



### ANALOG PERIPHERALS

#### 8-BIT ADC

- Up to 500ksps
- Up to 8 External Inputs
- Programmable Amplifier Gains of 4, 2, 1, & 0.5
- VREF from External Pin or VDD
- Internal or External Start of Conversion Sources
- Built-in Temperature Sensor ( $\pm 3^{\circ}\text{C}$ )

#### Comparator

- Programmable Hysteresis and Response Time
- Configurable as Wake-up or Reset Source
- Low Current (0.4uA)

### ON-CHIP DEBUG

- On-Chip Debug Circuitry Facilitates Full Speed, Non-Intrusive In-System Debug (No Emulator Required!)
- Provides Breakpoints, Single Stepping, Watchpoints
- Inspect/Modify Memory, Registers, and Stack
- Superior Performance to Emulation Systems Using ICE-Chips, Target Pods, and Sockets
- Low Cost, **Complete** Development Kit

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

- Typical Operating Current: 5.8mA @ 25MHz  
11uA @ 32kHz
- Typical Stop Mode Current: <0.1uA

**Temperature Range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$**

### HIGH SPEED 8051 $\mu\text{C}$ Core

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

### MEMORY

- 256 Bytes Internal Data RAM
- 8k Bytes FLASH; In-System Programmable in 512 byte Sectors

### DIGITAL PERIPHERALS

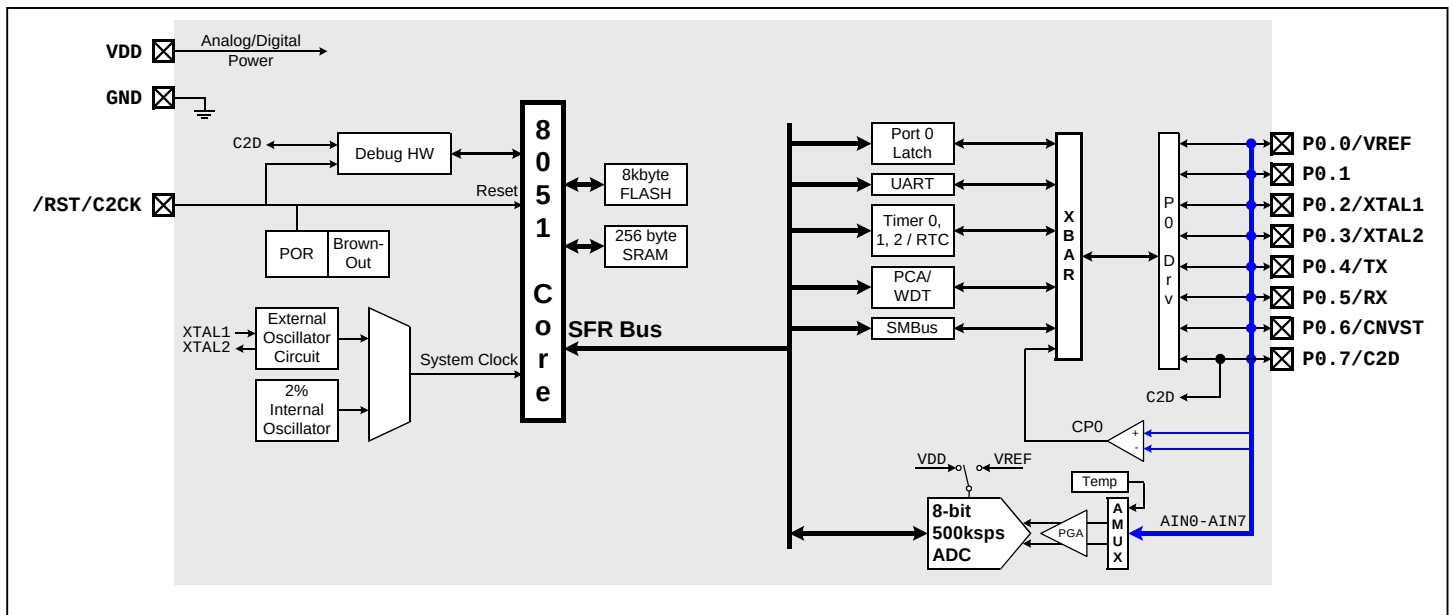
- 8 Port I/O; All 5V tolerant with High Sink Current
- Enhanced Hardware UART and SMBus™ Serial Ports
- Three General Purpose 16-Bit Counter/Timers
- 16-bit Programmable Counter Array with Three Capture/Compare Modules, WDT
- Real Time Clock Mode using PCA or Timer and External Clock Source

### CLOCK SOURCES

- Internal Oscillator: 25MHz, 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; Useful in Power Saving Modes

### 11-Pin Micro Lead Package

- 3 x 3mm PCB Footprint; Actual MLP Size 
- SMBus is a trademark of Intel Corp.





