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"[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	Active
Core Processor	8051
Core Size	8-Bit
Speed	25MHz
Connectivity	SMBus (2-Wire/I <sup>2</sup> C), SPI, UART/USART
Peripherals	Brown-out Detect/Reset, POR, PWM, Temp Sensor, WDT
Number of I/O	16
Program Memory Size	32KB (32K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	4.25K x 8
Voltage - Supply (Vcc/Vdd)	0.9V ~ 3.6V
Data Converters	A/D 15x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	24-WFQFN Exposed Pad
Supplier Device Package	24-QFN (4x4)
Purchase URL	<a href="https://www.e-xfl.com/product-detail/silicon-labs/c8051f921-g-gmr">https://www.e-xfl.com/product-detail/silicon-labs/c8051f921-g-gmr</a>

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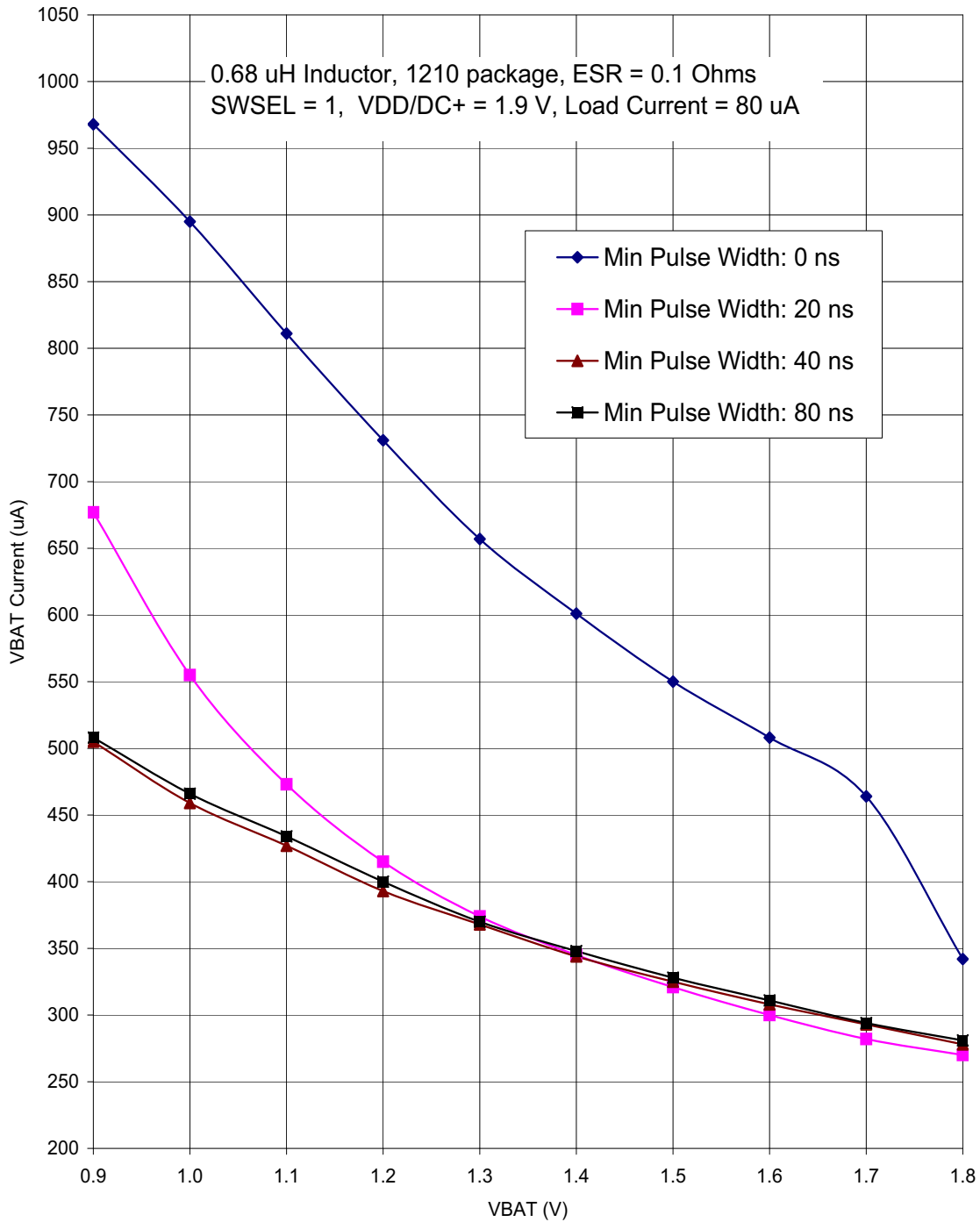
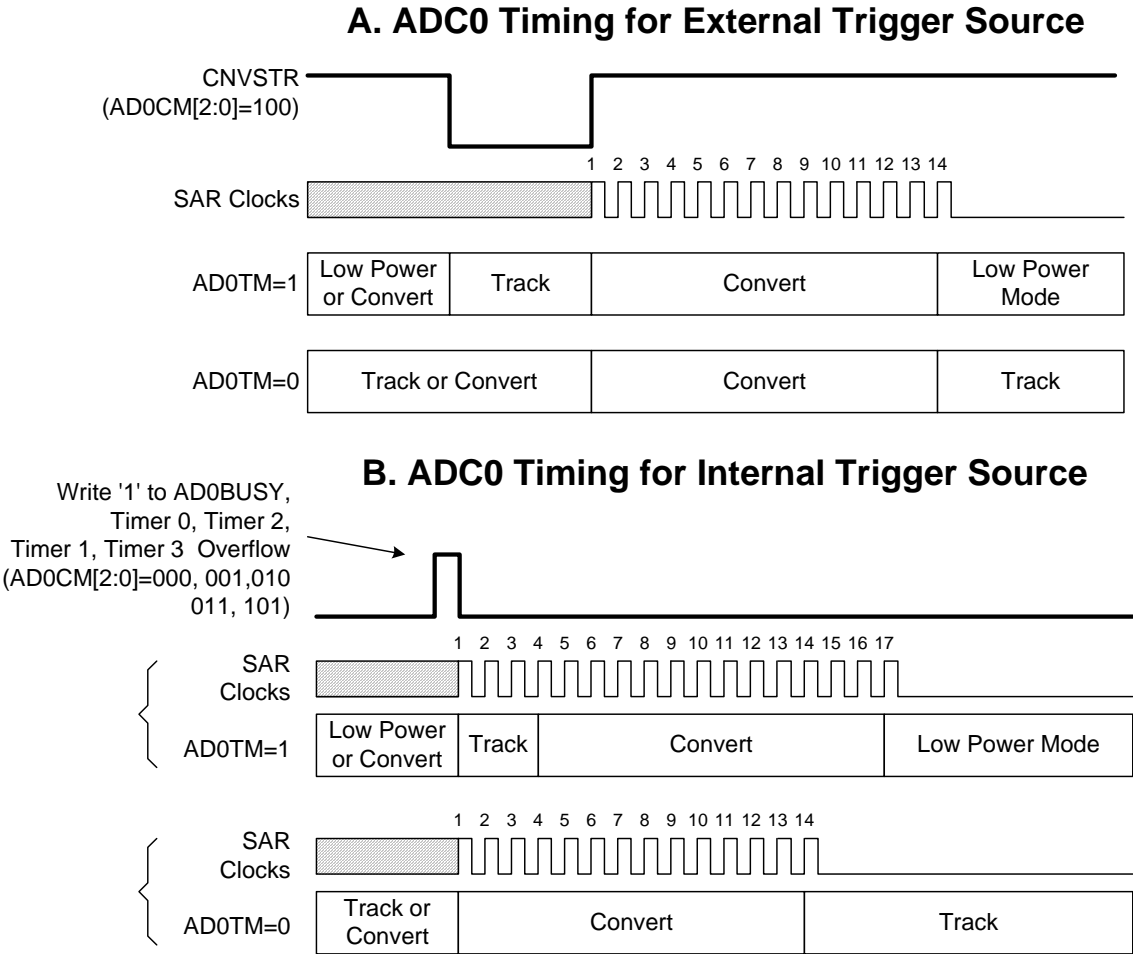


