

### Analog Peripherals

#### 24-Bit ADC

- 0.0015% nonlinearity
- Programmable throughput up to 1 ksp/s
- 8 external inputs; programmable as single-ended or differential
- Programmable amplifier gain: 128, 64, 32, 16, 8, 4, 2, 1
- Data-dependent windowed interrupt generator
- Built-in temperature sensor ( $\pm 3$  °C)

#### Two 8-Bit Current DACs

##### Comparator

- 16 Programmable hysteresis values and response time
- Configurable to generate interrupts or reset
- Low current (0.4  $\mu$ A)

##### Internal Voltage Reference

##### V<sub>DD</sub> 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, watchpoints
- Inspect/modify memory, registers, and stack
- Superior performance to emulation systems using ICE-chips, target pods, and sockets

#### Supply Voltage: 2.7 to 3.6 V

- Typical operating current: 17 mA at 50 MHz  
16  $\mu$ A at 32 kHz
- Typical stop mode current: <0.1  $\mu$ A

#### Temperature Range: -40 to +85 °C

### High-Speed 8051 $\mu$ C 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 data RAM
- 8 kB Flash; in-system programmable in 512 byte sectors (512 bytes are reserved)

### Digital Peripherals

- 17 port I/O; all 5 V tolerant
- Hardware SMBus™ (I2C™ compatible), SPI™, and UART serial ports available concurrently
- 16-bit programmable counter array with three capture/compare modules, WDT
- 4 general-purpose 16-bit counter/timers
- Realtime clock mode using PCA or timer and external clock source

### Clock Sources

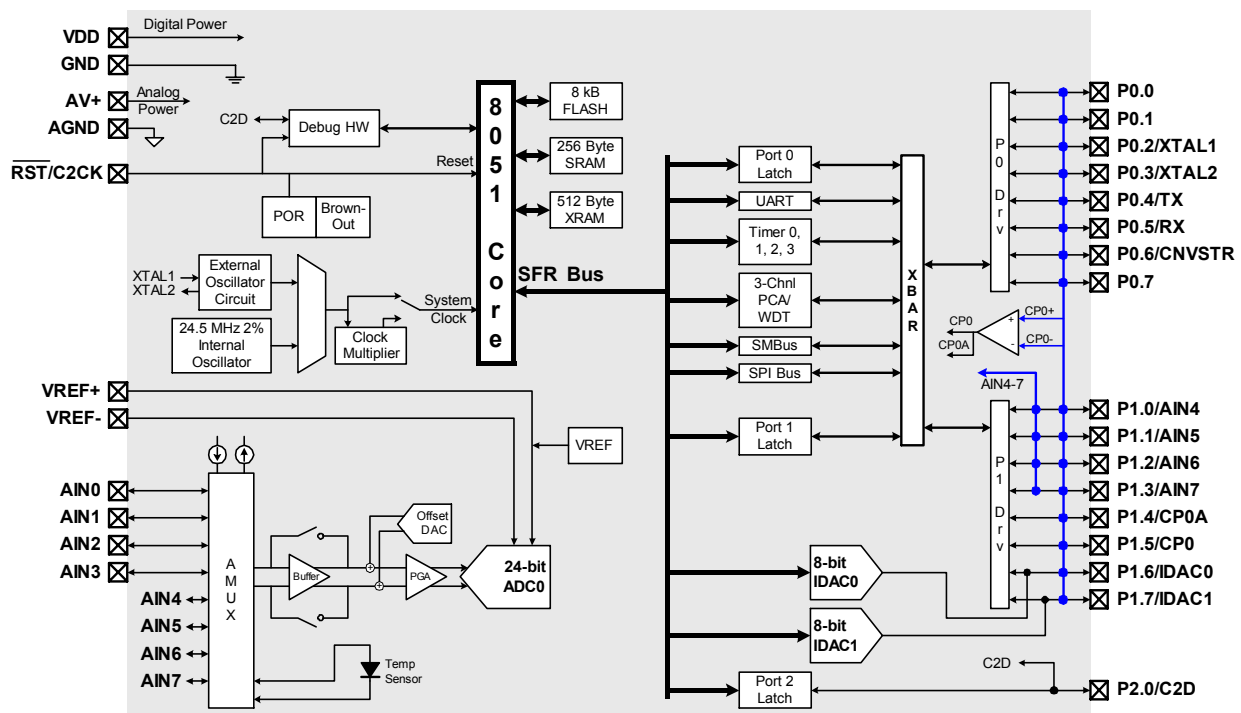
- Internal oscillator: 24.5 MHz, 2% accuracy supports UART operation
- External oscillator: Crystal, RC, C, or clock (1 or 2 pin modes)
- 2x clock multiplier to achieve 50 MHz internal clock
- Can switch between clock sources on-the-fly

