

# PIC18-Q41 Product Family

## Microcontrollers for Improved Sensor Interface Designs

### Summary

The PIC18-Q41 family of Microcontrollers (MCUs) combines sophisticated analog peripherals and powerful Core Independent Peripherals (CIPs) for small, high-performance data acquisition and sensor interfacing applications. Available in small 14- and 20-pin packages, these MCUs are equipped with an Operational Amplifier (OPA), a 12-bit Analog-to-Digital Converter with Computation (ADCC), and 8-bit Digital-to-Analog Converters (DACs) providing a high level of analog integration for amplification, filtering and signal conditioning. With our comprehensive development tool suite, you can easily configure peripherals and functions, generate application code and simulate analog circuits prior to hardware prototyping reducing your development time and time to market. PIC18-Q41 MCUs are well suited for IoT edge nodes, medical, wearables, LED lighting, home automation, automotive and industrial process control. If a cost-effective MCU with comparable performance is needed, PIC18-Q40 MCUs are a good option.



### Intelligent Sensing Capabilities

The PIC18-Q41 family integrates intelligent analog peripherals for amplification, filtering and signal conditioning used in sensing and measurement applications. They include an OPA, Zero Cross Detect (ZCD), comparators, two 8-bit DACs and a 12-bit ADC with Computation that automates Capacitive Voltage Divider (CVD) techniques for implementing advanced touch sensing, averaging, filtering, oversampling and automatic threshold comparison. These features significantly reduce the component count in the analog signal chain.

### Improved System Response

The CIPs enable the MCU to accomplish tasks in hardware while freeing up the CPU to accomplish other complex tasks or go to sleep to save power. This decreases system complexity by eliminating additional code and external components, reduces power consumption, allowing for deterministic response time and decreased validation time.

### Customizable Hardware

The need for external components is further reduced with the Configurable Logic Cell (CLC). The CLC peripheral lets you specify combinations of signals as inputs to a logic function and internally connects peripherals such as timers, Pulse-Width Modulators (PWMs), serial ports and I/O pins for hardware customization with unprecedented ease. The CLC enables a higher level of integration without any external components, thus reducing PCB footprint and system costs.

### Faster Time to Market

To reduce your time to market, the PIC18-Q41 family has been designed to integrate with MPLAB® Code Configurator (MCC) and MPLAB Mindi™ Analog Simulator for a seamless embedded development experience. MCC is a free, graphical programming environment that quickly generates application code. Using an intuitive interface, it enables and configures a rich set of peripherals and functions specific to your application. MPLAB Mindi Analog Simulator reduces circuit design time and design risk by simulating analog circuits prior to hardware prototyping. [www.microchip.com/MPLAB](http://www.microchip.com/MPLAB).

## Key Features

- 64 MHz internal oscillator
- Operational amplifier
- 8-bit buffered DAC
- 12-bit ADC with Computation (ADCC)
- Hardware Capacitive Voltage Divider (CVD) for touch sensing applications
- Two Analog comparators
- Up to 64 KB Flash program memory
- 512 B data EEPROM
- Up to 4 KB data SRAM
- Four Direct Memory Access (DMA)
- Three 16-bit dual PWMs
- Four Configurable Logic Cells (CLC)
- 32-bit Cyclic Redundancy Check (CRC) for reliable data/program memory monitoring
- Peripheral Pin Select (PPS)
- Three UART (one UART supports LIN/DMX/DALI protocols), SPI, I<sup>2</sup>C interfaces

## Development Made Easy



With full programming and debugging capabilities, the PIC18F16Q41 Curiosity Nano Evaluation Kit (EV26Q64A) is a compact, cost-effective development board that offers complete support for your next design. [www.microchip.com/curiositynano](http://www.microchip.com/curiositynano)

Curiosity Development Boards are fully integrated MCU development platforms targeted at first-time users, Makers, and those seeking a feature-rich rapid prototyping board. Designed from the ground-up to take full advantage of Microchip's MPLAB X and MPLAB Xpress development environments, Curiosity includes an integrated programmer/debugger, and requires no additional hardware to get started.

Curiosity (DM164137) supports the PIC18-Q41 family, as well as a number of other low-voltage, programming-enabled 8-bit PIC<sup>®</sup> MCUs from 8 to 20 pins. [www.microchip.com/curiosity](http://www.microchip.com/curiosity)

## Products

Part Number	Pin Count	Program Flash (KB)	Data EEPROM (B)	RAM (B)	I/O Pins	Operational Amplifier	12-bit ADCC (ch)	8-bit with HLT/ 16-bit Timers	Complimentary Waveform Generator	Signal Measurement Timer	16-bit dual PWM/CCP	Comparator/ZCD	NCO/DSM	CLC	32-bit CRC w/ Scanner	SPI/I <sup>2</sup> C	UART/UART with Protocol Support	DMA (ch)	Vectored Interrupts	PPS/PPMD /MAP	Packages
PIC18F04Q41	14	16	512	1,024	12	1	11	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	SOIC, TSSOP
PIC18F05Q41	14	32	512	2,048	12	1	11	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	SOIC, TSSOP
PIC18F06Q41	14	64	512	4,096	12	1	11	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	SOIC, TSSOP
PIC18F14Q41	20	16	512	1,024	18	1	17	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	PDIP, SOIC, SSOP, VQFN
PIC18F15Q41	20	32	512	2,048	18	1	17	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	PDIP, SOIC, SSOP, VQFN
PIC18F16Q41	20	64	512	4,096	18	1	17	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	PDIP, SOIC, SSOP, VQFN
PIC18F04Q40	14	16	512	1,024	12	–	11	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	SOIC, TSSOP
PIC18F05Q40	14	32	512	2,048	12	–	11	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	SOIC, TSSOP
PIC18F06Q40	14	64	512	4,096	12	–	11	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	SOIC, TSSOP
PIC18F14Q40	20	16	512	1,024	18	–	17	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	PDIP, SOIC, SSOP, VQFN
PIC18F15Q40	20	32	512	2,048	18	–	17	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	PDIP, SOIC, SSOP, VQFN
PIC18F16Q40	20	64	512	4,096	18	–	17	2/3	1	Y	3/1	2/1	1/1	4	Y	2/1	2/1	4	Y	Y/Y/Y	PDIP, SOIC, SSOP, VQFN

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