PIC12F635/PIC16F636/639

8/14/20-Pin Low-Power Flash Microcontroller Product Brief

High-Performance RISC CPU:

- Operating speeds from DC – 20 MHz
- Interrupt capability
- 8-level deep hardware stack
- Direct, Indirect and Relative Addressing modes
- 35 single-word instructions:
  - All instructions single cycle except branches
- On-chip Flash Program Memory:
  - 1024 x 14 for PIC12F635
  - 2048 x 14 for PIC16F636/PIC16F639
- General Purpose Registers (SRAM):
  - 64 x 8 for PIC12F635
  - 128 x 8 for PIC16F636/PIC16F639
- EEPROM Data Memory:
  - 128 x 8 for PIC12F635
  - 256 x 8 for PIC16F636/PIC16F639

Special Microcontroller Features:

- Precision Internal Oscillator:
  - Factory calibrated to ±1%
  - Software selectable frequency of 8 MHz to 31 kHz
  - Two-speed Start-up mode
  - Crystal fail detect for critical applications
- Clock mode switching for low-power operation
- Power-saving Sleep mode
- Multiplexed Master Clear/Input-pin
- Enhanced low-current Watchdog Timer (WDT) with on-chip oscillator (software selectable nominal 268 seconds with full prescaler) with software enable
- In-Circuit Serial Programming™ (ICSP™) via two pins
- Programmable code protection
- Brown-out Reset (BOR) with software control option
- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Wake-up Reset (WUR)
- Wide operating voltage range (2.0V to 5.5V)
- Industrial and extended temperature range
- High Endurance Flash/EEPROM Cell:
  - 100,000 write Flash endurance
  - 1,000,000 write EEPROM endurance
  - Data EEPROM retention > 40 years

Low-Power Features:

- Standby Current:
  - 1 nA @ 2.0V, typical
- Operating Current:
  - 8.5 μA @ 32 kHz, 2.0V, typical
  - 100 μA @ 1 MHz, 2.0V, typical
- Watchdog Timer Current:
  - 1 μA @ 2.0V, typical

Peripheral Features:

- 6 I/O pins (PIC12F635)
  12 I/O pins (PIC16F636/639):
  - Individual direction control
  - High current source/sink for direct LED drive
  - Individually selectable weak pull-ups/pull-downs
  - Interrupt-on-pin change option
- Ultra Low-Power Wake-Up (ULPWU)
- Programmable Low-Voltage Detection (PLVD) with interrupt
- Timer0:
  - 8-bit timer/counter with 8-bit programmable prescaler
- Enhanced Timer1:
  - 16-bit timer/counter with programmable prescaler
  - External Gate Input mode
  - Option to use OSC1 and OSC2 in LP mode as Timer1 oscillator, if INTOSC mode is selected
- KEELOQ® device compatible encryption/decryption engine
- Analog Comparator module with:
  - 1-2 analog comparators
  - Programmable on-chip voltage reference (CV_{REF}) module (% of V_{DD})
  - Comparator inputs/outputs externally accessible

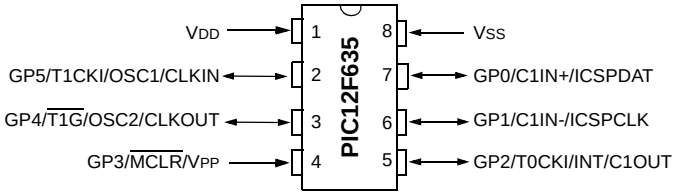
Low-Frequency Analog Front-End Features (PIC16F639 Only)

- Low standby current: 5 μA (with 3 channels enabled)
- Low operating current: 15 μA (with 3 channels enabled)
- Serial Peripheral Interface (SPI™) with internal MCU and external devices
- Three input pins for 125 kHz LF input signals
- High input detection sensitivity (3 mV_{PP}, typical)
- Demodulated data, Carrier clock or RSSI output selection
- 8 internal configuration registers
- Bidirectional transponder communication (LF talk back)
- Programmable antenna tuning capacitance (up to 63 pF, 1 pF/step)
- Supports Battery Back-up mode and a no battery operation with external circuits

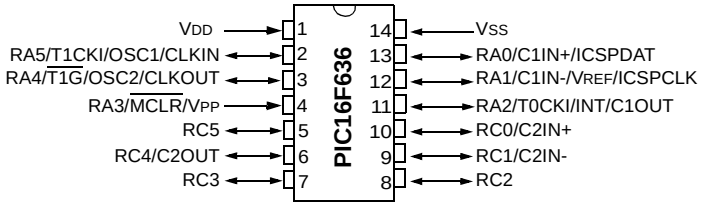
Device	Program Memory	Data Memory		I/O	Comparators	Low Frequency Analog Front-end
	Flash (words)	SRAM (bytes)	EEPROM (bytes)			
PIC12F635	1024	64	128	6	1	N
PIC16F636	2048	128	256	12	2	N
PIC16F639	2048	128	256	12	2	Y

Pin Diagrams

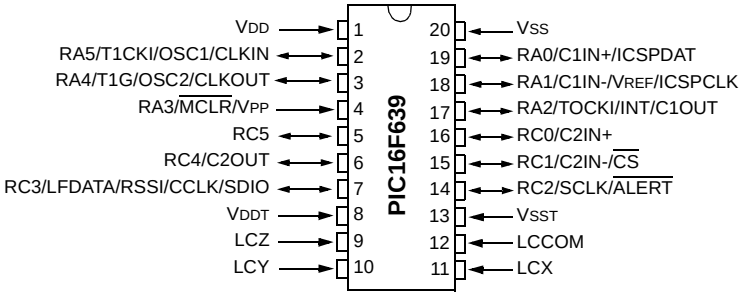
8-Pin PDIP, SOIC, DFN-S



14-Pin PDIP, SOIC, TSSOP



20-Pin SSOP



NOTES:

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