



PIC12F1822/16F1823

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

High-Performance RISC CPU:

- Only 49 Instructions, including 14 new “C compiler-friendly” Instructions
- Operating Speed:
 - DC – 32 MHz clock input
 - DC – 125 ns instruction cycle
- Interrupt Capability with Automatic Context Saving
- 16-Level Deep Hardware Stack with Optional Overflow/Underflow Reset
- Direct, Indirect and Relative Addressing modes:
 - Two full 16-bit File Select Registers (FSRs)
 - FSRs can read program and data memory

Special Microcontroller Features:

- Precision Internal Oscillator:
 - Factory calibrated to $\pm 1\%$, typical
 - Software selectable frequency range from 32 MHz to 31 kHz
- 31 kHz Low-Power Internal Oscillator
- External Oscillator Block with:
 - 4 crystal/resonator modes up to 32 MHz using 4xPLL
 - 3 external clock modes up to 32 MHz
- 4x Phase Locked Loop (PLL)
- Fail-Safe Clock Monitor
- Two-Speed Start-up
- Power-Saving Sleep mode
- Power-on Reset (POR)
- Power-up Timer (PWRT)
- Oscillator Start-up Timer (OST)
- Brown-out Reset (BOR) with Selectable Trip Point
- Extended Watch-Dog Timer (WDT)
- In-Circuit Serial Programming™ (ICSP™) via two pins
- In-Circuit Debug (ICD) via two pins
- Enhanced Low-Voltage Programming (LVP)
- Operating Voltage Range:
 - 1.8V to 3.6V (PIC16LF182X)
 - 1.8V to 5.5V (PIC16F182X)
- Programmable Code Protection
- Self-Programmable under Software Control

Low-Power Features:

- Standby Current (PIC1XLF182X):
 - 100 nA @ 1.8V, typical
- Operating Current (PIC1XLF182X):
 - 150 μ A @ 1 MHz, 1.8V, typical
- Watchdog Timer Current (PIC1XLF182X):
 - 800 nA @ 1.8V, typical

Peripheral Features:

- Up to 11 I/O Pins and 1 Input-only Pin:
 - High current sink/source for LED drivers
 - Individually programmable interrupt-on-change pins
 - Individually programmable weak pull-ups
- Timer0: 8-Bit Timer/Counter with 8-Bit Programmable Prescaler
- Enhanced Timer1:
 - 16-bit timer/counter with prescaler
 - External Gate Input mode
 - Dedicated low-power 32 kHz oscillator driver
- Timer2: 8-Bit Timer/Counter with 8-Bit Period Register, Prescaler and Postscaler
- Enhanced Capture, Compare, PWM modules (ECCP):
 - Software selectable time bases
 - Auto-shutdown and auto-restart
 - PWM steering
- Master Synchronous Serial Port (MSSP) with SPI and I²C™ with:
 - 7-bit address masking
 - SMBus/PMBus™ compatibility
- Enhanced Universal Synchronous Asynchronous Receiver Transmitter (EUSART):
 - RS-232, RS-485 and LIN compatible
 - Auto-Baud Detect
 - Auto-wake-up on start
- SR Latch (Integrated 555 Timer):
 - Multiple Set/Reset input options
- Analog-to-Digital Converter (ADC):
 - 10-bit resolution
 - Up to 8 channels
- Up to 2 Comparators:
 - Rail-to-rail inputs
 - Power mode control
 - Software controllable hysteresis
- Voltage Reference module:
 - Fixed voltage reference (FVR) with 1.024V, 2.048V and 4.096V output levels
 - 5-bit rail-to-rail resistive DAC with positive and negative reference selection
- Capacitive Touch Oscillator module
 - Up to 8 channels
- Data Signal Modulator:
 - Select modulator and carrier sources from various module outputs.

