

Analog Peripherals

10-Bit ADC

- ± 1 LSB INL; guaranteed monotonic
- Programmable throughput up to 100 ksps
- 13 external inputs; programmable as single-ended or differential
- Programmable amplifier gain: 16, 8, 4, 2, 1, 0.5
- Data-dependent windowed interrupt generator
- Built-in temperature sensor (± 3 °C)

High-Voltage Differential Amplifier

- 60 V common mode input range
- Offset adjust from -60 to $+60$ V
- 16 gain settings from 0.05 to 16

Three Comparators

Internal Voltage Reference

Precision 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, program trace memory
- Inspect/modify memory and registers
- Superior performance to emulation systems using ICE-chips, target pods, and sockets
- IEEE1149.1 compliant boundary scan

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

- 4352 bytes data RAM
- 32 kB Flash; in-system programmable in 512-byte sectors (512 bytes are reserved)
- External parallel data memory interface

CAN Bus 2.0B

- 32 message objects
- "Mailbox" implementation only interrupts CPU when needed

Digital Peripherals

- 32 port I/O; all are 5 V tolerant
- Hardware SMBus™ (I2C™ compatible), SPI™, and two UART serial ports available concurrently
- Programmable 16-bit counter array with 6 capture/compare modules
- 5 general-purpose 16-bit counter/timers
- Dedicated watchdog timer; bidirectional reset
- Real-time clock mode using timer 3 or PCA

Clock Sources

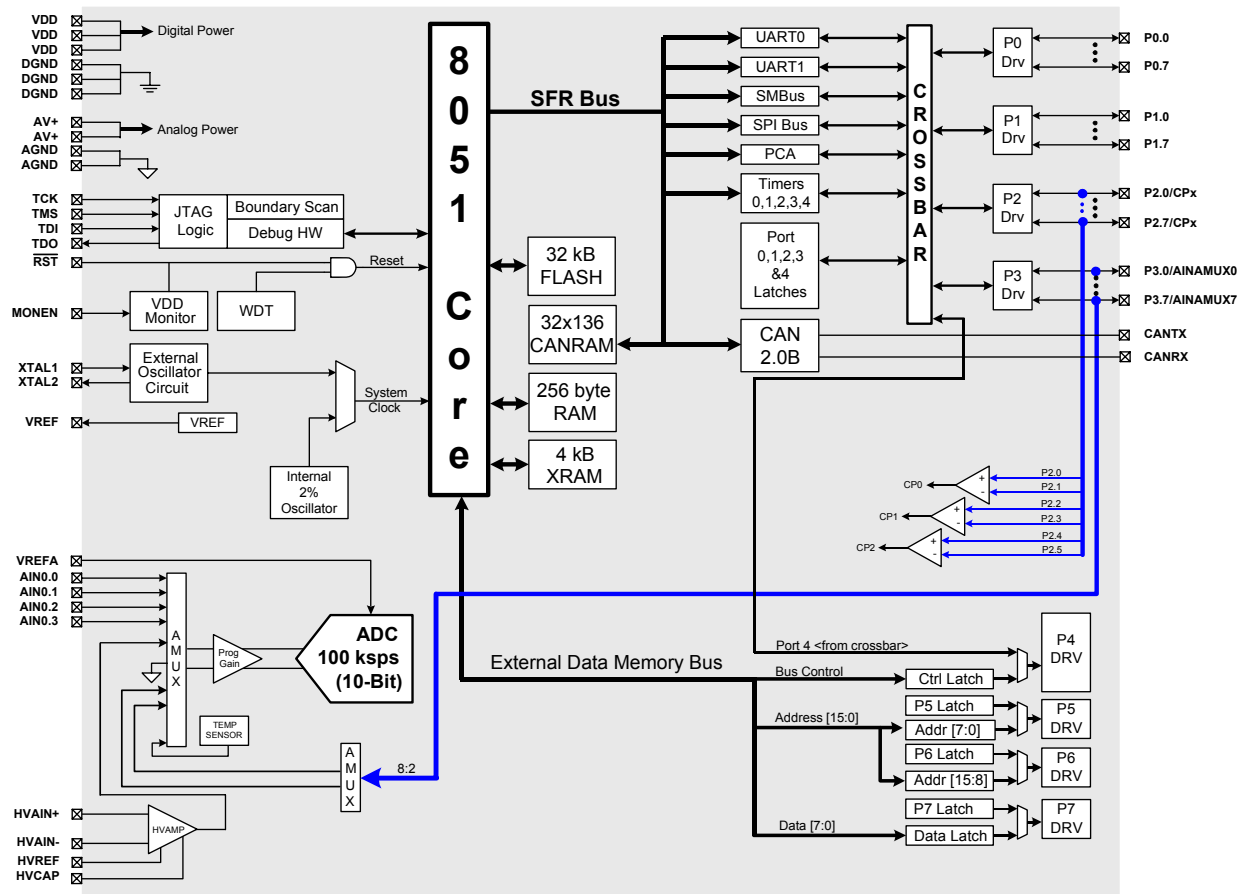
- Internal programmable 2% oscillator: up to 25 MHz
- External oscillator: Crystal, RC, C, or Clock

Supply Voltage: 2.7 to 3.6 V

- Typical operating current: 10 mA at 25 MHz
- Multiple power saving sleep and shutdown mode

64-Pin TQFP

Temperature Range: -40 to $+85$ °C

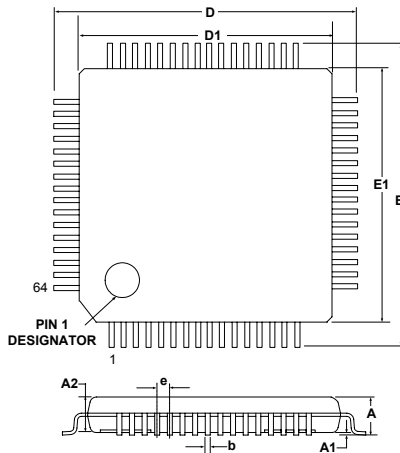


Selected Electrical Specifications

($T_A = -40$ 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 with CPU active | Clock = 25 MHz Clock = 1 MHz Clock = 32 kHz; V_{DD} Monitor Enabled | — | 10 0.5 20 | — | mA mA μ A |
| Supply Current (shutdown) | Oscillator off; V_{DD} Monitor Disabled | — | 0.1 | — | μ A |
| Clock Frequency Range | | DC | — | 25 | MHz |
| A/D Converter | | | | | |
| Resolution | | — | 10 | — | bits |
| Integral Nonlinearity | | — | — | ± 1 | LSB |
| Differential Nonlinearity | Guaranteed Monotonic | | | ± 1 | LSB |
| Signal-to-Noise Plus Distortion | | 59 | — | — | dB |
| Throughput Rate | | — | — | 100 | kSPS |
| Input Voltage Range | | 0 | — | V_{REF} | V |
| Comparators | | | | | |
| Supply Current | (each Comparator) | — | 1.5 | — | μ A |
| Response Time | ($CP+ - CP-$) = 100 mV | — | 4 | — | μ s |

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 | - |

C8051F040DK Development Kit