### Package

- 28-pin QFN (lead-free package)

### Ordering Part Numbers

- C8051F351-GM

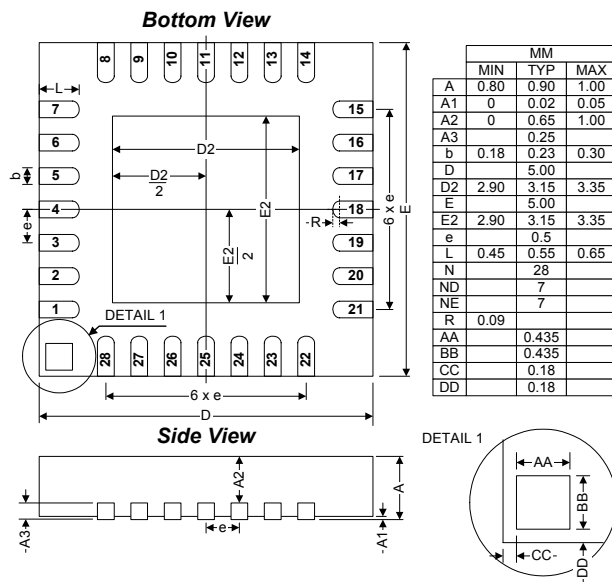


### Selected Electrical Specifications

( $T_A = -40$  to  $+85$  °C,  $V_{DD} = AV+ = 3.0$  V,  $V_{REF} = 2.5$  V External, PGA Gain = 1x, MDCLK = 2.4567 MHz, Decimation Ratio = 1920 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 = 50 MHz<br>Clock = 1 MHz<br>Clock = 32 kHz; $V_{DD}$ Monitor Enabled |     | 17<br>0.5<br>16 |          | mA<br>mA<br>$\mu$ A |
| Supply Current (shutdown)                | Oscillator not running; $V_{DD}$ Monitor Disabled                           |     | 0.1             |          | $\mu$ A             |
| Clock Frequency Range                    |   | DC  |                 | 50       | MHz                 |
| <b>24-BIT A/D CONVERTER</b>              |   |     |                 |          |                     |
| Resolution                               | (no missing codes)  |     | 24              |          | bits                |
| Integral Nonlinearity                    | Single-ended Mode<br>Differential Mode                                      |     |                 | $\pm 15$ | ppm FS              |
| Offset Error                             |   |     | $\pm 5$         |          | ppm                 |
| Gain Error                               |   |     | $\pm 0.002$     |          | %                   |
| Common Mode Rejection Ratio (CMRR)       |   |     | 110             |          | dB                  |
| Power Supply Rejection, DC               |   | 80  |                 |          | dB                  |
| Power Supply Current                     |   |     | 230             |          | $\mu$ A             |
| <b>8-BIT CURRENT-MODE D/A CONVERTERS</b> |   |     |                 |          |                     |
| Resolution                               |   |     | 8               |          | bits                |
| Integral Nonlinearity                    |   |     | $\pm 0.5$       |          | LSB                 |
| Differential Nonlinearity                | Guaranteed Monotonic  |     | $\pm 0.5$       | $\pm 1$  | LSB                 |

### Package Information



### C8051F350DK Development Kit

