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Details

Product Status	Active
Core Processor	eZ8
Core Size	8-Bit
Speed	20MHz
Connectivity	IrDA, UART/USART
Peripherals	Brown-out Detect/Reset, LED, LVD, POR, PWM, Temp Sensor, WDT
Number of I/O	6
Program Memory Size	2KB (2K x 8)
Program Memory Type	FLASH
EEPROM Size	64 x 8
RAM Size	512 x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 3.6V
Data Converters	A/D 4x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 105°C (TA)
Mounting Type	Surface Mount
Package / Case	8-VDFN Exposed Pad
Supplier Device Package	8-QFN (5x6)
Purchase URL	https://www.e-xfl.com/product-detail/zilog/z8f022aqb020eg

List of Figures

Figure 1.	Z8 Encore! XP F082A Series Block Diagram	3
Figure 2.	Z8F08xA, Z8F04xA, Z8F02xA and Z8F01xA in 8-Pin SOIC, QFN/MLF-S, or PDIP Package	9
Figure 3.	Z8F08xA, Z8F04xA, Z8F02xA and Z8F01xA in 20-Pin SOIC, SSOP or PDIP Package	9
Figure 4.	Z8F08xA, Z8F04xA, Z8F02xA and Z8F01xA in 28-Pin SOIC, SSOP or PDIP Package	9
Figure 5.	Power-On Reset Operation	25
Figure 6.	Voltage Brown-Out Reset Operation	26
Figure 7.	GPIO Port Pin Block Diagram	37
Figure 8.	Interrupt Controller Block Diagram	57
Figure 9.	Timer Block Diagram	71
Figure 10.	UART Block Diagram	100
Figure 11.	UART Asynchronous Data Format without Parity	101
Figure 12.	UART Asynchronous Data Format with Parity	101
Figure 13.	UART Asynchronous MULTIPROCESSOR Mode Data Format	105
Figure 14.	UART Driver Enable Signal Timing (shown with 1 Stop Bit and Parity)	107
Figure 15.	UART Receiver Interrupt Service Routine Flow	109
Figure 16.	Infrared Data Communication System Block Diagram	120
Figure 17.	Infrared Data Transmission	121
Figure 18.	IrDA Data Reception	122
Figure 19.	Analog-to-Digital Converter Block Diagram	125
Figure 20.	Comparator Block Diagram	140
Figure 21.	Flash Memory Arrangement	147
Figure 22.	Flash Controller Operation Flow Chart	148
Figure 23.	On-Chip Debugger Block Diagram	180
Figure 24.	Interfacing the On-Chip Debugger's DBG Pin with an RS-232 Interface; #1 of 2	181

Table 59.	Watchdog Timer Control Register (WDTCTL)	96
Table 60.	Watchdog Timer Reload Upper Byte Register (WDTU)	97
Table 61.	Watchdog Timer Reload High Byte Register (WDTH)	97
Table 62.	Watchdog Timer Reload Low Byte Register (WDTL)	98
Table 63.	UART Control 0 Register (U0CTL0)	111
Table 64.	UART Control 1 Register (U0CTL1)	112
Table 65.	UART Status 0 Register (U0STAT0)	114
Table 66.	UART Status 1 Register (U0STAT1)	115
Table 67.	UART Transmit Data Register (U0TXD)	116
Table 68.	UART Receive Data Register (U0RXD)	116
Table 69.	UART Address Compare Register (U0ADDR)	117
Table 70.	UART Baud Rate High Byte Register (U0BRH)	117
Table 71.	UART Baud Rate Low Byte Register (U0BRL)	117
Table 72.	UART Baud Rates	118
Table 73.	ADC Control Register 0 (ADCCTL0)	134
Table 74.	ADC Control/Status Register 1 (ADCCTL1)	136
Table 75.	ADC Data High Byte Register (ADCD_H)	137
Table 76.	ADC Data Low Byte Register (ADCD_L)	137
Table 77.	Comparator Control Register (CMP0)	141
Table 78.	Z8 Encore! XP F082A Series Flash Memory Configurations	146
Table 79.	Flash Code Protection Using the Flash Option Bits	150
Table 80.	Flash Status Register (FSTAT)	155
Table 81.	Flash Control Register (FCTL)	155
Table 82.	Flash Page Select Register (FPS)	156
Table 83.	Flash Sector Protect Register (FPROT)	157
Table 84.	Flash Frequency High Byte Register (FFREQH)	158
Table 85.	Flash Frequency Low Byte Register (FFREQL)	158
Table 86.	Trim Bit Address Register (TRMADR)	161
Table 87.	Trim Bit Data Register (TRMDR)	162
Table 88.	Flash Option Bits at Program Memory Address 0000H	162

