



PIC12F615/12HV615 PIC16F616/16HV616

8/14-Pin, 8-Bit Flash Microcontroller Product Brief

High-Performance RISC CPU:

- Only 35 single-word instructions to learn
- All single-cycle instructions except for program branches which are two-cycle
- Eight-level deep hardware stack
- Direct, Indirect and Relative Addressing modes for data and instructions
- Operating speed:
 - DC – 20 MHz clock input
 - DC – 200 ns instruction cycle

Special Microcontroller Features:

- Precision Internal Oscillator:
 - Selectable 4 MHz or 8 MHz frequency
 - Factory calibrated to $\pm 1\%$
- Power-Saving Sleep mode
- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Brown-out Reset (BOR)
- Watchdog Timer (WDT) with dedicated on-chip RC oscillator for reliable operation
- Multiplexed $\overline{\text{MCLR}}$ input pin with internal pull-up
- Programmable code protection
- Selectable oscillator options:
 - INTOSC: Precision internal oscillator
 - EXTRC: External low-cost RC oscillator
 - XT: Standard crystal/resonator
 - HS: High-speed crystal/resonator
 - LP: Power-saving, low frequency crystal
 - EC: High-speed external clock input
- In-Circuit Serial Programming™ (ICSP™)
- In-Circuit Debugging (ICD) support
- Programmable Interrupt-on-Change pins

Low-Power Features/CMOS Technology:

- Operating current:
 - 100 μA @ 2V, 1 MHz, typical
- Standby current:
 - 1 nA @ 2V, typical
- Low-power, high-speed Flash technology:
 - 100,000 Flash endurance
 - > 40-year retention

- Fully static design
- Wide operating voltage range:
 - 2.0V-5.5V for PIC12F615 and PIC16F616
 - 2.0V – user defined maximum voltage for PIC12HV615 and PIC16HV616
- Wide temperature range:
 - Industrial: -40°C to $+85^{\circ}\text{C}$
 - Extended: -40°C to $+125^{\circ}\text{C}$

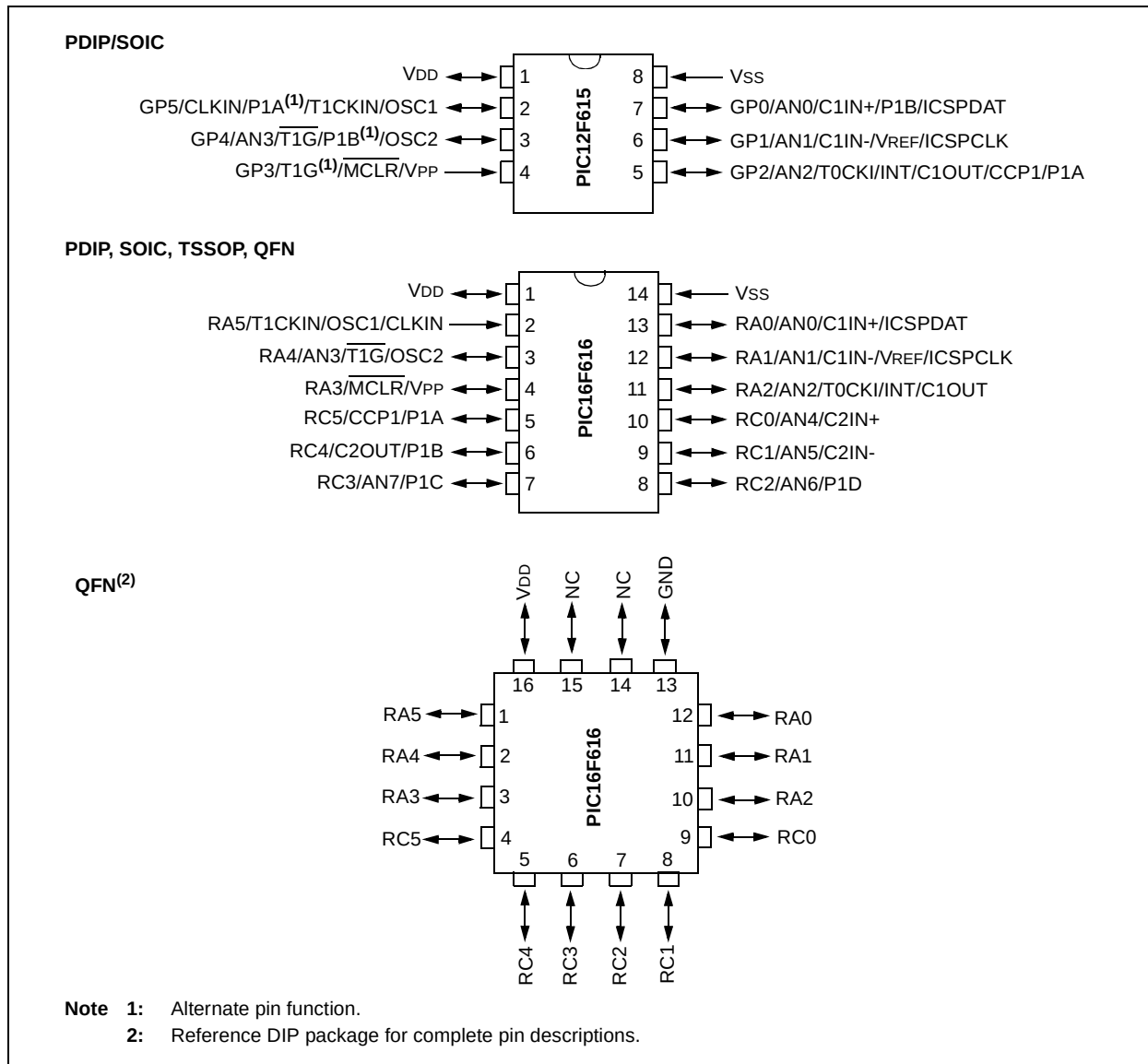
Peripheral Features:

