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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	Obsolete
Core Processor	eZ8
Core Size	8-Bit
Speed	5MHz
Connectivity	IrDA, UART/USART
Peripherals	Brown-out Detect/Reset, LED, POR, PWM, WDT
Number of I/O	22
Program Memory Size	2KB (2K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	512 x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 3.6V
Data Converters	A/D 8x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 105°C (TA)
Mounting Type	Surface Mount
Package / Case	28-SOIC (0.295", 7.50mm Width)
Supplier Device Package	-
Purchase URL	https://www.e-xfl.com/product-detail/zilog/z8f0223sj005ec

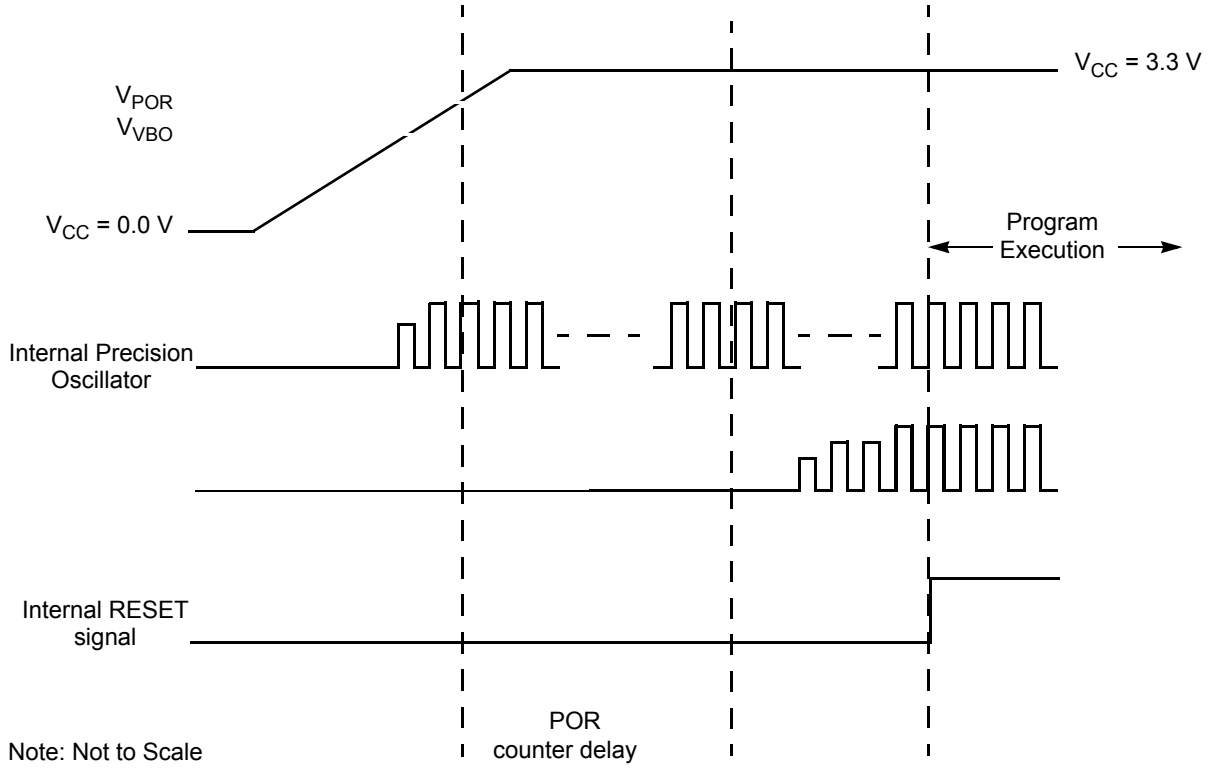


Figure 5. Power-On Reset Operation

Voltage Brownout Reset

The devices in the Z8 Encore! XP F0823 Series provide low VBO protection. The VBO circuit senses when the supply voltage drops to an unsafe level (below the VBO threshold voltage) and forces the device into the Reset state. While the supply voltage remains below the POR voltage threshold (V_{POR}), the VBO block holds the device in the Reset.

After the supply voltage again exceeds the Power-On Reset voltage threshold, the device progresses through a full System Reset sequence, as described in the POR section. Following POR, the POR status bit in the Reset Status (RSTSTAT) register is set to 1. Figure 6 displays Voltage Brownout operation. For the VBO and POR threshold voltages (V_{VBO} and V_{POR}), see Electrical Characteristics on page 193.

The VBO circuit can be either enabled or disabled during STOP mode. Operation during STOP mode is set by the VBO_AO Flash Option bit. For information on configuring VBO_AO, see Flash Option Bits on page 141.