PIC12F1822/16F1823

TABLE 1: PIC12F1822/16F1823 AND PIC12LF1822/16LF1823 FAMILY TYPES

Device	Program Memory Flash (words)	Data EEPROM (bytes)	SRAM (bytes)	I/Os	10-bit A/D (ch)	Timers 8/16-bit	EUSART	MSSP	ECCP	Cap Touch Channels
PIC12F1822	2048	256	128	6	4	2/1	1	1	1	4
PIC12LF1822	2048	256	128	6	4	2/1	1	1	1	4
PIC16F1823	2048	256	128	12	8	2/1	1	1	1	8
PIC16LF1823	2048	256	128	12	8	2/1	1	1	1	8

FIGURE 1: 8-PIN DIAGRAM FOR PIC12F1822/PIC12LF1822

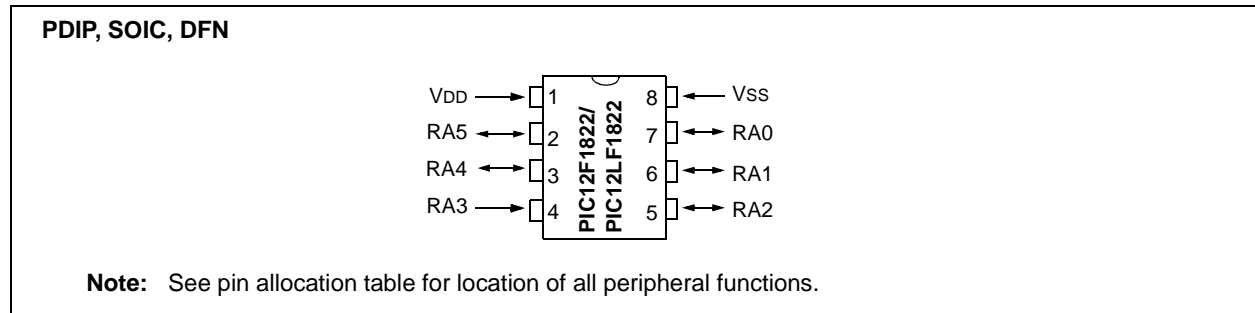


TABLE 2: 8-PIN ALLOCATION TABLE (PIC12F1822/PIC12LF1822)

I/O	8-Pin PDIP/SOIC/DFN	A/D	Reference	Cap Sense	Comparator	SR Latch	Timers	CCP	EUSART	MSSP	Interrupt	Modulator	Pull-up	Basic
RA0	7	AN0	DACOUT	CPS0	C1IN+	—	—	P1B ⁽¹⁾	TX ⁽¹⁾ CK ⁽¹⁾	SDO ⁽¹⁾ SS ⁽¹⁾	IOC	MDOUT	Y	ICSPDAT
RA1	6	AN1	VREF	CPS1	C1IN0-	SRI	—	—	RX ⁽¹⁾ DT ⁽¹⁾	SCL SCK	IOC	MDMIN	Y	ICSPCLK
RA2	5	AN2	—	CPS2	C1OUT	SRQ	T0CKI	CCP1 ⁽¹⁾ P1A ⁽¹⁾ FLT0	—	SDA SDI	INT/ IOC	MDCIN1	Y	—
RA3	4	—	—	—	—	—	T1G ⁽¹⁾	—	—	SS ⁽¹⁾	IOC	—	Y	MCLR VPP
RA4	3	AN3	—	CPS3	C1IN1-	—	T1G ⁽¹⁾ T1OSO	P1B ⁽¹⁾	TX ⁽¹⁾ CK ⁽¹⁾	SDO ⁽¹⁾	IOC	MDCIN2	Y	OSC2 CLKOUT CLKR
RA5	2	—	—	—	—	SRNQ	T1CKI T1OSI	CCP1 ⁽¹⁾ P1A ⁽¹⁾	RX ⁽¹⁾ DT ⁽¹⁾	—	IOC	—	Y	OSC1 CLKIN
VDD	1	—	—	—	—	—	—	—	—	—	—	—	—	VDD
VSS	8	—	—	—	—	—	—	—	—	—	—	—	—	VSS

Note 1: Pin functions can be assigned to one of two pin locations via software.