Figure 4.6. Typical One-Cell Suspend Mode Current

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## 5.2.2. Tracking Modes

Each ADC0 conversion must be preceded by a minimum tracking time in order for the converted result to be accurate. The minimum tracking time is given in Table 4.9. The AD0TM bit in register ADC0CN controls the ADC0 track-and-hold mode. In its default state when Burst Mode is disabled, the ADC0 input is continuously tracked, except when a conversion is in progress. When the AD0TM bit is logic 1, ADC0 operates in low-power track-and-hold mode. In this mode, each conversion is preceded by a tracking period of 3 SAR clocks (after the start-of-conversion signal). When the CNVSTR signal is used to initiate conversions in low-power tracking mode, ADC0 tracks only when CNVSTR is low; conversion begins on the rising edge of CNVSTR (see Figure 5.2). Tracking can also be disabled (shutdown) when the device is in low power standby or sleep modes. Low-power track-and-hold mode is also useful when AMUX settings are frequently changed, due to the settling time requirements described in “5.2.4. Settling Time Requirements” on page 73.



**Figure 5.2. 10-Bit ADC Track and Conversion Example Timing (BURSTEN = 0)**

## 5.2.4. Settling Time Requirements

A minimum amount of tracking time is required before each conversion can be performed, to allow the sampling capacitor voltage to settle. This tracking time is determined by the AMUX0 resistance, the ADC0 sampling capacitance, any external source resistance, and the accuracy required for the conversion. Note that in low-power tracking mode, three SAR clocks are used for tracking at the start of every conversion. For many applications, these three SAR clocks will meet the minimum tracking time requirements, and higher values for the external source impedance will increase the required tracking time.

Figure 5.4 shows the equivalent ADC0 input circuit. The required ADC0 settling time for a given settling accuracy (SA) may be approximated by Equation 5.1. When measuring the Temperature Sensor output or  $V_{DD}$  with respect to GND,  $R_{TOTAL}$  reduces to  $R_{MUX}$ . See Table 4.9 for ADC0 minimum settling time requirements as well as the mux impedance and sampling capacitor values.

$$t = \ln\left(\frac{2^n}{SA}\right) \times R_{TOTAL} C_{SAMPLE}$$

### Equation 5.1. ADC0 Settling Time Requirements

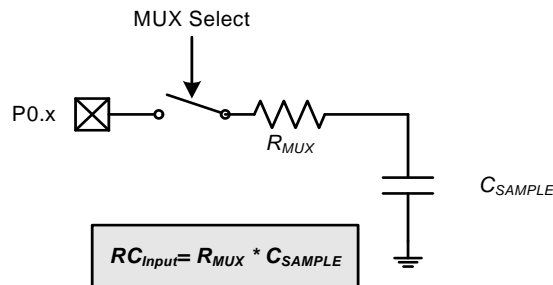
Where:

SA is the settling accuracy, given as a fraction of an LSB (for example, 0.25 to settle within 1/4 LSB)

t is the required settling time in seconds

$R_{TOTAL}$  is the sum of the AMUX0 resistance and any external source resistance.

n is the ADC resolution in bits (10).