Note: *This register is only reset during a Power-On Reset sequence. Other System Reset events do not affect it.*

Table 13. Power Control Register 0 (PWRCTL0)

BITS	7	6	5	4	3	2	1	0
FIELD	Reserved	Reserved		VBO	Reserved	ADC	COMP	Reserved
RESET	1	0	0	0	0	0	0	0
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	F80H							

Reserved—Must be 1

Reserved—Must be 0

VBO—Voltage Brownout Detector Disable
This bit and the VBO_AO Flash option bit must both enable the VBO for the VBO to be active.
0 = VBO enabled
1 = VBO disabled

ADC—Analog-to-Digital Converter Disable
0 = Analog-to-Digital Converter enabled
1 = Analog-to-Digital Converter disabled

COMP—Comparator Disable
0 = Comparator is enabled
1 = Comparator is disabled

Reserved—Must be 0

Table 30. LED Drive Enable (LEDEN)

BITS	7	6	5	4	3	2	1	0
FIELD	LEDEN[7:0]							
RESET	0	0	0	0	0	0	0	0
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	F82H							

LEDEN[7:0]—LED Drive Enable
These bits determine which Port C pins are connected to an internal current sink.
0 = Tristate the Port C pin.
1= Connect controlled current sink to the Port C pin.

LED Drive Level High Register

The LED Drive Level registers contain two control bits for each Port C pin (Table 31). These two bits select between four programmable drive levels. Each pin is individually programmable.

Table 31. LED Drive Level High Register (LEDLVLH)

BITS	7	6	5	4	3	2	1	0
FIELD	LEDLVLH[7:0]							
RESET	0	0	0	0	0	0	0	0
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	F83H							

LEDLVLH[7:0]—LED Level High Bit
{LEDLVLH, LEDLVLL} select one of four programmable current drive levels for each Port C pin.
00 = 3 mA
01= 7 mA
10= 13 mA
11= 20 mA

LED Drive Level Low Register

The LED Drive Level registers contain two control bits for each Port C pin (Table 32). These two bits select between four programmable drive levels. Each pin is individually programmable.

Table 46. Interrupt Edge Select Register (IRQES)

BITS	7	6	5	4	3	2	1	0
FIELD	IES7	IES6	IES5	IES4	IES3	IES2	IES1	IES0
RESET	0	0	0	0	0	0	0	0
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	FCDH							

IES*x*—Interrupt Edge Select *x*
0 = An interrupt request is generated on the falling edge of the PA*x* input or PDx
1 = An interrupt request is generated on the rising edge of the PA*x* input PDx
where *x* indicates the specific GPIO port pin number (0 through 7)

Shared Interrupt Select Register

The Shared Interrupt Select (IRQSS) register (Table 47) determines the source of the PADxS interrupts. The Shared Interrupt Select register selects between Port A and alternate sources for the individual interrupts.

Because these shared interrupts are edge-triggered, it is possible to generate an interrupt just by switching from one shared source to another. For this reason, an interrupt must be disabled before switching between sources.

Table 47. Shared Interrupt Select Register (IRQSS)

BITS	7	6	5	4	3	2	1	0
FIELD	Reserved	PA6CS	Reserved					
RESET	0	0	0	0	0	0	0	0
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	FCEH							

PA6CS—PA6/Comparator Selection
0 = PA6 is used for the interrupt for PA6CS interrupt request
1 = The Comparator is used for the interrupt for PA6CS interrupt request

Reserved—Must be 0

Interrupt Control Register

The Interrupt Control (IRQCTL) register (Table 48) contains the master enable bit for all interrupts.

0x = Timer Interrupt occurs on all defined Reload, Compare and Input Events
10 = Timer Interrupt only on defined Input Capture/Deassertion Events
11 = Timer Interrupt only on defined Reload/Compare Events

Reserved—Must be 0

PWMD—PWM Delay value
This field is a programmable delay to control the number of system clock cycles delay before the Timer Output and the Timer Output Complement are forced to their active state.

000 = No delay
001 = 2 cycles delay
010 = 4 cycles delay
011 = 8 cycles delay
100 = 16 cycles delay
101 = 32 cycles delay
110 = 64 cycles delay
111 = 128 cycles delay

INPCAP—Input Capture Event
This bit indicates if the most recent timer interrupt is caused by a Timer Input Capture Event.

0 = Previous timer interrupt is not a result of Timer Input Capture Event
1 = Previous timer interrupt is a result of Timer Input Capture Event

Timer 0–1 Control Register 1

The Timer 0–1 Control (TxCTL1) registers enable/disable the timers, set the prescaler value, and determine the timer operating mode.

