

### ANALOG PERIPHERALS

#### 10-BIT ADC

- $\pm 1$  LSB INL; No Missing Codes
- Programmable Throughput up to 200ksp/s
- Up to 13 External Inputs; Programmable as Single-Ended or Differential
- Built-in Temperature Sensor ( $\pm 3^\circ\text{C}$ )

#### Two Comparators

#### Internal Voltage Reference – 2.4V

#### POR/Brown-Out Detector

#### USB FUNCTION CONTROLLER

- USB Specification 2.0 Compliant
- Full-Speed (12 Mbps) or Low-Speed (1.5Mbps) Operation
- Integrated Clock Recovery; No External Crystal Required for either Full-Speed or Low-Speed Operation
- Supports Eight Flexible Endpoints
- Dedicated 1k Byte USB Buffer Memory
- Integrated Transceiver; No External Resistors Required

#### 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, Registers, and USB Memory
- Superior Performance to Emulation Systems Using ICE-Chips, Target Pods, and Sockets

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

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

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

### MEMORY

- 1280 Bytes Internal Data RAM (256 + 1K)
- 16k Bytes In-System Programmable FLASH Program Memory

### DIGITAL PERIPHERALS

- 21 Port I/O; All 5V tolerant with High Sink Current
- Hardware Enhanced UART, SPI™ and SMBus™ Serial Ports
- Four General Purpose 16-Bit Counter/Timers
- 16-bit Programmable Counter Array with Five Capture/Compare Modules

### CLOCK SOURCES

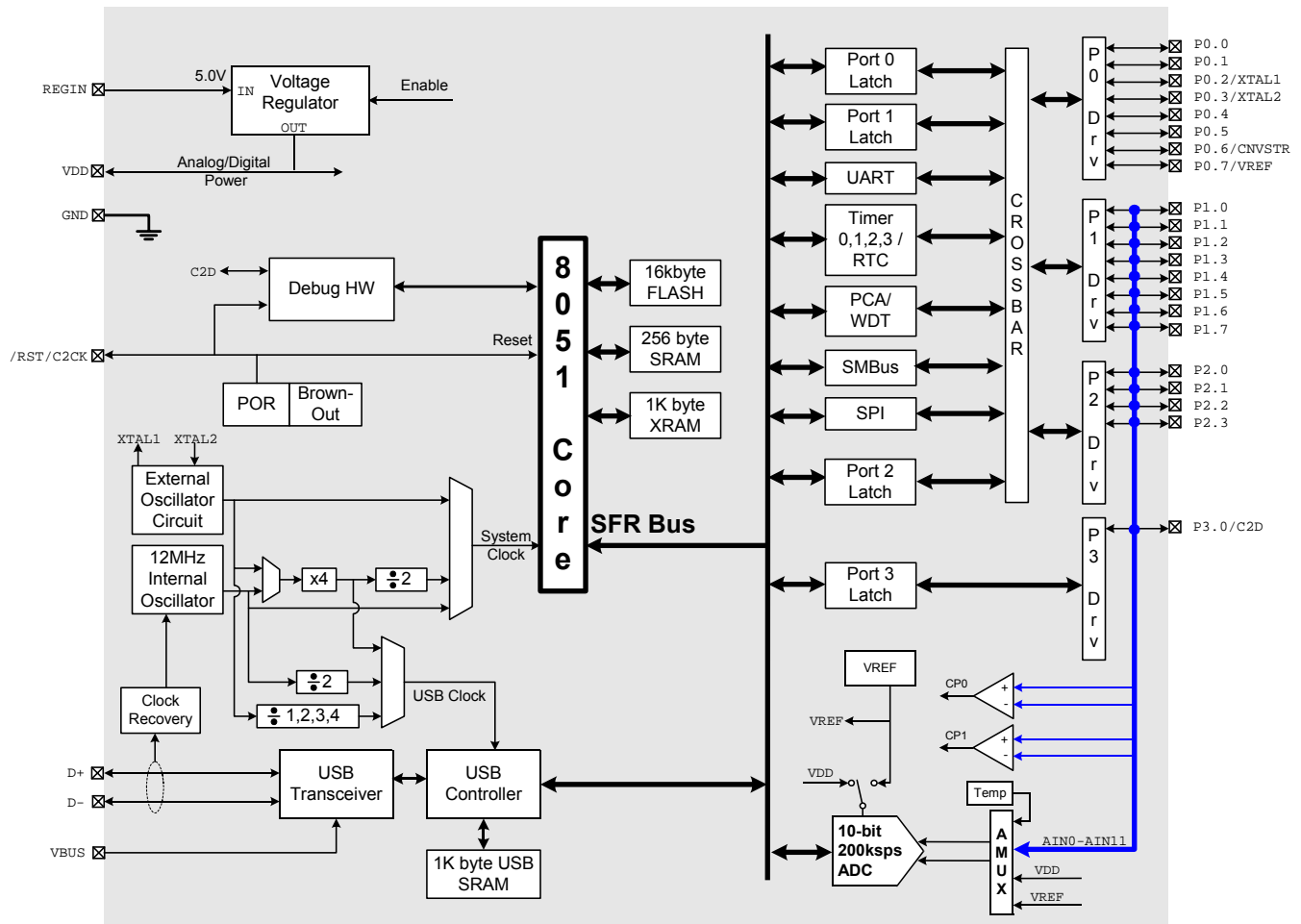
- Internal Oscillator: 0.25% Accuracy with Clock Recovery enabled. Supports all USB and UART Modes
- External Oscillator: Crystal, RC, C, or Clock
- On-Chip Clock Multiplier for USB Controller

