
20-Pin 8-Bit Flash Microcontroller Product Brief

High-Performance RISC CPU:

- C Compiler Optimized Architecture
- Only 49 Instructions
- Up to 3.5 Kbytes Linear Program Memory Addressing
- Up to 128 bytes Linear Data Memory Addressing
- Operating Speed:
 - DC – 20 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

Flexible Oscillator Structure:

- 16 MHz Internal Oscillator Block:
 - Accurate to $\pm 1\%$, typical
 - Software selectable frequency range from 16 MHz to 31 kHz
- 31 kHz Low-Power Internal Oscillator
- Three External Clock modes up to 20 MHz

Special Microcontroller Features:

- Operating Voltage Range:
 - 1.8V to 3.6V (PIC16LF1507)
 - 2.3V to 5.5V (PIC16F1507)
- Self-Programmable under Software Control
- Power-on Reset (POR)
- Power-up Timer (PWRT)
- Programmable Low-Power Brown-Out Reset (LPBOR)
- Extended Watch-Dog Timer (WDT):
 - Programmable period from 1 ms to 256s
- Programmable Code Protection
- In-Circuit Serial Programming™ (ICSP™) via two pins
- Enhanced Low-Voltage Programming (LVP)
- Power-Saving Sleep mode

Low-Power Features (PIC16LF1507):

- Standby Current:
 - 30 nA @ 1.8V, typical
- Operating Current:
 - 30 μ A per MHz @ 1.8V, typical
- Low-Power Watchdog Timer Current:
 - 300 nA @ 1.8V, typical
- Secondary Oscillator:
 - 600 nA @ 32 kHz

Analog Features:

- Analog-to-Digital Converter (ADC):
 - 10-bit resolution
 - Up to 12 channels
 - Auto acquisition capability
 - Conversion available during Sleep
 - FVR available as channel
- Voltage Reference module:
 - Fixed Voltage Reference (FVR) with 1.024V, 2.048V and 4.096V output levels

Peripheral Features:

- Up to 18 I/O Pins and 1 Input-only Pin:
 - High current sink/source 25 mA/25 mA
 - Individually programmable weak pull-ups
 - Individually programmable interrupt-on-change (IOC) pins
- Timer0: 8-Bit Timer/Counter with 8-Bit Programmable Prescaler
- Enhanced Timer1:
 - 16-bit timer/counter with prescaler
 - External Gate Input mode
- Timer2: 8-Bit Timer/Counter with 8-Bit Period Register, Prescaler and Postscaler
- Four 10-bit PWM modules
- Two Configurable Logic Cell (CLC) modules:
 - 12 selectable input source signals
 - Four inputs per module
 - Software control of combinational/sequential logic/state/clock functions
 - AND/OR/XOR/XOD/SR/JK
 - External or internal inputs/outputs
 - Operation while in Sleep
- Direct Digital Synthesis (DDS):
 - 24-bit Accumulator
 - 16-bit Addend
 - True linear frequency control
 - High-speed clock input
 - Selectable Output modes
 - Fixed Duty Cycle (FDC)
 - Pulse Frequency Modulation (PFM)
- Complementary Waveform Generator (CWG):
 - 6 selectable signal sources
 - Selectable falling and rising edge deadband control
 - Polarity control
 - 2 auto-shutdown sources
 - Multiple input sources: PWM, CLC, DDS

PIC16(L)F1507

TABLE 1: PIC16(L)F1507 FAMILY TYPES

Device	Program Memory Flash (words)	SRAM (bytes)	I/Os	10-bit A/D (ch)	Timers 8/16-bit	PWM	CWG	CLC	DDS
PIC16F1507 PIC16LF1507	2048	128	18	12	2/1	4	Yes	2	Yes

Note: Pin details are subject to change.