Table 56. Timer 0–1 Control Register 1 (TxCTL1)

BITS	7	6	5	4	3	2	1	0
FIELD	TEN	TPOL	PRES			TMODE		
RESET	0	0	0	0	0	0	0	0
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	F07H, F0FH							

TEN—Timer Enable
0 = Timer is disabled
1 = Timer enabled to count

TPOL—Timer Input/Output Polarity
Operation of this bit is a function of the current operating mode of the timer

Watchdog Timer Reload Byte registers (WDTU, WDTH, and WDTL) to allow changes to the time-out period. These write operations to the WDTCTL register address produce no effect on the bits in the WDTCTL register. The locking mechanism prevents spurious writes to the Reload registers.

This register address is shared with the read-only Reset Status Register.

Table 58. Watchdog Timer Control Register (WDTCTL)

BITS	7	6	5	4	3	2	1	0
FIELD	WDTUNLK							
RESET	X	X	X	X	X	X	X	X
R/W	W	W	W	W	W	W	W	W
ADDR	FF0H							

WDTUNLK—Watchdog Timer Unlock
The software must write the correct unlocking sequence to this register before it is allowed to modify the contents of the Watchdog Timer reload registers.

Watchdog Timer Reload Upper, High and Low Byte Registers

The Watchdog Timer Reload Upper, High and Low Byte (WDTU, WDTH, WDTL) registers (Tables 59 through Table 61) form the 24-bit reload value that is loaded into the Watchdog Timer when a `WDT` instruction executes. The 24-bit reload value is {WDTU[7:0], WDTH[7:0], WDTL[7:0]}. Writing to these registers sets the appropriate Reload Value. Reading from these registers returns the current Watchdog Timer count value.

Caution: *The 24-bit WDT Reload Value must not be set to a value less than* `000004H`.