PIC12F1822/16F1823

FIGURE 2: 14-PIN DIAGRAM FOR PIC16F1823/PIC16LF1823

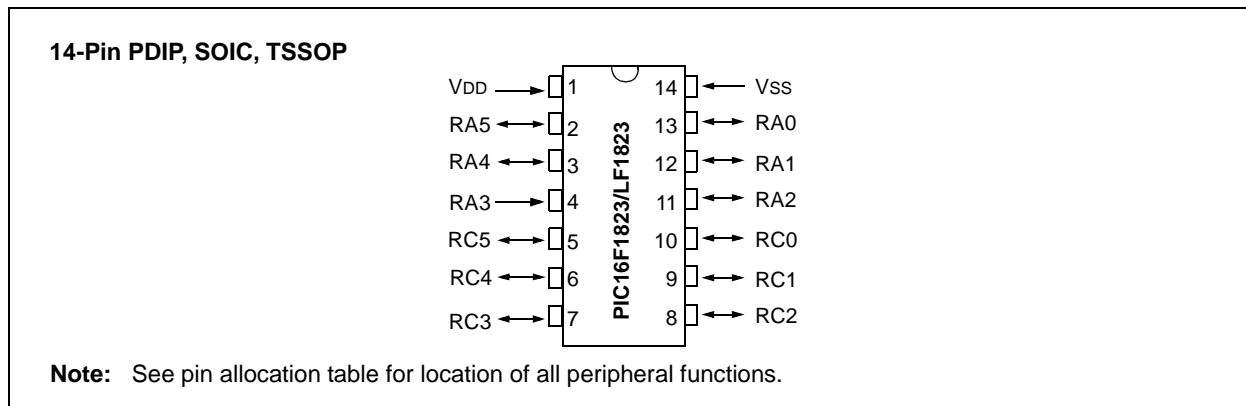


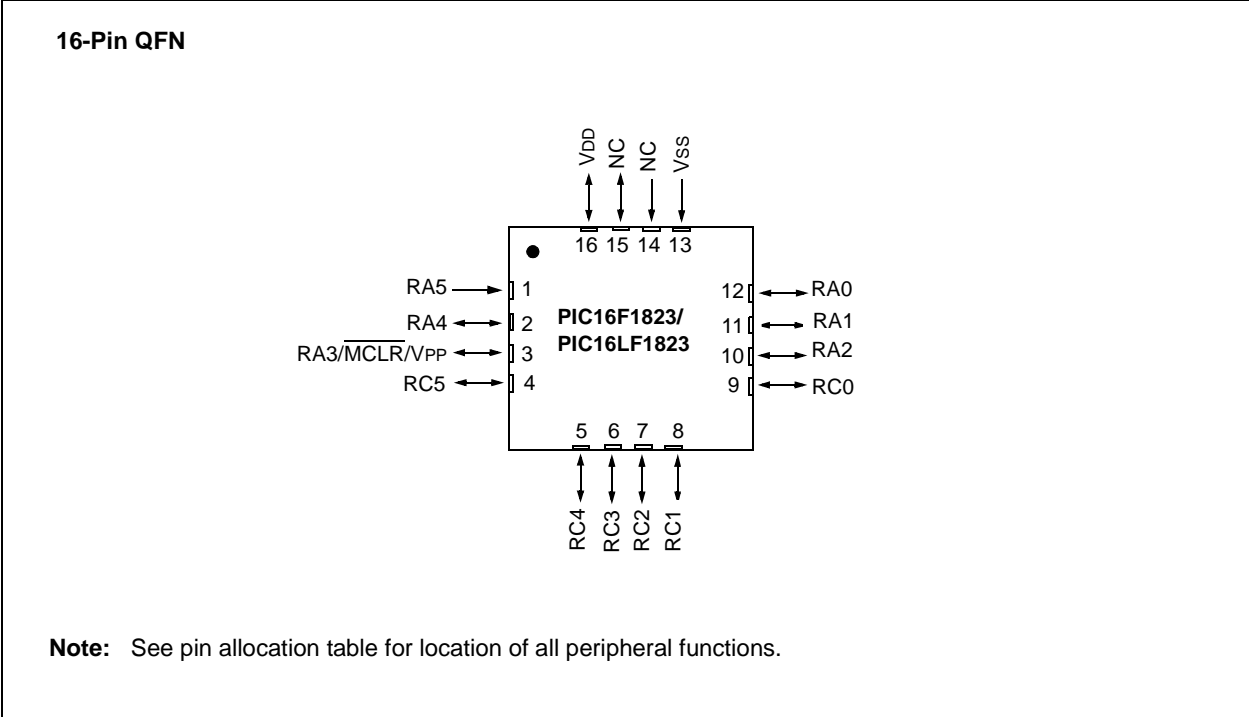
TABLE 3: 14-PIN ALLOCATION TABLE (PIC16F1823/PIC16LF1823)