**Note:** The value of CSAMPLE depends on the PGA Gain. See Table 4.9 for details.

**Figure 5.4. ADC0 Equivalent Input Circuits**

## SFR Definition 5.15. REF0CN: Voltage Reference Control

Bit	7	6	5	4	3	2	1	0
<b>Name</b>			REFGND	REFSL		TEMPE		REFOE
<b>Type</b>	R	R	R/W	R/W	R/W	R/W	R	R/W
<b>Reset</b>	0	0	0	1	1	0	0	0

SFR Page = 0x0; SFR Address = 0xD1

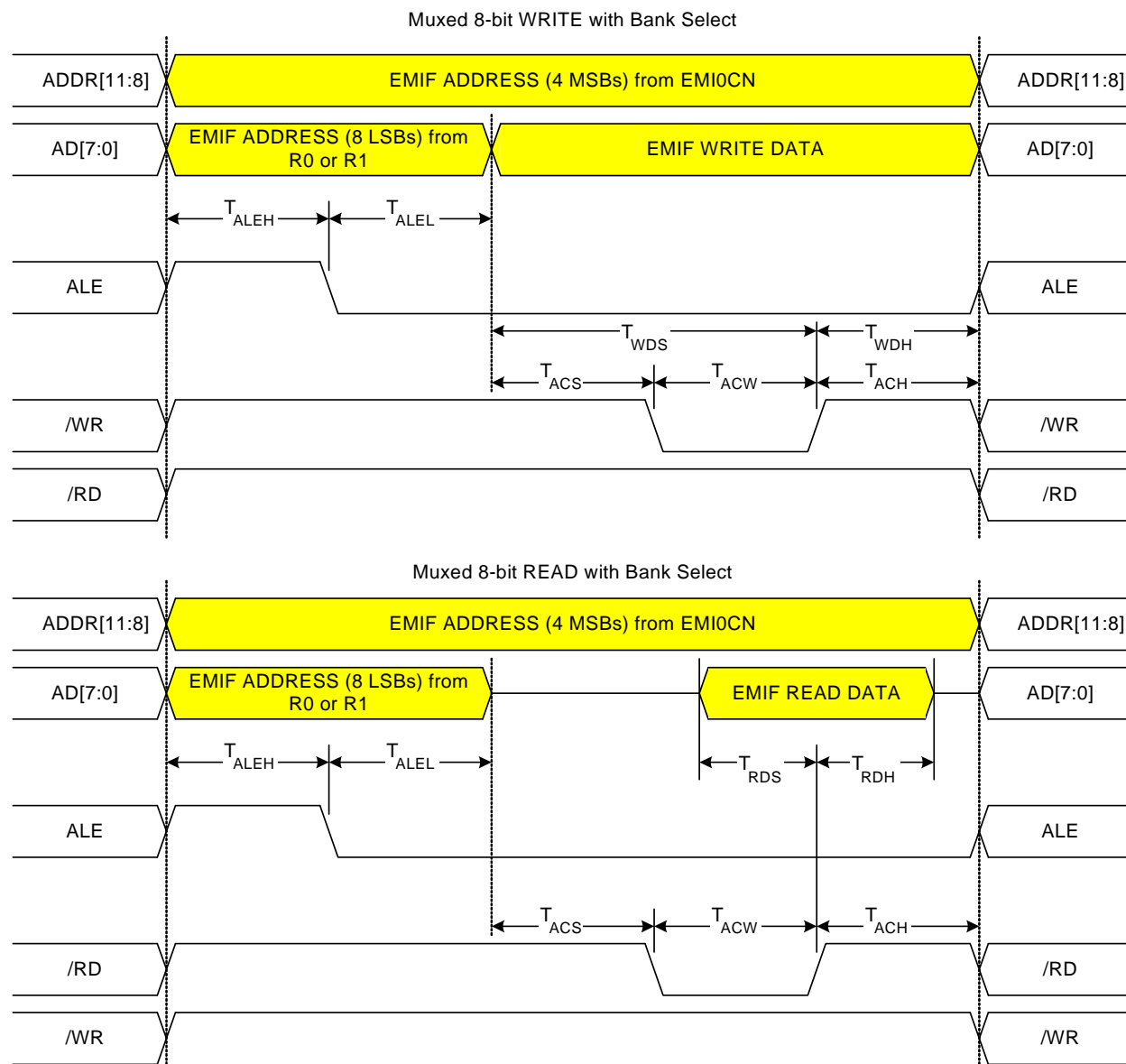
Bit	Name	Function
7:6	Unused	<b>Unused.</b> Read = 00b; Write = Don't Care.
5	REFGND	<b>Analog Ground Reference.</b> Selects the ADC0 ground reference. 0: The ADC0 ground reference is the GND pin. 1: The ADC0 ground reference is the P0.1/AGND pin.
4:3	REFSL	<b>Voltage Reference Select.</b> Selects the ADC0 voltage reference. 00: The ADC0 voltage reference is the P0.0/VREF pin. 01: The ADC0 voltage reference is the VDD/DC+ pin. 10: The ADC0 voltage reference is the internal 1.8 V digital supply voltage. 11: The ADC0 voltage reference is the internal 1.65 V high speed voltage reference.
2	TEMPE	<b>Temperature Sensor Enable.</b> Enables/Disables the internal temperature sensor. 0: Temperature Sensor Disabled. 1: Temperature Sensor Enabled.
1	Unused	<b>Unused.</b> Read = 0b; Write = Don't Care.
0	REFOE	<b>Internal Voltage Reference Output Enable.</b> Connects/Disconnects the internal voltage reference to the P0.0/VREF pin. 0: Internal 1.68 V Precision Voltage Reference disabled and not connected to P0.0/VREF. 1: Internal 1.68 V Precision Voltage Reference enabled and connected to P0.0/VREF.