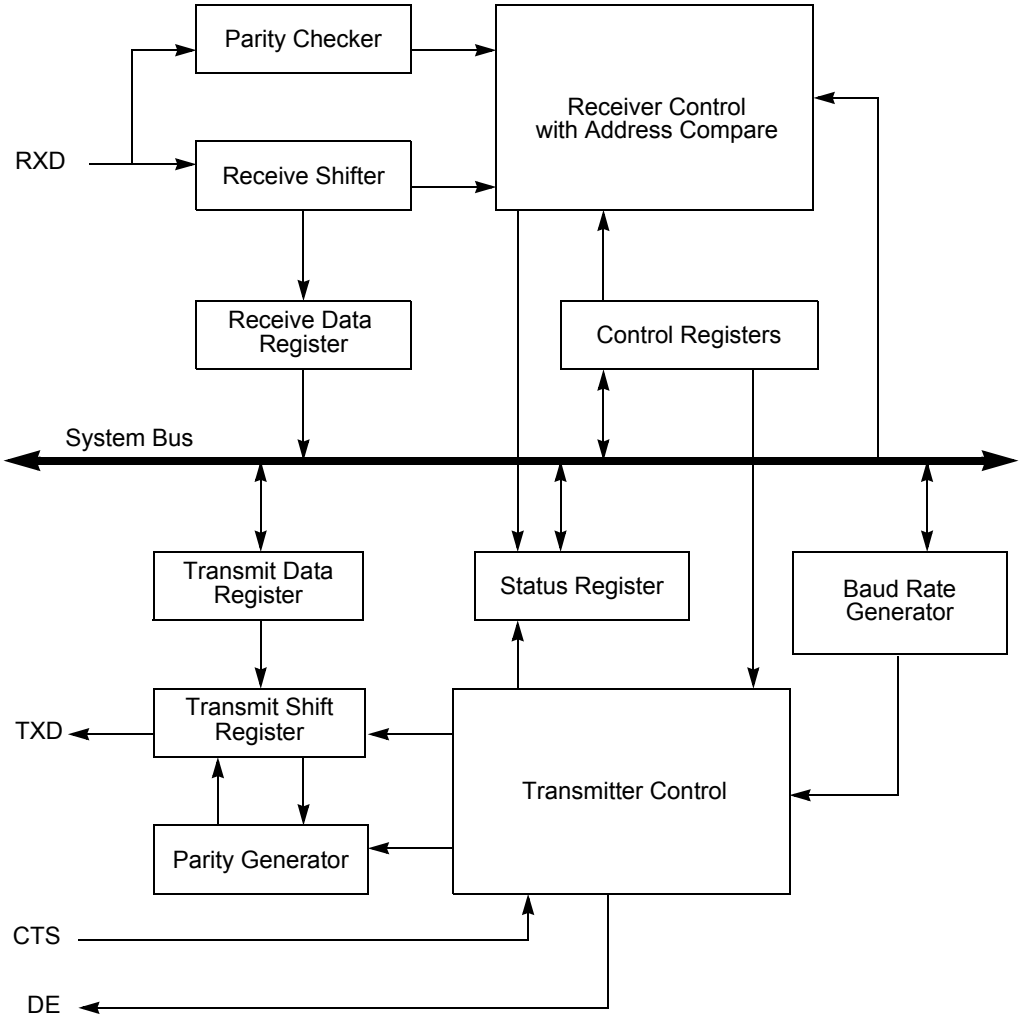


Figure 10. UART Block Diagram

Operation

Data Format

The UART always transmits and receives data in an 8-bit data format, least-significant bit (lsb) first. An even or odd parity bit can be added to the data stream. Each character begins with an active Low Start bit and ends with either 1 or 2 active High Stop bits. Figure 11 and Figure 12 display the asynchronous data format employed by the UART without parity and with parity, respectively.

Infrared Encoder/Decoder

Z8 Encore! XP® F0823 Series products contain a fully-functional, high-performance UART with Infrared Encoder/Decoder (Endec). The Infrared Endec is integrated with an on-chip UART to allow easy communication between the Z8 Encore! XP and IrDA Physical Layer Specification, Version 1.3-compliant infrared transceivers. Infrared communication provides secure, reliable, low-cost, point-to-point communication between PCs, PDAs, cell phones, printers and other infrared enabled devices.

Architecture

Figure 16 displays the architecture of the Infrared Endec.

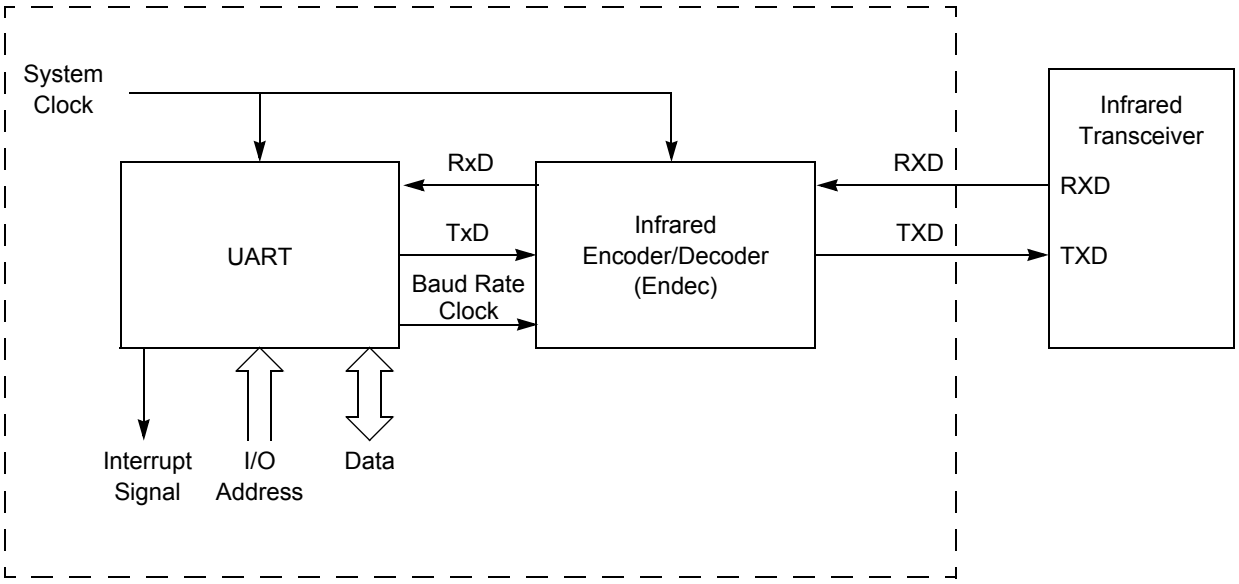


Figure 16. Infrared Data Communication System Block Diagram

Operation

When the Infrared Endec is enabled, the transmit data from the associated on-chip UART is encoded as digital signals in accordance with the IrDA standard and output to the infrared transceiver through the TXD pin. Similarly, data received from the infrared transceiver is passed to the Infrared Endec through the RXD pin, decoded by the Infrared

Software Compensation Procedure on page 122. The location of each calibration byte is provided in Table 93 on page 148.

