

Analog Peripherals

10-Bit ADC

- ± 1 LSB INL; no missing codes
- Programmable throughput up to 200 ksps
- Up to 13 external inputs; programmable as single-ended or differential
- Built-in temperature sensor (± 3 °C)

Two Comparators

Internal Voltage Reference: 2.4 V

POR/Brown-out Detector

USB Function Controller

- USB specification 2.0 compliant
- Full-speed (12 Mbps) or low-speed (1.5 Mbps) operation
- Integrated clock recovery; no external crystal required for either full-speed or low-speed operation
- Supports eight flexible endpoints
- Dedicated 1 kB 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

Voltage Regulator Input: 4.0 to 5.25 V

Temperature Range: -40 to +85 °C

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 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

- 21 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
- 4 general-purpose 16-bit counter/timers

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

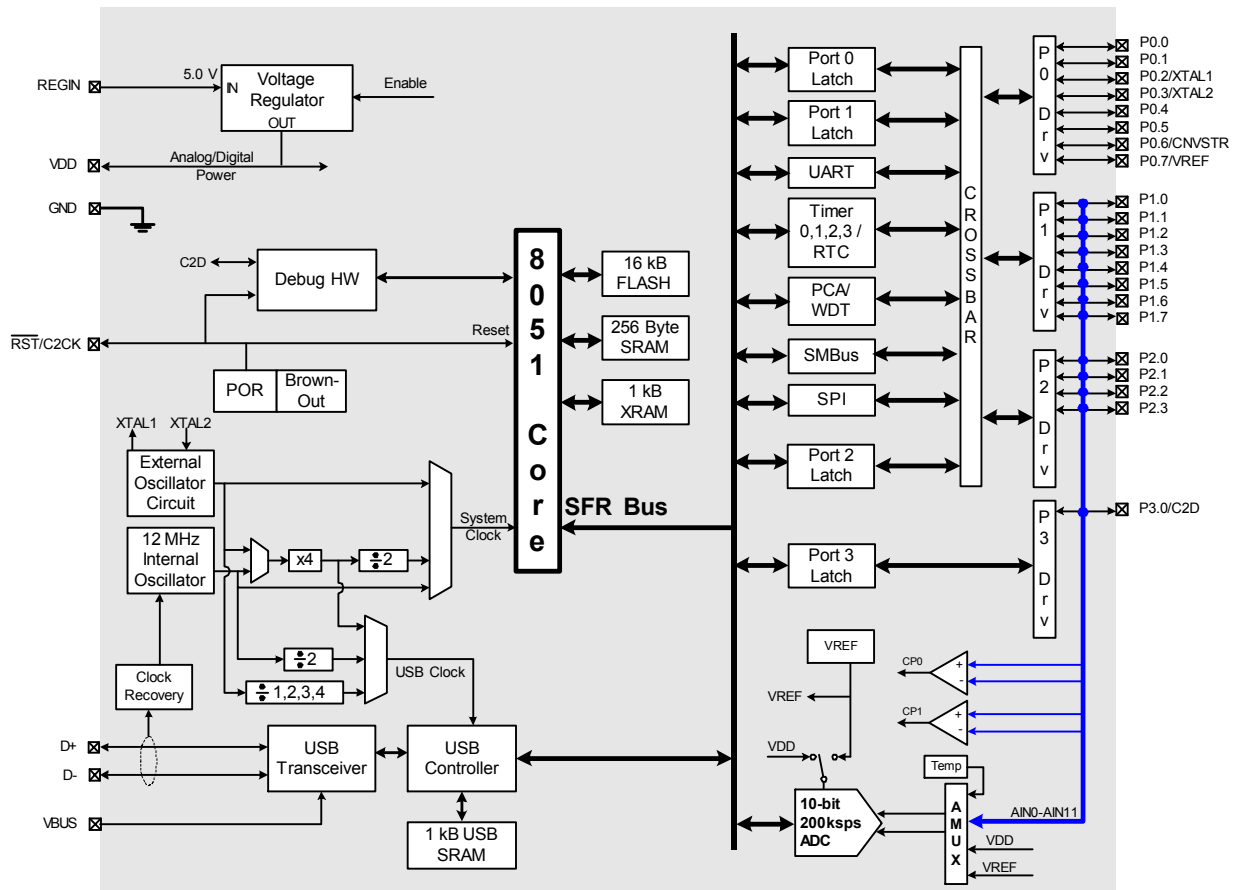
- On-chip voltage regulator supports USB bus-powered operation
- Regulator bypass mode supports USB self-powered operation