### 5.12. Voltage Reference Electrical Specifications

See Table 4.11 on page 62 for detailed Voltage Reference Electrical Specifications.

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## 10.8.2.1. Multiplexed 8-bit MOVX with Bank Select: EMI0CF[3:2] = 10.



Note: See the Port Input/Output chapter to determine which port pins are mapped to the ADDR[11:8], AD[7:0], ALE, /RD, and /WR signals.

**Figure 10.6. Multiplexed 8-bit MOVX with Bank Select Timing**

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## 11.1. SFR Paging

To accommodate more than 128 SFRs in the 0x80 to 0xFF address space, SFR paging has been implemented. By default, all SFR accesses target SFR Page 0x0 to allow access to the registers listed in Table 11.1. During device initialization, some SFRs located on SFR Page 0xF may need to be accessed. Table 11.2 lists the SFRs accessible from SFR Page 0x0F. Some SFRs are accessible from both pages, including the SFRPAGE register. SFRs accessible only from Page 0xF are in **bold**.

The following procedure should be used when accessing SFRs from Page 0xF:

- Step 1. Save the current interrupt state (EA\_save = EA).
- Step 2. Disable Interrupts (EA = 0).
- Step 3. Set SFRPAGE = 0xF.
- Step 4. Access the SFRs located on SFR Page 0xF.
- Step 5. Set SFRPAGE = 0x0.
- Step 6. Restore interrupt state (EA = EA\_save).

**Table 11.2. Special Function Register (SFR) Memory Map (Page 0xF)**

F8								
F0	<b>B</b>						EIP1	EIP2
E8								
E0	<b>ACC</b>						EIE1	EIE2
D8								
D0	<b>PSW</b>							
C8								
C0								
B8			<b>ADC0PWR</b>			<b>ADC0TK</b>		
B0								
A8	<b>IE</b>	CLKSEL						
A0	<b>P2</b>				<b>P0DRV</b>	<b>P1DRV</b>	<b>P2DRV</b>	SFRPAGE
98								
90	<b>P1</b>	<b>CRC0DAT</b>	<b>CRC0CN</b>	<b>CRC0IN</b>		<b>CRC0FLIP</b>	<b>CRC0AUTO</b>	<b>CRC0CNT</b>
88								
80	<b>P0</b>	SP	DPL	DPH		<b>TOFFL</b>	<b>TOFFH</b>	PCON
	<b>0(8)</b>	1(9)	2(A)	3(B)	4(C)	5(D)	6(E)	7(F)

(bit addressable)



## SFR Definition 12.5. EIE2: Extended Interrupt Enable 2

Bit	7	6	5	4	3	2	1	0
<b>Name</b>					ESPI1	ERTC0F	EMAT	EWARN
<b>Type</b>	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
<b>Reset</b>	0	0	0	0	0	0	0	0

SFR Page = All Pages; SFR Address = 0xE7

Bit	Name	Function
7:4	Unused	<b>Unused.</b> Read = 0000b. Write = Don't care.
3	ESPI1	<b>Enable Serial Peripheral Interface (SPI1) Interrupt.</b> This bit sets the masking of the SPI1 interrupts. 0: Disable all SPI1 interrupts. 1: Enable interrupt requests generated by SPI1.
2	ERTC0F	<b>Enable SmaRTClock Oscillator Fail Interrupt.</b> This bit sets the masking of the SmaRTClock Alarm interrupt. 0: Disable SmaRTClock Alarm interrupts. 1: Enable interrupt requests generated by SmaRTClock Alarm.
1	EMAT	<b>Enable Port Match Interrupts.</b> This bit sets the masking of the Port Match Event interrupt. 0: Disable all Port Match interrupts. 1: Enable interrupt requests generated by a Port Match.
0	EWARN	<b>Enable VDD/DC+ Supply Monitor Early Warning Interrupt.</b> This bit sets the masking of the VDD/DC+ Supply Monitor Early Warning interrupt. 0: Disable the VDD/DC+ Supply Monitor Early Warning interrupt. 1: Enable interrupt requests generated by VDD/DC+ Supply Monitor.

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## Internal Register Definition 20.5. RTC0XCN: SmaRTClock Oscillator Control

Bit	7	6	5	4	3	2	1	0
Name	AGCEN	XMODE	BIASX2	CLKVLD				
Type	R/W	R/W	R/W	R	R	R	R	R
Reset	0	0	0	0	0	0	0	0

SmaRTClock Address = 0x05

Bit	Name	Function
7	AGCEN	<b>SmaRTClock Oscillator Automatic Gain Control (AGC) Enable.</b> 0: AGC disabled. 1: AGC enabled.
6	XMODE	<b>SmaRTClock Oscillator Mode.</b> Selects Crystal or Self Oscillate Mode. 0: Self-Oscillate Mode selected. 1: Crystal Mode selected.
5	BIASX2	<b>SmaRTClock Oscillator Bias Double Enable.</b> <b>Enables/disables the Bias Double feature.</b> 0: Bias Double disabled. 1: Bias Double enabled.
4	CLKVLD	<b>SmaRTClock Oscillator Crystal Valid Indicator.</b> Indicates if oscillation amplitude is sufficient for maintaining oscillation. 0: Oscillation has not started or oscillation amplitude is too low to maintain oscillation. 1: Sufficient oscillation amplitude detected.
3:0	Unused	<b>Unused.</b> Read = 0000b; Write = Don't Care.

