FEATURER

Highlights

<table>
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<th>Program Memory</th>
<th>Data Memory</th>
<th>I/O</th>
<th>PWM</th>
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<td>4096</td>
<td>192</td>
<td>22</td>
<td>Yes</td>
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</table>

High-Performance RISC-like CPU

- Only 35 single word instructions to learn
- All single cycle instructions (200ns) except for program branches which are two-cycle
- Operating speed:
  - DC - 20 MHz clock input
  - DC - 200ns instruction cycle
- 4096 x 14 on-chip EPROM program memory
- 192 x 8 general purpose registers (SRAM)
- Interrupt capability
- Eight levels deep hardware stack
- Direct, indirect and relative addressing modes

Peripheral Features

- 22 I/O pins with individual direction control
- High current sink/source for direct LED drive
- Two pins that can be configured as capture input, PWM output, or compare output
  - 16-bit Capture, max resolution 12.5 ns (typ)
  - 16-bit Compare, max resolution 200 ns
  - 1 to 10-bit PWM resolution. Maximum PWM frequency @: 8-bit resolution = 80 kHz
    10-bit resolution = 20 kHz
- TMR0: 8-bit timer/counter with 8-bit programmable prescaler
- TMR1: 16-bit timer/counter (time-base for capture/compare). TMR1 can be incremented during sleep via external crystal/clock (for real-time clock)
- TMR2: 8-bit timer/counter with 8-bit period register (time-base for PWM), prescaler and postscaler
- Synchronous Serial Port (SSP) with SPI and \( I^2C \) interface
- Universal Synchronous Asynchronous Receiver Transmitter (USART)

PIN DIAGRAMS

PDIP, SOIC, Windowed CERDIP

Special Microcontroller Features

- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Brown-out Protection
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code protection
- Power saving SLEEP mode
- Selectable oscillator options
- Serial in-system programming (via two pins)

CMOS Technology

- Low-power, high-speed CMOS EPROM technology
- Fully static design
- Wide-operating voltage range (3.0V to 6.0V)
- Commercial and Industrial Temp. Range
- Low-power consumption
  - <2mA @ 5V, 4 MHz
  - 15UA typical @ 3V, 32 KHz
  - <1UA typical standby current @ 3V

\( I^2C \) is a trademark of Philips Corporation.