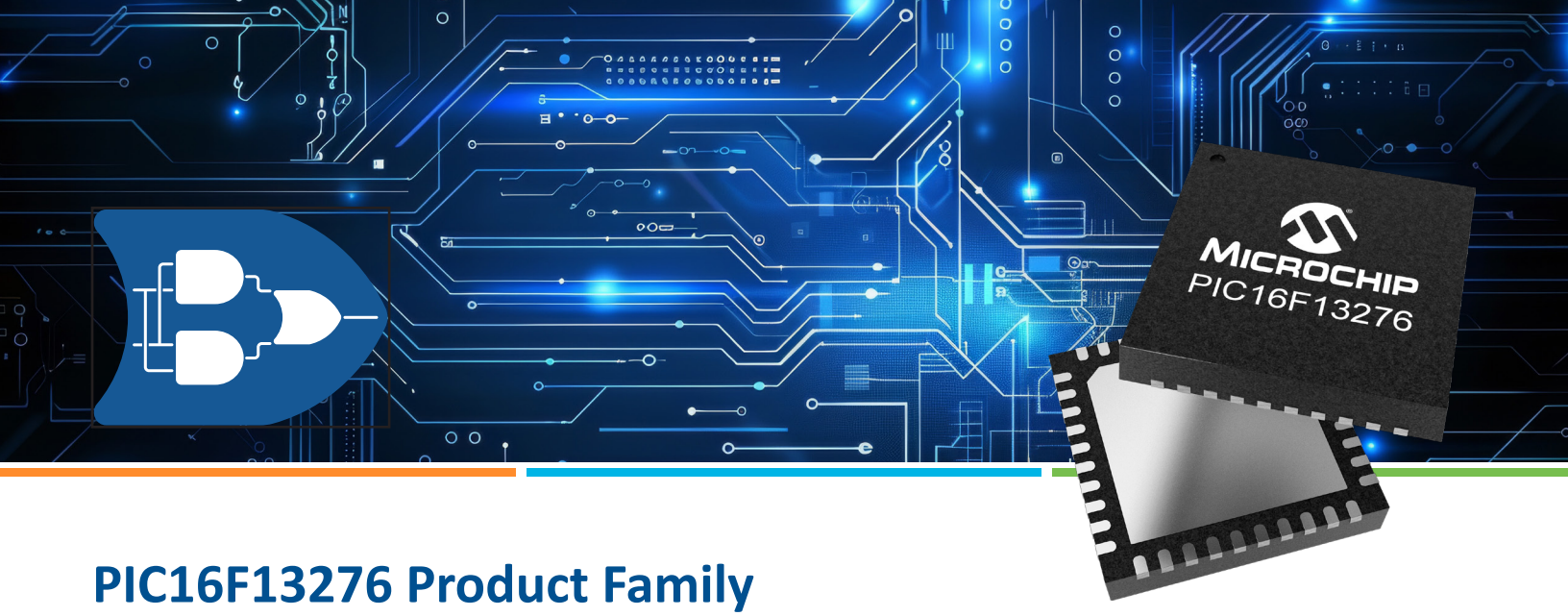


PIC16F13276 Product Family

Embedded Innovation With Configurable Logic and Enhanced Security

Summary

The PIC16F13276 family of microcontrollers (MCU) combines low-power operation, integrated configurable logic, robust security features and a versatile peripheral set.

The MCUs feature a built-in Configurable Logic Block (CLB), which allows developers to implement custom digital logic functions directly within a device to streamline PCB design and enables fast, deterministic hardware responses.

Advanced security features, such as Programming and Debugging Interface Disable (PDID), provide a higher level of physical security than typical code protection. This device also offers a comprehensive suite of analog and digital peripherals, including high-resolution Analog-to-Digital Converters (ADCs), Digital-to-Analog Converters (DACs), comparators, multiple Pulse-Width Modulation (PWM) channels and standard communication interfaces like I^2C, SPI and UART, to support a wide variety of application needs without requiring extra components.

Available in 8- to 40- pin packages with up to 28 KB Flash, the PIC16F13276 MCU is a cost-effective and low power device for simple, resource-constrained designs, making it particularly well-suited for embedded, industrial and IoT applications where efficiency, flexibility and security are top priorities.

Configurable Logic Block

Our CLB is a reconfigurable digital logic module integrated into the PIC16F13276 MCU to perform hardware-based logic operations independent of the CPU. Functionally like a small Complex Programmable Logic Device (CPLD), the CLB enables fast, deterministic responses and supports complex digital logic designs directly within the MCU, which reduces the need for external components and saves PCB space. Some key benefits of the CLB peripheral include auto-load at boot, operation in low-power sleep modes, dynamic reconfiguration for on-the-fly logic changes and seamless integration with other MCU peripherals. Auto-load on boot for the CLB refers to the capability of the PIC16F13276 MCU to automatically initialize and configure the CLB with predefined logic settings immediately upon power-up or reset, without requiring manual intervention or additional firmware execution. With up to 32 basic logic elements such as gates, flip-flops and multiplexers, the CLB offers a powerful and flexible solution for embedded applications where performance, responsiveness and power efficiency are critical.

