



# C8051F124

50MIPS, 128K Flash, 12-Bit ADC, 100-Pin MCU

PRELIMINARY

## ANALOG PERIPHERALS

- **12-bit ADC**
  - ±1LSB INL; No Missing Codes
  - Programmable Throughput up to 100ksps
  - Eight External Inputs; Programmable as Single-Ended or Differential
  - Programmable Amplifier Gain: 16, 8, 4, 2, 1, 0.5
  - Data Dependable Windowed Interrupt Generator
  - Built-in Temperature Sensor ( $\pm 3^{\circ}\text{C}$ )
- **8-bit ADC**
  - ±1LSB INL; No Missing Codes
  - Programmable Throughput up to 500ksps
  - Eight External Inputs
  - Programmable Amplifier Gain: 4, 2, 1, 0.5
- **Two 12-bit DACs**
  - Can Synchronize Outputs to Timers for Jitter-Free Waveform Generation
- **Two Comparators**
- **Internal Voltage Reference**
- **VDD 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
- Inspect/Modify Memory and Registers
- Real-Time Instruction Trace Buffer
- IEEE1149.1 Compliant Boundary Scan
- Low Cost, **Complete** Development Kit

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

- Pipelined Instruction Architecture; Executes 70% of Instructions in 1 or 2 System Clocks
- Up to **50MIPS** Throughput with 50MHz System Clock
- Expanded Interrupt Handler

## MEMORY

- 8448 Bytes Internal Data RAM (256 + 8k)
- 128k Bytes FLASH; In-System Programmable in 1k Byte Sectors
- External Parallel Data Memory Interface

## DIGITAL PERIPHERALS

- 64 Port I/O (All are 5V Tolerant with High Sink Current)
- Hardware SMBus™ (I2C™ Compatible), SPI™, and **Two** UART Serial Ports Available Concurrently
- Programmable 16-bit Counter/Timer Array with Six Capture/Compare Modules
- Five General Purpose 16-bit Counter/Timers
- Dedicated Watch-Dog Timer; Bi-directional Reset
- Real-Time Clock Mode using a Timer or PCA

## CLOCK SOURCES

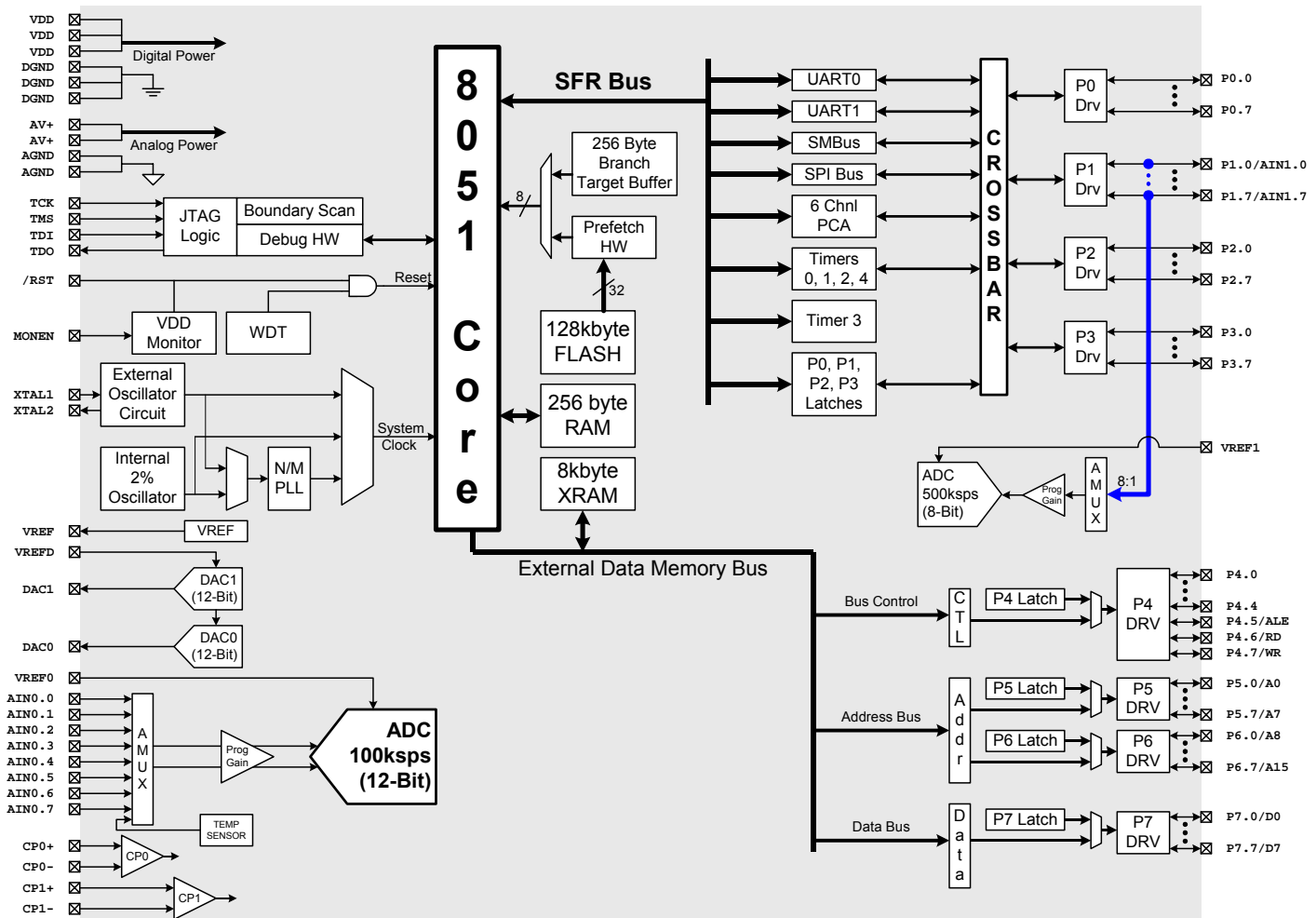
- Internal Oscillator: 24.5Mhz, 2% Accuracy Supports UART Operation
- On-Chip Programmable PLL: up to 50MHz
- External Oscillator: Crystal, RC, C, or Clock

