

PSoC™ Development Tools Selector Guide

For the CY8C29x66, CY8C27x43, CY8C24794, CY8C24x23A, CY8C21x34, and CY8C21x23

There is a Cypress Development kit for every need – from entry-level evaluation and prototyping, to full-speed, real-time emulation and debugging, to high volume manufacturing programming.

Software

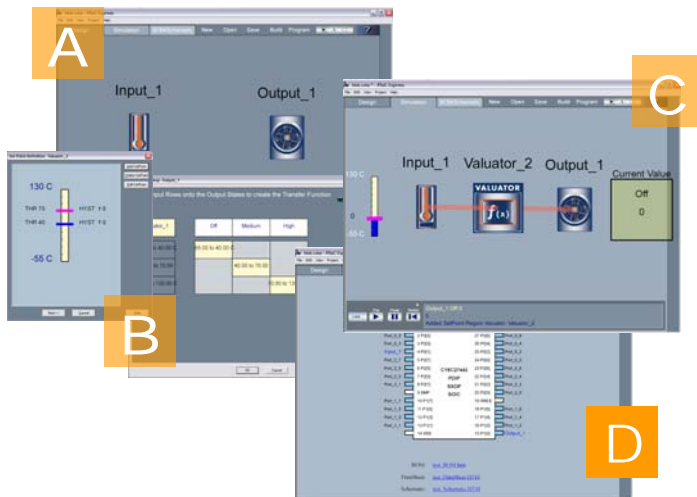
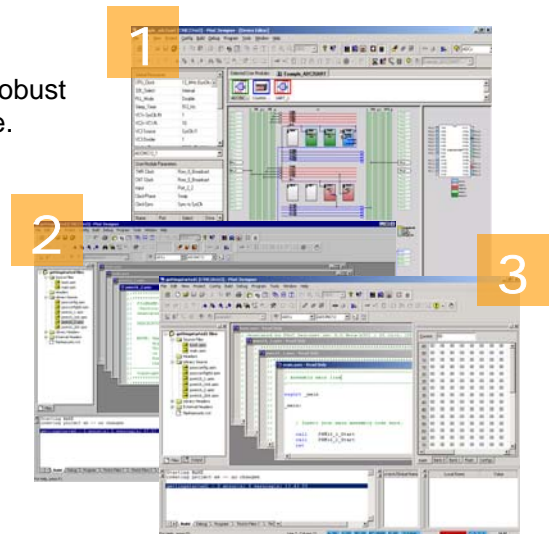
PSoC software is available for free download at <http://www.cypress.com>.

PSoC Designer

At the core of the PSoC development software suite is PSoC Designer™. Utilized by thousands of PSoC developers, this robust software has been facilitating PSoC designs for half a decade.

There are three subsystems within PSoC Designer:

- 1) Device Editor: Configure PSoC hardware blocks and IO, route internal signals, and define system parameters.
- 2) Application Editor: Write application code in C or assembly language. (A fully integrated C compiler is accessible with the purchase of a license.)
- 3) Debugger: Debug using breakpoints, trace, watch variables, advanced dynamic event points, and more.



PSoC Express

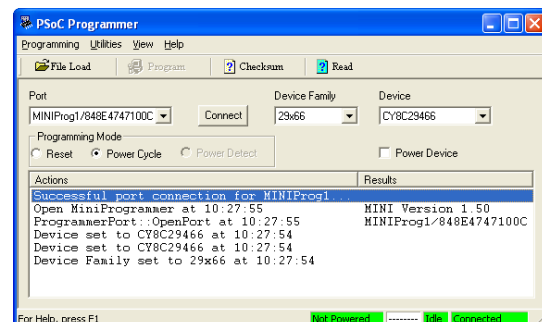
As the newest addition to the PSoC development software suite, PSoC Express™ is the first visual embedded system design tool that allows a user to create an entire PSoC project and generate a schematic, BOM, and data sheet without writing a single line of code. Users work directly with application objects such as LEDs, switches, sensors, and fans.

- Select inputs and outputs (A)
- Define the output's behavior (B)
- Simulate the design to verify (C)
- Build to generate PSoC HEX file, BOM, schematic, and datasheet (D)

PSoC Programmer

Flexible enough to be used on the bench in development, yet suitable for factory programming, PSoC Programmer works either as a standalone programming application or it can operate directly from PSoC Designer or PSoC Express.

PSoC Programmer is the one-stop programming application for Cypress' PSoC development tools.



