

### Analog Peripherals

#### 10-Bit ADC

- $\pm 1$  LSB INL; no missing codes
- Programmable throughput up to 200 ksp/s
- Up to 17 external inputs; programmable as single-ended or differential
- Built-in temperature sensor ( $\pm 3$  °C)

#### Two Comparators

**Internal Voltage Reference: 2.4 V**

#### POR/Brown-out Detector

#### USB Function Controller

- USB specification 2.0 compliant
- Full-speed (12 Mbps) or low-speed (1.5 Mbps) operation
- Integrated clock recovery; no external crystal required for either full-speed or low-speed operation
- Supports eight flexible endpoints
- Dedicated 1 kB USB buffer memory
- Integrated transceiver; no external resistors required

#### 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, registers, and USB memory
- Superior performance to emulation systems using ICE-chips, target pods, and sockets

**Temperature Range: -40 to +85 °C**

### High-Speed 8051 $\mu$ C 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

- 2304 bytes data RAM (256 + 2 kB)
- 32 kB Flash; in-system programmable in 512-byte sectors (512 bytes are reserved)
- External parallel data memory interface

#### Digital Peripherals

- 40 port I/O; all are 5 V tolerant
- Hardware SMBus™ (I<sup>2</sup>C™ compatible), SPI™, and 2 UART serial ports available concurrently
- 4 general-purpose 16-bit counter/timers
- Programmable 16-bit counter array with 5 capture/compare modules

#### Clock Sources

- Internal oscillator: 0.25% accuracy with clock recovery enabled; supports all USB and UART modes
- External oscillator: Crystal, RC, C, or Clock
- On-chip clock multiplier: up to 48 MHz

#### Voltage Regulator

- On-chip voltage regulator supports USB bus-powered operation
- Regulator bypass mode supports USB self-powered operation

**Operating Voltage: 2.7 to 5.25 V**

#### Ordering Part Number

- C8051F345-GQ, 48-Pin TQFP, 9x9 mm<sup>2</sup>