## 21.3. Priority Crossbar Decoder

The Priority Crossbar Decoder assigns a Port I/O pin to each software selected digital function using the fixed peripheral priority order shown in Figure 21.3. The registers XBR0, XBR1, and XBR2 defined in SFR Definition 21.1, SFR Definition 21.2, and SFR Definition 21.3 are used to select digital functions in the Crossbar. The Port pins available for assignment by the Crossbar include all Port pins (P0.0–P2.6) which have their corresponding bit in PnSKIP set to 0.

From Figure 21.3, the highest priority peripheral is UART0. If UART0 is selected in the Crossbar (using the XBRn registers), then P0.4 and P0.5 will be assigned to UART0. The next highest priority peripheral is SPI1. If SPI1 is selected in the Crossbar, then P1.0–P1.2 will be assigned to SPI1. P1.3 will be assigned if SPI1 is configured for 4-wire mode. The user should ensure that the pins to be assigned by the Crossbar have their PnSKIP bits set to 0.

For all remaining digital functions selected in the Crossbar, starting at the top of Figure 21.3 going down, the least-significant unskipped, unassigned Port pin(s) are assigned to that function. If a Port pin is already assigned (e.g., UART0 or SPI1 pins), or if its PnSKIP bit is set to 1, then the Crossbar will skip over the pin and find next available unskipped, unassigned Port pin. All Port pins used for analog functions, GPIO, or dedicated digital functions such as the EMIF should have their PnSKIP bit set to 1.

Figure 21.3 shows the Crossbar Decoder priority with no Port pins skipped (P0SKIP, P1SKIP, P2SKIP = 0x00); Figure 21.4 shows the Crossbar Decoder priority with the External Oscillator pins (XTAL1 and XTAL2) skipped (P0SKIP = 0x0C).

### Important Notes:

- The Crossbar must be enabled (XBARE = 1) before any Port pin is used as a digital output. Port output drivers are disabled while the Crossbar is disabled.
- When SMBus is selected in the Crossbar, the pins associated with SDA and SCL will automatically be forced into open-drain output mode regardless of the PnMDOUT setting.
- SPI0 can be operated in either 3-wire or 4-wire modes, depending on the state of the NSSMD1-NSSMD0 bits in register SPI0CN. The NSS signal is only routed to a Port pin when 4-wire mode is selected. When SPI0 is selected in the Crossbar, the SPI0 mode (3-wire or 4-wire) will affect the pinout of all digital functions lower in priority than SPI0.
- For given XBRn, PnSKIP, and SPInCN register settings, one can determine the I/O pin-out of the device using Figure 21.3 and Figure 21.4.

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## SFR Definition 21.13. P1: Port1

Bit	7	6	5	4	3	2	1	0
Name	P1[7:0]							
Type	R/W							
Reset	1	1	1	1	1	1	1	1

SFR Page = All Pages; SFR Address = 0x90; Bit-Addressable

Bit	Name	Description	Write	Read
7:0	P1[7:0]	<b>Port 1 Data.</b> Sets the Port latch logic value or reads the Port pin logic state in Port cells configured for digital I/O.	0: Set output latch to logic LOW. 1: Set output latch to logic HIGH.	0: P1.n Port pin is logic LOW. 1: P1.n Port pin is logic HIGH.

**Note:** Pin P1.7 is only available in 32-pin devices.

## SFR Definition 21.14. P1SKIP: Port1 Skip

Bit	7	6	5	4	3	2	1	0
Name	P1SKIP[7:0]							
Type	R/W							
Reset	0	0	0	0	0	0	0	0

SFR Page = 0x0; SFR Address = 0xD5

Bit	Name	Function
7:0	P1SKIP[7:0]	<b>Port 1 Crossbar Skip Enable Bits.</b> These bits select Port 1 pins to be skipped by the Crossbar Decoder. Port pins used for analog, special functions or GPIO should be skipped by the Crossbar. 0: Corresponding P1.n pin is not skipped by the Crossbar. 1: Corresponding P1.n pin is skipped by the Crossbar.

**Note:** Pin P1.7 is only available in 32-pin devices.

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## SFR Definition 21.17. P1DRV: Port1 Drive Strength

Bit	7	6	5	4	3	2	1	0
Name	P1DRV[7:0]							
Type	R/W							
Reset	0	0	0	0	0	0	0	0

SFR Page = 0xF; SFR Address = 0xA5

Bit	Name	Function
7:0	P1DRV[7:0]	<b>Drive Strength Configuration Bits for P1.7–P1.0 (respectively).</b> Configures digital I/O Port cells to high or low output drive strength. 0: Corresponding P1.n Output has low output drive strength. 1: Corresponding P1.n Output has high output drive strength.
<b>Note:</b> Pin P1.7 is only available in 32-pin devices.		

