

Analog Peripherals

10-Bit ADC

- ± 1 LSB INL; no missing codes
- Programmable throughput up to 200 ksp/s
- Up to 21 external inputs; programmable as single-ended or differential
- Data-dependent windowed interrupt generator
- Built-in temperature sensor (± 3 °C)

Two Comparators

- Programmable hysteresis and response time
- Configurable to generate interrupts or reset
- Low current (0.4 μ A)

POR/Brown-out Detector

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

Supply Voltage: 2.7 to 3.6 V

- Typical Operating Current: 7 mA at 25 MHz
15 μ A at 32 kHz
- Typical Stop Mode Current: <0.1 μ A

High-Speed 8051 μ C 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 programmable in 512-byte sectors (512 bytes are reserved)

Digital Peripherals

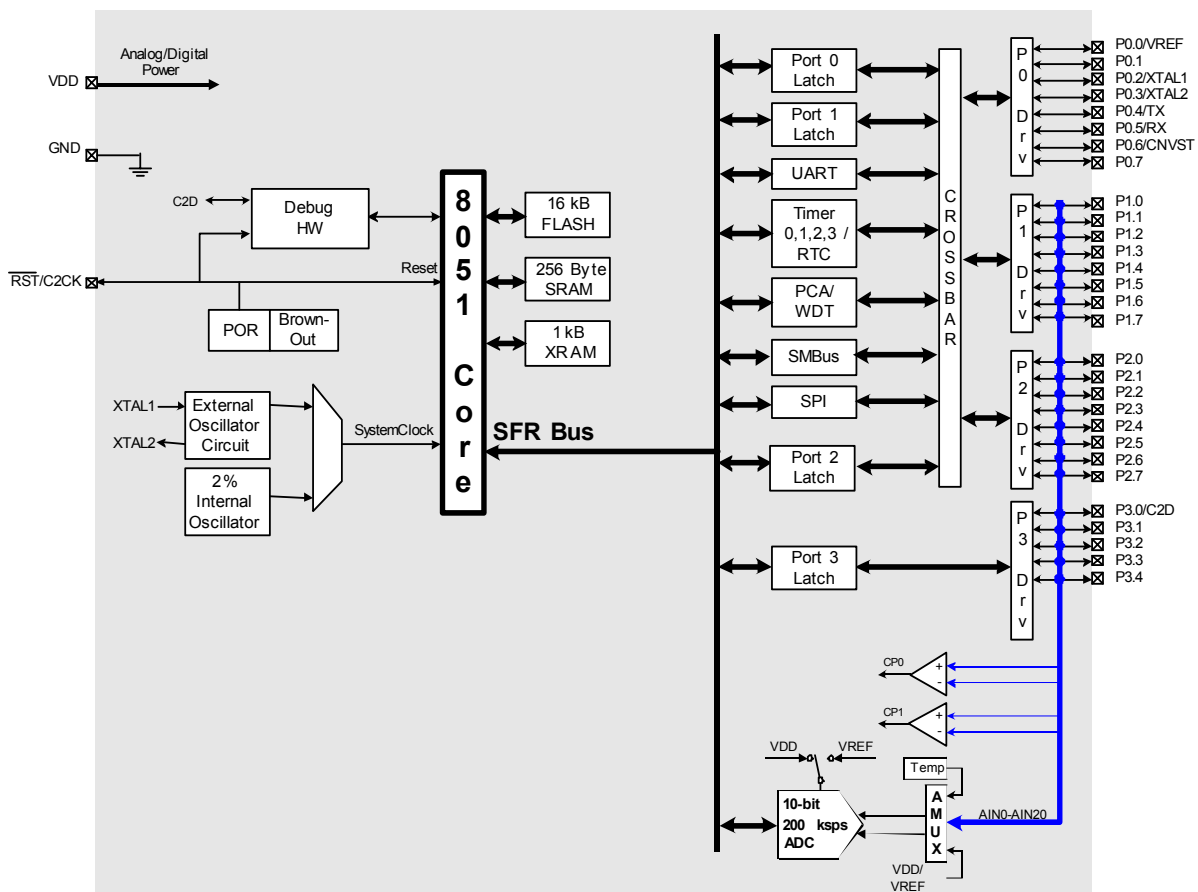
- 29 port I/O; all are 5 V tolerant
- Hardware SMBus™ (I2C™ compatible), SPI™, and UART serial ports available concurrently
- Programmable 16-bit counter/timer array with five capture/compare modules, WDT
- 4 general-purpose 16-bit counter/timers
- Realtime clock mode using timer or PCA