Table 89.	Flash Options Bits at Program Memory Address 0001H	164
Table 90.	Trim Options Bits at Address 0000H	165
Table 91.	Trim Option Bits at 0001H	165
Table 92.	Trim Option Bits at 0002H (TIPO)	166
Table 93.	Trim Option Bits at Address 0003H (TLVD)	166
Table 94.	LVD Trim Values	167
Table 95.	Trim Option Bits at 0004H	168
Table 96.	ADC Calibration Bits	169
Table 97.	ADC Calibration Data Location	169
Table 98.	Temperature Sensor Calibration High Byte at 003A (TSCALH)	171
Table 99.	Temperature Sensor Calibration Low Byte at 003B (TSCALL)	171
Table 100.	Watchdog Calibration High Byte at 007EH (WDTCALH)	172
Table 101.	Serial Number at 001C - 001F (S_NUM)	173
Table 102.	Serialization Data Locations	173
Table 103.	Watchdog Calibration Low Byte at 007FH (WDTCALL)	173
Table 104.	Lot Identification Number (RAND_LOT)	174
Table 105.	Randomized Lot ID Locations	174
Table 106.	Write Status Byte	177
Table 107.	NVDS Read Time	179
Table 108.	OCD Baud-Rate Limits	184
Table 109.	Debug Command Enable/Disable	186
Table 110.	OCD Control Register (OCDCTL)	191
Table 111.	OCD Status Register (OCDSTAT)	192
Table 112.	Oscillator Configuration and Selection	194
Table 113.	Oscillator Control Register (OSCCTL)	196
Table 114.	Recommended Crystal Oscillator Specifications	200
Table 115.	Transconductance Values for Low, Medium and High Gain Operating Modes	200
Table 116.	Assembly Language Syntax Example 1	205
Table 117.	Assembly Language Syntax Example 2	205
Table 118.	Notational Shorthand	206

Table 8. Reset and Stop Mode Recovery Characteristics and Latency

Reset Characteristics and Latency			
Reset Type	Control Registers	eZ8 CPU	Reset Latency (Delay)
System Reset	Reset (as applicable)	Reset	66 Internal Precision Oscillator Cycles
System Reset with Crystal Oscillator Enabled	Reset (as applicable)	Reset	5000 Internal Precision Oscillator Cycles
Stop Mode Recovery	Unaffected, except WDT_CTL and OSC_CTL registers	Reset	66 Internal Precision Oscillator Cycles + IPO startup time
Stop Mode Recovery with Crystal Oscillator Enabled	Unaffected, except WDT_CTL and OSC_CTL registers	Reset	5000 Internal Precision Oscillator Cycles

During a System Reset or Stop Mode Recovery, the Internal Precision Oscillator requires 4 μ s to start up. Then the Z8 Encore! XP F082A Series device is held in Reset for 66 cycles of the Internal Precision Oscillator. If the crystal oscillator is enabled in the Flash option bits, this reset period is increased to 5000 IPO cycles. When a reset occurs because of a low voltage condition or Power-On Reset (POR), this delay is measured from the time that the supply voltage first exceeds the POR level. If the external pin reset remains asserted at the end of the reset period, the device remains in reset until the pin is deasserted.

