

25 MIPS, 8 kB Flash, 10-Bit ADC, 28-Pin Mixed-Signal MCU

Analog Peripherals

10-Bit ADC

- ±1 LSB INL; no missing codes
- Programmable throughput up to 200 ksps
- Up to 17 external inputs; programmable as single-ended or differential
- Data-dependent windowed interrupt generator
- Built-in temperature sensor (±3 °C)

Two Comparators

- Programmable hysteresis and response time
- Configurable to generate interrupts or reset
- Low current (0.4 μA)

POR/Brown-out Detector

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 and registers
- Superior performance to emulation systems using ICE-chips, target pods, and sockets

Supply Voltage: 2.7 to 3.6 V

Typical Operating Current: 7 mA at 25 MHz
15 μA at 32 kHz
Typical Stop Mode Current: <0.1 μA

Temperature Range: -40 to +85 °C

High-Speed 8051 µC 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

- 1280 bytes internal data RAM (256 + 1 k)
- 8 kB Flash; in-system programmable in 512-byte sectors (512 bytes are reserved)

Digital Peripherals

- 25 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, WDT
- 4 general-purpose 16-bit counter/timers
- Realtime clock mode using timer or PCA

Clock Sources

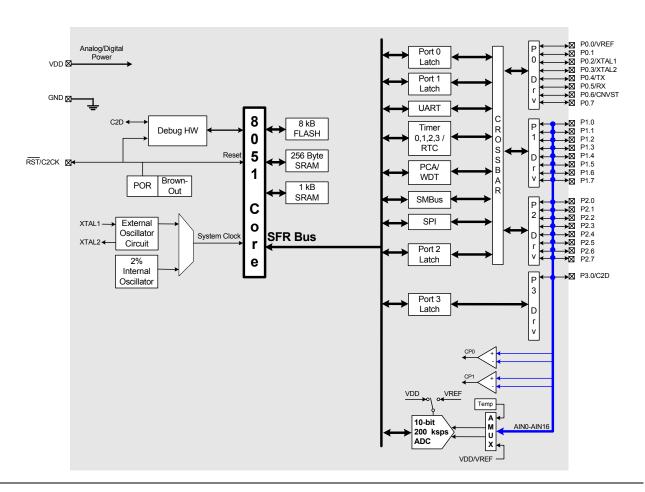
- Internal oscillator: 24.5 MHz, 2% accuracy supports UART operation
- External oscillator: Crystal, RC, C, or Clock (1 or 2 pin modes)
- Can switch between clock sources on-the-fly

Package

- 28-pin QFN (lead-free package)

Ordering Part Number

- C8051F313-GM



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Selected Electrical Specifications

 $(T_A = -40 \text{ to } +85 \text{ C}^{\circ}, V_{DD} = 2.7 \text{ V} \text{ unless otherwise specified})$

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
GLOBAL CHARACTERISTICS					
Supply Voltage		2.7		3.6	V
Supply Current	Clock = 25 MHz		7		mA
	Clock = 1 MHz		0.5		mA
	Clock = 32 kHz; V _{DD} Monitor Disabled		15		μA
Supply Current	Oscillator off; V _{DD} Monitor Enabled		10		μA
(shutdown)	Oscillator off; V _{DD} Monitor Disabled		<0.1		μA
Clock Frequency Range		DC		25	MHz
INTERNAL OSCILLATOR					
Frequency		24.0	24.5	25.0	MHz
A/D CONVERTER					
Resolution			10		bits
Integral Nonlinearity				±1	LSB
Differential Nonlinearity	Guaranteed Monotonic			±1	LSB
Signal-to-Noise Plus		53			dB
Distortion					
Throughput Rate				200	ksps
COMPARATORS					
Mode0 Response Time	(CP+) - (CP-) = 100 mV		0.10		μs
Mode0 Supply Current			7.6		μA
Mode1 Response Time	(CP+) - (CP-) = 100 mV		0.18		μs
Mode1 Supply Current			3.2		μA
Mode2 Response Time	(CP+) - (CP-) = 100 mV		0.32		μs
Mode2 Supply Current			1.3		μA
Mode3 Response Time	(CP+) – (CP-) = 100 mV		1.0		μs
Mode3 Supply Current			0.40		μA

Package Information

Bottom View MIN TYP MAX **←**L→ (15 6 **16** _ ₹ 5 **17** D2 E E2 -R≯ **4** 3 19 e L N ND NE R AA BB CC DD 0.65 2 [2 2 20 21 DETAIL 1 Side View DETAIL 1

C8051F310DK Development Kit

