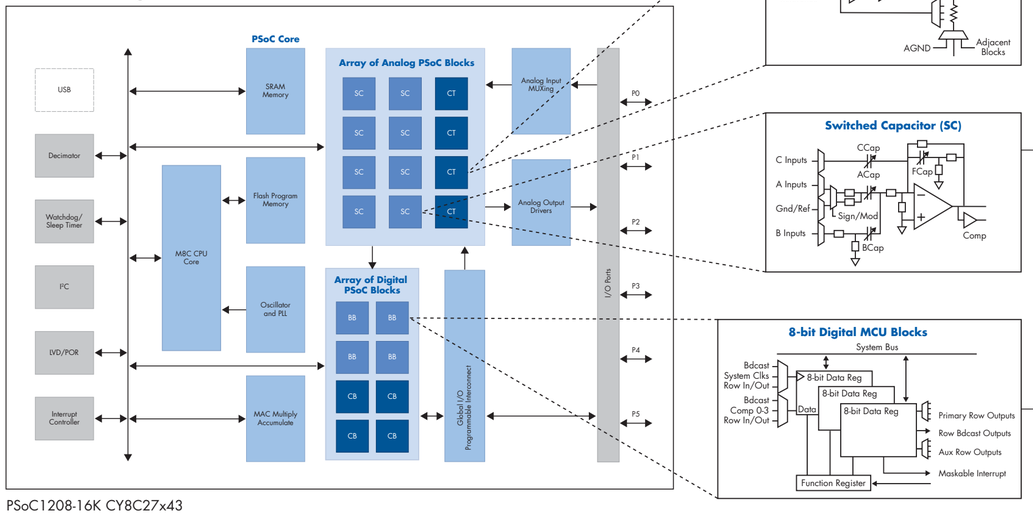
PSoC integrates up to 12 analog and 16 digital configurable hardware blocks. PSoC blocks have the ability to implement a wide variety of user-selectable hardware peripheral functions configured via register settings.

The analog blocks are designed around an operational amplifier and include programmable multiplexing and feedback characteristics.

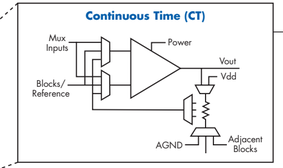
Each digital block is an 8-bit-wide resource. Therefore, creating an 8-bit Pulse Width Modulator requires one digital PSoC block. Two or more blocks can be used together to create wider bit-width functions.

Flexible pinouts and configurable internal routing and MUXes enable you to construct complete systems without concern for layout details.

PSoC Block Diagram



PSoC1208-16K CY8C27x43



User Module Library

Over 50 prebuilt, precharacterized analog, digital, and mixed-signal user modules make it easy to select and implement hardware peripheral functions.

ANALOG FUNCTIONS

ADCs
- Incremental 6 – 14 bits
- Delta Sigma 6 – 13 bits

DAC
- 6, 8, and 9-bit
- 6 and 8-bit multiplying

Filters
- 2-pole Low-pass filter
- 2-pole Band-pass filter

Notch filters
DTMF Dialer
Modulator
Peak Detector
V to I Converter

Amplifiers
- Programmable Gain Amplifier
- Instrumentation Amplifier
- Inverting Amplifier

Comparators
- Programmable Comparator
- Hysteresis Comparator
- Zero-Crossing Comparator

CapSense

DIGITAL FUNCTIONS

8, 16, 24, 32-bit Timer
8, 16, 24, 32-bit Counter
8, 16, 24, 32-bit PWM
8, 16-bit Dead Band Generator
Pseudo Random Source
Cyclic Redundancy Check

Communications Interface
- I²C Master
- I²C Slave
- SPI Master
- SPI Slave
- Full Duplex UART
  - Tx, Rx
- Full Speed USB V2.0

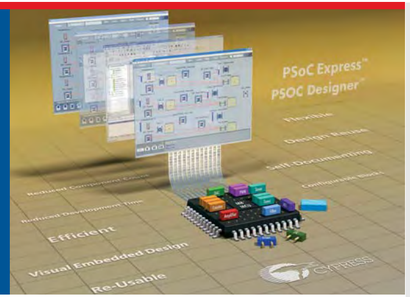
Part Selection Matrix

Cypress provides PSoC devices with mix and match parameters to allow you to optimize your designs based on the level of integration required.

Part Number	Anlg	Dgtl	Flash	RAM	Temp	HW Comm Bus	Package
PSoC1216-32K						**CY8C29466, CY8C29566, CY8C29666, CY8C29866**	
CY8C29x66	12	16	32K	2K	I, E	I2C	28-PDIP 28-SSOP 28-SOIC 44-TQFP 48-QFN (7x7) 100-TQFP 48-SSOP
PSoC1208-16K						**CY8C27143, CY8C27243, CY8C27443, CY8C27543, CY8C27643**	
CY8C27x43	12	8	16K	256	I, E	I2C	8-PDIP 20-SSOP 20-SOIC 28-PDIP 28-SSOP 28-SOIC 44-TQFP 48-SSOP 48-QFN (7x7)
PSoC0604-4K						**CY8C24123A, CY8C24223A, CY8C24423A**	
CY8C24x23A	6	4	4K	256	I, E	I2C	8-PDIP 8-SOIC 20-PDIP 20-SSOP 20-SOIC 28-PDIP 28-SSOP 28-SOIC 32-QFN (5x5)
PSoC0604-16K-USB w/CapSense							**CY8C24794, CY8C24894**
CY8C24x94	6	4	16K	1K	I	I2C USB	56-QFN (8x8) 68-QFN (8x8)
PSoC0204-8K w/CapSense						**CY8C21234, CY8C21334, CY8C21434, CY8C21534, CY8C21634**	
CY8C21x34	2E	4	8K	512	I, E	I2C	16-SOIC 20-SSOP 28-SSOP 32-QFN (5x5)
PSoC0204-4K						**CY8C21123, CY8C21223, CY8C21323**	
CY8C21x23	2E	4	4K	256	I, E	I2C	8-SOIC 16-SOIC 20-SSOP 24-QFN (4x4)
PRoC							**CYWUSB6953**
CYWUSB6953	2E	4	8K	512	0-70C	I2C USB	48-QFN