At the beginning of Reset, all GPIO pins are configured as inputs with pull-up resistor disabled, except PD0 (or PA2 on 8-pin devices) which is shared with the reset pin. On reset, the PD0 is configured as a bidirectional open-drain reset. The pin is internally driven low during port reset, after which the user code may reconfigure this pin as a general purpose output.

During Reset, the eZ8 CPU and on-chip peripherals are idle; however, the on-chip crystal oscillator and Watchdog Timer oscillator continue to run.

Upon Reset, control registers within the Register File that have a defined Reset value are loaded with their reset values. Other control registers (including the Stack Pointer, Register Pointer and Flags) and general-purpose RAM are undefined following Reset. The eZ8 CPU fetches the Reset vector at Program Memory addresses 0002H and 0003H and loads that value into the Program Counter. Program execution begins at the Reset vector address.

As the control registers are reinitialized by a system reset, the system clock after reset is always the IPO. The software must reconfigure the oscillator control block, such that the correct system clock source is enabled and selected.

PA0 and PA6 contain two different timer functions, a timer input and a complementary timer output. Both of these functions require the same GPIO configuration, the selection between the two is based on the timer mode. See **the Timers chapter on page 70** for more details.

! Caution: For pins with multiple alternate functions, Zilog recommends writing to the AFS1 and AFS2 subregisters before enabling the alternate function via the AF subregister. As a result, spurious transitions through unwanted alternate function modes will be prevented.

Direct LED Drive

The Port C pins provide a current sinked output capable of driving an LED without requiring an external resistor. The output sinks current at programmable levels of 3 mA, 7 mA, 13 mA and 20 mA. This mode is enabled through the LED control registers. The LED Drive Enable (LEDEN) Register turns on the drivers. The LED Drive Level (LEDLVLH and LEDLVLL) registers select the sink current.

For correct function, the LED anode must be connected to V_{DD} and the cathode to the GPIO pin. Using all Port C pins in LED drive mode with maximum current may result in excessive total current. See **the Electrical Characteristics chapter on page 226** for the maximum total current for the applicable package.

Shared Reset Pin

On the 20- and 28-pin devices, the PD0 pin shares function with a bidirectional reset pin. Unlike all other I/O pins, this pin does not default to GPIO function on power-up. This pin acts as a bidirectional input/open-drain output reset until the software reconfigures it. The PD0 pin is an output-only open drain when in GPIO mode. There are no pull-up, High Drive, or Stop Mode Recovery source features associated with the PD0 pin.

On the 8-pin product versions, the reset pin is shared with PA2, but the pin is not limited to output-only when in GPIO mode.

! Caution: If PA2 on the 8-pin product is reconfigured as an input, ensure that no external stimulus drives the pin low during any reset sequence. Since PA2 returns to its RESET alternate function during system resets, driving it Low holds the chip in a reset state until the pin is released.

Port A–D Control Registers

The Port A–D Control registers set the GPIO port operation. The value in the corresponding Port A–D Address Register determines which subregister is read from or written to by a Port A–D Control Register transaction; see Table 20.

Table 20. Port A–D Control Registers (PxCTL)

Bit	7	6	5	4	3	2	1	0
Field	PCTL							
RESET	00H							
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Address	FD1H, FD5H, FD9H, FDDH							

Bit	Description
[7:0]	Port Control
PCTLx	The Port Control Register provides access to all subregisters that configure the GPIO port operation.

Note: x indicates the specific GPIO port pin number (7–0).

Port A–D Data Direction Subregisters

The Port A–D Data Direction subregister is accessed through the Port A–D Control Register by writing 01H to the Port A–D Address Register; see Table 21.

Table 21. Port A–D Data Direction Subregisters (PxDD)

Bit	7	6	5	4	3	2	1	0
Field	DD7	DD6	DD5	DD4	DD3	DD2	DD1	DD0
RESET	1	1	1	1	1	1	1	1
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Address	If 01H in Port A–D Address Register, accessible through the Port A–D Control Register							

Bit	Description
[7:0]	Data Direction
DDx	These bits control the direction of the associated port pin. Port Alternate Function operation overrides the Data Direction Register setting. 0 = Output. Data in the Port A–D Output Data Register is driven onto the port pin. 1 = Input. The port pin is sampled and the value written into the Port A–D Input Data Register. The output driver is tristated.