Package

- 28-pin QFN (standard lead and lead-free packages)

Ordering Part Numbers

- Lead-free package: C8051F321-GM
- Standard package: C8051F321

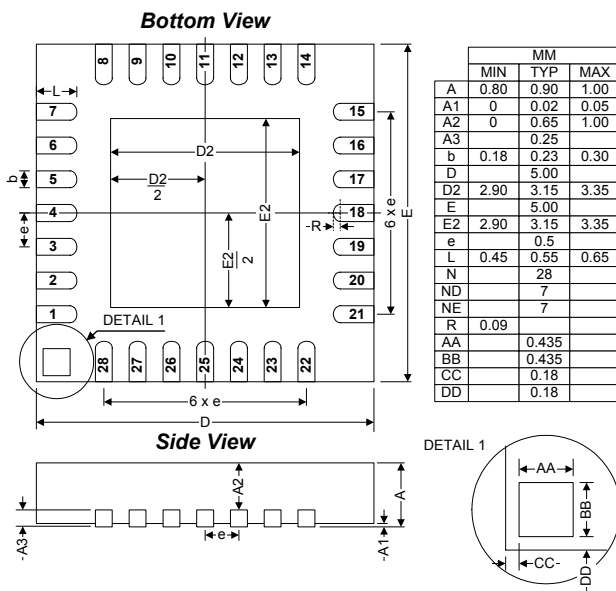


Selected Electrical Specifications

($T_A = 0$ to $+70$ C°, VREG = 5.0 V unless otherwise specified)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
GLOBAL CHARACTERISTICS					
Regulator Input Voltage (REGIN)		4.0		5.25	V
V _{DD} (VREG Output)		3.0	3.3	3.6	V
VREG Bias Current	VREG Enabled		70		μA
Supply Current with CPU and USB active	CPU Clock = 24 MHz, USB Clock = 48 MHz CPU Clock = 12 MHz, USB Clock = 6 MHz		18		mA
Supply Current (suspend mode, Oscillator off)	V _{DD} Monitor Enabled; VREG Disabled V _{DD} Monitor Disabled; VREG Disabled		30 <0.1		μA μA
CPU System Clock Range		DC		25	MHz
INTERNAL OSCILLATOR & CLOCKS					
Frequency	Clock Recovery Enabled Clock Recovery Disabled	11.97 11.82	12.0 12.0	12.03 12.18	MHz MHz
USB Clock	Full-Speed Operation Low-Speed Operation	47.88 5.91	48.0 6.0	48.12 6.09	MHz MHz
A/D CONVERTER					
Resolution			10		bits
Integral Nonlinearity			±½	±1	LSB
Differential Nonlinearity	Guaranteed Monotonic		±½	±1	LSB
Signal-to-Noise Plus Distortion		53			dB
Throughput Rate				200	ksps
Input Voltage Range		0		V _{REF}	V
COMPARATOR					
Response Time Mode0	(CP+) – (CP-) = 100 mV		0.1		μs
Current Consumption Mode0			7.6		μA
Response Time Mode1	(CP+) – (CP-) = 100 mV		0.18		μs
Current Consumption Mode1			3.2		μA
Response Time Mode2	(CP+) – (CP-) = 100 mV		0.32		μs
Current Consumption Mode2			1.3		μA
Response Time Mode3	(CP+) – (CP-) = 100 mV		1		μs
Current Consumption Mode3			0.4		μA

Package Information



C8051F320DK Development Kit