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

- Typical Operating Current: 25mA @ 50MHz
- Typical Stop Mode Current: <0.1uA

## 100-Pin TQFP

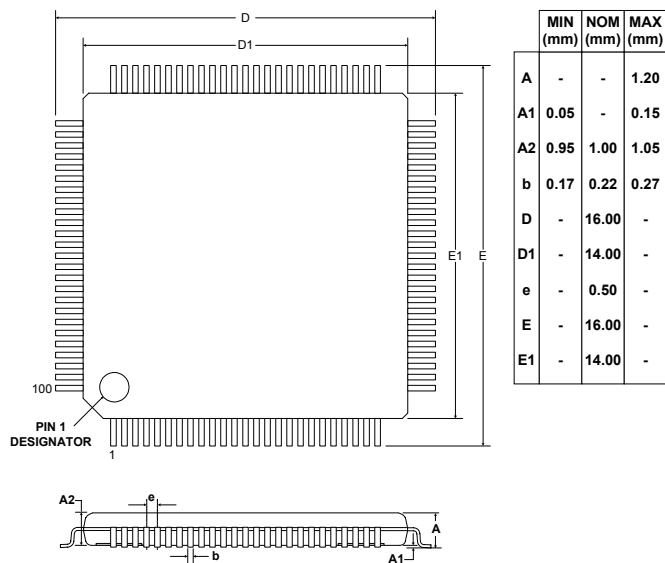
Temperature Range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$



**SELECTED ELECTRICAL SPECIFICATIONS** TA = -40°C to +85°C unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>GLOBAL CHARACTERISTICS</b>					
Supply Voltage		2.7		3.6	V
Supply Current (CPU active)	Clock=50MHz		25		mA
	Clock=1MHz		0.5		mA
	Clock=32kHz		16		μA
Supply Current (shutdown)	Oscillator off; VDD Monitor Enabled		10		μA
	Oscillator off; VDD Monitor Disabled		<0.1		μA
Clock Frequency Range		DC		50	MHz
<b>INTERNAL CLOCKS</b>					
Oscillator Frequency		24.0	24.5	25.0	MHz
PLL Frequency		48	49	50	MHz
<b>A/D CONVERTER</b>					
Resolution			12		bits
Integral Nonlinearity				± 1	LSB
Differential Nonlinearity	Guaranteed Monotonic			± 1	LSB
Signal-to-Noise Plus Distortion		66	69		dB
Throughput Rate				100	ksps
<b>D/A CONVERTERS</b>					
Resolution			12		bits
Differential Nonlinearity	Guaranteed Monotonic			± 1	LSB
Output Settling Time			10		μS
<b>COMPARATORS</b>					
Supply Current	(each Comparator)		1.5		μA
Response Time	(CP+) – (CP-) = 100mV		4.0		μS

**PACKAGE INFORMATION**



**C8051F124DK DEVELOPMENT KIT**