Note: x indicates the specific GPIO port pin number (7–0).

- Set the initial logic level (High or Low) for the Timer Output alternate function, if appropriate
2. Write to the Timer High and Low Byte registers to set the starting count value.
 3. Write to the Timer Reload High and Low Byte registers to set the Compare value.
 4. Enable the timer interrupt, if appropriate and set the timer interrupt priority by writing to the relevant interrupt registers.
 5. If using the Timer Output function, configure the associated GPIO port pin for the Timer Output alternate function.
 6. Write to the Timer Control Register to enable the timer and initiate counting.

In COMPARE Mode, the system clock always provides the timer input. The Compare time can be calculated by the following equation:

$$\text{COMPARE Mode Time (s)} = \frac{(\text{Compare Value} - \text{Start Value}) \times \text{Prescale}}{\text{System Clock Frequency (Hz)}}$$

GATED Mode

In GATED Mode, the timer counts only when the Timer Input signal is in its active state (asserted), as determined by the TPOL bit in the Timer Control Register. When the Timer Input signal is asserted, counting begins. A timer interrupt is generated when the Timer Input signal is deasserted or a timer reload occurs. To determine if a Timer Input signal deassertion generated the interrupt, read the associated GPIO input value and compare to the value stored in the TPOL bit.

The timer counts up to the 16-bit reload value stored in the Timer Reload High and Low Byte registers. The timer input is the system clock. When reaching the reload value, the timer generates an interrupt, the count value in the Timer High and Low Byte registers is reset to 0001H and counting resumes (assuming the Timer Input signal remains asserted). Also, if the Timer Output alternate function is enabled, the Timer Output pin changes state (from Low to High or from High to Low) at timer reset.

Observe the following steps for configuring a timer for GATED Mode and initiating the count:

1. Write to the Timer Control Register to:
 - Disable the timer

Bit	Description (Continued)
[6] TPOL (cont'd)	<p>GATED Mode</p> <p>0 = Timer counts when the Timer Input signal is High (1) and interrupts are generated on the falling edge of the Timer Input.</p> <p>1 = Timer counts when the Timer Input signal is Low (0) and interrupts are generated on the rising edge of the Timer Input.</p> <p>CAPTURE/COMPARE Mode</p> <p>0 = Counting is started on the first rising edge of the Timer Input signal. The current count is captured on subsequent rising edges of the Timer Input signal.</p> <p>1 = Counting is started on the first falling edge of the Timer Input signal. The current count is captured on subsequent falling edges of the Timer Input signal.</p> <p>PWM DUAL OUTPUT Mode</p> <p>0 = Timer Output is forced Low (0) and Timer Output Complement is forced High (1) when the timer is disabled. When enabled, the Timer Output is forced High (1) upon PWM count match and forced Low (0) upon reload. When enabled, the Timer Output Complement is forced Low (0) upon PWM count match and forced High (1) upon reload. The PWMD field in TxCTL0 Register is a programmable delay to control the number of cycles time delay before the Timer Output and the Timer Output Complement is forced to High (1).</p> <p>1 = Timer Output is forced High (1) and Timer Output Complement is forced Low (0) when the timer is disabled. When enabled, the Timer Output is forced Low (0) upon PWM count match and forced High (1) upon reload. When enabled, the Timer Output Complement is forced High (1) upon PWM count match and forced Low (0) upon reload. The PWMD field in TxCTL0 Register is a programmable delay to control the number of cycles time delay before the Timer Output and the Timer Output Complement is forced to Low (0).</p> <p>CAPTURE RESTART Mode</p> <p>0 = Count is captured on the rising edge of the Timer Input signal.</p> <p>1 = Count is captured on the falling edge of the Timer Input signal.</p> <p>COMPARATOR COUNTER Mode</p> <p>When the timer is disabled, the Timer Output signal is set to the value of this bit. When the timer is enabled, the Timer Output signal is complemented upon timer Reload. Also:</p> <p>0 = Count is captured on the rising edge of the comparator output.</p> <p>1 = Count is captured on the falling edge of the comparator output.</p> <p>Caution: When the Timer Output alternate function TxOUT on a GPIO port pin is enabled, TxOUT changes to whatever state the TPOL bit is in. The timer does not need to be enabled for that to happen. Also, the Port Data Direction Subregister is not required to be set to output on TxOUT. Changing the TPOL bit with the timer enabled and running does not immediately change the TxOUT.</p>

