



AVR32 and RISC MCUs

UC3L

Offers up to 256 KB Flash, 16 KB SRAM, 50 MHz performance and is available in 48- and 64-pin options with picoPower® peripherals, CAT module, Full-Speed USB and FlashVault code protection

UC3C

Offers up to 512 KB Flash, 68 KB SRAM, 66 MHz performance and is available in 64-, 100- and 144-pin options with automotive qualification, FPU, Ethernet, USB, dual CAN, dual LIN and FlashVault code protection

UC3D

Offers up to 128 KB Flash, 16 KB SRAM, 48 MHz performance and is available in 48- and 64-pin options with hardware QTouch® technology, Full-Speed USB and CAT module

UC3A3/A4

Offers up to 256 KB Flash, 128 KB SRAM, 84 MHz performance and is available in 100- and 144-pin options with Hi-Speed USB, NAND Flash and SDRAM interface, SD/SDIO, AES and crypto module

UC3A0/A1

Offers up to 512 KB Flash, 64 KB SRAM, 66 MHz performance and is available in 100- and 144-pin options with Ethernet MAC, USB and SDRAM interfaces

UC3B

Offers up to 512 KB Flash, 96 KB SRAM, 60 MHz performance and is available in 48- and 64-pin options with USB and I²S

SAM 7 Series

SAM 7S

Offers up to 512 KB of dual-bank Flash, 64 KB SRAM, 55 MHz performance and available in 48- and 64-pin options with Full-Speed USB, SPI, USART, I²C and 10-bit ADC

SAM 7SE

Offers up to 512 KB of dual-bank Flash and 32 KB SRAM, 55 MHz performance and available in 128- and 144-pin options with EBI (supports static memory, NAND, CompactFlash® and SDRAM), Full-Speed USB, USART, SPI, I²C and 10-bit ADC

SAM 7X

Offers up to 512 KB dual-bank Flash, 128 KB SRAM, 55 MHz performance and available in 100-pin options with Full-Speed USB, Ethernet MAC, CAN 2.0A and 2.0B, USART, SPI, I²C and 10-bit ADC

SAM 7XC

Offers up to 512 KB dual-bank Flash, 128 KB SRAM, 55 MHz performance and is available in a 100-pin option with two crypto blocks, Full-Speed USB, Ethernet MAC, CAN 2.0A and 2.0B, USARTs, SPI, I²C and 10-bit ADC

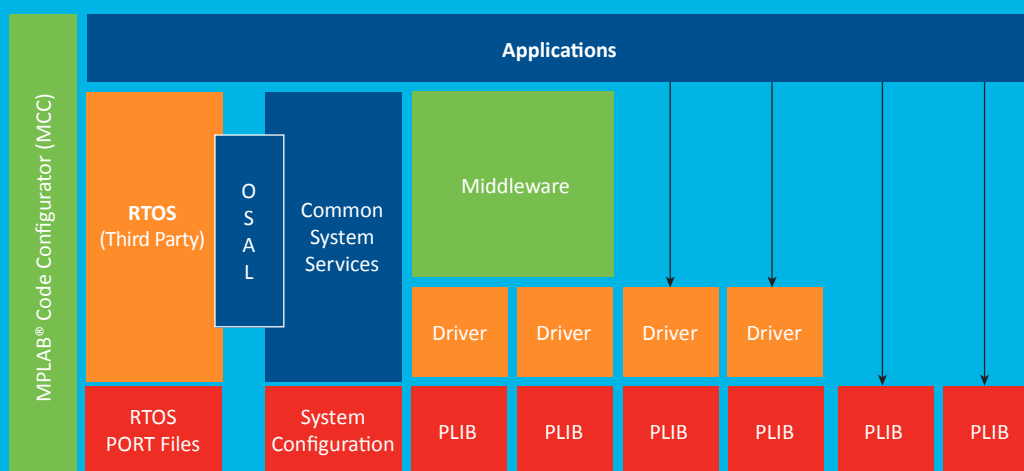


MPLAB Harmony v3 Embedded Software Development Framework

The MPLAB Harmony Software Framework is a unified and powerful content development and delivery environment that includes optimized peripheral libraries, simplified drivers and modular software downloads. It works with MPLAB X Integrated Development Environment (IDE) to enhance your application development experience.