Table 93. ADC Calibration Data Location

Info Page Address	Memory Address	Compensation Usage	ADC Mode	Reference Type
60	FE60	Offset	Single-Ended Unbuffered	Internal 2.0 V
08	FE08	Gain High Byte	Single-Ended Unbuffered	Internal 2.0 V
09	FE09	Gain Low Byte	Single-Ended Unbuffered	Internal 2.0 V
63	FE63	Offset	Single-Ended Unbuffered	Internal 1.0 V
0A	FE0A	Gain High Byte	Single-Ended Unbuffered	Internal 1.0 V
0B	FE0B	Gain Low Byte	Single-Ended Unbuffered	Internal 1.0 V
66	FE66	Offset	Single-Ended Unbuffered	External 2.0 V
0C	FE0C	Gain High Byte	Single-Ended Unbuffered	External 2.0 V
0D	FE0D	Gain Low Byte	Single-Ended Unbuffered	External 2.0 V

Serialization Data

Table 94. Serial Number at 001C-001F (S_NUM)

BITS	7	6	5	4	3	2	1	0
FIELD	S_NUM							
RESET	U	U	U	U	U	U	U	U
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	Information Page Memory 001C-001F							

Note: U = Unchanged by Reset. R/W = Read/Write.

S_NUM— Serial Number Byte
The serial number is a unique four-byte binary value.

Table 95. Serialization Data Locations

Info Page Address	Memory Address	Usage
1C	FE1C	Serial Number Byte 3 (most significant)
1D	FE1D	Serial Number Byte 2
1E	FE1E	Serial Number Byte 1
1F	FE1F	Serial Number Byte 0 (least significant)

Randomized Lot Identifier

Table 96. Lot Identification Number (RAND_LOT)

BITS	7	6	5	4	3	2	1	0
FIELD	RAND_LOT							
RESET	U	U	U	U	U	U	U	U
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
ADDR	Interspersed throughout Information Page Memory							

Note: U = Unchanged by Reset. R/W = Read/Write.

RAND_LOT— Randomized Lot ID
The randomized lot ID is a 32 byte binary value that changes for each production lot.

Table 97. Randomized Lot ID Locations

Info Page Address	Memory Address	Usage
3C	FE3C	Randomized Lot ID Byte 31 (most significant)
3D	FE3D	Randomized Lot ID Byte 30
3E	FE3E	Randomized Lot ID Byte 29
3F	FE3F	Randomized Lot ID Byte 28
58	FE58	Randomized Lot ID Byte 27
59	FE59	Randomized Lot ID Byte 26
5A	FE5A	Randomized Lot ID Byte 25
5B	FE5B	Randomized Lot ID Byte 24

Debug Command	Command Byte	Enabled when NOT in DEBUG mode?	Disabled by Flash Read Protect Option Bit
Stuff Instruction	11H	–	Disabled.
Execute Instruction	12H	–	Disabled.
Reserved	13H–FFH	–	–

In the following list of OCD Commands, data and commands sent from the host to the OCD are identified by 'DBG ← Command/Data'. Data sent from the OCD back to the host is identified by 'DBG → Data'.

- **Read OCD Revision (00H)**—The Read OCD Revision command determines the version of the OCD. If OCD commands are added, removed, or changed, this revision number changes.

```
DBG ← 00H
DBG → OCDRev[15:8] (Major revision number)
DBG → OCDRev[7:0] (Minor revision number)
```

- **Read OCD Status Register (02H)**—The Read OCD Status register command reads the OCDSTAT register.

```
DBG ← 02H
DBG → OCDSTAT[7:0]
```

- **Read Runtime Counter (03H)**—The Runtime Counter counts system clock cycles in between breakpoints. The 16-bit Runtime Counter counts up from 0000H and stops at the maximum count of FFFFH. The Runtime Counter is overwritten during the Write Memory, Read Memory, Write Register, Read Register, Read Memory CRC, Step Instruction, Stuff Instruction, and Execute Instruction commands.

```
DBG ← 03H
DBG → RuntimeCounter[15:8]
DBG → RuntimeCounter[7:0]
```

- **Write OCD Control Register (04H)**—The Write OCD Control Register command writes the data that follows to the OCDCTL register. When the Flash Read Protect Option Bit is enabled, the DBGMODE bit (OCDCTL[7]) can only be set to 1, it cannot be cleared to 0 and the only method of returning the device to normal operating mode is to reset the device.

```
DBG ← 04H
DBG ← OCDCTL[7:0]
```

- **Read OCD Control Register (05H)**—The Read OCD Control Register command reads the value of the OCDCTL register.

