C8051F351

50 MIPS, 8 kB Flash, 24-Bit ADC MCU

PRELIMINARY

ANALOG PERIPHERALS

24-BIT ADC

- No missing codes
- 0.002% nonlinearity
- Programmable conversion rates up to 1 ksps
- 1x to 128x PGA
- 8 input multiplexer
- Built-in temperature sensor

Two 8-bit Current DACs

Comparator

- Programmable hysteresis and response time
- Configurable as wake-up or reset source
- Low current (0.4 µA)

ON-CHIP DEBUG

- On-chip debug circuitry facilitates full speed, non-intrusive In-system debug (No emulator required)
- Provides breakpoints, single stepping, watchpoints
- Inspect/modify memory, registers, and stack
- Superior performance to emulation systems using ICE-chips, target pods, and sockets
- Low cost, complete development kit

SUPPLY VOLTAGE .....2.7 to 3.6 V

- Typical operating current: 17 mA @ 50 MHz
  16 µA @ 32 kHz
- Typical stop mode current: <0.1 µA

HIGH-SPEED 8051 µC Core

- Pipelined instruction architecture; executes 70% of instructions in 1 or 2 system clocks
- Up to **50 MIPS** throughput with 50 MHz clock
- Expanded interrupt handler

MEMORY

- 768 bytes (256 + 512) internal data RAM
- 8 kB Flash; in-system programmable in 512 byte sectors

DIGITAL PERIPHERALS

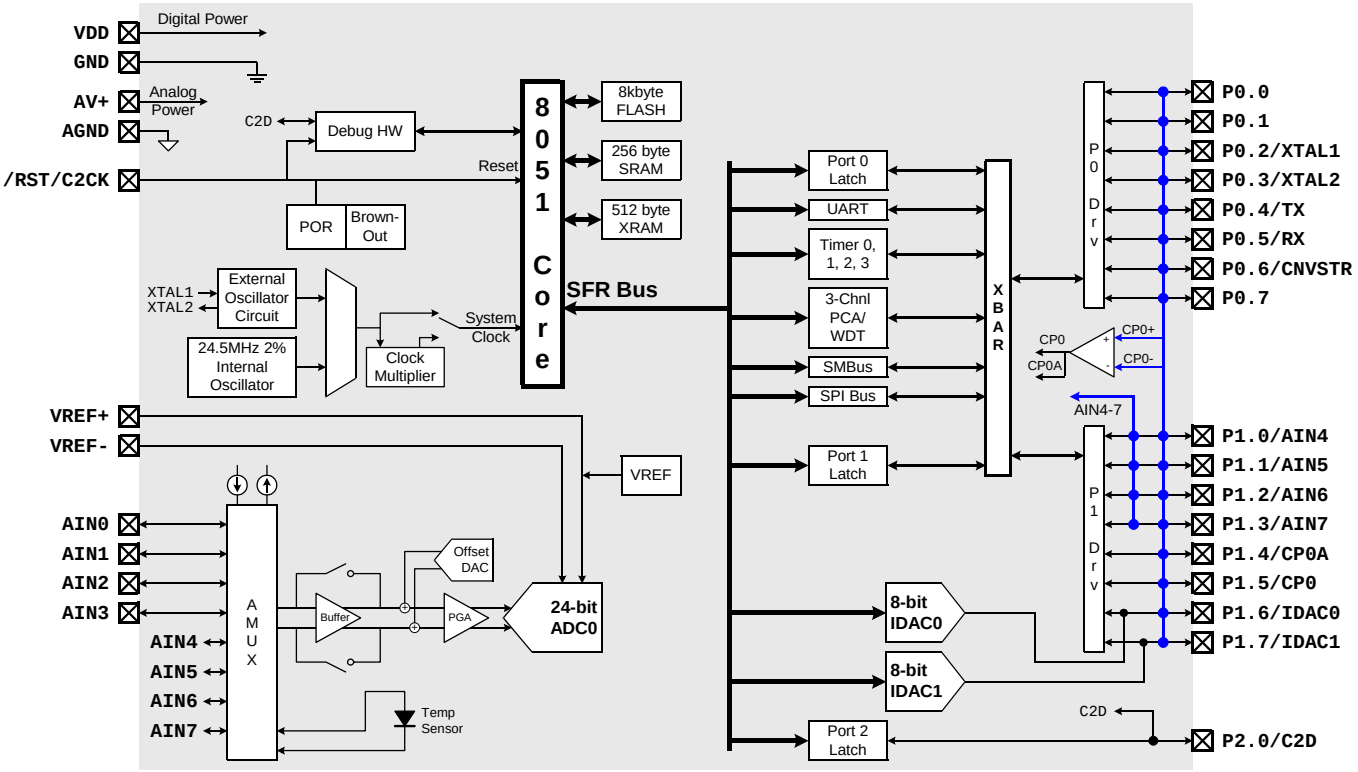
- 17 port I/O; all 5 V tolerant with high sink current
- Enhanced hardware UART, SPI, and SMBus™ serial ports
- Three general purpose 16-bit counter/timers
- 16-bit programmable counter array with three capture/compare modules, WDT
- Real time clock mode using PCA or timer and external clock source