Clock Sources

- Internal oscillator: 24.5 MHz, 2% accuracy supports UART operation
- External oscillator: Crystal, RC, C, or Clock (1 or 2 pin modes)
- Can switch between clock sources on-the-fly

32-Pin LQFP

Temperature Range: -40 to +85 °C

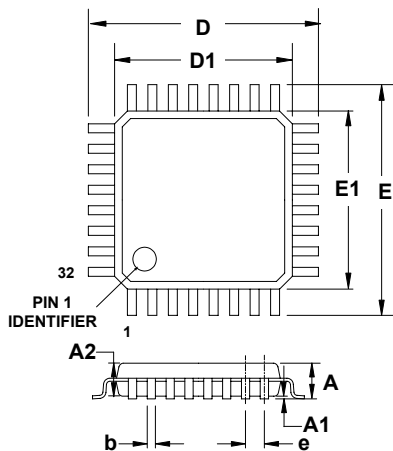


Selected Electrical Specifications

($T_A = -40$ to $+85$ C°, $V_{DD} = 2.7$ V unless otherwise specified)

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------------------|---|------|------|---------|---------|
| GLOBAL CHARACTERISTICS | | | | | |
| Supply Voltage | | 2.7 | | 3.6 | V |
| Supply Current | Clock = 25 MHz | | 7 | | mA |
| | Clock = 1 MHz | | 0.5 | | mA |
| | Clock = 32 kHz; V_{DD} Monitor Disabled | | 15 | | μ A |
| Supply Current (shutdown) | Oscillator off; V_{DD} Monitor Enabled | | 10 | | μ A |
| | Oscillator off; V_{DD} Monitor Disabled | | <0.1 | | μ A |
| Clock Frequency Range | | DC | | 25 | MHz |
| INTERNAL OSCILLATOR | | | | | |
| Frequency | | 24.0 | 24.5 | 25.0 | MHz |
| A/D CONVERTER | | | | | |
| Resolution | | | 10 | | bits |
| Integral Nonlinearity | | | | ± 1 | LSB |
| Differential Nonlinearity | Guaranteed Monotonic | | | ± 1 | LSB |
| Signal-to-Noise Plus Distortion | | 53 | | | dB |
| Throughput Rate | | | | 200 | ksps |
| COMPARATORS | | | | | |
| Mode0 Response Time | (CP+) – (CP-) = 100 mV | | 0.10 | | μ s |
| Mode0 Supply Current | | | 7.6 | | μ A |
| Mode1 Response Time | (CP+) – (CP-) = 100 mV | | 0.18 | | μ s |
| Mode1 Supply Current | | | 3.2 | | μ A |
| Mode2 Response Time | (CP+) – (CP-) = 100 mV | | 0.32 | | μ s |
| Mode2 Supply Current | | | 1.3 | | μ A |
| Mode3 Response Time | (CP+) – (CP-) = 100 mV | | 1.0 | | μ s |
| Mode3 Supply Current | | | 0.40 | | μ A |

Package Information



| | MIN (mm) | NOM (mm) | MAX (mm) |
|----|----------|----------|----------|
| A | - | - | 1.60 |
| A1 | 0.05 | - | 0.15 |
| A2 | 1.35 | 1.40 | 1.45 |
| b | 0.30 | 0.37 | 0.45 |
| D | - | 9.00 | - |
| D1 | - | 7.00 | - |
| e | - | 0.80 | - |
| E | - | 9.00 | - |
| E1 | - | 7.00 | - |

C8051F310DK Development Kit