- **Read Program Memory CRC (0EH)**—The Read Program Memory Cyclic Redundancy Check (CRC) command computes and returns the CRC of Program Memory using the 16-bit CRC-CCITT polynomial. If the device is not in DEBUG mode, this command returns FFFFH for the CRC value. Unlike most other OCD Read commands, there is a delay from issuing of the command until the OCD returns the data. The OCD reads the Program Memory, calculates the CRC value, and returns the result. The delay is a function of the Program Memory size and is approximately equal to the system clock period multiplied by the number of bytes in the Program Memory.

  ```
  DBG ← 0EH
  DBG → CRC[15:8]
  DBG → CRC[7:0]
  ```

- **Step Instruction (10H)**—The Step Instruction command steps one assembly instruction at the current Program Counter (PC) location. If the device is not in DEBUG mode or the Flash Read Protect Option bit is enabled, the OCD ignores this command.

  ```
  DBG ← 10H
  ```

- **Stuff Instruction (11H)**—The Stuff Instruction command steps one assembly instruction and allows specification of the first byte of the instruction. The remaining 0-4 bytes of the instruction are read from Program Memory. This command is useful for stepping over instructions where the first byte of the instruction has been overwritten by a Breakpoint. If the device is not in DEBUG mode or the Flash Read Protect Option bit is enabled, the OCD ignores this command.

  ```
  DBG ← 11H
  DBG ← opcode[7:0]
  ```

- **Execute Instruction (12H)**—The Execute Instruction command allows sending an entire instruction to be executed to the eZ8 CPU. This command can also step over breakpoints. The number of bytes to send for the instruction depends on the opcode. If the device is not in DEBUG mode or the Flash Read Protect Option bit is enabled, this command reads and discards one byte.

  ```
  DBG ← 12H
  DBG ← 1-5 byte opcode
  ```

On-Chip Debugger Control Register Definitions

OCD Control Register

The OCD Control register controls the state of the OCD. This register is used to enter or exit DEBUG mode and to enable the BRK instruction. It also resets Z8 Encore! XP® F0823 Series device.

Table 115. eZ8 CPU Instruction Summary (Continued)

Assembly Mnemonic	Symbolic Operation	Address Mode dst	Address Mode src	Opcode(s) (Hex)	Flags C	Z	S	V	D	H	Fetch Cycles	Instr. Cycles
HALT	HALT Mode			7F	–	–	–	–	–	–	1	2
INC dst	dst ← dst + 1	R		20	–	*	*	–	–	–	2	2
		IR		21							2	3
		r		0E-FE							1	2
INCW dst	dst ← dst + 1	RR		A0	–	*	*	*	–	–	2	5
		IRR		A1							2	6
IRET	FLAGS ← @SP SP ← SP + 1 PC ← @SP SP ← SP + 2 IRQCTL[7] ← 1			BF	*	*	*	*	*	*	1	5
JP dst	PC ← dst	DA		8D	–	–	–	–	–	–	3	2
		IRR		C4							2	3
JP cc, dst	if cc is true PC ← dst	DA		0D-FD	–	–	–	–	–	–	3	2
JR dst	PC ← PC + X	DA		8B	–	–	–	–	–	–	2	2
JR cc, dst	if cc is true PC ← PC + X	DA		0B-FB	–	–	–	–	–	–	2	2
LD dst, rc	dst ← src	r	IM	0C-FC	–	–	–	–	–	–	2	2
		r	X(r)	C7							3	3
		X(r)	r	D7							3	4
		r	Ir	E3							2	3
		R	R	E4							3	2
		R	IR	E5							3	4
		R	IM	E6							3	2
		IR	IM	E7							3	3
		Ir	r	F3							2	3
		IR	R	F5							3	3
Flags Notation:	* = Value is a function of the result of the operation. – = Unaffected X = Undefined				0 = Reset to 0 1 = Set to 1							

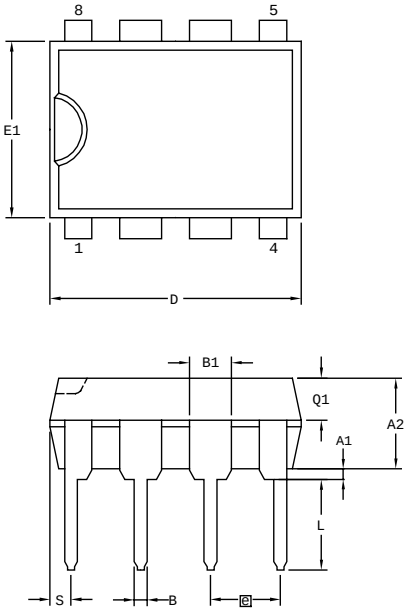
Table 118. DC Characteristics (Continued)