Universal Asynchronous Receiver/Transmitter

The universal asynchronous receiver/transmitter (UART) is a full-duplex communication channel capable of handling asynchronous data transfers. The UART uses a single 8-bit data mode with selectable parity. Features of the UART include:

- 8-bit asynchronous data transfer
- Selectable even- and odd-parity generation and checking
- Option of one or two STOP bits
- Separate transmit and receive interrupts
- Framing, parity, overrun and break detection
- Separate transmit and receive enables
- 16-bit baud rate generator (BRG)
- Selectable MULTIPROCESSOR (9-bit) Mode with three configurable interrupt schemes
- Baud rate generator (BRG) can be configured and used as a basic 16-bit timer
- Driver enable (DE) output for external bus transceivers

Architecture

The UART consists of three primary functional blocks: transmitter, receiver and baud rate generator. The UART's transmitter and receiver function independently, but employ the same baud rate and data format. Figure 10 displays the UART architecture.

Low Power Operational Amplifier

The LPO is a general-purpose low power operational amplifier. Each of the three ports of the amplifier is accessible from the package pins. The LPO contains only one pin configuration: ANA0 is the output/feedback node, ANA1 is the inverting input and ANA2 is the noninverting input.

Operation

To use the LPO, it must be enabled in the Power Control Register 0 (PWRCTL0). The default state of the LPO is OFF. To use the LPO, the LPO bit must be cleared by turning it ON (for details, see the [Power Control Register 0](#) section on page 33). When making normal ADC measurements on ANA0 (i.e., measurements not involving the LPO output), the LPO bit must be turned OFF. Turning the LPO bit ON interferes with normal ADC measurements.

! Caution: The LPO bit enables the amplifier even in STOP Mode. If the amplifier is not required in STOP Mode, disable it. Failing to perform this results in STOP Mode currents higher than necessary.

As with other ADC measurements, any pins used for analog purposes must be configured as such in the GPIO registers. See the [Port A–D Alternate Function Subregisters](#) section on page 47 for details.

LPO output measurements are made on ANA0, as selected by the ANAIN[3:0] bits of ADC Control Register 0. It is also possible to make single-ended measurements on ANA1 and ANA2 while the amplifier is enabled, which is often useful for determining offset conditions. Differential measurements between ANA0 and ANA2 may be useful for noise cancellation purposes.

If the LPO output is routed to the ADC, then the BUFFMODE[2:0] bits of ADC Control/Status Register 1 must also be configured for unity-gain buffered operation. Sampling the LPO in an unbuffered mode is not recommended.

When either input is overdriven, the amplifier output saturates at the positive or negative supply voltage. No instability results.

In the above equation, T is the temperature in °C; V is the sensor output in volts.

Assuming a compensated ADC measurement, the following equation defines the relationship between the ADC reading and the die temperature:

$$T = (25/128) \times (ADC - TSCAL[11:2]) + 30$$

In the above equation, T is the temperature in C; ADC is the 10-bit compensated ADC value; and TSCAL is the temperature sensor calibration value, ignoring the two least significant bits of the 12-bit value.

See the Temperature Sensor Calibration Data section on page 171 for the location of TSCAL.

Calibration

The temperature sensor undergoes calibration during the manufacturing process and is maximally accurate at 30°C. Accuracy decreases as measured temperatures move further from the calibration point.

