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What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "Embedded - Microcontrollers"

Details	
Product Status	Obsolete
Core Processor	8051
Core Size	8-Bit
Speed	25MHz
Connectivity	LINbus, SPI, UART/USART
Peripherals	Brown-out Detect/Reset, POR, PWM, Temp Sensor, WDT
Number of I/O	16
Program Memory Size	2KB (2K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	256 x 8
Voltage - Supply (Vcc/Vdd)	2V ~ 5.25V
Data Converters	A/D 16x12b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 125°C (TA)
Mounting Type	Surface Mount
Package / Case	20-TSSOP (0.173", 4.40mm Width)
Supplier Device Package	20-TSSOP
Purchase URL	https://www.e-xfl.com/product-detail/silicon-labs/c8051f536-it

C8051F536

25 MIPS, 2 kB Flash, 12-Bit ADC, 20-Pin Automotive MCU

Analog Peripherals

12-Bit ADC, 5 V input signal; up to 16 external inputs

- ±1 LSB INL; guaranteed monotonic
- Programmable throughput up to 200 ksps
- Data-dependent windowed interrupt generator
- Programmable gain maximizes input signal span

Built-in Temperature Sensor (±3 °C)

One Comparator

Internal Voltage Reference

Precision V_{DD} Monitor/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, watch-points
- Inspect/modify memory, registers, and stack
- Superior performance to emulation systems using ICE-chips, target pods, and sockets

Supply Voltage: 2.7 to 5.25 V

- Typical operating current: 7 mA at 25 MHz at 5.0 V
- Multiple power saving sleep and shutdown modes

Temperature Range: –40 to +125 °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

- 2 kB Flash; in-system programmable; flexible security features
- 256 bytes data RAM

LIN 2.0

- Master or slave operation using dedicated hardware (not software implementation with UART)

Digital Peripherals

- Up to 16 digital I/O; all are 5 V push-pull
- Programmable 16-bit counter array with three capture/compare modules
- Three general-purpose 16-bit counter/timers
- Dedicated watchdog timer; bidirectional reset
- Real-time clock mode using timer 3 or PCA

Clock Sources

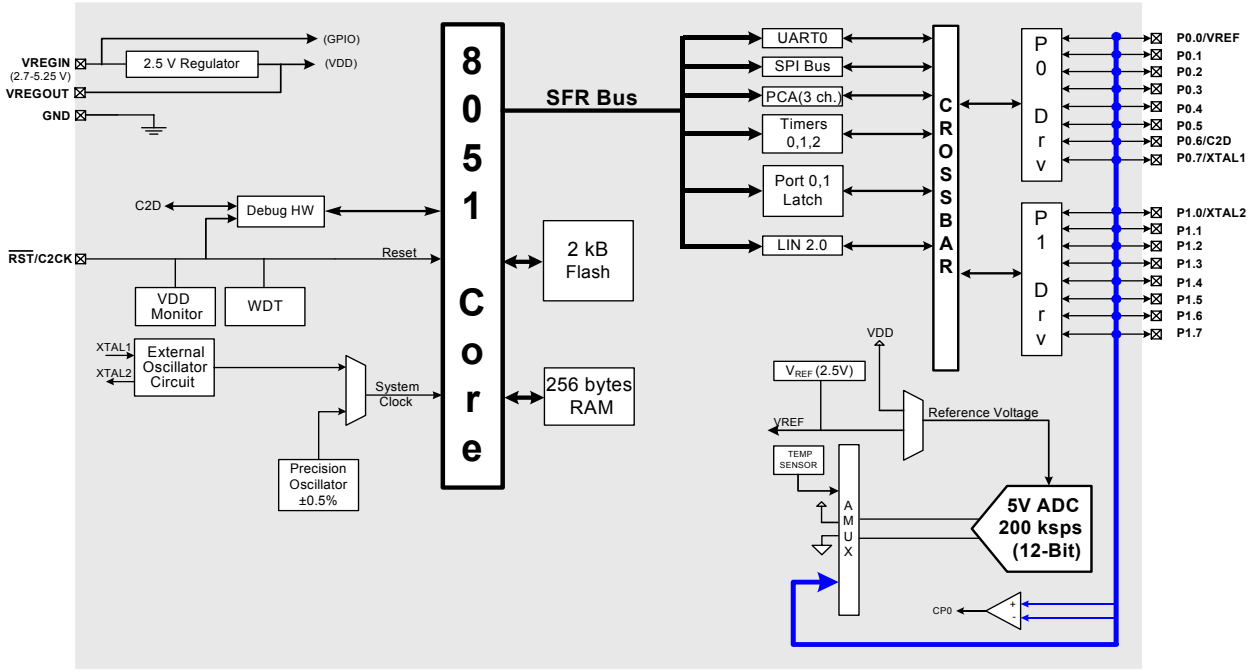
- High-precision internal programmable oscillator up to 25 MHz
- External oscillator: Crystal, RC, C, or Clock