FIGURE 1: 20-PIN PDIP, SOIC, SSOP PACKAGE DIAGRAM FOR PIC16(L)F1507

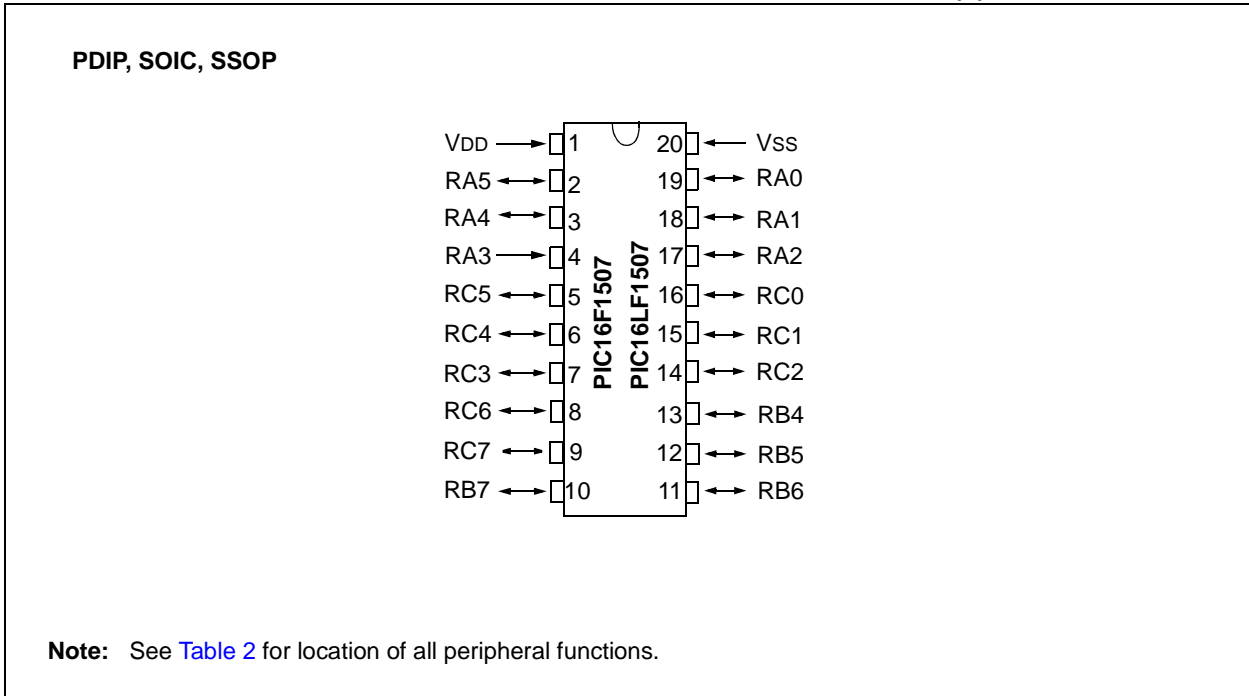
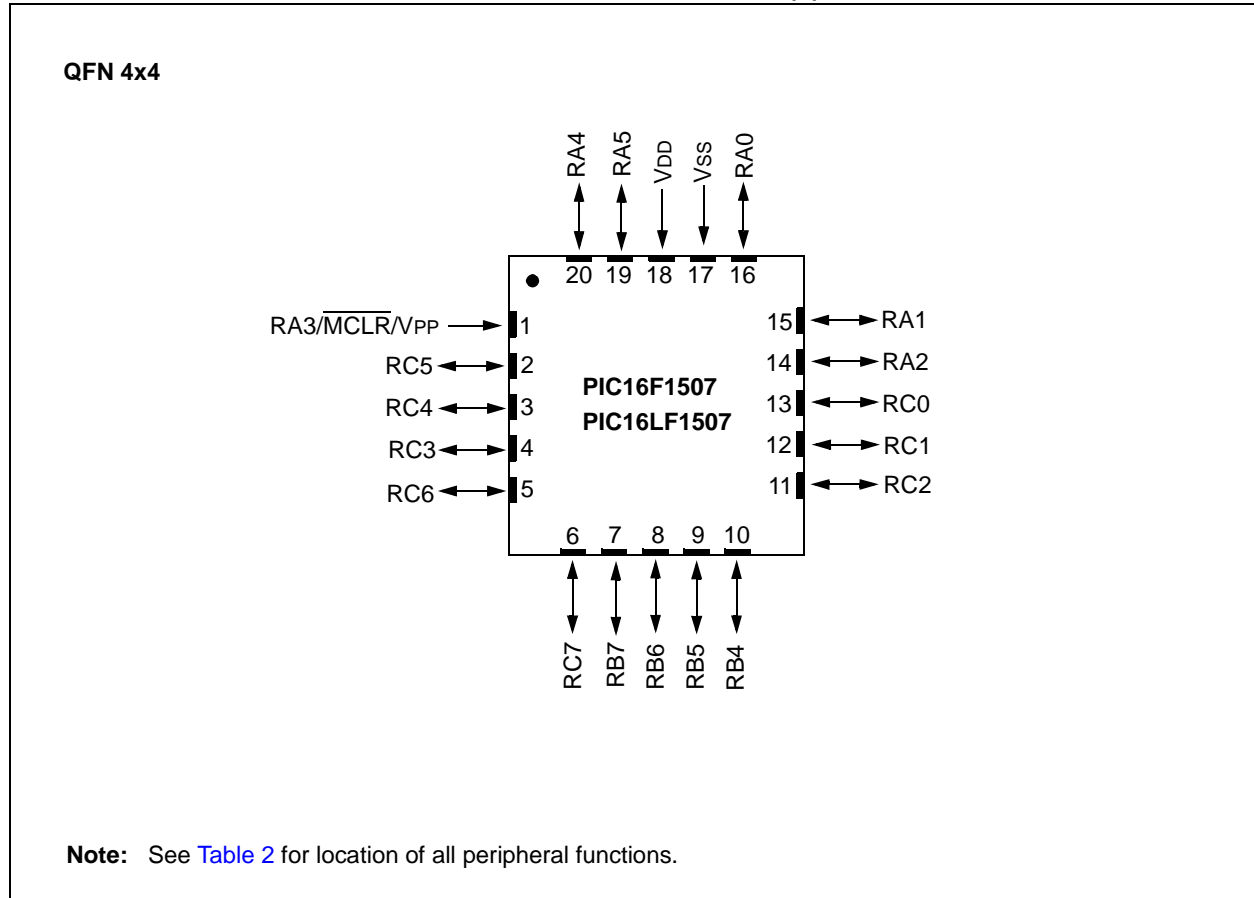


