C8051F044

25 MIPS, 64 kB Flash, 10-Bit ADC, 100-Pin Mixed-Signal MCU

Analog Peripherals

10-Bit ADC

- ±1 LSB INL; guaranteed monotonic
- Programmable throughput up to 100 ksps
- 13 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

- 60 V common mode input range
- Offset adjust from –60 to +60 V
- 16 gain settings from 0.05 to 16

Three Comparators

Internal Voltage Reference

Precision V_{DD} 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

Supply Voltage: 2.7 to 3.6 V

- Typical operating current: 10 mA at 25 MHz
- Multiple power saving sleep and shutdown modes

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

- 4352 bytes data RAM
- 64 kB Flash; in-system programmable in 512-byte sectors (512 bytes are reserved)
- External parallel 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 5 V tolerant
- Hardware SMBus™ (I2C™ compatible), SPI™, and two UART serial ports available concurrently
- Programmable 16-bit counter array with 6 capture/compare modules
- 5 general-purpose 16-bit counter/timers
- Dedicated watchdog timer; bidirectional reset
- Real-time clock mode using timer 3 or PCA

Clock Sources

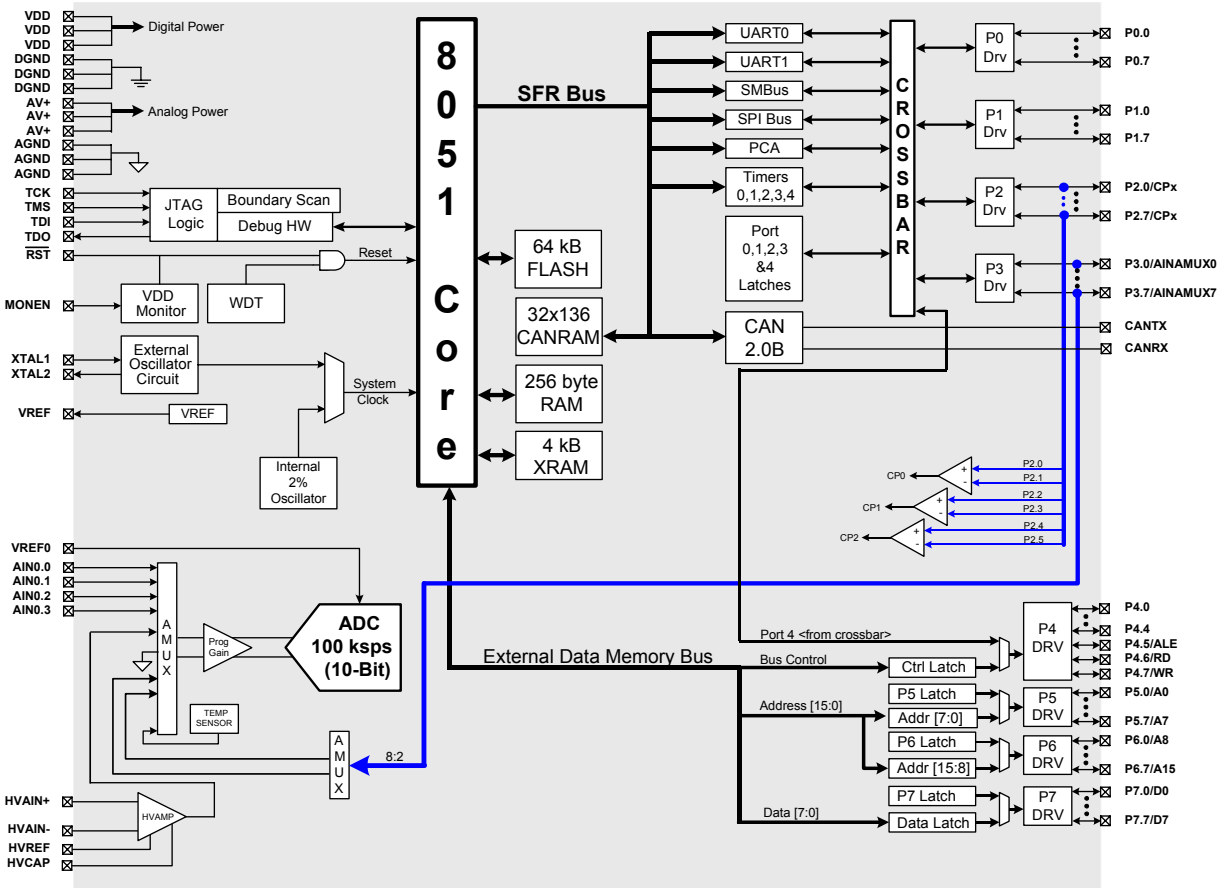
- Internal programmable 2% oscillator: up to 25 MHz
- External oscillator: Crystal, RC, C, or Clock

Package

- 100-pin TQFP (standard lead and lead-free packages)

Ordering Part Numbers

- Lead-free package: C8051F044-GQ
- Standard package: C8051F044



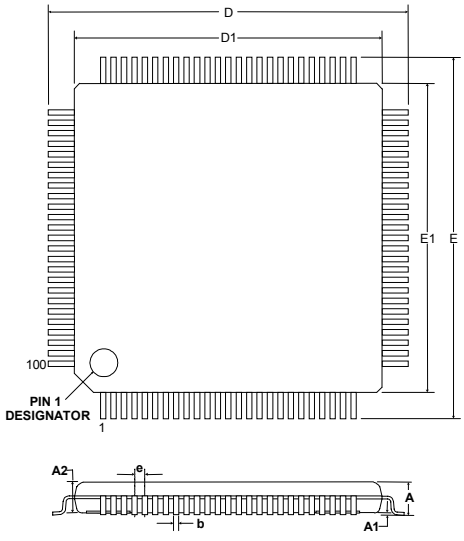
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Selected Electrical Specifications

(T_A = –40 to +85 C°, V_{DD} = 2.7 V unless otherwise specified)

Parameter	Conditions	Min	Typ	Max	Units
Global Characteristics					
Supply Voltage		2.7	—	3.6	V
Supply Current with CPU active	Clock = 25 MHz Clock = 1 MHz Clock = 32 kHz; V_{DD} Monitor Enabled	—	10 0.5 20	—	mA mA µA
Supply Current (shutdown)	Oscillator off; V_{DD} Monitor Disabled	—	0.1	—	µA
Clock Frequency Range		DC	—	25	MHz
A/D Converter					
Resolution		—	10	—	bits
Integral Nonlinearity		—	—	±1	LSB
Differential Nonlinearity	Guaranteed Monotonic			±1	LSB
Signal-to-Noise Plus Distortion		59	—	—	dB
Throughput Rate		—	—	100	ksps
Input Voltage Range		0	—	VREF	V
Comparators					
Supply Current	(each Comparator)	—	1.5	—	µA
Response Time	(CP+ – CP-) = 100 mV	—	4	—	µs

Package Information



	MIN (mm)	NOM (mm)	MAX (mm)
A	-	-	1.20
A1	0.05	-	0.15
A2	0.95	1.00	1.05
b	0.17	0.22	0.27
D	-	16.00	-
D1	-	14.00	-
e	-	0.50	-
E	-	16.00	-
E1	-	14.00	-

C8051F040DK Development Kit



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