

## 14-Pin Low Power FLASH Microcontroller Product Brief

### HIGH PERFORMANCE RISC CPU

- Only 35 instructions to learn
  - All single cycle instructions except branches
- Operating speed:
  - DC - 20 MHz oscillator/clock input
  - DC - 200 ns instruction cycle
- Interrupt capability
- 8-level deep hardware stack
- Direct, Indirect, and Relative Addressing modes

### SPECIAL MICROCONTROLLER FEATURES

- Precision Internal Oscillator
  - Factory calibrated to  $\pm 1\%$
  - Software selectable frequency range of 8 MHz to 32 kHz
  - Two-speed Start-up mode
  - Crystal fail detect for critical applications
  - Clock mode switching during operation for low power operation
- Power saving SLEEP mode
- Wide operating voltage range (2.0V - 5.5V)
- Industrial and extended temperature range
- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Brown-out Detect (BOD) with software control option
- Enhanced low current Watchdog Timer (WDT) with on-chip oscillator (software selectable nominal 268 seconds with full prescaler) with software enable
- Multiplexed Master Clear/Input pin
- Programmable code protection
- High Endurance FLASH/EEPROM cell
  - 100,000 write FLASH endurance
  - 1,000,000 write EEPROM endurance
  - FLASH/data EEPROM retention: > 40 years

### LOW POWER FEATURES

- Standby Current:
  - 1 nA @ 2.0V, typical
- Operating Current:
  - 8.5  $\mu$ A @ 32 kHz, 2.0V, typical
  - 100  $\mu$ A @ 1 MHz, 2.0V, typical

### PERIPHERAL FEATURES

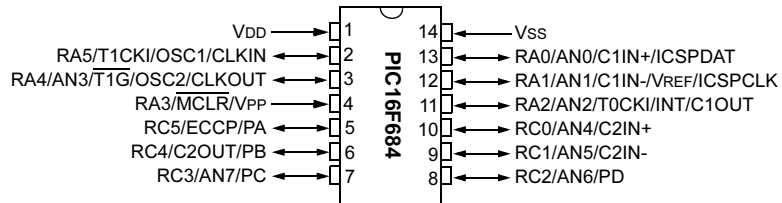
- 11 I/O pins and 1 input-only pin
  - High current source/sink for direct LED drive
  - Interrupt-on-pin change
  - Individually programmable weak pull-ups
  - Low power wake-up
- Analog comparator module with:
  - Two analog comparators
  - Programmable on-chip voltage reference (CVREF) module (% of VDD)
  - Comparator inputs and outputs externally accessible
- A/D Converter
  - 10-bit resolution and 8 channels
- Timer0: 8-bit timer/counter with 8-bit programmable prescaler
- Enhanced Timer1
  - 16-bit timer/counter with prescaler
  - External Gate Input mode
  - Option to use OSC1 and OSC2 in LP mode as Timer1 oscillator, if INTOSC mode selected
- Timer2: 8-bit timer/counter with 8-bit period register, prescaler and postscaler
- Enhanced Capture, Compare, PWM module
  - 16-bit Capture, max resolution 12.5 ns
  - Compare, max resolution 200 ns
  - 10-bit PWM with 1, 2 or 4 output channels, programmable "dead time", max frequency 20 kHz
- In-Circuit Serial Programming™ (ICSP™) via two pins

Device	Program Memory	Data Memory		I/O	10-bit A/D (ch)	Comparators	Timers 8/16-bit
	FLASH (words)	SRAM (bytes)	EEPROM (bytes)				
PIC16F684	2048	128	256	12	8	2	2/1

# PIC16F684

## Pin Diagram

14-pin PDIP, SOIC, TSSOP



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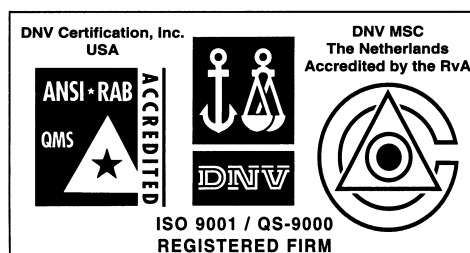
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