FIGURE 2: 20-PIN QFN PACKAGE DIAGRAM FOR PIC16(L)F1507



PIC16(L)F1507

TABLE 2: 20-PIN ALLOCATION TABLE (PIC16(L)F1507)

I/O	20-Pin PDIP/SOIC/SSOP	20-Pin QFN	A/D	Reference	CWG	DDS	CLC	Timers	PWM	Interrupt	Pull-up	Basic
RA0	19	16	AN0	—	—	—	—	—	—	IOC	Y	ICSPDAT/ICDDAT
RA1	18	15	AN1	VREF+	—	—	—	—	—	IOC	Y	ICSPCLK/ICDCLK
RA2	17	14	AN2	—	CWGFLT	—	CLC1OUT ⁽²⁾	T0CKI	PWM3	INT/IOC	Y	—
RA3	4	1	—	—	—	—	CLC1IN0	—	—	IOC	Y	MCLR VPP
RA4	3	20	AN3	—	—	—	—	T1G	—	IOC	Y	CLKOUT
RA5	2	19	—	—	—	—	—	T1CKI	—	IOC	Y	CLKIN
RB4	13	10	AN10	—	—	—	—	—	—	IOC	Y	—
RB5	12	9	AN11	—	—	—	—	—	—	IOC	Y	—
RB6	11	8	—	—	—	—	—	—	—	IOC	Y	—
RB7	10	7	—	—	—	—	—	—	—	IOC	Y	—
RC0	16	13	AN4	—	—	—	CLC2OUT	—	—	—	—	—
RC1	15	12	AN5	—	—	DDS1OUT ⁽²⁾	—	—	PWM4	—	—	—
RC2	14	11	AN6	—	—	—	—	—	—	—	—	—
RC3	7	4	AN7	—	—	—	CLC2IN0	—	PWM2	—	—	—
RC4	6	3	—	—	CWGB	—	CLC2IN1	—	—	—	—	—
RC5	5	2	—	—	CWGA	—	CLC1OUT ⁽¹⁾	—	PWM1	—	—	—
RC6	8	5	AN8	—	—	DDS1OUT ⁽¹⁾	—	—	—	—	—	—
RC7	9	6	AN9	—	—	—	CLC1IN1	—	—	—	—	—
VDD	1	18	—	—	—	—	—	—	—	—	—	VDD
VSS	20	17	—	—	—	—	—	—	—	—	—	VSS

Note 1: Pin function is selected via APFCON register.

2: This is default location for this pin function.

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