Basic Development Kit

CY3215-DK Basic Development Kit

Everything you need to get started with PSoC, with support for the 28-pin DIP package.

- PSoC Designer Software CD-ROM
- ICE-Cube In-Circuit Emulator
- ICE Flex-Pod for CY8C29x66 Family
- Backward Compatible Cat-5 Adapter
- Mini-Eval Programming Board in One
- 110 ~ 240V Power Supply, Euro-Plug Adapter
- iMAGEcraft C Compiler (Registration Required)
- ISSP Cable
- USB 2.0 Cable and Blue Cat-5 Cable
- 2 CY8C29466-24PXI 28-PDIP Chip Samples



ICE-Cube

The ICE-Cube (available in the CY3215-DK) is driven by the Debugger subsystem of PSoC Designer. This software interface allows users to run, halt, and single step the processor and view the content of specific memory locations. It also allows the user to set complex event points. Event points can start and stop the trace memory on the ICE, as well as break the program execution. The ICE-Cube supports large memory model PSoC devices (devices with >256 bytes of RAM) and is backward compatible with previous PSoC devices (CY8C27x43 and CY8C24x23A).

Flex-Pod versus Legacy Pods

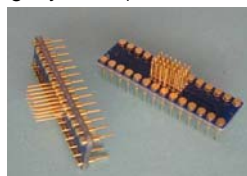
Flex-Pods are state-of-the-art emulation pods that integrate the functionality of the legacy pod, foot, mask, and Cat-5 cable all into one piece of hardware. This integration creates greater signal integrity through the elimination of connections. Application Note AN2222, Flex-Pod Soldering Guide, is included with each non-DIP Flex-Pod Kit.

Flex-Pod (CY3211-28PDIP)

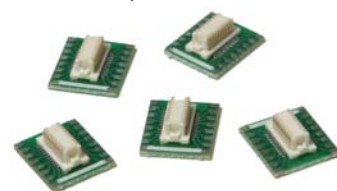


Legacy Pod
Legacy Mask
Legacy Foot

Legacy Feet (CY3207-032)



Flex-Pod Feet (CY3230-16SOIC-AK)



CY3202-C iMAGEcraft C Compiler

The C compiler is included in the CY3215-DK. For use with other kits, the CY3202-C is available as a separate purchase. It is fully integrated into PSoC Designer. PSoC Designer provides source-level debugging to round out its C language support. (No C compiler purchase is necessary for using PSoC Express.)

- ANSI C compiler
- Inline assembly and interface with assembly modules
- Modern stack-based architecture
- 7 basic data types including IEEE 32-bit floating point
- Assembler and linker
- Math and string libraries
- C interrupt service routines
- Librarian

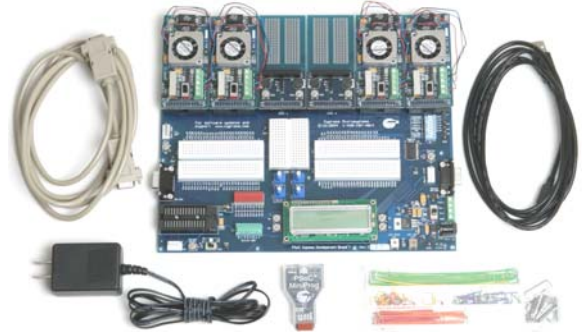


Express Development Kit

CY3210-ExpressDK PSoC Express Development Kit

The CY3210-ExpressDK is for advanced prototyping and development with PSoC Express. It provides access to I2C buses, voltage references, switches, upgradeable modules and more.

- PSoC Express Software CD-ROM
- Express Development Board
- 4 Fan Modules
- 2 Proto Modules
- MiniProg In-System Serial Programmer
- MiniEval PCB Evaluation Board
- Jumper Wire Kit
- USB 2.0 Cable
- Serial Cable (DB9)
- 110 ~ 240V Power Supply, Euro-Plug Adapter
- 2 CY8C24423A-24PXI 28-PDIP Chip Samples
- 2 CY8C27443-24PXI 28-PDIP Chip Samples
- 2 CY8C29466-24PXI 28-PDIP Chip Samples



CY3210-FanMod Fan Module Kit

This kit provides two extra fan modules for use with the CY3210-ExpressDK.



CY3210-ProtoMod Proto Module Kit

This kit provides two extra proto modules for use with the CY3210-ExpressDK.



