



# C8051F040

## CAN2.0B 64KB ISP FLASH MCU

PRELIMINARY

### ANALOG PERIPHERALS

#### 12-bit ADC

- ±1LSB INL; Guaranteed Monotonic
- Programmable Throughput up to 100ksps
- 12 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

- 60V Common Mode Input Range
- Offset Adjust from -60V to +60V
- 16 Gain Settings from 0.05 to 16

#### 8-bit ADC

- Programmable Throughput up to 500ksps
- 8 External Inputs; Programmable as Single-Ended or Differential
- Programmable Amplifier Gain: 4, 2, 1, 0.5

#### Two 12-bit DACs

#### Three Comparators

#### Internal Voltage Reference

#### Precision VDD 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 µC CORE

- Pipe-lined Instruction Architecture; Executes 70% of Instructions in 1 or 2 System Clocks
- Up to 25MIPS Throughput with 25MHz System Clock
- Expanded Interrupt Handler

### MEMORY

- 4352 Bytes Internal Data RAM (256 + 4k)
- 64k Bytes In-System Programmable FLASH Program Memory
- External 64k Byte Data Memory Interface

### CAN Bus 2.0B

- 32 Message Objects
- "Mailbox" implementation only interrupts CPU when needed

### DIGITAL PERIPHERALS

- 64 Port I/O; All are 5V tolerant
- Hardware SMBus™ (I2C™ Compatible), SPI™, and Two UART Serial Ports Available Concurrently
- Programmable 16-bit Counter Array with 6 Capture/Compare Modules
- Five General Purpose 16-bit Counter/Timers
- Dedicated Watch-Dog Timer; Bi-directional Reset