I/O	14-Pin PDIP/SOIC/TSSOP	16-Pin QFN	A/D	Reference	Cap Sense	Comparator	SR Latch	Timers	CCP	EUSART	MSSP	Interrupt	Modulator	Pull-up	Basic
RA0	13	12	AN0	DACOUT	CPS0	C1IN+	—	—	—	TX ⁽¹⁾ CK ⁽¹⁾	—	IOC	—	Y	ICSPDAT
RA1	12	11	AN1	VREF	CPS1	C12IN0-	SRI	—	—	RX ⁽¹⁾ DT ⁽¹⁾	—	IOC	—	Y	ICSPCLK
RA2	11	10	AN2	—	CPS2	C1OUT	SRQ	T0CKI	FLT0	—	—	INT/ IOC	—	Y	—
RA3	4	3	—	—	—	—	—	T1G ⁽¹⁾	—	—	SS ⁽¹⁾	IOC	—	Y	MCLR VPP
RA4	3	2	AN3	—	CPS3	—	—	T1G ⁽¹⁾ T1OSO	—	—	SDO ⁽¹⁾	IOC	—	Y	OSC2 CLKOUT CLKR
RA5	2	1	—	—	—	—	—	T1CKI T1OSI	—	—	—	IOC	—	Y	OSC1 CLKIN
RC0	10	9	AN4	—	CPS4	C2IN+	—	—	—	—	SCL SCK	—	—	Y	—
RC1	9	8	AN5	—	CPS5	C12IN1-	—	—	—	—	SDA SDI	—	—	Y	—
RC2	8	7	AN6	—	CPS6	C12IN2-	—	—	P1D	—	SDO ⁽¹⁾	—	MDCIN1	Y	—
RC3	7	6	AN7	—	CPS7	C12IN3-	—	—	P1C	—	SS ⁽¹⁾	—	MDMIN	Y	—
RC4	6	5	—	—	—	C2OUT	SRNQ	—	P1B	RX ⁽¹⁾ DT ⁽¹⁾	—	—	MDOUT	Y	—
RC5	5	4	—	—	—	—	—	—	CCP1 P1A	TX ⁽¹⁾ CK ⁽¹⁾	—	—	MDCIN2	Y	—
VDD	1	16	—	—	—	—	—	—	—	—	—	—	—	—	VDD
VSS	14	13	—	—	—	—	—	—	—	—	—	—	—	—	VSS

Note 1: Pin functions can be assigned to one of two pin locations via software.

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FIGURE 3: 16-PIN DIAGRAM FOR PIC16F1823/PIC16LF1823



Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
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