Emulation Accessory Kits

PSoC Emulation Accessories Overview

The following tables can be used to associate a specific PSoC part with its appropriate Development Kit, Flex-Pod Kit (or Pod Kit and Foot Kit), and YProgrammer Kit. The first table includes the CY8C29x66 and CY8C21x34 kits, which are supported with Flex-Pods. The second table includes the CY8C27x43 and CY8C24x23 kits, which are supported with legacy emulation pods and feet. Flex-Pod Kits include a practice Flex-Pod and a practice PCB, in addition to two Flex-Pods.

Chip Part #	Pin Package	Dev. Kit	Flex-Pod Kit	Foot Kit	YProgrammer
CY8C29466-24PXI	28 PDIP	CY3215-DK	CY3211-28PDIP	CY3230-28PDIP-AK	CY3205-PR
CY8C29466-24PVXI	28 SSOP	CY3215-DK	CY3211-28SSOP	CY3230-28SSOP-AK	CY3205-S3
CY8C29466-24SXI	28 SOIC	CY3215-DK	CY3211-28SOIC	CY3230-28SOIC-AK	CY3205-S2
CY8C29566-24AXI	44 TQFP	CY3215-DK	CY3211-44TQFP	CY3230-44TQFP-AK	CY3205-S5
CY8C29666-24PVXI	48 SSOP	CY3215-DK	CY3211-48SSOP	CY3230-48SSOP-AK	CY3205-S4
CY8C29666-24LFXI	48 MLF	CY3215-DK	CY3211-48MLF	CY3230-48MLF-AK	Use ISSP
CY8C29866-24AXI	100 TQFP	CY3215-DK	CY3211-100TQFP	CY3230-100TQFP-AK	Use ISSP

CY8C24794-24LFXI	56 MLF	CY3215-DK	CY3214-56MLF	CY3230-56MLF-AK	Use ISSP
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Chip Part #	Pin Package	Dev. Kit	Flex-Pod Kit	Foot Kit	YProgrammer
CY8C21234-24SXI	16 SOIC	CY3215-DK	CY3212-16SOIC	CY3230-16SOIC-AK	Use ISSP
CY8C21334-24PVXI	20 SSOP	CY3215-DK	CY3212-20SSOP	CY3230-20SSOP-AK	CY3205-S3
CY8C21434-24LFXI	32 MLF	CY3215-DK	CY3212-32MLF	CY3230-32MLF-AK	Use ISSP
CY8C21534-24PVXI	28 SSOP	CY3215-DK	CY3212-28SSOP	CY3230-28SSOP-AK	CY3205-S3
CY8C21634-24LFXI	32 MLF	CY3215-DK	CY3212-32MLF2	CY3230-32MLF-AK	Use ISSP

CY8C21123-24SXI	8 SOIC	CY3215-DK	CY3213-8SOIC	CY3230-8SOIC-AK	Use ISSP
CY8C21223-24SXI	16SOIC	CY3215-DK	CY3213-16SOIC	CY3230-16SOIC-AK	Use ISSP
CY8C21323-24PVXI	20 SSOP	CY3215-DK	CY3213-20SSOP	CY3230-20SSOP-AK	CY3205-S3
CY8C21323-24LFXI	24 MLF	CY3215-DK	CY3213-24MLF	--	Use ISSP

Chip Part #	Pin Package	Dev. Kit	Pod Kit	Foot Kit	YProgrammer
CY8C27143-24PXI	8 PDIP	CY3215-DK*	CY3207-POD	CY3207-012	CY3205-PR
CY8C27243-24PVXI	20 SSOP	CY3215-DK*	CY3207-POD	CY3207-060	CY3205-S3
CY8C27243-24SXI	20 SOIC	CY3215-DK*	CY3207-POD	CY3207-050	CY3205-S3
CY8C27443-24PXI	28 PDIP	CY3215-DK*	CY3207-POD	CY3207-032	CY3205-PR
CY8C27443-24PVXI	28 SSOP	CY3215-DK*	CY3207-POD	CY3207-080	CY3205-S3
CY8C27443-24SXI	28 SOIC	CY3215-DK*	CY3207-POD	CY3207-070	CY3205-S2
CY8C27543-24AXI	44 TQFP	CY3215-DK*	CY3207-POD	CY3207-105	CY3205-S5
CY8C27643-24PVXI	48 SSOP	CY3215-DK*	CY3207-POD	CY3207-095	CY3205-S4
CY8C27643-24LFXI	48 MLF	CY3215-DK*	CY3207-POD	--	Use ISSP