Security Features of Programming and Debugging Interface Disable (PDID)

PDID is essential for protecting embedded systems from unauthorized access and tampering by permanently disabling the MCU's programming and debugging interface. This feature is important in applications where security, intellectual property protection and device integrity are paramount. PDID supports compliance with security standards by reducing the attack surface and enabling secure firmware update mechanisms through immutable bootloaders. While irreversible, its implementation significantly strengthens product resilience against tampering and cyber threats, making it a vital component in secure product design.

Key Features

- One CLB with 32 Look-Up Table (LUT)-based logic elements for custom hardware logic, which enables CPU-independent operation and faster response times
- Enhanced code protection:
  - One-time programmability and ICSP™ interface disable for secure firmware and data protection
- Advanced analog and digital peripherals:
  - 10-bit ADC with computation
  - Hardware Capacitive Voltage Divider (CVD) for touch sensing applications
  - 10-bit DAC
  - Two analog comparators
  - Dual 16-bit PWM modules
  - Multiple timers and CCP modules
  - SMBus-compatible I²C/SPI and dual EUSARTs
- Up to 28 KB Flash program memory, up to 2 KB data SRAM, 256 B data EEPROM
- Four Configurable Logic Cells (CLC)
- 32-bit Cyclic Redundancy Check (CRC) for reliable data/program memory monitoring
- Peripheral Pin Select (PPS)

Fast Development Time

PIC16F13276 MCUs are fully supported by our comprehensive development ecosystem to accelerate your time to market. The PIC16F13276 family integrates seamlessly with MPLAB® Code Configurator (MCC), a free software plug-in for MPLAB X IDE and MPLAB Tools for Microsoft® Visual Studio® Code (VS Code®), that offers an intuitive, GUI-based interface for configuring the device and its on-board peripherals. MCC makes it easy to design, configure and simulate CLB logic graphically, without needing Hardware Description Language (HDL) or manual register manipulation. It includes a graphical CLB configuration and timing analysis design, simulation and debugging functionality tool, which further enhances development speed and convenience. The CLB configuration tool streamlines custom logic design by automating setup and minimizing errors, while the timing analysis feature allows your design to meet required timing constraints and operates reliably. These capabilities work together to streamline development, improve reliability and optimize resource usage for robust embedded system designs.

The PIC16F13276 Curiosity Nano Evaluation Kit (Part No. EV18Z11A) provides full programming and debugging support, enabling complete and seamless development experience. These features collectively contribute to faster development cycles and significantly reduce time to market.

Part Number	Program Flash (KB)	Data SRAM (B)	Data Memory (B)	I/O Pins	Configurable Logic Block (BLEs)	Programming and Debug Interface Disable	10 bit ADCC (ch)	10-bit DAC	Analog Comparators	8-bit (w/ HLT) / 16-bit Timers	16-bit dual PWM/ CCP	CLC	32-bit CRC w/ Mem Scan & WWDT	I²C/SPI	EUSART	PPS/PMD /MAP	Packages
PIC16F13214	7	512	256	6	32	Y	5	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	SOIC
PIC16F13215	14	1,024	256	6	32	Y	5	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	SOIC
PIC16F13224	7	512	256	12	32	Y	11	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	TSSOP, SOIC
PIC16F13225	14	1,024	256	12	32	Y	11	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	TSSOP, SOIC
PIC16F13226	28	2,048	256	12	32	Y	11	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	TSSOP, SOIC
PIC16F13244	7	512	256	18	32	Y	17	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	PDIP, SSOP, VQFN
PIC16F13245	14	1,024	256	18	32	Y	17	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	PDIP, SSOP, VQFN
PIC16F13246	28	2,048	256	18	32	Y	17	1	2	2 / 3	2 / 2	4	Y	1 / 1	2	Y / Y / Y	PDIP, SSOP, VQFN
PIC16F13254	7	512	256	25	32	Y	24	1	2	2 / 3	2 / 2	4	Y	2 / 2	2	Y / Y / Y	SSOP, VQFN
PIC16F13255	14	1,024	256	25	32	Y	24	1	2	2 / 3	2 / 2	4	Y	2 / 2	2	Y / Y / Y	SSOP, VQFN
PIC16F13256	28	2,048	256	25	32	Y	24	1	2	2 / 3	2 / 2	4	Y	2 / 2	2	Y / Y / Y	SSOP, VQFN
PIC16F13274	7	512	256	36	32	Y	35	1	2	2 / 3	2 / 2	4	Y	2 / 2	2	Y / Y / Y	PDIP, VQFN, TQFP
PIC16F13275	14	1,024	256	36	32	Y	35	1	2	2 / 3	2 / 2	4	Y	2 / 2	2	Y / Y / Y	PDIP, VQFN, TQFP
PIC16F13276	28	2,048	256	36	32	Y	35	1	2	2 / 3	2 / 2	4	Y	2 / 2	2	Y / Y / Y	PDIP, VQFN, TQFP

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