MPLAB Harmony provides flexible choices that span different architectures, performance levels and applications. It enables you to develop robust, interoperable, Real-Time Operating System (RTOS)-friendly applications and offers quick and extensive support for third-party software integration. Use it with MPLAB Code Configurator (MCC), our free graphical programming environment, to generate seamless, easy-to-understand C code that can be used in your application development. MCC includes a modular download manager and can be used to select and configure all MPLAB Harmony middleware, system services and peripherals.

MPLAB Harmony Block Diagram



Key Benefits

- Core-agnostic implementation that supports MIPS and Arm Cortex core architectures
- 1000+ demo/application examples
- A variety of reference applications/examples
- Easily configurable using MCC's Graphical User Interface (GUI)
- Layered and self-contained framework includes:
 - Peripheral libraries: hardware abstraction layer
 - Drivers and services
 - Reusable middleware
 - Supports 32-bit PIC® (MIPS-based) and SAM (Arm Cortex-based) MCU and MPU device families
 - Fully integrated with third-party solutions

MPLAB Harmony Resources



MPLAB Harmony Middleware Repositories

Audio Library: This repository contains a variety of audio drivers, encoders, decoders and firmware projects. Each example application project describes its hardware setup, block diagram, requirements, hardware compatibility and operation.

Bluetooth Library: This repository contains the MPLAB Harmony v3 Bluetooth Package. It supports a fast-to-market Bluetooth development environment for 32-bit SAM and PIC MCUs.

Cryptography Library: The cryptography library includes functions to perform encryption, decryption, hashing, authentication and compression within an embedded application. It also comes with Random Number Generation (RNG) functions.

Graphics Library: The graphics repository contains the files for MPLAB Harmony Graphics Suite quick-start applications, drivers, tools, libraries and templates.

Wireless Wi-Fi® Library: This repository contains Wi-Fi solutions that will enable you to incorporate connectivity quickly into your designs. We also offer wireless ICs, modules, software and development kits that make connecting effortless for your customers.

Motor Control Library: This module contains motor control demonstrations implemented on 32-bit microcontrollers.

Touch Library: Use this software library for developing touch applications on 32-bit microcontrollers with a Peripheral Touch Controller. The library supports both self-capacitance and mutual-capacitance acquisition methods.

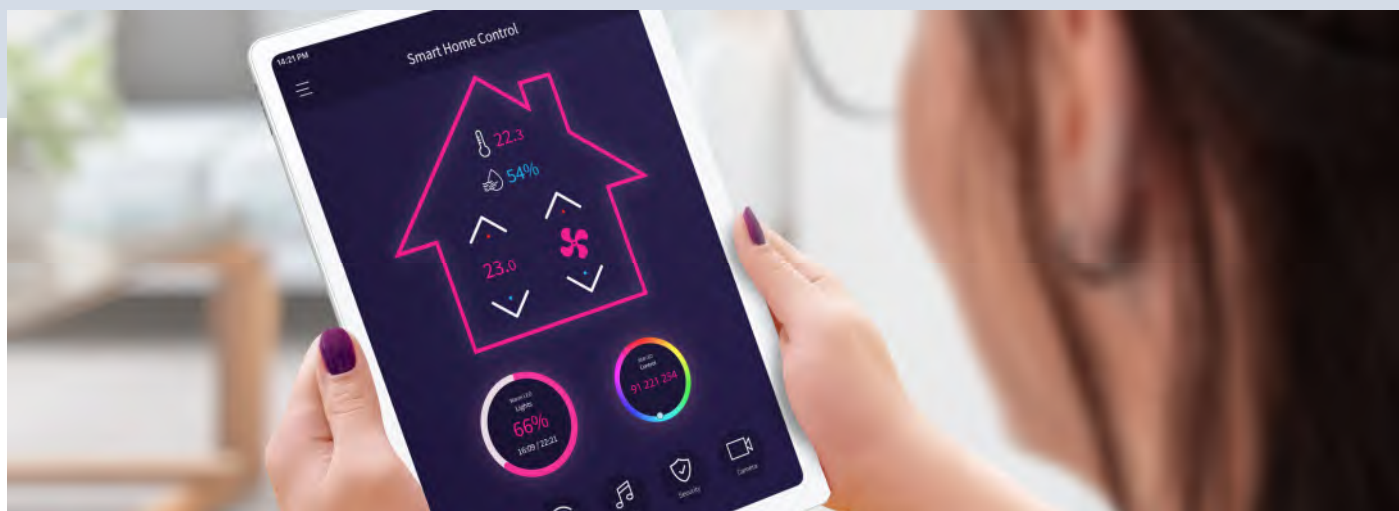
Networking (TCP/IP) Library: This repository provides a fast-to-market TCP/IP stack for 32-bit PIC and SAM microcontrollers. It contains multiple applications that demonstrate communication over TCP/IP using well-known protocols such as TCP, UDP, HTTP and SMTP.

