C8051F804/810/816/822

25 MIPS, 8-16 kB Flash, 10-Bit ADC, 8-Channel Capacitive Sense Mixed-Signal MCU

Capacitance to Digital Converter

- Supports buttons, sliders, wheels, and capacitive proximity sensing
- Fast 40 µs per channel conversion time
- 16-bit resolution
- 8 input channels
- Auto-scan and wake-on-touch
- Auto-accumulate 4x, 8x, 16x, 32x, and 64x samples

Analog Peripherals

10-Bit ADC (F804 and F816 only)

- Up to 500 ksps
- Up to 12 external single-ended inputs
- VREF from on-chip VREF, external pin or V_{DD}
- Internal or external start of conversion source
- Built-in temperature sensor

Comparator

- Programmable hysteresis and response time
- Configurable as interrupt or reset source

On-Chip Debug

- On-chip debug circuitry facilitates full speed, non-intrusive in-system debug (no emulator required)
- Provides breakpoints, single stepping, inspect/modify memory and registers
- Superior performance to emulation systems using ICE-chips, target pods, and sockets
- Low cost, **complete** development kit

High-Speed 8051 µC Core

- Pipelined instruction architecture; executes 70% of instructions in 1 or 2 system clocks
- Up to 25 MIPS throughput with 25 MHz clock
- Expanded interrupt handler

Memory

- Up to 512 bytes internal data RAM (256 + 256)
- Up to 8-16 kB Flash; In-system programmable in 512-byte Sectors

Digital Peripherals

- 13 Port I/O with high sink current
- Hardware enhanced UART, SMBus™ (I²C compatible), and enhanced SPI™ serial ports
- Three general purpose 16-bit counter/timers
- 16-Bit programmable counter array (PCA) with 3 capture/compare modules and enhanced PWM functionality
- Real time clock mode using timer and crystal

Clock Sources

- 24.5 MHz ±2% Oscillator
  - Supports crystal-less UART operation
- External oscillator: Crystal, RC, C, or clock (1 or 2 pin modes)
- Can switch between clock sources on-the-fly; useful in power saving modes

Supply Voltage 1.8 to 3.6 V

- Built-in voltage supply monitor

16-Pin SOIC

Temperature Range: –40 to +85 °C