Table 107. NVDS Read Time

Operation	Minimum Latency	Maximum Latency
Read (16 byte array)	875	9961
Read (64 byte array)	876	8952
Read (128 byte array)	883	7609
Write (16 byte array)	4973	5009
Write (64 byte array)	4971	5013
Write (128 byte array)	4984	5023
Illegal Read	43	43
Illegal Write	31	31

If NVDS read performance is critical to your software architecture, you can optimize your code for speed. Try the first suggestion below before attempting the second.

1. Periodically refresh all addresses that are used. The optimal use of NVDS in terms of speed is to rotate the writes evenly among all addresses planned to use, bringing all reads closer to the minimum read time. Because the minimum read time is much less than the write time, however, actual speed benefits are not always realized.
2. Use as few unique addresses as possible to optimize the impact of refreshing, plus minimize the requirement for it.

Crystal Oscillator

The products in the Z8 Encore! XP F082A Series contain an on-chip crystal oscillator for use with external crystals with 32kHz to 20MHz frequencies. In addition, the oscillator supports external RC networks with oscillation frequencies up to 4MHz or ceramic resonators with frequencies up to 8MHz. The on-chip crystal oscillator can be used to generate the primary system clock for the internal eZ8 CPU and the majority of the on-chip peripherals. Alternatively, the X_{IN} input pin can also accept a CMOS-level clock input signal (32kHz–20MHz). If an external clock generator is used, the X_{OUT} pin must be left unconnected. The Z8 Encore! XP F082A Series products do not contain an internal clock divider. The frequency of the signal on the X_{IN} input pin determines the frequency of the system clock.

► **Note:** Although the X_{IN} pin can be used as an input for an external clock generator, the CLKIN pin is better suited for such use (see the [System Clock Selection](#) section on page 193).

Operating Modes

The Z8 Encore! XP F082A Series products support four oscillator modes:

- Minimum power for use with very low frequency crystals (32kHz–1 MHz)
- Medium power for use with medium frequency crystals or ceramic resonators (0.5 MHz to 8 MHz)
- Maximum power for use with high frequency crystals (8 MHz to 20 MHz)
- On-chip oscillator configured for use with external RC networks (<4 MHz)

The oscillator mode is selected via user-programmable Flash option bits. See [the Flash Option Bits](#) chapter on page 159 for information.

Crystal Oscillator Operation

The XTLDIS Flash option bit controls whether the crystal oscillator is enabled during reset. The crystal may later be disabled after reset if a new oscillator has been selected as the system clock. If the crystal is manually enabled after reset through the OSCCTL Register, the user code must wait at least 1000 crystal oscillator cycles for the crystal to stabilize. After this, the crystal oscillator may be selected as the system clock.

► **Note:** The stabilization time varies depending on the crystal, resonator or feedback network used. See Table 115 for transconductance values to compute oscillator stabilization times.

Figure 27 displays a recommended configuration for connection with an external fundamental-mode, parallel-resonant crystal operating at 20MHz. Recommended 20MHz crystal specifications are provided in Table 114. Printed circuit board layouts must add no more than 4pF of stray capacitance to either the X_{IN} or X_{OUT} pins. If oscillation does not occur, reduce the values of capacitors C1 and C2 to decrease loading.

