

# PIC16F151X/152X Microcontrollers

*High integration, enhanced performance devices with nanoWatt XLP.*

## Summary

In today's competitive environment it can be challenging to design highly efficient systems while keeping the power consumption and cost under control. The PIC16F15XX microcontrollers are designed to achieve this, while promoting a high level of integration within the microcontroller itself. The PIC16F15XX family consists of microcontrollers in 28, 40/44 and 64 pin-count, and are based on the latest and high performance Enhanced Mid-Range Core. The combination of the highly efficient architecture, fast performance, peripheral integration and low cost makes this family suitable for various cost sensitive general-purpose applications.

The six members of PIC16F15XX family offer up to 28KB of Flash program memory, up to 1.5 KB or RAM, up to 30 input channels for 10-bit ADC, up to 2 SPI/I<sup>2</sup>C™, up to 2 EUSART, new temperature indicator module, up to 10 CCP modules, and multiple other peripherals and features. These MCUs are designed to enable a wide variety of applications, while saving on board space and design costs. The low power "LF" options for these products are also available; these will allow operation from 1.8V to 3.6V. These LF options are highly suitable for battery-powered applications, because of their excellent power performance.

## Key Features

- **Enhanced Mid-Range Architecture**  
Offers higher performance, C-friendly code development, efficient code execution, automatic context savings on interrupts, higher memory and RAM support, among other enhancements.
- **Touch-screen/mTouch™ Support**  
Up to 30 channels of 10-bit ADC can be utilized to implement high-resolution touch screen controllers or to design capacitive touch keys and sliders.
- **Communication Peripherals**  
Up to 2 SPI/I<sup>2</sup>C and up to 2 EUSARTs, provide designers the flexibility to implement multiple embedded communications networks.
- **Motor and Lighting Control**  
Up to 10 Capture Compare and PWM peripherals can be utilized to implement a variety of motor control and lighting applications. In PWM mode, there are up to five different time bases to choose from, which allows for independent PWM control.
- **eXtreme Low Power (XLP) Performance**  
With low standby currents and low active currents, these MCUs enable energy efficient designs.



## Why PIC16F15XX?

- **Ease of Design** – With hundreds of code examples and application libraries, designing with these parts could not be any simpler.
- **Easy Migration** – These MCUs are pin compatible with other Microchip 8-bit MCUs, which means drop-in compatibility on your existing board. C-optimized architecture for worry free migration, even from other 8-bit architectures.
- **Various Applications in a Variety of Market Segments** – A wide array of peripherals enable many applications in consumer electronics, automotive, medical, home appliance and other markets.
- **Low Cost** – This MCU family is designed to enable highly efficient designs while promoting cost savings.

## Development Made Easy

The PIC16F15XX family provides a low-cost development experience from code creation, to integration into the end application.

- **Develop your Code** – MPLAB® IDE with integrated HI-TECH C® compiler allows designers to develop code and simulate their application with zero initial investment.
- **Program and Debug** – The PIC16F15XX family supports In-Circuit Debug functionality without the use of an additional header. Connect the PICKit™ 3 Debugger or MPLAB ICD 3 In-Circuit Debugger to get started.



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## Additional Information

- PIC16(L)F1516/7/8/9 Data Sheet, DS41452
- PIC16(L)F1526/7 Data Sheet, DS41458
- PIC1XF1XXX Software Migration, DS41375
- 8-bit PIC® Microcontroller Solution Brochure, DS39630
- Corporate Focus Product Selector Guide, DS01308
- Quick Guide to Microchip Development Tools Brochure, DS51894

## Sample Information

On-line Sampling: [sample.microchip.com](http://sample.microchip.com)