CY8C24123A-24PXI	8 PDIP	CY3215-DK*	CY3208B-POD	CY3207-012	CY3205-PR
CY8C24123A-24SXI	8 SOIC	CY3215-DK*	CY3208B-POD	CY3208-040	CY3205-S2
CY8C24223A-24PXI	20 PDIP	CY3215-DK*	CY3208B-POD	CY3208-022	CY3205-PR
CY8C24223A-24PVXI	20 SSOP	CY3215-DK*	CY3208B-POD	CY3207-060	CY3205-S3
CY8C24223A-24SXI	20 SOIC	CY3215-DK*	CY3208B-POD	CY3207-050	CY3205-S3
CY8C24423A-24PXI	28 PDIP	CY3215-DK*	CY3208B-POD	CY3207-032	CY3205-PR
CY8C24423A-24PVXI	28 SSOP	CY3215-DK*	CY3208B-POD	CY3207-080	CY3205-S3
CY8C24423A-24SXI	28 SOIC	CY3215-DK*	CY3208B-POD	CY3207-070	CY3205-S2
CY8C24423A-24LFXI	32 MLF	CY3215-DK	CY3208B-32MLF (Flex-Pod Kit)		Use ISSP

*CY3205-DK also compatible

PSoC Emulator Legacy Pod Kits (for non-Flex-Pods)

Emulation pods are available to support all pin counts for a particular package type. The Pod Kit includes the generic pod, masks, feet for all pin counts of a package type, and a chip sample. (The table is arranged into two groups of rows that correspond to the two part families: CY8C27xxx and CY8C24xxx).

Pod Kit Part #	Samples (2 Each)	Masks	Feet	YProgrammer
CY3207-AI	CY8C27543-24AXI	N/A	1 EA 44	CY3205-S5
CY3207-PI	CY8C27143-24PXI, CY8C27443-24PXI	1 EA 8, 20, 28	1 EA 8, 28	CY3205-PR
CY3207-POD	CY8C27443-24PXI	1 EA 28	1 28 DIP	None
CY3207-PVI	CY8C27243-24PVXI, CY8C27443-24PVXI, CY8C27643-24PVXI	1 EA 8/20, 28	1 EA 20, 28, 48	CY3205-S3, CY3205-S4
CY3207-SI	CY8C27243-24SXI, CY8C27443-24SXI	1 EA 8, 20, 28	1 EA 20, 28	CY3205-S2

CY3208B-POD	CY8C24423-24PXI	1 EA 28	1 EA 28	None
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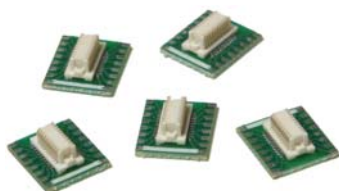
PSoC Emulator Replacement Flex-Pod Feet (for Flex-Pods)

Each Foot Kit includes 5 spare feet. The surface mount feet are soldered to the target PCB and are not reusable. Application Note AN2222a details the soldering process for Flex-Pod feet. Feet are delicate and may easily be damaged. Order enough additional feet to support anticipated prototype requirements. The following table contains the details for the PSoC Feet Kits.

Spare Feet Kit Part #	Foot Print	Chip Part Number			
		CY8C29x66	CY8C24794	CY8C21x34	CY8C21x23
CY3230-8SOIC-AK	8-Pin SOIC	--	--	--	CY8C21123-24SXI
CY3230-16SOIC-AK	16-Pin SOIC	--	--	CY8C21234-24SXI	CY8C21223-24SXI
CY3230-20SSOP-AK	20-Pin SSOP	--	--	CY8C21334-24PVXI	CY8C21323-24PVXI
CY3230-28SOIC-AK	28-Pin SOIC	CY8C29466-24SXI	--	--	--
CY3230-28SSOP-AK	28-Pin SSOP	CY8C29466-24PVXI	--	CY8C21534-24PVXI	--
CY3230-32MLF-AK	32-Pin MLF	--	--	CY8C21434-24LFXI, CY8C21634-24LFXI	--
CY3230-44TQFP-AK	44-Pin TQFP	CY8C29566-24AXI	--	--	--
CY3230-48MLF-AK	48-Pin MLF	CY8C29666-24LFXI	--	--	--
CY3230-48SSOP-AK	48-Pin SSOP	CY8C29666-24PVXI	--	--	--
CY3230-56MLF-AK	56-Pin MLF	--	CY8C24794-24LFXI	--	--
CY3230-100TQFP-AK	100-Pin TQFP	CY8C29866-24AXI	--	--	--