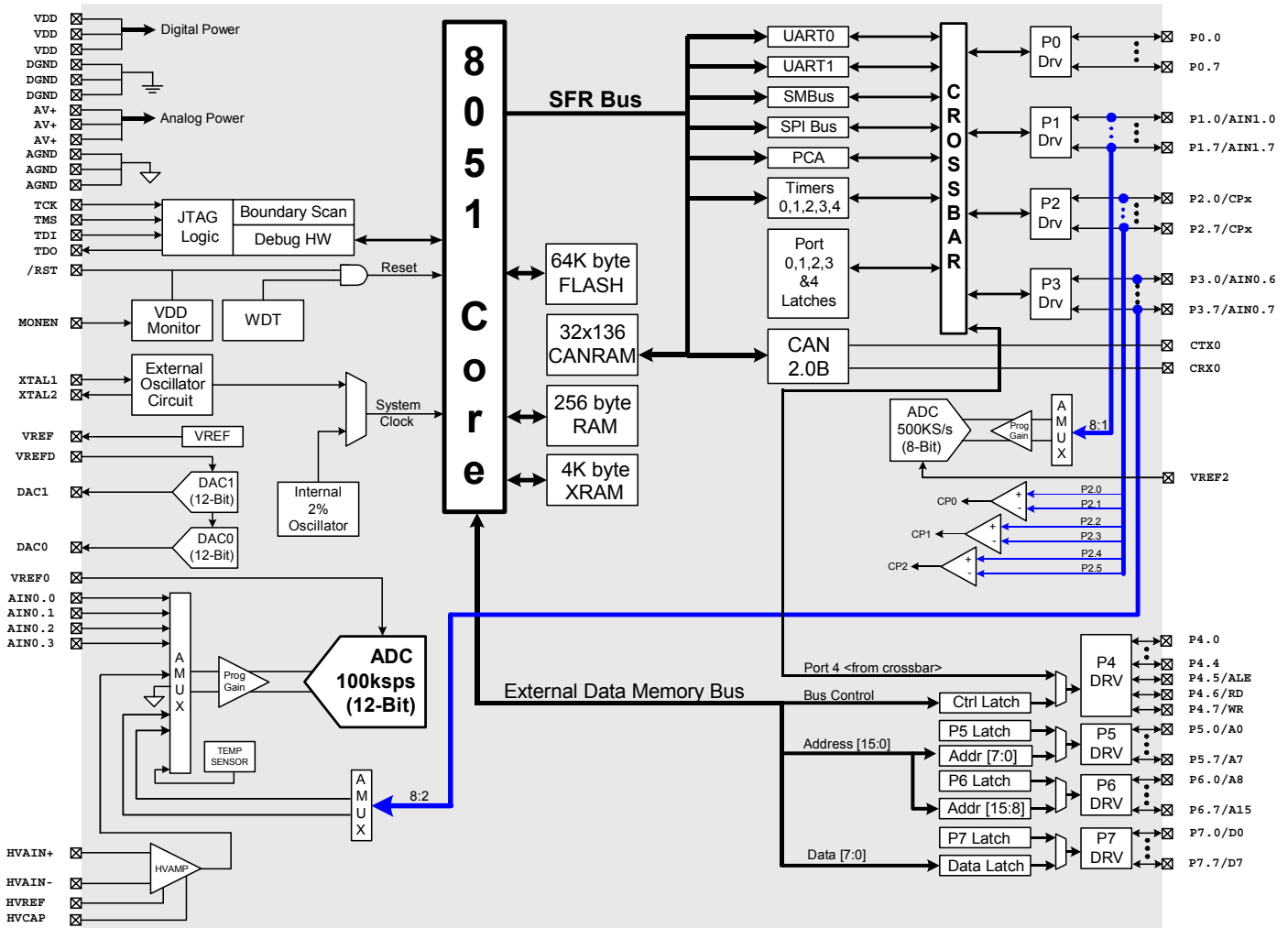
### CLOCK SOURCES

- Internal Programmable 2% Oscillator: Up to 25MHz
- External Oscillator: Crystal, RC, C, or Clock
- Real-Time Clock Mode using Timer 3 or PCA

### SUPPLY VOLTAGE ..... 2.7V to 3.6V

- Typical Operating Current: 10mA @ 25MHz
- Multiple Power Saving Sleep and Shutdown Modes

### 100-Pin TQFP; Temp Range -40°C to +85°C





# C8051F040

## CAN2.0B 64KB ISP FLASH MCU

PRELIMINARY

**SELECTED ELECTRICAL SPECIFICATIONS**  $T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ,  $V_{DD} = 2.7\text{V}$  unless otherwise specified.

| PARAMETER                       | CONDITIONS                                   | MIN | TYP | MAX     | UNITS         |
|---------------------------------|--|-----|-----|---------|---------------|
| <b>GLOBAL CHARACTERISTICS</b>   |  |     |     |         |               |
| Supply Voltage                  |  | 2.7 |     | 3.6     | V             |
| Supply Current (CPU active)     | Clock=25MHz                                  |     | 10  |         | mA            |
|                                 | Clock=1MHz                                   |     | 0.5 |         | mA            |
|                                 | Clock=32kHz; VDD Monitor Enabled             |     | 20  |         | $\mu\text{A}$ |
| Supply Current (shutdown)       | Oscillator not running; VDD Monitor Disabled |     | 0.1 |         | $\mu\text{A}$ |
| Clock Frequency Range           |  | DC  |     | 25      | MHz           |
| <b>A/D CONVERTER</b>            |  |     |     |         |               |
| Resolution                      |  |     | 12  |         | bits          |
| Integral Nonlinearity           |  |     |     | $\pm 1$ | LSB           |
| Differential Nonlinearity       | Guaranteed Monotonic                         |     |     | $\pm 1$ | LSB           |
| Signal-to-Noise Plus Distortion |  | 66  | 69  |         | dB            |
| Throughput Rate                 |  |     |     | 100     | ksps          |
| Input Voltage Range             |  | 0   |     | VREF    | V             |
| <b>D/A CONVERTERS</b>           |  |     |     |         |               |
| Resolution                      |  |     | 12  |         | LSB           |
| Differential Nonlinearity       |  |     |     | $\pm 1$ | LSB           |
| Output Settling Time            |  |     | 10  |         | $\mu\text{s}$ |
| <b>COMPARATORS</b>              |  |     |     |         |               |
| Supply Current                  | (each Comparator)                            |     | 1.5 |         | $\mu\text{A}$ |
| Response Time                   | $ CP+ - CP-  = 100\text{mV}$                 |     | 4   |         | $\mu\text{s}$ |