Symbol	Parameter	T_A = -40 °C to +105 °C (unless otherwise specified)			Units	Conditions
		Minimum	Typical	Maximum		
V_{OH2}	High Level Output Voltage	2.4	–	–	V	I_{OH} = -20 mA; V_{DD} = 3.3 V High Output Drive enabled.
I_{IH}	Input Leakage Current	–	±0.002	±5	µA	$V_{IN} = V_{DD}$ V_{DD} = 3.3 V;
I_{IL}	Input Leakage Current	–	±0.007	±5	µA	$V_{IN} = V_{SS}$ V_{DD} = 3.3 V;
I_{TL}	Tristate Leakage Current	–	–	±5	µA	
I_{LED}	Controlled Current Drive	1.8	3	4.5	mA	{AFS2,AFS1} = {0,0}
		2.8	7	10.5	mA	{AFS2,AFS1} = {0,1}
		7.8	13	19.5	mA	{AFS2,AFS1} = {1,0}
		12	20	30	mA	{AFS2,AFS1} = {1,1}
C_{PAD}	GPIO Port Pad Capacitance	–	8.0[2]	–	pF	
C_{XIN}	XIN Pad Capacitance	–	8.0[2]	–	pF	
C_{XOUT}	XOUT Pad Capacitance	–	9.5[2]	–	pF	
I_{PU}	Weak Pull-up Current	30	100	350	µA	V_{DD} = 3.0 V–3.6 V
V_{RAM}	RAM Data Retention Voltage	TBD			V	Voltage at which RAM retains static values; no reading or writing is allowed.

Notes
1. This condition excludes all pins that have on-chip pull-ups, when driven Low.
2. These values are provided for design guidance only and are not tested in production.

Packaging

Figure 34 displays the 8-pin Plastic Dual Inline Package (PDIP) available for the Z8 Encore! XP® F0823 Series devices.

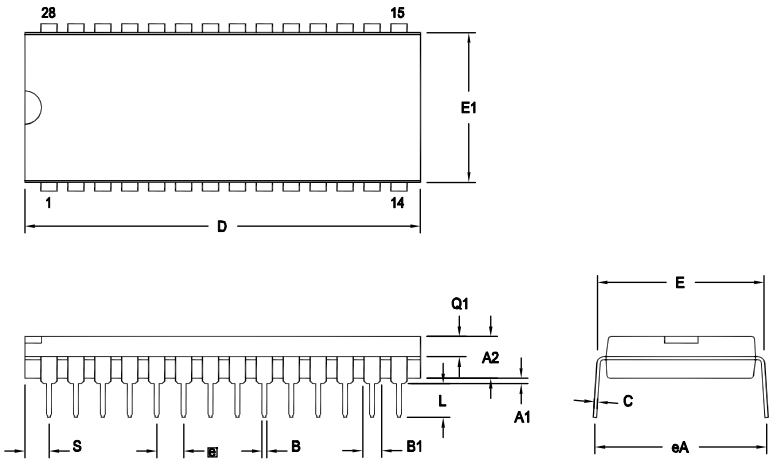


SYMBOL	MILLIMETER		INCH	
	MIN	MAX	MIN	MAX
A1	0.38	0.81	0.015	0.032
A2	3.25	3.81	0.128	0.150
B	0.38	0.53	0.015	0.021
B1	1.40	1.65	0.055	0.065
C	0.20	0.30	0.008	0.012
D	9.02	9.78	0.355	0.385
E	7.62	8.26	0.300	0.325
E1	6.10	6.60	0.240	0.260
e	2.54 BSC		0.100 BSC	
eA	7.87	9.14	0.310	0.360
L	3.18	3.43	0.125	0.135
Q1	1.40	1.65	0.055	0.065
S	0.64	0.89	0.025	0.035

CONTROLLING DIMENSIONS : MM.

Figure 34. 8-Pin Plastic Dual Inline Package (PDIP)

Figure 40 displays the 28-pin Plastic Dual Inline Package (PDIP) available for Z8 Encore! XP F0823 Series devices.



SYMBOL	OPT #	MILLIMETER		INCH	
		MIN	MAX	MIN	MAX
A1		0.38	1.02	.015	.040
A2		3.18	4.19	.125	.165
B		0.38	0.53	.015	.021
B1	01	1.40	1.65	.055	.065
	02	1.14	1.40	.045	.055
C		0.23	0.38	.009	.015
D	01	36.58	37.34	1.440	1.470
	02	35.31	35.94	1.390	1.415
E		15.24	15.75	.600	.620
E1	01	13.59	14.10	.535	.555
	02	12.83	13.08	.505	.515
e		2.54 TYP		.100 BSC	
eA		15.49	16.76	.610	.660
L		3.05	3.81	.120	.150
Q1	01	1.40	1.91	.055	.075
	02	1.40	1.78	.055	.070
S	01	1.52	2.29	.060	.090
	02	1.02	1.52	.040	.060

CONTROLLING DIMENSIONS : INCH

OPTION TABLE	
OPTION #	PACKAGE
01	STANDARD
02	IDF

Note: ZiLOG supplies both options for production. Component layout PCB design should cover bigger option 01.