USB Library: The USB module provides USB controller drivers for 32-bit PIC and SAM devices, as well as host and device middleware with support for common device classes.



Device Setup Repositories

Core	The core module components provide the simple-to-use abstractions of 32-bit SAM and PIC device peripherals and shared resources on which the MPLAB Harmony middleware is based, including drivers, services and the Operating System Abstraction Layer (OSAL).
Chip Support Package (CSP)	The CSP module contains independent, low-level Peripheral Libraries (PLIBs) that are simple functions to initialize and control peripherals and basic device features on which MPLAB Harmony drivers and services are based. The CSP supports initialization of 32-bit devices and development of simple applications that directly control peripheral hardware with minimal external dependencies.
Board Support Package (BSP)	The BSP module provides initial configuration settings for PIC and SAM Xplained development boards.
MPLAB® Code Configurator (MCC)	This GUI-based configuration utility accelerates the development of embedded applications using 32-bit SAM and PIC devices.
Bootloader	The bootloader module components provide a framework to develop bootloaders for microcontrollers. The Bootloader Library can be used to upgrade firmware on a target device without requiring an external programmer or debugger.



Functional Safety

Our 32-bit MCUs offer a wide range of functional safety support focused on the following standards:

- ISO 26262 for automotive applications
- ISO 61508 for industrial applications
- IEC 60730 for household appliance applications

We offer a complete set of functional safety collateral for each standard as well as third-party certifications.

32-bit MCU Functional Safety Portfolio	Description	CPU Frequency (MHz)	AEC-Q100	ISO 26262 Automotive Safety	IEC 60730 (Class B)	IEC 61508 (SIL 2/3)
SAM DA1	Arm® Cortex®-M0+ core, 16–64 KB Flash	48	✓	✓	-	-
SAM D21	Arm Cortex-M0+ core, 16–256 KB Flash	48	✓	✓	✓	✓ ¹
SAM D20	Arm Cortex-M0+ core, 16–256 KB Flash	48	✓	-	✓	-
SAM C20/C21	Arm Cortex-M0+ core, 32–256 KB Flash, 5V	48	✓	✓	✓	✓ ¹
SAM C20N/C21N	Arm Cortex-M0+ core, 32–256 KB Flash, 5V	48	✓	✓	-	✓ ¹
PIC32CM MC	Arm Cortex-M0+ core, 64–128 KB Flash, 5V	48	✓	✓	✓	✓ ¹
SAM L21	Arm Cortex-M0+ core, 32–256 KB Flash	48	-	-	-	✓ ¹
PIC32CM JH	Arm Cortex-M0+ core, 256–512 KB Flash	48	✓	✓	✓	✓ ²
SAM D51/E5x	Arm Cortex-M4F core, 512–1024 KB Flash	120	✓	✓	✓	✓ ²
PIC32CX SG	Arm Cortex-M4F core, 512–1024 KB Flash	120	✓	✓	✓	✓ ²
PIC32CK SG	Arm Cortex-M33 core, 512–2048 KB Flash	120	✓	✓	-	✓ ²
PIC32MK MC/GP	MIPS32® microAptiv™ core, 512–2048 KB Flash	120	✓	✓	-	✓ ²
SAM S70/E70	Arm Cortex-M7 core, 512–2048 KB Flash	300	-	-	✓	✓ ²
SAM V70/V71	Arm Cortex-M7 core, 512–2048 KB Flash	300	✓	✓	-	-
PIC32CZ CA	Arm Cortex-M7 core, 2048–8192 KB Flash	300	✓	✓	-	✓ ²

IEC 61508 Industrial Safety Notes:

1. Third-party SIL 2/3 STL developed by embex

2. Microchip-developed SIL 2 STL

Please contact your local Microchip sales office for the current safety and security schedules for our 32-bit MCUs.