### VOLTAGE REGULATOR

- On-Chip Voltage Regulator Supports USB Bus-Powered Operation
- Regulator Bypass Mode Supports USB Self-Powered Operation

### VOLTAGE REGULATOR INPUT..... 4.0V to 5.25V

28-Pin MLP Package – 5mm x 5mm





# C8051F321

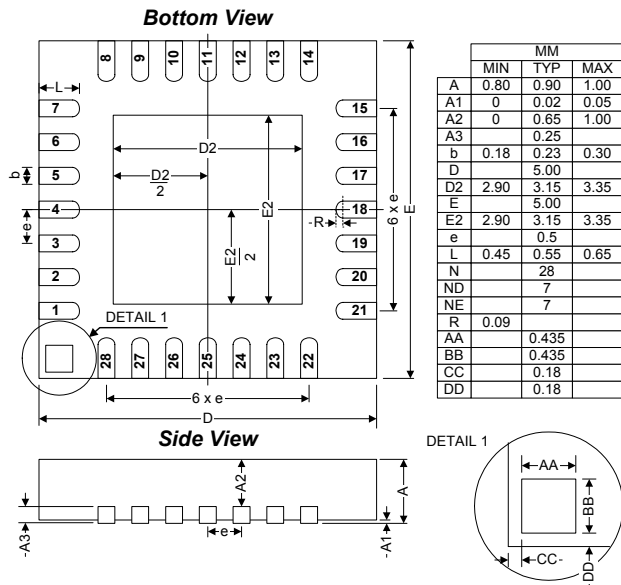
## USB Mixed-Signal 16KB FLASH MCU

**PRELIMINARY**

**SELECTED ELECTRICAL SPECIFICATIONS**  $T_A = 0^\circ\text{C}$  to  $+70^\circ\text{C}$ ,  $V_{REG} = 5.0\text{V}$  unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>GLOBAL CHARACTERISTICS</b>					
Regulator Input Voltage (REGIN)		4.0		5.25	V
VDD (VREG Output)		3.0	3.3	3.6	V
VREG Bias Current	VREG Enabled		70		$\mu\text{A}$
Supply Current with CPU and USB active	CPU Clock=24MHz, USB Clock=48MHz		18		mA
	CPU Clock=12MHz, USB Clock=6MHz		9		mA
Supply Current (suspend mode, Oscillator off)	VDD Monitor Enabled; VREG Disabled		30		$\mu\text{A}$
	VDD Monitor Disabled; VREG Disabled		<0.1		$\mu\text{A}$
CPU System Clock Range		DC		25	MHz
<b>INTERNAL OSCILLATOR &amp; CLOCKS</b>					
Frequency	Clock Recovery Enabled	11.97	12.0	12.03	MHz
	Clock Recovery Disabled	11.82	12.0	12.18	MHz
USB Clock	Full-Speed Operation	47.88	48.0	48.12	MHz
	Low-Speed Operation	5.91	6.0	6.09	MHz
<b>A/D CONVERTER</b>					
Resolution			10		bits
Integral Nonlinearity			$\pm 1/2$	$\pm 1$	LSB
Differential Nonlinearity	Guaranteed Monotonic		$\pm 1/2$	$\pm 1$	LSB
Signal-to-Noise Plus Distortion		53			dB
Throughput Rate				200	ksps
Input Voltage Range		0		VREF	V
<b>COMPARATOR</b>					
Response Time Mode0	(CP+) – (CP-) = 100mV		0.1		$\mu\text{s}$
Current Consumption Mode0			7.6		$\mu\text{A}$
Response Time Mode1	(CP+) – (CP-) = 100mV		0.18		$\mu\text{s}$
Current Consumption Mode1			3.2		$\mu\text{A}$
Response Time Mode2	(CP+) – (CP-) = 100mV		0.32		$\mu\text{s}$
Current Consumption Mode2			1.3		$\mu\text{A}$
Response Time Mode3	(CP+) – (CP-) = 100mV		1		$\mu\text{s}$
Current Consumption Mode3			0.4		$\mu\text{A}$

### PACKAGE INFORMATION



### C8051F320DK DEVELOPMENT KIT