## SFR Definition 21.18. P2: Port2

Bit	7	6	5	4	3	2	1	0
Name	P2[7:0]							
Type	R/W							
Reset	1	1	1	1	1	1	1	1

SFR Page = All Pages; SFR Address = 0xA0; Bit-Addressable

Bit	Name	Description	Write	Read
7:0	P2[7:0]	<b>Port 2 Data.</b> Sets the Port latch logic value or reads the Port pin logic state in Port cells configured for digital I/O.	0: Set output latch to logic LOW. 1: Set output latch to logic HIGH.	0: P2.n Port pin is logic LOW. 1: P2.n Port pin is logic HIGH.
<b>Note:</b> Pins P2.0-P2.6 are only available in 32-pin devices.				

## SFR Definition 21.19. P2SKIP: Port2 Skip

Bit	7	6	5	4	3	2	1	0
<b>Name</b>	P2SKIP[7:0]							
<b>Type</b>	R/W							
<b>Reset</b>	0	0	0	0	0	0	0	0

SFR Page = 0x0; SFR Address = 0xD6

Bit	Name	Description	Read	Write
7:0	P2SKIP[7:0]	<p><b>Port 1 Crossbar Skip Enable Bits.</b></p> <p>These bits select Port 2 pins to be skipped by the Crossbar Decoder. Port pins used for analog, special functions or GPIO should be skipped by the Crossbar.</p> <p>0: Corresponding P2.n pin is not skipped by the Crossbar.</p> <p>1: Corresponding P2.n pin is skipped by the Crossbar.</p>		
<p><b>Note:</b> Pins P2.0-P2.6 are only available in 32-pin devices.</p>				

## SFR Definition 21.20. P2MDIN: Port2 Input Mode

Bit	7	6	5	4	3	2	1	0
<b>Name</b>	Reserved	P2MDIN[6:0]						
<b>Type</b>	R/W							
<b>Reset</b>	1	1	1	1	1	1	1	1

SFR Page = 0x0; SFR Address = 0xF3

Bit	Name	Function
7		Reserved. Read = 1b; Must Write 1b.
6:0	P2MDIN[3:0]	<p><b>Analog Configuration Bits for P2.6–P2.0 (respectively).</b></p> <p>Port pins configured for analog mode have their weak pullup and digital receiver disabled. The digital driver is not explicitly disabled.</p> <p>0: Corresponding P2.n pin is configured for analog mode.</p> <p>1: Corresponding P2.n pin is not configured for analog mode.</p>
<p><b>Note:</b> Pins P2.0-P2.6 are only available in 32-pin devices.</p>		

## SFR Definition 24.3. SPInCKR: SPI Clock Rate

Bit	7	6	5	4	3	2	1	0
<b>Name</b>	SCRn[7:0]							
<b>Type</b>	R/W							
<b>Reset</b>	0	0	0	0	0	0	0	0

SFR Addresses: SPI0CKR = 0xA2, SPI1CKR = 0x85

SFR Pages: SPI0CKR = 0x0, SPI1CKR = 0x0

Bit	Name	Function
7:0	SCRn	<p><b>SPI Clock Rate.</b></p> <p>These bits determine the frequency of the SCK output when the SPI module is configured for master mode operation. The SCK clock frequency is a divided version of the system clock, and is given in the following equation, where <i>SYSCLK</i> is the system clock frequency and <i>SPInCKR</i> is the 8-bit value held in the SPInCKR register.</p> $f_{SCK} = \frac{SYSCLK}{2 \times (SPInCKR[7:0] + 1)}$ <p>for 0 &lt;= SPI0CKR &lt;= 255</p> <p>Example: If SYSCLK = 2 MHz and SPInCKR = 0x04,</p> $f_{SCK} = \frac{2000000}{2 \times (4 + 1)}$ $f_{SCK} = 200kHz$

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## SFR Definition 24.4. SPInDAT: SPI Data

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<b>Bit</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Name</b>	SPInDAT[7:0]							
<b>Type</b>	R/W							
<b>Reset</b>	0	0	0	0	0	0	0	0

SFR Addresses: SPI0DAT = 0xA3, SPI1DAT = 0x86

SFR Pages: SPI0DAT = 0x0, SPI1DAT = 0x0

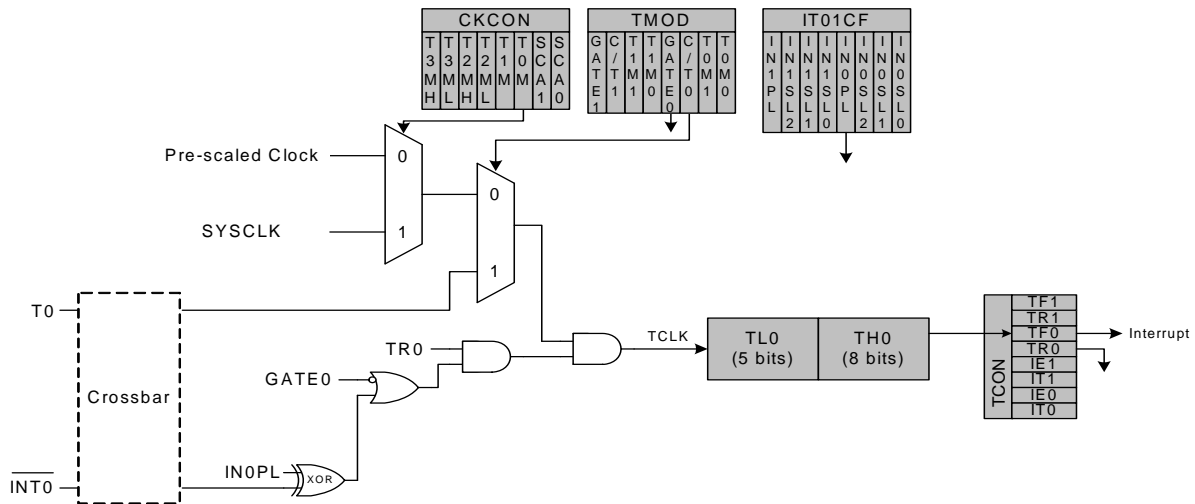
<b>Bit</b>	<b>Name</b>	<b>Function</b>
7:0	SPInDAT	<b>SPIn Transmit and Receive Data.</b> The SPInDAT register is used to transmit and receive SPIn data. Writing data to SPInDAT places the data into the transmit buffer and initiates a transfer when in Master Mode. A read of SPInDAT returns the contents of the receive buffer.