Available Now

In Development

Planned



Developing With SAM, PIC32C, and AVR32 Microcontrollers

Development Platforms

Xplained Platforms

Our Xplained prototyping and evaluation platform speeds up the development of projects using our Arm Cortex-based SAM, PIC32C, and AVR32 MCUs. These low-cost, easy-to-use evaluation kits are excellent for demonstrating the features and capabilities of your selected device and can be customized with a wide range of extension boards. We also offer a variety of example projects and code drivers to simplify your development. We offer the following families of Xplained boards:

- **Xplained:** This platform supports fast prototyping and evaluation for designs using AVR32 and SAM MCUs.
- **Xplained Pro:** This professional platform features auto-identification, an on-board debugger and standardized extension connectors.
- **Xplained Mini:** This ultra-low-cost platform is excellent for evaluating low-pin-count parts. It features auto-identification, an on-board debugger and access to all device pins.
- **Xplained Ultra:** This evaluation platform for high-end MCUs provides access to high-speed data and external memory interfaces, CCL, intelligent low-power peripheral event system.

Xplained Platform

Product Family	Board	Part Number
SAM E	SAM E70 Xplained	ATSAME70-XPLD

Xplained Pro Platform

Product Family	Board	Part Number
SAM C	SAM C21 Xplained Pro	ATSAMC21-XPRO
	SAM C21N Xplained Pro	ATSAMC21N-XPRO
SAM D	SAM DA1 Xplained Pro	ATSAMDA1-XPRO
	SAM D11 Xplained Pro	ATSAMD11-XPRO
	SAM D20 Xplained Pro	ATSAMD20-XPRO
	SAM HA1G16A Xplained Pro	ATSAMHA1G16A-XPRO
	SAM D21 Xplained Pro	ATSAMD21-XPRO
SAM L	SAM L10 Xplained Pro	DM320204
	SAM L11 Xplained Pro	DM320205
	SAM L21 Xplained Pro	ATSAML21-XPRO-B
	SAM L22 Xplained Pro	ATSAML22-XPRO-B
SAM G	SAM G55 Xplained Pro	ATSAMG55-XPRO
SAM 4	SAM 4E Xplained Pro	ATSAM4E-XPRO
	SAM 4L8 Xplained Pro	ATSAM4L8-XPRO
	SAM 4N Xplained Pro	ATSAM4N-XPRO
	SAM 4S Xplained Pro	ATSAM4S-XPRO
	SAM 4S Xplained Pro Starter Kit	ATSAM4S-XSTK
SAM D5/E5	SAM E54 Xplained Pro	ATSAME54-XPRO

Xplained Mini Platform

Product Family	Board	Part Number
SAM D	SAM D10 Xplained Mini	ATSAMD10-XMINI

Xplained Ultra Platform

Product Family	Board	Part Number
SAM V	SAM V71 Xplained Ultra	ATSAMV71-XULT
SAM E	SAM E70 Xplained Ultra	DM320113

Legacy Xplained Platform

Product Family	Board	Part Number
AVR32	UC3-A3 Xplained	AT32UC3A3-XPLD
	UC3-L0 Xplained	AT32UC3L0-XPLD



Curiosity Platform

Our Curiosity platform is a fully integrated development solution that is targeted at first-time users, makers and anyone seeking a feature-rich rapid prototyping board.