Figure 40. 28-Pin Plastic Dual Inline Package (PDIP)

Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Description
Z8 Encore! XP with 8 KB Flash								
Standard Temperature: 0 °C to 70 °C								
Z8F0813PB005SC	8 KB	1 KB	6	12	2	0	1	PDIP 8-pin package
Z8F0813QB005SC	8 KB	1 KB	6	12	2	0	1	QFN 8-pin package
Z8F0813SB005SC	8 KB	1 KB	6	12	2	0	1	SOIC 8-pin package
Z8F0813SH005SC	8 KB	1 KB	16	18	2	0	1	SOIC 20-pin package
Z8F0813HH005SC	8 KB	1 KB	16	18	2	0	1	SSOP 20-pin package
Z8F0813PH005SC	8 KB	1 KB	16	18	2	0	1	PDIP 20-pin package
Z8F0813SJ005SC	8 KB	1 KB	24	18	2	0	1	SOIC 28-pin package
Z8F0813HJ005SC	8 KB	1 KB	24	18	2	0	1	SSOP 28-pin package
Z8F0813PJ005SC	8 KB	1 KB	24	18	2	0	1	PDIP 28-pin package
Extended Temperature: -40 °C to 105 °C								
Z8F0813PB005EC	8 KB	1 KB	6	12	2	0	1	PDIP 8-pin package
Z8F0813QB005EC	8 KB	1 KB	6	12	2	0	1	QFN 8-pin package
Z8F0813SB005EC	8 KB	1 KB	6	12	2	0	1	SOIC 8-pin package
Z8F0813SH005EC	8 KB	1 KB	16	18	2	0	1	SOIC 20-pin package
Z8F0813HH005EC	8 KB	1 KB	16	18	2	0	1	SSOP 20-pin package
Z8F0813PH005EC	8 KB	1 KB	16	18	2	0	1	PDIP 20-pin package
Z8F0813SJ005EC	8 KB	1 KB	24	18	2	0	1	SOIC 28-pin package
Z8F0813HJ005EC	8 KB	1 KB	24	18	2	0	1	SSOP 28-pin package
Z8F0813PJ005EC	8 KB	1 KB	24	18	2	0	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging								

Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Description
Z8 Encore! XP with 4 KB Flash, 10-Bit Analog-to-Digital Converter								
Standard Temperature: 0 °C to 70 °C								
Z8F0423PB005SC	4 KB	1 KB	6	12	2	4	1	PDIP 8-pin package
Z8F0423QB005SC	4 KB	1 KB	6	12	2	4	1	QFN 8-pin package
Z8F0423SB005SC	4 KB	1 KB	6	12	2	4	1	SOIC 8-pin package
Z8F0423SH005SC	4 KB	1 KB	16	18	2	7	1	SOIC 20-pin package
Z8F0423HH005SC	4 KB	1 KB	16	18	2	7	1	SSOP 20-pin package
Z8F0423PH005SC	4 KB	1 KB	16	18	2	7	1	PDIP 20-pin package
Z8F0423SJ005SC	4 KB	1 KB	22	18	2	8	1	SOIC 28-pin package
Z8F0423HJ005SC	4 KB	1 KB	22	18	2	8	1	SSOP 28-pin package
Z8F0423PJ005SC	4 KB	1 KB	22	18	2	8	1	PDIP 28-pin package
Extended Temperature: -40 °C to 105 °C								
Z8F0423PB005EC	4 KB	1 KB	6	12	2	4	1	PDIP 8-pin package
Z8F0423QB005EC	4 KB	1 KB	6	12	2	4	1	QFN 8-pin package
Z8F0423SB005EC	4 KB	1 KB	6	12	2	4	1	SOIC 8-pin package
Z8F0423SH005EC	4 KB	1 KB	16	18	2	7	1	SOIC 20-pin package
Z8F0423HH005EC	4 KB	1 KB	16	18	2	7	1	SSOP 20-pin package
Z8F0423PH005EC	4 KB	1 KB	16	18	2	7	1	PDIP 20-pin package
Z8F0423SJ005EC	4 KB	1 KB	22	18	2	8	1	SOIC 28-pin package
Z8F0423HJ005EC	4 KB	1 KB	22	18	2	8	1	SSOP 28-pin package
Z8F0423PJ005EC	4 KB	1 KB	22	18	2	8	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging								

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