Flex-Pod Kit (CY3212-16SOIC)

Flex-Pod Feet (CY3230-16SOIC-AK)



PSoC Emulator Replacement Legacy Pod Feet (for non-Flex-Pods)

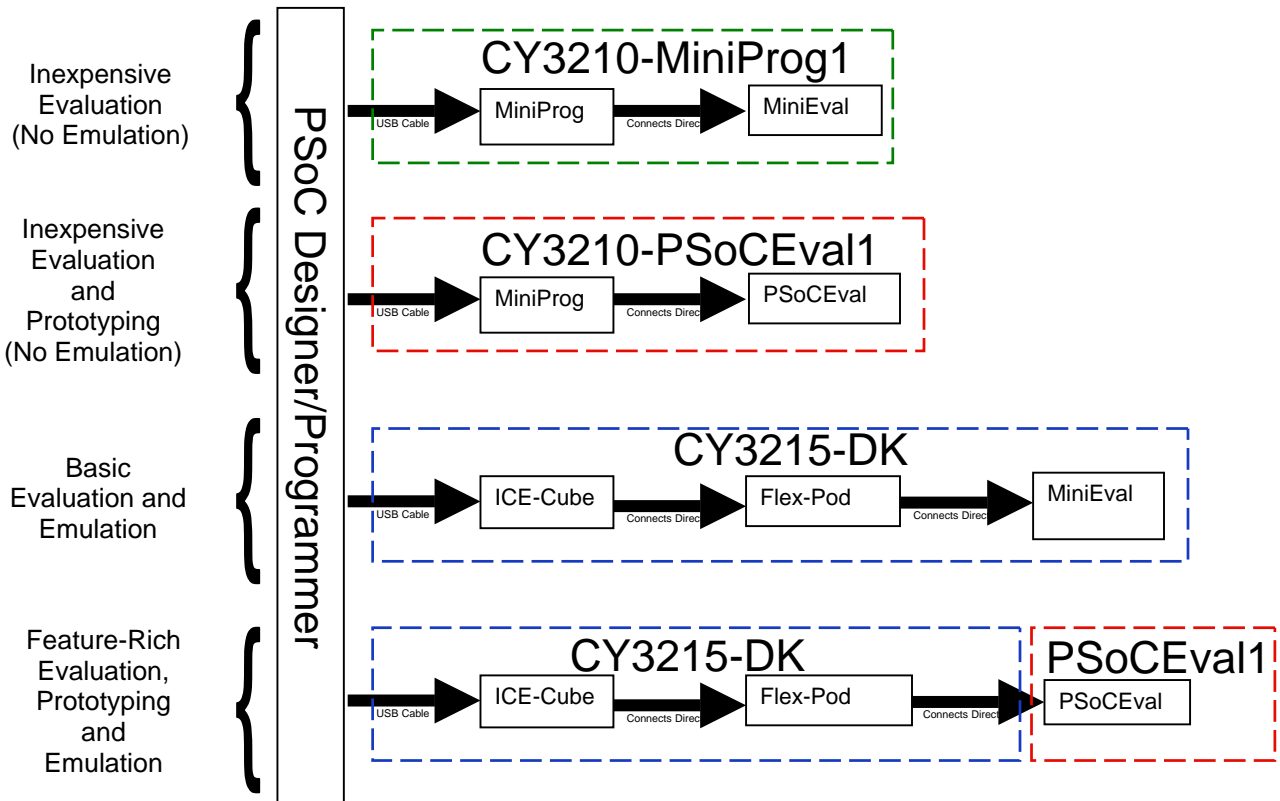
The surface mount feet are soldered to the target PCB and are not reusable. Feet are delicate and may easily be damaged. Order enough additional feet to support anticipated prototype requirements. The following table contains details for the PSoC Feet Kits.