Curiosity Platform

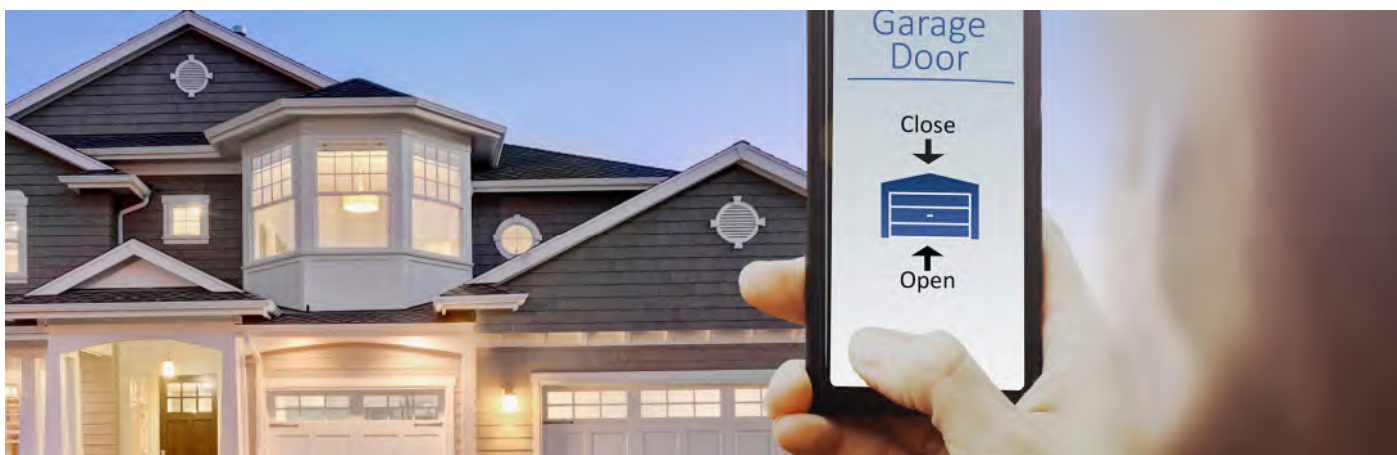
Product Family	Board	Part Number
SAM G	SAM G55 Audio Curiosity Board	EV78Y10A
SAM D	SAM D21 Curiosity Nano Evaluation Kit	DM320119
SAM D5/E5	SAM E54 Curiosity Ultra Development Board	DM320210
	SAM E51 Curiosity Nano Evaluation Kit	EV76S68A
PIC32CM	PIC32CM MC00 Curiosity Pro Evaluation Kit	EV15N46A
	PIC32CM MC Curiosity Nano Evaluation Kit	EV10N93A
	PIC32CM LE00 Curiosity Pro Evaluation Kit	EV80P12A
	PIC32CM LS00 Curiosity Pro Evaluation Kit	EV12U44A
	PIC32CM LS60 Curiosity Pro Evaluation Kit	EV76R77A
	PIC32CM JH01 Curiosity Pro Evaluation Kit	EV81X90A
PIC32CX	PIC32CX SG61 Curiosity Ultra Evaluation Board	EV09H35A
	PIC32CX SG41 Curiosity Ultra Evaluation Board	EV06X38A

IoT Cloud Platform

This plug-and-play platform for designing secure, cloud-connected systems features a SAM D21 MCU.