**Table 24.1. SPI Slave Timing Parameters**

Parameter	Description	Min	Max	Units
<b>Master Mode Timing</b> * (See Figure 24.8 and Figure 24.9)				
$T_{MCKH}$	SCK High Time	$1 \times T_{SYSCLK}$	—	ns
$T_{MCKL}$	SCK Low Time	$1 \times T_{SYSCLK}$	—	ns
$T_{MIS}$	MISO Valid to SCK Shift Edge	$1 \times T_{SYSCLK} + 20$	—	ns
$T_{MIH}$	SCK Shift Edge to MISO Change	0	—	ns
<b>Slave Mode Timing</b> * (See Figure 24.10 and Figure 24.11)				
$T_{SE}$	NSS Falling to First SCK Edge	$2 \times T_{SYSCLK}$	—	ns
$T_{SD}$	Last SCK Edge to NSS Rising	$2 \times T_{SYSCLK}$	—	ns
$T_{SEZ}$	NSS Falling to MISO Valid	—	$4 \times T_{SYSCLK}$	ns
$T_{SDZ}$	NSS Rising to MISO High-Z	—	$4 \times T_{SYSCLK}$	ns
$T_{CKH}$	SCK High Time	$5 \times T_{SYSCLK}$	—	ns
$T_{CKL}$	SCK Low Time	$5 \times T_{SYSCLK}$	—	ns
$T_{SIS}$	MOSI Valid to SCK Sample Edge	$2 \times T_{SYSCLK}$	—	ns
$T_{SIH}$	SCK Sample Edge to MOSI Change	$2 \times T_{SYSCLK}$	—	ns
$T_{SOH}$	SCK Shift Edge to MISO Change	—	$4 \times T_{SYSCLK}$	ns
$T_{SLH}$	Last SCK Edge to MISO Change (CKPHA = 1 ONLY)	$6 \times T_{SYSCLK}$	$8 \times T_{SYSCLK}$	ns
*Note: $T_{SYSCLK}$ is equal to one period of the device system clock (SYSCLK).				

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**Figure 25.1. T0 Mode 0 Block Diagram**

## 25.1.2. Mode 1: 16-bit Counter/Timer

Mode 1 operation is the same as Mode 0, except that the counter/timer registers use all 16 bits. The counter/timers are enabled and configured in Mode 1 in the same manner as for Mode 0.

# C8051F93x-C8051F92x

## 26.3.4. Frequency Output Mode

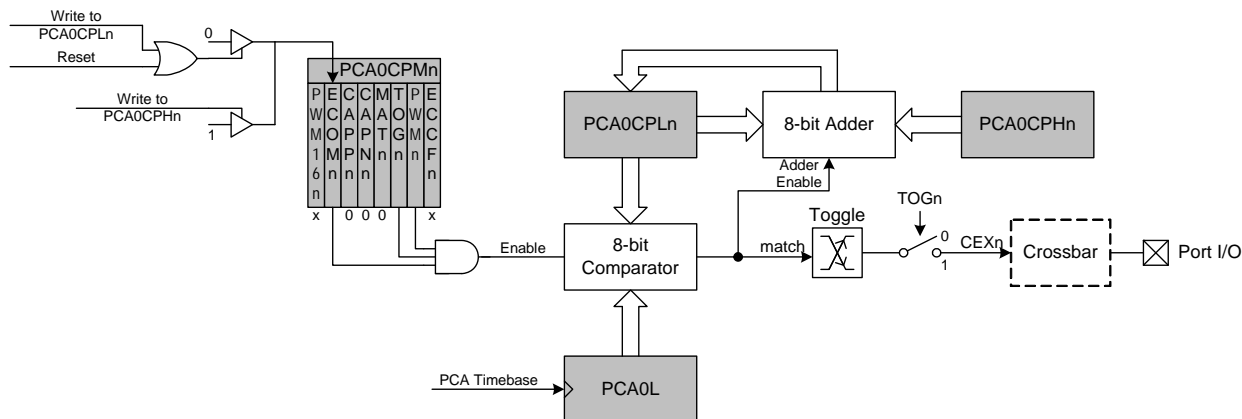
Frequency Output Mode produces a programmable-frequency square wave on the module's associated CEXn pin. The capture/compare module high byte holds the number of PCA clocks to count before the output is toggled. The frequency of the square wave is then defined by Equation 26.1.

$$F_{CEXn} = \frac{F_{PCA}}{2 \times PCA0CPHn}$$

**Note:** A value of 0x00 in the PCA0CPHn register is equal to 256 for this equation.

### Equation 26.1. Square Wave Frequency Output

Where  $F_{PCA}$  is the frequency of the clock selected by the CPS2–0 bits in the PCA mode register, PCA0MD. The lower byte of the capture/compare module is compared to the PCA counter low byte; on a match, CEXn is toggled and the offset held in the high byte is added to the matched value in PCA0CPLn. Frequency Output Mode is enabled by setting the ECOMn, TOGn, and PWMn bits in the PCA0CPMn register. The MATn bit should normally be set to 0 in this mode. If the MATn bit is set to 1, the CCFn flag for the channel will be set when the 16-bit PCA0 counter and the 16-bit capture/compare register for the channel are equal.



