High-Performance PIC32MZ with Floating Point Unit (FPU) Embedded Connectivity Family

**Summary**

The PIC32MZ with FPU Embedded Connectivity family offers a high-performance MCU with MIPS32 M-Class core running at 200 MHz/330 DMIPS. The core features an FPU for fast, single- and double-precision math and enhanced DSP functionality with four 64-bit accumulators, single-cycle MAC and a 5-stage pipeline. It is coupled with up to 2 MB Flash and 512 KB SRAM and several on-board advanced peripherals including I²S/SPI for audio; 8-/16-bit Parallel Master Port (PMP) and External Bus Interface (EBI) for graphics or external memory; 48-channel, 12-bit Analog-to-Digital Converter (ADC); Hi-Speed USB 2.0-compliant Device/Host/OTG; 10/100 Mbps Ethernet MAC; Serial Quad Interface (SQI) for serial devices and Crypto Engine for reduced software overhead and easy execution of encryption/decryption.

**Key Features**

- 200 MHz/330 DMIPS MIPS32 M-Class core
- Up to 2 MB dual-panel Flash for live update support
- Floating Point Unit for fast single- and double-precision math
- DSP enhanced core:
  - Four 64-bit accumulators
  - Single-cycle MAC
- 12-bit, 12 Mpsps, 48-channel ADC
- Memory management unit for optimum embedded OS execution
- microMIPS™ mode for up to 35% code compression
- CAN, UART, I²C, PMP, EBI, SQI and analog comparators
- SPI/I²S interfaces for audio processing and playback
- Hi-Speed USB Device/Host/OTG
- 10/100 Mbps Ethernet MAC with MII and RMII interface
- Temperature range: −40 to 85°C; −40 to 125°C
- AEC-Q100 REVG (Grade 1-40 to 125°C)
- Class B safety library, IEC 60730 (planned)

*High frequency (250 MHz) option available for I-temp (−40 to 85°C) version only. For a complete list of high-frequency PIC32MZ devices, please visit www.microchip.com/pic32.

**MPLAB® Harmony for PIC32 MCUs**

MPLAB Harmony is a flexible, abstracted, fully integrated firmware development environment for PIC32 microcontrollers. It enables robust framework development of interoperable RTOS-friendly libraries with quick and extensive Microchip support for third-party software integration. MPLAB Harmony includes a set of peripheral libraries, drivers and system services that are readily accessible for application development. The code development format allows for maximum re-use and reduces time to market. It features the MPLAB Harmony Configurator (MHC) plug-in that provides a graphical way to select and configure all MPLAB Harmony components including middleware, system services and peripherals with ease.

www.microchip.com/32bit
## Featured PIC32MZ Devices with Floating Point Unit*

<table>
<thead>
<tr>
<th>Device</th>
<th>Flash (Kb)</th>
<th>Extra Flash (Kb)</th>
<th>SRAM (KB)</th>
<th>Pin Count</th>
<th>Speed (MHz)</th>
<th>SPI**/PWM</th>
<th>I/F</th>
<th>UART</th>
<th>DMA Channels</th>
<th>General Dedicated</th>
<th>PPS</th>
<th>USB Full-Speed</th>
<th>10/100 Ethernet</th>
<th>CAN2/2B</th>
<th>ADC</th>
<th>S/H</th>
<th>Analog Comparator</th>
<th>Timer 16/32-bit</th>
<th>JTAG Program, Debug, Boundary Scan</th>
<th>Encryption</th>
<th>Temp. Range (°C)</th>
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*For a complete list of PIC32MZ devices with FPU, please visit www.microchip.com/pic32.
**High frequency (250 MHz) option available for f×temp (1–40 to 85°C) version only. For a complete list of high-frequency PIC32MZ devices, please visit www.microchip.com/pic32.

### Development Tools

#### PIC32MZ with FPU Embedded Connectivity Starter Kits (DM320007/DM320007-C)

This kit boasts an on-board 200 MHz, 2 MB Flash PIC32MZ with FPU, 12-bit ADC, Hi-Speed USB, CAN, Ethernet, EBI, SQI and more. The kit also features a plug-in interface that can accommodate various 10/100 Ethernet PHY transceiver daughter boards for prototyping and development in addition to a 40-pin expansion connector. Two versions of the starter kit are available: one with an on-chip crypto engine (DM320007-C) and one without (DM320007).

#### PIC32MZ2048 EF Plug-In Module (PIM) (MA320019)

This PIM enables USB, Ethernet, CAN and general purpose embedded control development using the Explorer 16 Development Board.

### Package Options

- 64-lead QFN (MR)
  - 9 x 9 x 0.9 mm
- 64-lead TQFP (PT)
  - 10 x 10 x 1 mm
- 100-lead TQFP (PT)
  - 12 x 12 x 1 mm
- 100-lead TQFP (PF)
  - 14 x 14 x 1 mm
- 124-lead VTFA (TL)
  - 9 x 9 x 0.9 mm
- 144-lead TQFP (PH)
  - 16 x 16 x 1 mm
- 144-lead LQFP (PL)
  - 20 x 20 x 1.4 mm

### PIC32MZ2048 EF Audio PIM (MA320018)

This PIM enables Bluetooth and digital audio development using the PIC32 Bluetooth Audio Development Kit.

**Note:** This PIM is not compatible with the Explorer 16 Development Board.

### Curiosity PIC32MZ EF Development Board (DM320104)

This board is a cost-effective, fully integrated 32-bit development platform featuring the high-performance PIC32MZ EF series with an integrated FPU and crypto acceleration hardware. It includes an integrated programmer/debugger and an on-board MRF24WN-0MA-I/RM100 Wi-Fi® N module. The board is fully integrated with MPLAB® X IDE and MPLAB Harmony framework. The board fully supports Cloud-based MPLAB Xpress IDE development and offers expansion capabilities making it a great choice for developing IoT, connectivity, security and general-purpose applications.

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