IoT Cloud Platform

Product Family	Board	Part Number
SAM D	SAM D21 IoT WG Development Board	EV75S95A



Extension Boards

Application	Extension Board	Part Number
Connectivity	WINC1500 Xplained Pro (Wi-Fi®)	ATWINC1500-XPRO
	WINC3400 Xplained Pro	ATWINC3400-XPRO
	WBZ451 Curiosity Development Board	EV96B94A
	Ethernet1 Xplained Pro	ATETHERNET1-XPRO
	PIC32 WFI32E Curiosity Board	EV12F11A
	WFI32-IoT Development Board	EV36W50A
	ATWILC1000-SD Evaluation Kit	ATWILC1000-SD
Touch and Graphics	QT1 Xplained Pro	ATQT1-XPRO
	QT2 Xplained Pro	ATQT2-XPRO
	QT3 Xplained Pro	ATQT3-XPRO
	QT4 Xplained Pro	ATQT4-XPRO
	QT6 Xplained Pro	ATQT6-XPRO
	QT7 Xplained Pro	ATQT7-XPRO
	T10 Xplained Pro Extension Kit	AC47H23A
	Curiosity Nano Touch Adapter	AC80T88A
	SAM E5x Graphics and Touch Curiosity Development Board	EV14C17A
	SLCD1 Xplained Pro	ATSLCD1-XPRO
	QT8 Xplained Pro Extension Kit	AC164161
	PIC32CM LE00 ULP Touch	EV55S83A
General Purpose	OLED1 Xplained Pro	ATOLED1-XPRO
	Curiosity Nano Base for Click boards™	AC164162
	PROTO1 Xplained Pro	ATPROTO1-XPRO
	I/O1 Xplained Pro	ATIO1-XPRO
	BNO055 Xplained Pro	ATBNO055-XPRO
Security	CryptoAuth Xplained Pro Version B	ATCRYPTOAUTH-XPRO-B
	CryptoAuth Trust Platform Development Kit	DM320118
	SAM D21 ML Evaluation Kit with TDK InvenSense 6-Axis MEMS	EV18H79A
	SAM D21 ML Evaluation Kit with BOSCH IMU	EV45Y33A
	TA100 14-pin SOIC CryptoAutomotive™ Security IC Socket Board	AC164166
	TA100 8-pin SOIC CryptoAutomotive Security IC Socket Board	AC164167



Motor Control Plug-in Modules (PIMs)

Product Family	PIM	Part Number
SAM E70	ATSAME70 Motor Control Plug-In Module*	MA320203
SAM C21	ATSAMC21 Motor Control Plug-In Module*	MA320206
SAM E54	ATSAME54 Motor Control Plug-In Module*	MA320207
PIC32CM	PIC32CM MC00 Motor Control Plug-In Module	EV94F66A
PIC32MK	PIC32MK MCA Motor Control Plug-In Module	EV74U93A

*Works with MCHV-2 (DM330023-2) and MCLV-2 (DM330021-2) Motor Control Development Boards

Programming and Debugging Tools

Programmer/Debugger	Part Number
MPLAB® Snap In-Circuit Debugger	PG164100
MPLAB PICKIT™ 5 In-Circuit Debugger	PG164150

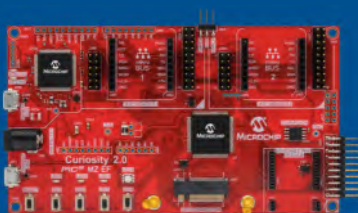


Developing With PIC32M Microcontrollers

32-bit Starter Kits and Curiosity Development Kits

Getting started with one of our 32-bit PIC32M MCUs is easy with one of our fully integrated starter kits or Curiosity boards. We also include application demos, software libraries and Board Support Packages (BSP) for faster development.

Featured Product: Curiosity PIC32MZ EF 2.0 Development Board (DM320209)



The Curiosity PIC32 MZ EF 2.0 Development Board is a fully integrated 32-bit development platform featuring the high-performance PIC32MZ EF series of MCUs. This development board comes with an integrated programmer and debugger and is available with a variety of expansion options, including a mikroBUS™ socket. It is an excellent option for developing Ethernet, Wi-Fi, IoT, audio, graphics and general-purpose embedded control applications.



Starter Kits and Curiosity Boards

Product Family	Starter Kits and Curiosity Boards	Part Number
PIC32MK	PIC32MK MCA Curiosity Pro	EV15D86A
	PIC32MK MCJ Curiosity Pro Development Board	DT100133
	PIC32MK MCM Curiosity Pro Development Board	EV31E34A
PIC32MM	PIC32MM USB Curiosity Development Board	DM320107
	PIC32MM Curiosity Development Board	DM320101
PIC32MX1/2/5	PIC32MX1/2/5 Starter Kit	DM320100
	Microstick II	DM330013-2
	PIC32MX274 XLP Starter Kit	DM320105
PIC32MX3/4	Curiosity PIC32MX Development Board	DM320103
	PIC32 USB Starter Kit III	DM320003-3
	PIC32 Starter Kit	DM320001
PIC32MX5/6/7	PIC32 Ethernet Starter Kit II	DM320004-2
PIC32MZ	Curiosity 2.0 PIC32MZ Development Board	DM320209
	PIC32MZ with FPU Embedded Connectivity Starter Kit	DM320007
	PIC32MZ with FPU Embedded Connectivity Starter Kit with Crypto Engine	DM320007-C
	PIC32MZ Embedded Graphics with External DRAM (DA) Starter Kit	DM320008
	PIC32MZ Embedded Graphics with External DRAM (DA) Starter Kit (Crypto)	DM320008-C
	PIC32MZ DA Curiosity Development Kit	EV87D54A