**Figure 26.7. PCA Frequency Output Mode**

## SFR Definition 26.7. PCA0CPLn: PCA Capture Module Low Byte

Bit	7	6	5	4	3	2	1	0
<b>Name</b>	PCA0CPn[7:0]							
<b>Type</b>	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
<b>Reset</b>	0	0	0	0	0	0	0	0

SFR Addresses: PCA0CPL0 = 0xFB, PCA0CPL1 = 0xE9, PCA0CPL2 = 0xEB,  
PCA0CPL3 = 0xED, PCA0CPL4 = 0xFD, PCA0CPL5 = 0xD2

SFR Pages: PCA0CPL0 = 0x0, PCA0CPL1 = 0x0, PCA0CPL2 = 0x0,  
PCA0CPL3 = 0x0, PCA0CPL4 = 0x0, PCA0CPL5 = 0x0

Bit	Name	Function
7:0	PCA0CPn[7:0]	<p><b>PCA Capture Module Low Byte.</b></p> <p>The PCA0CPLn register holds the low byte (LSB) of the 16-bit capture module n. This register address also allows access to the low byte of the corresponding PCA channel's auto-reload value for 9, 10, or 11-bit PWM mode. The ARSEL bit in register PCA0PWM controls which register is accessed.</p>
<p><b>Note:</b> A write to this register will clear the module's ECOMn bit to a 0.</p>		

## SFR Definition 26.8. PCA0CPHn: PCA Capture Module High Byte

Bit	7	6	5	4	3	2	1	0
<b>Name</b>	PCA0CPn[15:8]							
<b>Type</b>	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
<b>Reset</b>	0	0	0	0	0	0	0	0

SFR Addresses: PCA0CPH0 = 0xFC, PCA0CPH1 = 0xEA, PCA0CPH2 = 0xEC,  
PCA0CPH3 = 0xEE, PCA0CPH4 = 0xFE, PCA0CPH5 = 0xD3

SFR Pages: PCA0CPH0 = 0x0, PCA0CPH1 = 0x0, PCA0CPH2 = 0x0,  
PCA0CPH3 = 0x0, PCA0CPH4 = 0x0, PCA0CPH5 = 0x0

Bit	Name	Function
7:0	PCA0CPn[15:8]	<p><b>PCA Capture Module High Byte.</b></p> <p>The PCA0CPHn register holds the high byte (MSB) of the 16-bit capture module n. This register address also allows access to the high byte of the corresponding PCA channel's auto-reload value for 9, 10, or 11-bit PWM mode. The ARSEL bit in register PCA0PWM controls which register is accessed.</p>
<p><b>Note:</b> A write to this register will set the module's ECOMn bit to a 1.</p>		

## 27. C2 Interface

C8051F93x-C8051F92x devices include an on-chip Silicon Labs 2-Wire (C2) debug interface to allow Flash programming and in-system debugging with the production part installed in the end application. The C2 interface uses a clock signal (C2CK) and a bi-directional C2 data signal (C2D) to transfer information between the device and a host system. See the C2 Interface Specification for details on the C2 protocol.

### 27.1. C2 Interface Registers

The following describes the C2 registers necessary to perform Flash programming through the C2 interface. All C2 registers are accessed through the C2 interface as described in the C2 Interface Specification.

#### C2 Register Definition 27.1. C2ADD: C2 Address

Bit	7	6	5	4	3	2	1	0
Name	C2ADD[7:0]							
Type	R/W							
Reset	0	0	0	0	0	0	0	0

Bit	Name	Function										
7:0	C2ADD[7:0]	<p><b>C2 Address.</b> The C2ADD register is accessed via the C2 interface to select the target Data register for C2 Data Read and Data Write commands.</p> <table border="1"> <thead> <tr> <th>Address</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0x00</td> <td>Selects the Device ID register for Data Read instructions</td> </tr> <tr> <td>0x01</td> <td>Selects the Revision ID register for Data Read instructions</td> </tr> <tr> <td>0x02</td> <td>Selects the C2 Flash Programming Control register for Data Read/Write instructions</td> </tr> <tr> <td>0xB4</td> <td>Selects the C2 Flash Programming Data register for Data Read/Write instructions</td> </tr> </tbody> </table>	Address	Description	0x00	Selects the Device ID register for Data Read instructions	0x01	Selects the Revision ID register for Data Read instructions	0x02	Selects the C2 Flash Programming Control register for Data Read/Write instructions	0xB4	Selects the C2 Flash Programming Data register for Data Read/Write instructions
Address	Description											
0x00	Selects the Device ID register for Data Read instructions											
0x01	Selects the Revision ID register for Data Read instructions											
0x02	Selects the C2 Flash Programming Control register for Data Read/Write instructions											
0xB4	Selects the C2 Flash Programming Data register for Data Read/Write instructions											