Spare Feet Kit Part #	Description	# of Masks	Chip Part Number	
			CY8C27xxx	CY8C24xxxA
CY3207-012	2 Spare Pod Feet for 8-Pin DIP	1	CY8C27143-24PXI	CY8C24123A-24PXI
CY3207-032	2 Spare Pod Feet for 28-Pin DIP	1	CY8C27443-24PXI	CY8C24423A-24PXI
CY3207-050	10 Spare Pod Feet for 20-Pin SOIC	3	CY8C27243-24SXI	CY8C24223A-24SXI
CY3207-060	10 Spare Pod Feet for 20-Pin SSOP	3	CY8C27243-24PVXI	CY8C24223A-24PVXI
CY3207-070	10 Spare Pod Feet for 28-Pin SOIC	3	CY8C27443-24SXI	CY8C24423A-24SXI
CY3207-080	10 Spare Pod Feet for 28-Pin SSOP	3	CY8C27443-24PVXI	CY8C24423A-24PVXI
CY3207-095	5 Spare Pod Feet for 48-Pin SSOP	N/A	CY8C27643-24PVXI	--
CY3207-105	5 Spare Pod Feet for 44-Pin TQFP	N/A	CY8C27543-24AXI	--
CY3208-022	2 Spare Pod Feet for 20-Pin DIP	1	--	CY8C24223A-24PXI
CY3208-040	2 Spare Pod Feet for 8-Pin SOIC	1	--	CY8C24123A-24SXI

Evaluation Tools

Overview

There are three types of general evaluation methods for the PSoC. The picture below illustrates the device path for these three methods:



CY3210-MiniProg1

This inexpensive evaluation kit allows a user to program PSoC devices via the MiniProg1 programming unit. A MiniEval1 board is also included in the kit. The MiniEval board is a programming and evaluation board that allows socket programming of DIP devices. It also includes LEDs and a POT for simple evaluation and demonstration, but does not include a prototyping area. The MiniProg utilizes a 5-pin ISSP (In-System Serial Programming) header to program PSoC devices on the MiniEval board or directly on a target board. (To learn how to prepare your target board for ISSP, see Application Note AN2014 available at <http://www.cypress.com>.) The MiniProg is small, compact, and connects to the PC via a provided USB 2.0 cable.



Kit Includes:

- MiniProg Programming Unit
- MiniEval Socket Programming and Evaluation Board
- 28-Pin CY8C29466-24PXI PDIP PSoC Device Sample
- 28-Pin CY8C27443-24PXI PDIP PSoC Device Sample
- PSoC Designer Software CD
- Getting Started Guide
- USB 2.0 Cable

CY3210-PSoCEval1

This evaluation kit features an evaluation board and MiniProg1 programming unit. The evaluation board includes an LCD module, Potentiometer, LEDs, and plenty of breadboarding space to meet all of your evaluation needs. The MiniProg1 programming unit will program PSoC devices directly on the evaluation board or on other boards via a 5-pin header. The MiniProg1 is small and compact, and connects to a PC via a provided USB 2.0 Cable.



Kit Includes:

- Evaluation Board with LCD Module
- MiniProg Programming Unit
- 28-Pin CY8C29466-24PXI PDIP PSoC Device Sample (2)
- PSoC Designer Software CD
- Getting Started Guide
- USB 2.0 Cable

CY3214-PSoCEvalUSB

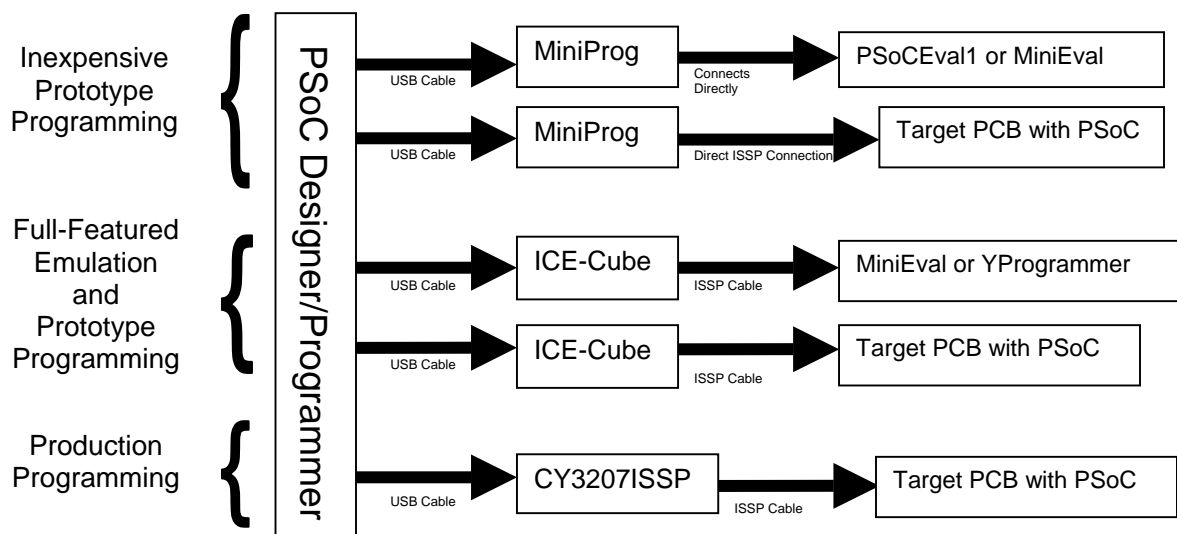
This new evaluation kit is specifically for the CY8C24794. It includes an evaluation board and MiniProg1 programming unit. The evaluation board features an On-Chip Debugger (OCD). The OCD allows full-featured, on-board emulation of the CY8C24794 when combined with an ICE-Cube (available in the CY3215-DK). The board also features USB connectivity and CapSense™ buttons and slider. Also included on the board is an LCD module, potentiometer, LEDs, an enunciator, and plenty of breadboarding space to meet all of your evaluation needs.