Powerful Tools That Speed Time-to-Market

PSoC comes with free programming software and inexpensive hardware design tools. Fast, efficient, prototyping and design for embedded systems is now a reality.

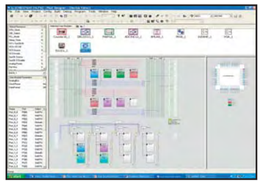


Software Tools

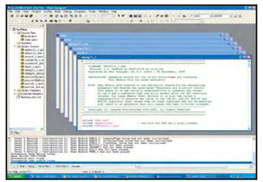
PSoC Designer and PSoC Express provide a choice in Windows-based integrated development environments.

PSoC Designer™

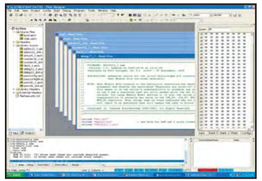
A complete development environment, including a C Compiler and Assembler.



Device Editor: Select, Place, and Configure User Modules, and Resources, and Pins



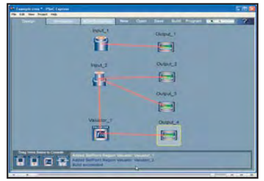
Application Editor: C Compiler, Assembler, Librarian



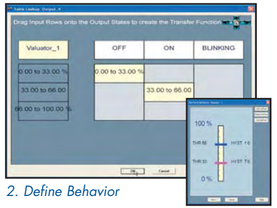
Debugger: In-Circuit Emulation, Break/Event Points, Trace

PSoC Express™

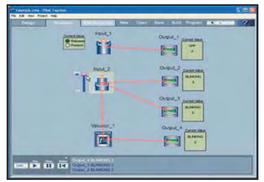
The industry's first virtual embedded design tool, allowing designs to be completed without writing a single line of code.



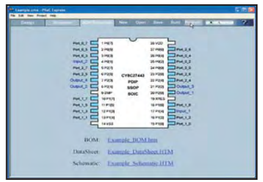
1. Select Inputs and Outputs



2. Define Behavior



3. Simulate and Verify

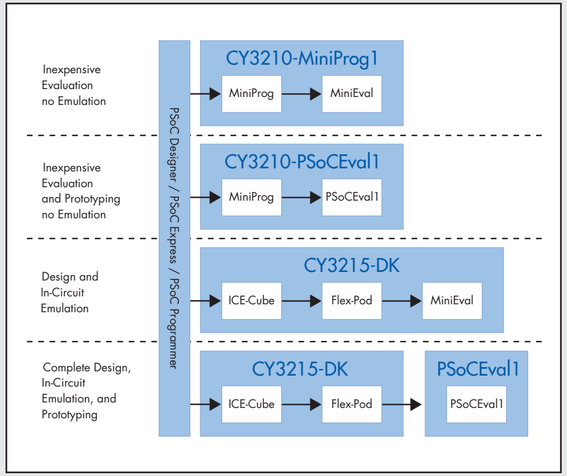


4. Build: Generate Hex Files; Produce Project Reports, BOMs, and Schematics

Hardware Tools

From evaluation to prototyping and emulation, Cypress offers development kits to suit your design requirements.

Evaluation Kits



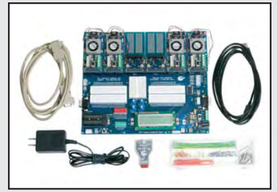
CY3210-MiniProg1

CY3210-PSoCEval1

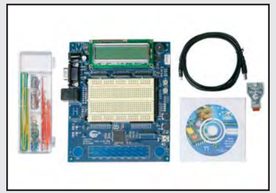
CY3215-DK

Development Kits

PRoC
CY3653



PSoC Express
CY3210-ExpressDK



PSoC w/USB
CY3214-PSoCEvalUSB

PSoC CapSense
CY3212-CapSense

In-System Programming Tools

CY3207ISSP

- In-System or In-Socket
- Prototype or Production
- Protection Circuitry
- Industrial Grade

World Class Support

www.cypress.com/psoc

PSoC Books

- "Designer's Guide To The Cypress PSoC" by Robert Ashby
- "Embedded Systems: Desktop Integration" by Oliver H. Bailey
- "Electrical Engineering 101: Everything You Should Have Learned in School But Probably Didn't" by Darren Ashby

Online Design Resources

- Hundreds of Application Notes
- Reference Design Kits
- Example Designs
- Knowledge Base
- Datasheets
- User Forum

Higher Education Program for Universities

- Course Material
- Low-cost Development Tools
- Cypress Technical Liaison

Online Technical Support

www.cypress.com/support

- 24/7 ConnectionCenter™ Support Team
- Create/track your case until closure
- Guaranteed 4-hour response time

CYPros Certified Consultants

www.cypress.com/support/cypros

- Hundreds of consultants worldwide to assist you

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