Plug-In Module (PIM) Platforms

Development Boards

Board	Part Number
Motor Control MCHV-3 Development Board	DM330023-3
Explorer 16/32 Development Board	DM240001-2
Motor Control MCHV-2 Development Board	DM330023-2
Motor Control MCLV-2 Development Board	DM330021-2

PIMs

Product Family	PIM	Part Number
PIC32MK	PIC32MK1024 Motor Control Plug-In Module*	MA320024
	PIC32MK MCM Motor Control Plug-In Module*	MA320211
PIC32MM	PIC32MM0064GPL036 Plug-In Module	MA320020
	PIC32MM0256GPM064 Plug-In Module	MA320023
PIC32MX1/2/5	PIC32MX250F128D Plug-In Module	MA320011
	PIC32MX270F256D Plug-In Module	MA320014
	PIC32MX570F512L Plug-In Module	MA320015
	PIC32 XLP Plug-In Module	MA320021
PIC32MX3/4	PIC32MX360F512L Plug-In Module	MA320001
	PIC32MX460F512L Plug-In Module	MA320002
	PIC32MX450/470 Plug-In Module	MA320002-2
PIC32MX5/6/7	PIC32MX795F512L Plug-In Module	MA320003
PIC32MZ	PIC32MZ with FPU Plug-In Module	MA320019

*Works with MCHV-2 (DM330023-2), MCLV-2 (DM330021-2) and MCHV-3 (DM330023-3) Motor Control Development Boards



PICtail™ Plus Daughter Boards

Application	Board	Part Number
CAN	CAN/LIN PICtail Plus Daughter Card	AC164130-2
USB	USB PICtail Plus Daughter Card	AC164131
Ethernet	Ethernet PICtail Plus Daughter Card	AC164123
	Fast 100 Mbps Ethernet PICtail Plus Daughter Card	AC164132
Wi-Fi®	MRF24WN0MA Module	AC164153
	MRF24WG0MA Module	AC164149
	WINC1500 Module	AC164156

*Note: Starter Kits require I/O Expansion Board (DM320002) to connect PICtail Plus daughter cards.

Expansion Boards and Development Kits

Board	Part Number
I/O Expansion Board	DM320002
High-Performance 4.3" WQVGA Display Module with maXTouch® Technology	AC320005-4
High-Performance WVGA LCD Display Module with maXTouch Technology	AC320005-5
KSZ8863 Ethernet PHY Daughter Board	AC320004-7
565 LCD Adapter Graphics Card	AC320212
SSD1963 LCD Controller Graphics Card	AC320214
maXTouch® Curiosity Pro Board	AC320007
24-bit Pass-Through Graphics Card	AC320213

Emulators and Debuggers

Emulator/Debugger	Part Number
MPLAB® PICKit™ 5 In-Circuit Debugger	PG164150
MPLAB ICD 5 In-Circuit Debugger	DV164055
MPLAB Snap In-Circuit Debugger	PG164100

Reference Designs and Solutions Pages

To accelerate your prototyping and development, we provide an array of online reference designs and solutions that highlight a selection of our products and technologies. These designs range from implementing the basic functional elements of an application up to creating an entire subsystem. Each of these proven hardware and software solutions includes an evaluation kit, firmware source code, hardware design files and user guides.