Kit Includes:

- CY8C24794 Evaluation Board with LCD Module
- MiniProg Programming Unit
- PSoC Designer Software CD
- PSoC Support CD (with CY8C24794 Example Projects)
- Getting Started Guide
- USB 2.0 Cable

Programming Methods



YProgrammer Kits

YProgrammer boards are used with the ICE to program parts for system prototypes. The YProgrammer board is connected to the ICE via the Cat-5 cable. A single ZIF socket is included.

YProgrammer Part #	Package Type	Chip Part #				
		CY8C29x66	CY8C27x43	CY8C24x23A	CY8C21x34	CY8C21x23
CY3205-PR	8 PDIP	--	CY8C27143-24XPI	CY8C24123A-24PXI	--	--
Use ISSP	8 SOIC	--	--	CY8C24123A-24SXI	--	CY8C21123-24SXI
Use ISSP	16 SOIC	--	--	--	CY8C21234-24SXI	CY8C21223-24SXI
CY3205-PR	20 PDIP	--	--	CY8C24223A-24PXI	--	--
CY3205-S2	20 SOIC	--	CY8C27243-24SXI	CY8C24223A-24SXI	--	--
CY3205-S3	20 SSOP	--	CY8C27243-24PVXI	CY8C24223A-24PVXI	CY8C21334-24PVXI	CY8C21323-24PVXI
Use ISSP	24 MLF	--	--	--	--	CY8C21323-24LFXI
CY3205-PR	28 PDIP	CY8C29466-24PXI	CY8C27443-24PXI	CY8C24423A-24PXI	--	--
CY3205-S2	28 SOIC	CY8C29466-24SXI	CY8C27443-24SXI	--	--	--
CY3205-S3	28 SSOP	CY8C29466-24PVXI	CY8C27443-24PVXI	CY8C24423A-24PVXI	CY8C21534-24PVXI	--
Use ISSP	32 MLF	--	--	CY8C24423A-24LFXI	CY8C21434-24LFXI	--
CY3205-S5	44 TQFP	CY8C29566-24AXI	CY8C27543-24AXI	--	--	--
CY3205-S4	48 SSOP	CY8C29666-24PVXI	CY8C27643-24PVXI	--	--	--
Use ISSP	48 MLF	CY8C29666-24LFXI	CY8C27643-24LFXI	--	--	--
Use ISSP	100 TQFP	CY8C298666-24AXI	--	--	--	--

To accommodate the largest number of pin counts with each board, the largest socket is installed. For example, the CY3205-PR includes a 28-pin DIP socket. It therefore supports 8, 20, and 28-pin DIP parts. The CY3205-S3 includes a 28-pin SSOP socket that can accept both the 20 and 28-pin SSOP parts. The body width of the 48-pin SSOP package is wider than the 20 and 28 pin so the CY3205-S4 is necessary for the 48-pin SSOP parts.

CY3207ISSP

The CY3207ISSP is a production programmer. It includes protection circuitry and an industrial case that is more robust than the MiniProg and the ICE-Cube in a production-programming environment. The CY3207ISSP can program parts in-system or mounted in the socket. Use the table to the right to identify adapters for CY3207ISSP socket programming.

