

## 25 MIPS, 8 kB Flash, 8-Bit ADC, 48-Pin Mixed-Signal MCU

### Analog Peripherals 8-Bit ADC

- ±1/2 LSB INL; no missing codes
- Programmable throughput up to 100 ksps
- 32 external inputs (each port I/O can be configured as an ADC input onthe-flv)
- Programmable amplifier gain: 16, 8, 4, 2, 1, 0.5
- Data-dependent windowed interrupt generator
- V<sub>REF</sub> from external pin or V<sub>DD</sub>

#### Two comparators

- Programmable hysteresis
- Configurable to generate interrupts or reset

## V<sub>DD</sub> Monitor and Brown-out Detector

### **On-Chip JTAG Debug**

- On-chip emulation circuitry facilitates full-speed, non-intrusive, in-circuit emulation
- Supports breakpoints, single stepping, watchpoints, inspect/modify memory, and registers
- Superior performance to emulation systems using ICE-chips, target pods, and sockets
- Fully compliant with IEEE 1149.1 specification

### 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; up to 21 interrupt sources

#### Memory

- 256 bytes data RAM
- 8 kB Flash; in-system programmable in 512 byte sectors (512 bytes are reserved)

#### **Digital Peripherals**

- 32 port I/O; all are 5 V tolerant
- Hardware SPI™ and UART serial ports available concurrently
- 3 general-purpose 16-bit counter/timers
- Dedicated watchdog timer; bidirectional reset

#### **Clock Sources**

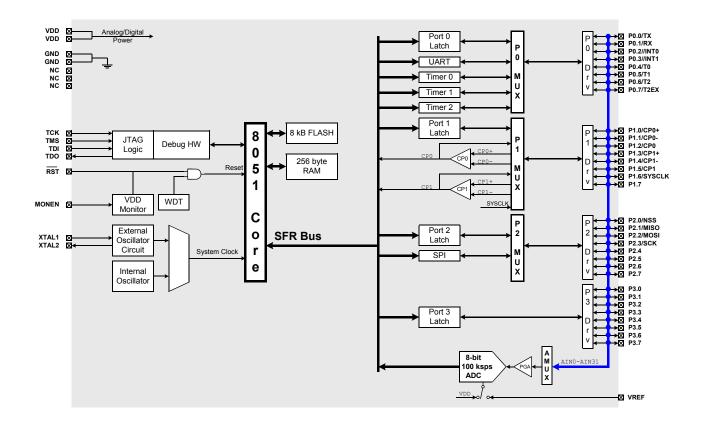
- Internal programmable oscillator: 2-16 MHz
- External oscillator: Crystal, RC, C, or Clock
- Can switch between clock sources on-the-fly

#### Supply Voltage: 2.7 to 3.6 V

- Typical operating current: 9 mA at 25 MHz
- Typical stop mode current: <0.1 uA

#### 48-Pin TQFP

- Temperature Range: -40 to +85 °C



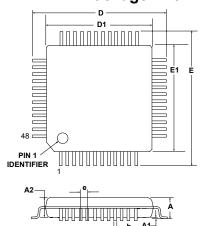
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## **Selected Electrical Specifications**

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

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS			
GLOBAL CHARACTERISTICS								
Digital Supply Voltage		2.7		3.6	V			
Digital Supply Current	Clock = 25 MHz		9		mA			
with CPU active	Clock = 1 MHz		0.4		mA			
	Clock = 32 kHz; V <sub>DD</sub> Monitor Disabled		11		μΑ			
Digital Supply Current	Oscillator not running; V <sub>DD</sub> Monitor		7		μΑ			
(shutdown)	Enabled		0.4					
	Oscillator not running; V <sub>DD</sub> Monitor Disabled		0.1		μA			
Digital Supply RAM Data			1.5		V			
Retention Voltage								
CPU & DIGITAL I/O PORTS								
Clock Frequency Range		DC		25	MHz			
Port Output High Voltage	I <sub>OH</sub> = -3 mA, Port I/O push-pull	VDD - 0.7			>			
Port Output Low Voltage	$I_{OL} = 8.5 \text{ mA}$			0.6	>			
Input High Voltage		0.7 x VDD			V			
Input Low Voltage				$0.3 \times V_{DD}$	V			
SPI Bus Clock Frequency	fCLK=MCU Clock; SPI in Master Mode			fCLK/2	MHz			
A/D CONVERTER								
Resolution		8 bits		bits				
Integral Nonlinearity				±1/2	LSB			
Differential Nonlinearity	Guaranteed Monotonic			±1/4	LSB			
Signal to Noise Ratio			49		dB			
Throughput Rate				100	ksps			
Input Voltage Range		0		$V_{REF}$	>			
COMPARATORS								
Response Time	CP+ – CP-   = 100 mV		4		μs			
Input Voltage Range		-0.25		$V_{DD} + 0.25$	V			
Input Bias Current		<b>–</b> 5	0.001	+5	nA			
Input Offset Voltage		-10		+10	mV			

# **Package Information**



<b>U</b>								
		MIN (mm)	NOM (mm)					
	A		-	1.20				
	<b>A</b> 1	0.05	-	0.15				
	A2	0.95	1.00	1.05				
	b	0.17	0.22	0.27				
	D	-	9.00	-				
	D1	-	7.00	-				
	е	-	0.50	-				
	E	-	9.00	-				
	E1	-	7.00	-				

# C8051F226DK Development Kit