Reference Design	MCU Family	Featured Microchip Products
IoT Smart Asset Monitor	PIC32CM MC00	ATECC608B ATWINC1510
IoT Smart Appliance Control	PIC32CM MC00 SAM C21 SAM E51	EMC2301 BM70 MIC33050 MCP73871
SD Card USB Data Logger	SAM D21 SAM L21	AT30TSE758A
Thermal Camera Heat Map	PIC32MZ EF SAM E70	LAN8740A ATWINC1510
Bluetooth® Low Energy-Based Weather Station	M D21 SAM L21	MCP73830 BM70/71
Location-Tagged SOS, Asset or Vehicle Tracking	SAM D21	AT27C4096
Motion Surveillance	SAM E70 SAM E54	LAN8740A ATWINC1510 AC243008
Audio Player/Recorder	PIC32C	MCP4725
SD Card/USB Audio Player	PIC32C	ATMXT144UD-A
Snake Game with Graphics	PIC32MZ EF	MCP3204 SSD1963
USB Mass Storage Device for Multiple Drives	PIC32MX	
Vending Machine	SAM E54	MIC2184 KSZ8091 SST2xVF
Wi-Fi® Remote Control for Lighting or Appliances	PIC32MZ EF	HV96001 WINC3400

Visit the [Reference Designs](#) area on our website to explore more solutions.

Package Options

Package	Size (mm)	Pin Count
QFN	4 × 4	24
	5 × 5	32
	5 × 5	40
	6 × 6	28
	6 × 6	36
	6 × 6	48
	7 × 7	48
	8 × 8	44
	9 × 9	64
UFBGA	5 × 5	64
	6 × 6	100
	6 × 6	144
VFBGA	7 × 7	100
WLCSP	1.9 × 2.4	20
	2.2 × 2.2	27
	2.8 × 2.6	35
	2.7 × 2.7	45
	2.79 × 2.79	32
	2.84 × 2.84	49
	3.2 × 3.4	56
	5.2 × 5.3	64
Thin WLCSP	4.4 × 4.7	64

	Package Size (mm)	Pin Count
TFBGA	7 × 7	100
	7 × 7	144
	10 × 10	121
LFBGA	11 × 11	144
	15 × 15	208
	15 × 15	288
VFBGA	7 × 7	32
	7 × 7	48
	10 × 10	44
	10 × 10	64
	12 × 12	100
	14 × 14	100
	14 × 14	128
	16 × 16	144
LQFP	20 × 20	176
	20 × 20	144
SOIC	3.9 × 8.7	14
	7.5 × 12.8	20
	7.5 × 17.9	28
SSOP	5.3 × 10.2	28
	5.3 × 8.2	24
SPDIP	7.3 × 34.7	28

Terminology

AC	Analog Comparator
ADC	Analog-to-Digital Converter
AES	Advanced Encryption Standard
AFE	Analog Front End
BOR	Brown-out Reset
CAT	Capacitive Touch
CCL	Configurable Custom Logic
CDAC	Control Digital-to-Analog Converter
CFD	Clock Failure Detection
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
DAC	Digital-to-Analog Converter
DES	Data Encryption Standard
DIVAS	Division and Square Root Accelerator
DMA	Direct Memory Access
DSP	Digital Signal Processing
EBI	External Bus Interface
ECC	Error Correction Code
eMMC	Embedded MultiMediaCard
FPU	Floating Point Unit
GCM	Galois/Counter Mode
GPU	Graphics Processing Unit
HSM	Hardware Security Module
HSMCI	High-Speed MultiMediaCard Interface
ICM	Integrity Check Monitor
LCCG	Low-Cost Controllerless Graphics
MAC	Media Access Controller
MBIST	Memory Built-in Self-Test

NVM	Nonvolatile Memory
QEI	Quadrature Encoder Interface
PAC	Peripheral Access Controller
PDEC	Positional Decoder
PMP	Parallel Master Port
POR	Power-on Reset
PPS	Peripheral Pin Select
PTC	Peripheral Touch Controller
PUKCC	Public Key Cryptography Controller
PWM	Pulse-Width Modulation
QSPI	Quad Serial Peripheral Interface
RAM	Random Access Memory
RTC	Real-Time Clock
RTCC	Real-Time Clock/Calendar
SD	Secure Digital
SDADC	Sigma-Delta Analog-to-Digital Converter
SDIO	Secure Digital Input/Output
SERCOM	Serial Communication
SHA	Secure Hash Algorithm
SDHC	Secure Digital Host Controller
SLCD	Segment LCD
SiP	System in Package
TC	Timer/Counter
TCM	Tightly Coupled Memory
TDES	Triple Data Encryption Standard
TRNG	True Random Number Generator
WDT	Watchdog Timer
XLP	eXtreme Low Power



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