PSoC Foot Print	Emulation Technologies P/N
8-Pin SOIC	AS-08-08-01S-3
16-Pin SOIC	AS-16-16-02S-3
20-Pin SOIC	AS-20-20-01S-3-GANG
28-Pin SOIC	AS-28-28-02S-3
20-Pin SSOP	AS-20-20-01SS-3
24-Pin MLF	AS-24-28-01ML-6
28-Pin SSOP	AS-28-28-02SS-6ENP-GANG
32-Pin MLF	AS-32-28-02ML-6
48-Pin MLF	AS-48-28-02ML-6
48-Pin SSOP	AS-48-48-01SS-6-GANG
56-Pin MLF	AS-56-28-01ML-6
100-Pin TQFP	AS-100-28-01TQ-6

ISSP Overview

The CY3207ISSP, ICE-Cube, and MiniProg1 all allow easy In-System Serial Programming (ISSP). A black cable is included in the Development Kit for ISSP. All designers are encouraged to design their PCBs with an ISSP capability.

ISSP is perfect for prototyping because it allows rapid reprogramming of the PSoC part mounted on the PCB and eliminates the need for a package-specific YProgrammer. ISSP can also be useful in production programming because it eliminates the need for programming individual chips prior to PCB assembly. Often times ISSP is cheaper than using a programming house.



Pictured to the right is an ICE-Cube connected directly to a project PCB (the PSoCEval). ISSP can be done with the small ISSP connector. An ISSP connector is pictured to the left. See Application Notes AN2014 and AN2026, AN2026a, AN2026b for more information on ISSP.



3rd-Party Tools

Several tools have been specially designed to accompany PSoC devices during development and production by the following 3rd-party vendors. Specific details for each of these tools can be found online under **Evaluation Boards >> PSoC** at <http://www.cypress.com>.

RPM Systems Corporation

RPM Systems Corp. of Redmond, Washington announces the release of the MPQ Manufacturing Programmer with support for In-System Programming (ISP) of Cypress PSoC devices. MPQ is a 4-port device programmer intended for medium to high volume in-circuit programming of devices in manufacturing. It features the following capabilities:

- Programs up to four devices simultaneously from one MPQ.
- Connects up to 16 MPQ programmers in parallel to program up to 64 devices simultaneously.
- Stores up to four different device images in programmer Flash.
- Standalone (push-button), PC-controlled and ATE-controlled modes of operation.
- Accommodates nominal target device voltages from 2.7V to 5.0V.
- Extruded aluminum case and rigorous circuit protection to survive manufacturing environments.
- Upgradeable software to accommodate future devices.
- Cable sets to support Cypress standard 5-pin programming connector or RPM standard 6-pin QuISP connector.

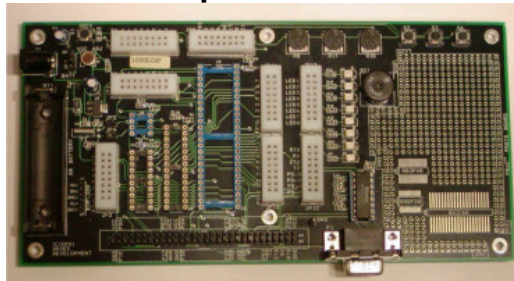
Phone: 425.869.3901 Email: sales@rpmsys.com

RPM Systems Corporation



<http://www.rpmsys.com/mpq.html>

Aries Development



The PSoC PROTO BOARD is a complete standalone development board for evaluating and developing applications using PSoC devices. It was created to give engineers the ability to develop and test applications without creating their own custom board. It is easily configurable to schematically "look like" your end application. It allows development with any PSoC device in a DIP package.

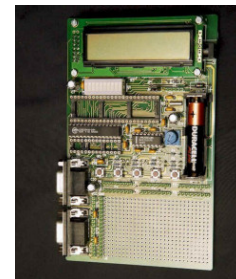
<http://aries-development.com/devtools/PSoC.htm>

Orlin Technology

The OTPSoC Kit enables evaluation and prototyping of the complete family of Cypress Programmable System-on-Chip (PSoC™) devices.

The OTPSoC retains compatibility with Cypress' own PSoC Pup basic evaluation board while adding a wealth of features to allow evaluation of the complete feature-set of the entire PSoC device family.

The OTPSoC fully supports the Cypress PSoC ICE for code debug and both out-of-system and in-system programming. <http://www.orlin.com/OTPSoC.htm>



For information and support on PSoC devices: <http://www.cypress.com/psoc>.

Items may be purchased online at the Cypress Online Store: <http://www.cypress.com/> home page.

Or you can purchase Development Tools from one of Cypress' accredited distributors.