# C8051F018

## 25 MIPS, 16 kB Flash, 10-Bit ADC, 64-Pin Mixed-Signal MCU

### Analog Peripherals

**10-Bit ADC**

- ±1 LSB INL; no missing codes
- Programmable throughput up to 100 ksps
- 8 external inputs; programmable as single-ended or differential
- Data-dependent windowed interrupt generator
- Built-in temperature sensor (±3 °C)

**Two Comparators**

- 16 programmable hysteresis values
- Configurable to generate interrupts or reset

**Internal Voltage Reference**

**$V_{DD}$ Monitor/Brown-out Detector**

### On-Chip JTAG Debug & Boundary Scan

- On-chip debug circuitry facilitates full speed, non-intrusive in-system debug (no emulator required)
- Provides breakpoints, single stepping, watchpoints, stack monitor
- Inspect/modify memory and registers
- Superior performance to emulation systems using ICE-chips, target pods, and sockets
- IEEE1149.1 compliant boundary scan

### Supply Voltage: 2.8 to 3.6 V

- Typical operating current: 12.5 mA at 25 MHz
- Multiple power saving sleep and shutdown modes

### Temperature Range: –40 to +85 °C

### 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 system clock
- Expanded interrupt handler

### Memory

- 1280 bytes data RAM
- 16 kB Flash; in system programmamble in 512-byte sectors (512 bytes are reserved)

### Digital Peripherals

- 32 port I/O; all are 5 V tolerant
- Hardware SMBus™ (I2C™ compatible), SPI™, and UART serial ports available concurrently
- Programmable 16-bit counter/timer array with five capture/compare modules
- 4 general-purpose 16-bit counter/timers
- Dedicated watchdog timer; bidirectional reset

### Clock Sources

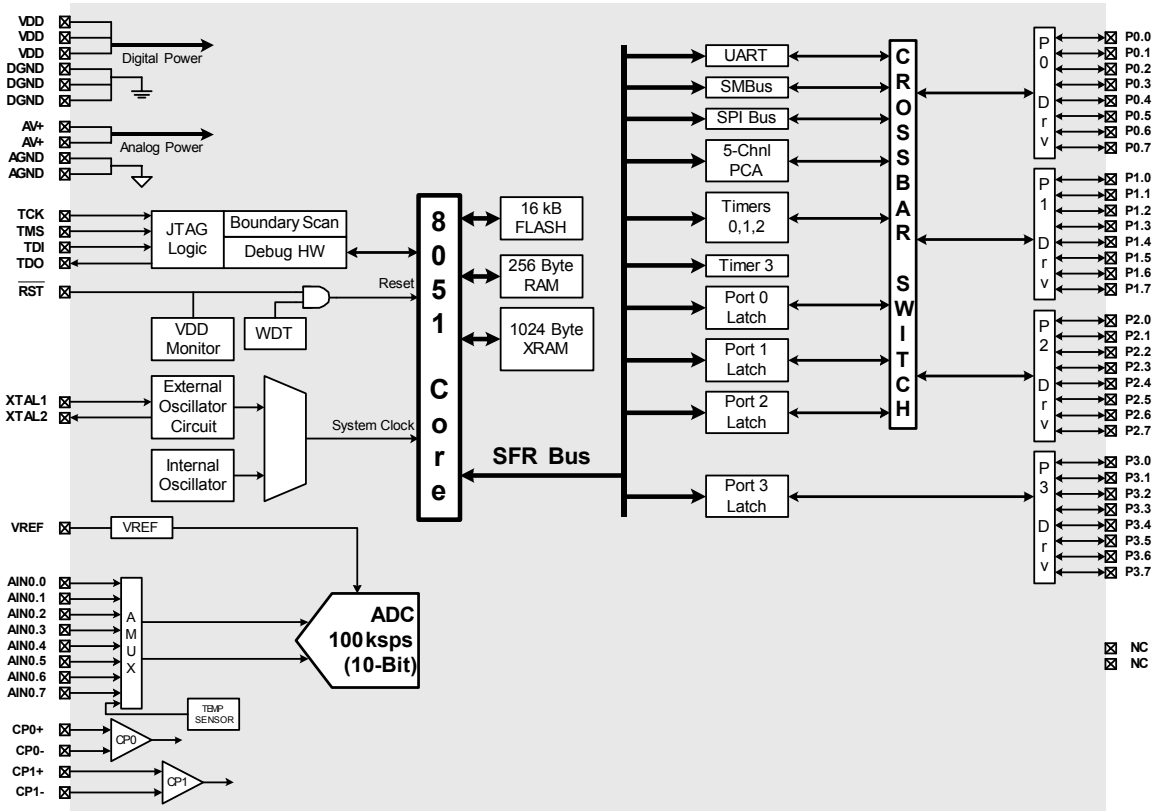
- Internal programmable oscillator: 2–16 MHz
- External oscillator: Crystal, RC, C, or Clock
- Can switch between clock sources on-the-fly

### Package

- 64-pin TQFP (standard lead and lead-free packages)

### Ordering Part Numbers

- Lead-free package: C8051F018-GQ
- Standard package: C8051F018

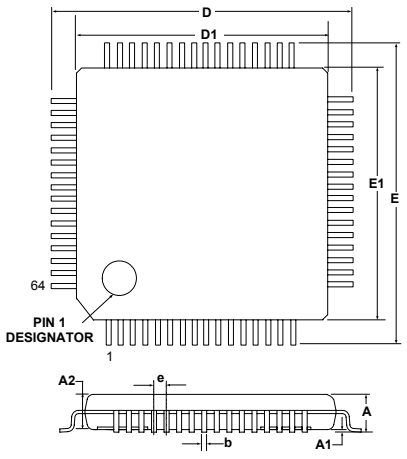


## Selected Electrical Specifications

($T_A$ = –40 to +85 C°, $V_{DD}$ = 2.8 V unless otherwise specified)

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|
| **GLOBAL CHARACTERISTICS** | | | | | |
| Supply Voltage | | 2.8 | | 3.6 | V |
| Supply Current (CPU active) | Clock = 25 MHz<br>Clock = 1 MHz<br>Clock = 32 kHz | | 12.5<br>0.5<br>20 | | mA<br>mA<br>µA |
| Supply Current (shutdown) | Oscillator not running | | 10 | | µA |
| Clock Frequency Range | | DC | | 25 | MHz |
| **A/D CONVERTER** | | | | | |
| Resolution | | | 10 | | bits |
| Integral Nonlinearity | | | ±½ | ±1 | LSB |
| Differential Nonlinearity | Guaranteed Monotonic | | ±½ | ±1 | LSB |
| Signal-to-Noise Plus Distortion | | 59 | 61 | | dB |
| Throughput Rate | | | | 100 | ksps |
| Input Voltage Range | | 0 | | $V_{REF}$ | V |
| **COMPARATORS** | | | | | |
| Supply Current | (each Comparator) | | 1.3 | | µA |
| Response Time | \| (CP+) – (CP-) \| = 100 mV | | 4 | | µs |

## Package Information




| | MIN (mm) | NOM (mm) | MAX (mm) |
|---|---|---|---|
| A | - | - | 1.20 |
| A1 | 0.05 | - | 0.15 |
| A2 | 0.95 | - | 1.05 |
| b | 0.17 | 0.22 | 0.27 |
| D | - | 12.00 | - |
| D1 | - | 10.00 | - |
| e | - | 0.50 | - |
| E | - | 12.00 | - |
| E1 | - | 10.00 | - |

## C8051F005DK Development Kit