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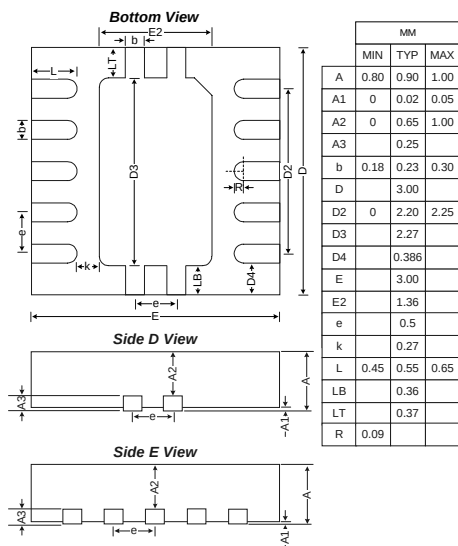
## 8KB Flash, 256 RAM, 8-Bit ADC, 11-Pin MCU

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 with CPU active     | Clock=25MHz                                 |                     | 5.8       |                     | mA            |
|                                    | Clock=1MHz                                  |                     | 0.34      |                     | mA            |
|                                    | Clock=32kHz; VDD Monitor Disabled           |                     | 11        |                     | $\mu\text{A}$ |
| Supply Current (shutdown)          | Oscillator off; VDD Monitor Enabled         |                     | 10        |                     | $\mu\text{A}$ |
|                                    | Oscillator off; VDD Monitor Disabled        |                     | <0.1      |                     | $\mu\text{A}$ |
| <b>CPU &amp; DIGITAL I/O PORTS</b> |                                             |                     |           |                     |               |
| Clock Frequency Range              |                                             | DC                  |           | 25                  | MHz           |
| Port Output High Voltage           | $I_{OH} = -3\text{mA}$ , Port I/O push-pull | $V_{DD} - 0.7$      |           |                     | V             |
| Port Output Low Voltage            | $I_{OL} = 8.5\text{mA}$                     |                     |           | 0.6                 | V             |
| Input High Voltage                 |                                             | $0.7 \times V_{DD}$ |           |                     | V             |
| Input Low Voltage                  |                                             |                     |           | $0.3 \times V_{DD}$ | V             |
| <b>INTERNAL OSCILLATOR</b>         |                                             |                     |           |                     |               |
| Frequency                          |                                             | 24.0                | 24.5      | 25.0                | MHz           |
| <b>A/D CONVERTER</b>               |                                             |                     |           |                     |               |
| Resolution                         |                                             |                     | 8         |                     | bits          |
| Integral Nonlinearity              |                                             |                     | $\pm 1/2$ | $\pm 1$             | LSB           |
| Differential Nonlinearity          | Guaranteed Monotonic                        |                     | $\pm 1/2$ | $\pm 1$             | LSB           |
| Signal-to-Noise Plus Distortion    |                                             | 49                  |           |                     | dB            |
| Throughput Rate                    |                                             |                     |           | 500                 | ksps          |
| Input Voltage Range                |                                             | 0                   |           | $V_{REF}$           | V             |
| <b>COMPARATOR</b>                  |                                             |                     |           |                     |               |
| Response Time Mode0                | $(CP+) - (CP-) = 100\text{mV}$              |                     | 0.1       |                     | $\mu\text{s}$ |
| Current Consumption Mode0          |                                             |                     | 7.6       |                     | $\mu\text{A}$ |
| Response Time Mode1                | $(CP+) - (CP-) = 100\text{mV}$              |                     | 0.18      |                     | $\mu\text{s}$ |
| Current Consumption Mode1          |                                             |                     | 3.2       |                     | $\mu\text{A}$ |
| Response Time Mode2                | $(CP+) - (CP-) = 100\text{mV}$              |                     | 0.32      |                     | $\mu\text{s}$ |
| Current Consumption Mode2          |                                             |                     | 1.3       |                     | $\mu\text{A}$ |
| Response Time Mode3                | $(CP+) - (CP-) = 100\text{mV}$              |                     | 1         |                     | $\mu\text{s}$ |
| Current Consumption Mode3          |                                             |                     | 0.4       |                     | $\mu\text{A}$ |

### PACKAGE INFORMATION



### C8051F300DK DEVELOPMENT KIT