### PIC16F15XX Microcontrollers

| Device                    | I/O | Flash (KB) | Data RAM (Bytes) | CCP | EUSART | MSSP (SPI/I <sup>2</sup> C™) | 10-bit ADC ch | Timers (8-bit/16-bit) | Operating Voltage      | Pins  | Packages                    |
|---------------------------|-----|------------|------------------|-----|--------|------------------------------|---------------|-----------------------|------------------------|-------|-----------------------------|
| PIC16F1516<br>PIC16LF1516 | 25  | 14         | 512              | 2   | 1      | 1/1                          | 17            | 2/1                   | 2.3V-5.5V<br>1.8V-3.6V | 28    | SPDIP, SOIC, SSOP, 4x4 UQFN |
| PIC16F1518<br>PIC16LF1518 | 25  | 28         | 1024             | 2   | 1      | 1/1                          | 17            | 2/1                   | 2.3V-5.5V<br>1.8V-3.6V | 28    | SPDIP, SOIC, SSOP, 4x4 UQFN |
| PIC16F1517<br>PIC16LF1517 | 36  | 14         | 512              | 2   | 1      | 1/1                          | 28            | 2/1                   | 2.3V-5.5V<br>1.8V-3.6V | 40/44 | PDIP, 10x10 TQFP, 5x5 UQFN  |
| PIC16F1519<br>PIC16LF1519 | 36  | 28         | 1024             | 2   | 1      | 1/1                          | 28            | 2/1                   | 2.3V-5.5V<br>1.8V-3.6V | 40/44 | PDIP, 10x10 TQFP, 5x5 UQFN  |
| PIC16F1526<br>PIC16LF1526 | 54  | 14         | 768              | 10  | 2      | 2/2                          | 30            | 6/3                   | 2.3V-5.5V<br>1.8V-3.6V | 64    | 10x10 TQFP, 9x9 QFN         |
| PIC16F1527<br>PIC16LF1527 | 54  | 28         | 1536             | 10  | 2      | 2/2                          | 30            | 6/3                   | 2.3V-5.5V<br>1.8V-3.6V | 64    | 10x10 TQFP, 9x9 QFN         |

### Development Tools from Microchip

| Part Number | Development Tool                                                                                 | Description                                                                                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DV164131    | PICkit™ 3 Debug Express                                                                          | In-Circuit Debugger/Programmer uses in-circuit debugging logic incorporated into each chip with Flash memory to provide a low-cost hardware debugger and programmer.                                                                                                                     |
| DV164035    | MPLAB® ICD 3 In-Circuit Debugger                                                                 | Cost effective high-speed hardware debugger/programmer for Flash Digital Signal Controller (DSC) and microcontroller (MCU) devices.                                                                                                                                                      |
| DM164130-1  | F1 Evaluation Platform<br><a href="http://www.microchip.com/F1Eval">www.microchip.com/F1Eval</a> | Demonstration/development tool for Enhanced Mid-Range PIC® MCUs (PIC12F1XXX/ PIC16F1XXX), provides a platform for general purpose development and includes demos focused on low power, LCD and motor control.                                                                            |
| DM164130-5  | F1 + Low Voltage Evaluation Platform                                                             | Demonstration/development tool for Enhanced Mid-Range PIC® MCUs (PIC12F1XXX/ PIC16F1XXX), provides a platform for general purpose and low voltage development, and includes demos focused on low voltage, low power, LCD and motor control.                                              |
| DV164132    | F1 Evaluation Kit                                                                                | Demonstration/development tool for Enhanced Mid-Range PIC® MCUs (PIC12F1XXX/ PIC16F1XXX) and includes the PICkit™ 3 for quick programming and development. This kit provides a platform for general purpose development and includes demos focusing on low power, LCD and motor control. |
| DM163022    | PICDEM™ 2 Plus Demonstration Board                                                               | A simple board that demonstrates the capabilities of the 18-, 28- and 40-pin PIC16XXXX and PIC18XXXX devices. It can be used stand-alone with a programmed part, with an in-circuit emulator or in-circuit debugger.                                                                     |
| DV007004    | MPLAB® PM3 Universal Device Programmer                                                           | Operates with a PC or as a stand-alone unit, and programs Microchip's entire line of PIC® devices as well as the latest dsPIC30F DSC devices.                                                                                                                                            |
| DM164120-3  | PICkit™ 2 28-pin Demo Board                                                                      | This small demo board comes populated with Microchip's PIC16F886 28-pin MCU and includes a generous prototyping area. Also includes two bare boards for those interested in customizing their development.                                                                               |



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