CLOCK SOURCES

- Internal oscillator: 24.5 MHz, 2% accuracy supports UART operation
- External oscillator: crystal, RC, C, or clock (1 or 2 pin modes)
- 2x clock multiplier to achieve 50 MHz internal clock
- Can switch between clock sources on-the-fly

28-Pin MLP Package

Temperature Range: –40 to +85 °C



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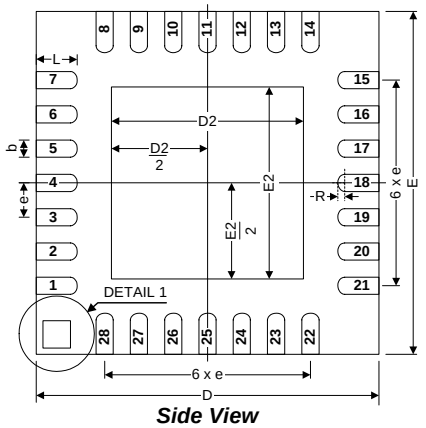
SELECTED ELECTRICAL SPECIFICATIONS

T_A = –40 to +85 °C, V_{DD} = AV+ = 3.0 V, VREF = 2.5 V External, PGA Gain = 1x, MDCLK = 2.4567 MHz, Decimation Ratio = 1920 unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
GLOBAL CHARACTERISTICS					
Supply Voltage		2.7		3.6	V
Supply Current (CPU active)	Clock=50 MHz Clock=1 MHz Clock=32 kHz; V_{DD} Monitor Enabled		17 0.5 16		mA mA µA
Supply Current (shutdown)	Oscillator not running; V_{DD} Monitor Disabled		0.1		µA
Clock Frequency Range		DC		50	MHz
24-BIT A/D CONVERTER					
Resolution	(no missing codes)		24		bits
Integral Nonlinearity	Single-ended Mode Differential Mode			±15	ppm FS
Offset Error			±5		ppm
Gain Error			±0.002		%
Common Mode Rejection Ratio (CMRR)			110		dB
Power Supply Rejection, DC		80			dB
Power Supply Current			230		µA
8-BIT CURRENT-MODE D/A CONVERTERS					
Resolution			8		bits
Integral Nonlinearity			±0.5		LSB
Differential Nonlinearity	Guaranteed Monotonic		±0.5	±1	LSB

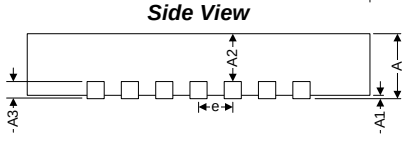
PACKAGE INFORMATION

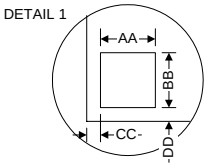
Bottom View



	MM		
	MIN	TYP	MAX
A	0.80	0.90	1.00
A1	0	0.02	0.05
A2	0	0.65	1.00
A3		0.25	
b	0.18	0.23	0.30
D		5.00	
D2	2.90	3.15	3.35
E		5.00	
E2	2.90	3.15	3.35
e		0.5	
L	0.45	0.55	0.65
N		28	
ND		7	
NE		7	
R	0.09		
AA		0.435	
BB		0.435	
CC		0.18	
DD		0.18	

Side View





C8051F350DK DEVELOPMENT KIT