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### What is "[Embedded - Microcontrollers](#)"?

"[Embedded - Microcontrollers](#)" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

### Applications of "[Embedded - Microcontrollers](#)"

#### Details

Product Status	Active
Core Processor	PIC
Core Size	8-Bit
Speed	20MHz
Connectivity	-
Peripherals	Brown-out Detect/Reset, POR, PWM, WDT
Number of I/O	5
Program Memory Size	3.5KB (2K x 14)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	128 x 8
Voltage - Supply (Vcc/Vdd)	2V ~ 5.5V
Data Converters	A/D 4x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 125°C (TA)
Mounting Type	Surface Mount
Package / Case	8-VDFN Exposed Pad
Supplier Device Package	8-DFN (3x3)
Purchase URL	<a href="https://www.e-xfl.com/product-detail/microchip-technology/pic12f617-e-mf">https://www.e-xfl.com/product-detail/microchip-technology/pic12f617-e-mf</a>

## 8-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:

- Program Memory Read Capability
- Program Memory Write Capability
- 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 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™)
- Programmable Interrupt-on-Change pins

### Low-Power Features

- Operating current:
  - 130  $\mu\text{A}$  @ 2V, 1 MHz, typical
  - 240  $\mu\text{A}$  @ 2V, 4 MHz, typical
- Standby current:
  - 50 nA @ 2V, typical
- Watchdog Timer current:
  - 1  $\mu\text{A}$  @ 2V, typical

### CMOS Technology:

- Low-power, high-speed Flash technology:
  - 100,000 Flash endurance
  - > 40-year retention
- Fully static design
- Wide operating voltage range: 2.0V – 5.5V
- Wide temperature range:
  - Industrial: -40°C to +85°C
  - Extended: -40°C to +125°C

### Peripheral Features:

- I/O pins:
  - 5 I/O pins with individual direction control
  - 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
  - 3 internal channels to convert internal voltage references
- Analog Comparator:
  - One comparator
  - 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
- Enhanced Capture Compare/PWM module (ECCP):
  - User selectable simultaneous PWM and complementary PWM output for bridge drive applications
  - 16-bit capture maximum resolution 12.5 ns
  - Compare maximum resolution 200 ns
  - 10-bit PWM maximum frequency 20 kHz

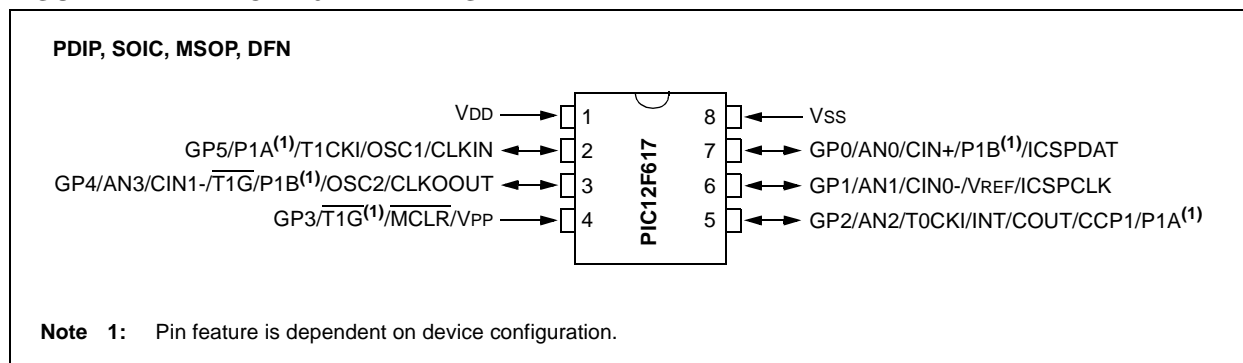
# PIC12F617

**TABLE 1: PIC12F617 FEATURE SUMMARY**

Device	Program Memory Flash (Words)	Self Read/ Self Write	SRAM (bytes)	I/O	Timers 8/16 bit	10-bit A/D Channels	Comparators	ECCP
PIC12F617	2048 x 14	Yes/Yes	128	6	2/1	4	1	Yes

**Note:** Pin details are subject to change.

**FIGURE 1: PIC12F617 PIN DIAGRAM**



**TABLE 2: PIC12F617 PIN SUMMARY (PDIP, SOIC, MSOP, DFN)**

I/O	8-pin PDIP, SOIC, MSOP, DFN	A/D	Reference	Comparator	Timers	ECCP	Pull-up	Interrupt	Basic
GP0	7	AN0	—	CIN+	—	P1B <sup>(1)</sup>	Y	IOC	ICSPDAT
GP1	6	AN1	VREF	CIN0-	—	—	Y	IOC	ICSPCLK
GP2	5	AN2	—	COU	T0CKI	CCP1 / P1A <sup>(1)</sup>	Y	INT IOC	—
GP3	4	—	—	—	T1G <sup>(1)</sup>	—	Y <sup>(2)</sup>	IOC	MCLR/VPP
GP4	3	AN3	—	CIN1-	T1G <sup>(1)</sup>	P1B <sup>(1)</sup>	Y	IOC	OSC2/CLKOUT
GP5	2	—	—	—	T1CKI	P1A <sup>(1)</sup>	Y	IOC	OSC1/CLKIN
VDD	1	—	—	—	—	—	—	—	—
VSS	8	—	—	—	—	—	—	—	—

**Note 1:** Pin feature is dependent on device configuration.

**2:** Pull-up only available when pin is configured as MCLR.

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