Packages

- 20-Pin TSSOP and 20-Pin QFN (4x4 mm)

Ordering Part Numbers

- C8051F536-IT (TSSOP)
- C8051F536-IM (QFN)

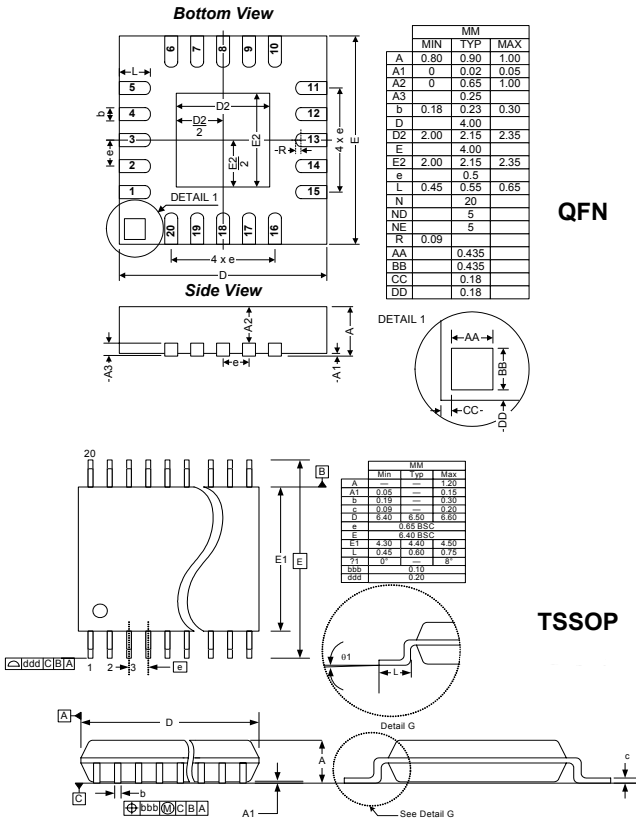


Selected Electrical Specifications

(T_A = –40 to +125 C°, V_{REGIN} = 2.7 V unless otherwise specified)

Parameter	Conditions	Min	Typ	Max	Units
Global Characteristics					
Supply Voltage (V_{REGIN})		2.7	—	5.25	V
Supply Current (CPU active) V_{REGIN} = 2.7–5.0 V	Clock = 25 MHz Clock = 1 MHz Clock = 32 kHz; V_{DD} monitor enabled	— — —	7 0.8 33	— — —	mA mA µA
Supply Current (shutdown)	Oscillator not running; V_{DD} monitor disabled	—	0.2	—	µA
Clock Frequency Range		dc	—	25	MHz
A/D Converter					
Resolution			12		bits
Integral Nonlinearity		—	—	±1	LSB
Differential Nonlinearity	Guaranteed monotonic	—	—	±1	LSB
Signal-to-Noise Plus Distortion		—	68	—	dB
Throughput Rate		—	—	200	ksps
Input Voltage Range		0	—	V_{REF}	V
Flash					
Endurance		40K	150K	—	E/W cycles
Erase Cycle Time		10	12	14	ms
Write Cycle Time		40	50	60	µs

Package Information



	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		4.00	
D2	2.00	2.15	2.35
E		4.00	
E2	2.00	2.15	2.35
e		0.5	
L	0.45	0.55	0.65
N		20	
ND		5	
NE		5	
R	0.09		
AA		0.435	
BB		0.435	
CC		0.18	
DD		0.18	

QFN

	MM		
	Min	Typ	Max
A	—	—	1.20
A1	0.05	—	0.15
b	0.19	—	0.30
c	0.09	—	0.20
D	6.40	6.50	6.60
e		0.65 BSC	
E		6.40 BSC	
E1	4.30	4.40	4.50
L	0.45	0.60	0.75
θ1	0°	—	8°
bbb		0.10	
ddd		0.20	

TSSOP

C8051F530DK Development Kit