- I/O pins:
 - 5 I/O pins with individual direction control (PIC12F615, PIC12HV615)
 - 11 I/O pins with individual direction control (PIC16F616, PIC16HV616)
 - 1 input only pin
 - Individually selectable weak pull-ups
 - High current sink/source for direct LED drive
- Analog-to-Digital (A/D) Converter:
 - 10-bit resolution
 - 4 external channels (PIC12F615, PIC12HV615)
 - 8 external channels (PIC16F616, PIC16HV616)
 - 3 internal channels to convert internal voltage references
- Analog Comparator:
 - One comparator (PIC12F615, PIC12HV615)
 - Two comparators (PIC16F616, PIC16HV616)
 - Comparator inputs and output accessible externally
 - On-chip 0.6V absolute voltage reference
 - Programmable on-chip voltage reference (CVREF) module (% of VDD)
- Timer0 module: 8-bit timer/counter with 8-bit programmable prescaler
- Enhanced Timer1 module:
 - 16-bit timer/counter with prescaler
 - External gate input
 - Option to use OSC1/OSC2 input in LP mode as Timer1 oscillator when in INTOSC mode
 - Option to use system clock source as Timer1 clock input
- Timer2 module: 8-bit timer/counter with 8-bit prescaler and postscaler

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- Enhanced Capture Compare/PWM module (ECCP):
 - 16-bit capture maximum resolution 12.5 ns
 - Compare maximum resolution 200 ns
- 10-bit PWM maximum frequency 20 kHz
- User selectable PWM output on primary or alternate pins. (Alternate pin selection PIC12HV615 only)

FIGURE 1: PIN DIAGRAMS



Device	Program Memory	Data Memory	I/O	Timers 8/16 bit	10-bit A/D Channels	Comparators	Voltage Regulator
	Flash Words	SRAM (bytes)					
PIC12F615	1024 x 14	64	6	2/1	4	1	N
PIC16F616	2048 x 14	128	12	2/1	8	2	N
PIC12HV615	1024 x 14	64	6	2/1	4	1	Y
PIC16HV616	2048 x 14	128	12	2/1	8	2	Y

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