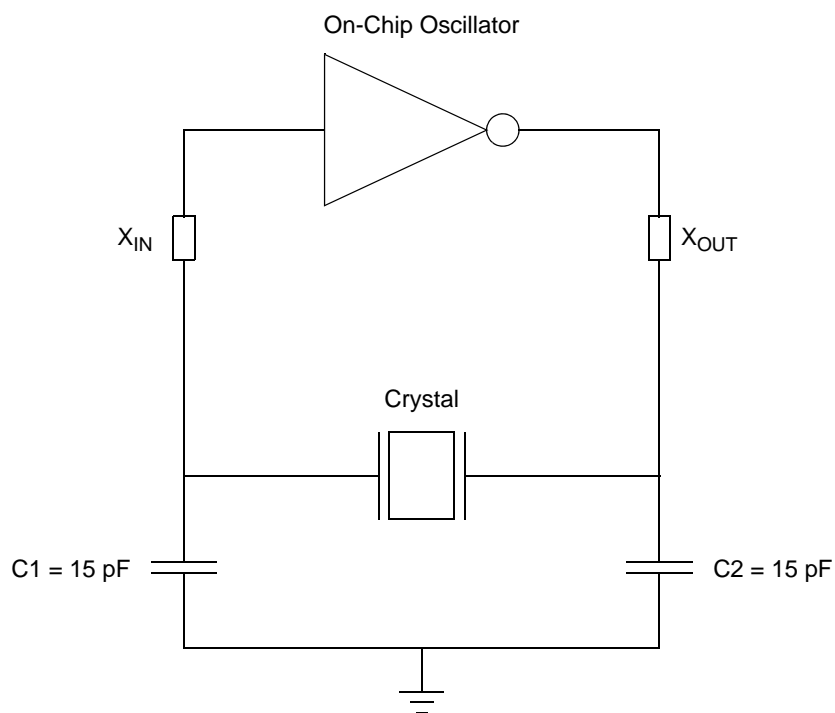


Figure 27. Recommended 20MHz Crystal Oscillator Configuration

Assembly Language Source Program Example

```
JP START      ; Everything after the semicolon is a comment.
START:        ; A label called 'START'. The first instruction (JP START) in this
              ; example causes program execution to jump to the point within the
              ; program where the START label occurs.

LD R4, R7     ; A Load (LD) instruction with two operands. The first operand,
              ; Working Register R4, is the destination. The second operand,
              ; Working Register R7, is the source. The contents of R7 is
              ; written into R4.

LD 234H, #01  ; Another Load (LD) instruction with two operands.
              ; The first operand, Extended Mode Register Address 234H,
              ; identifies the destination. The second operand, Immediate Data
              ; value 01H, is the source. The value 01H is written into the
              ; Register at address 234H.
```

Assembly Language Syntax

For proper instruction execution, eZ8 CPU assembly language syntax requires that the operands be written as 'destination, source'. After assembly, the object code usually has the operands in the order 'source, destination', but ordering is opcode-dependent. The following instruction examples illustrate the format of some basic assembly instructions and the resulting object code produced by the assembler. This binary format must be followed if manual program coding is preferred or if you intend to implement your own assembler.

Example 1. If the contents of registers 43H and 08H are added and the result is stored in 43H, the assembly syntax and resulting object code is:

Table 116. Assembly Language Syntax Example 1

Assembly Language Code	ADD	43H,	08H	(ADD dst, src)
Object Code	04	08	43	(OPC src, dst)

Example 2. In general, when an instruction format requires an 8-bit register address, that address can specify any register location in the range 0–255 or, using Escaped Mode Addressing, a Working Register R0–R15. If the contents of Register 43H and Working Register R8 are added and the result is stored in 43H, the assembly syntax and resulting object code is:

Table 117. Assembly Language Syntax Example 2

Assembly Language Code	ADD	43H,	R8	(ADD dst, src)
Object Code	04	E8	43	(OPC src, dst)

Table 131. DC Characteristics (Continued)

T_A = -40°C to +105°C (unless otherwise specified)						
Symbol	Parameter	Minimum	Typical	Maximum	Units	Conditions
V _{OH1}	High Level Output Voltage	2.4	–	–	V	I _{OH} = -2 mA; V _{DD} = 3.0 V High Output Drive disabled.
V _{OL2}	Low Level Output Voltage	–	–	0.6	V	I _{OL} = 20 mA; V _{DD} = 3.3 V High Output Drive enabled.
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}	X _{OUT} 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.

Figure 38 and Table 147 provide timing information for UART pins for the case where CTS is not used for flow control. DE asserts after the Transmit Data Register has been written. DE remains asserted for multiple characters as long as the Transmit Data Register is written with the next character before the current character has completed.

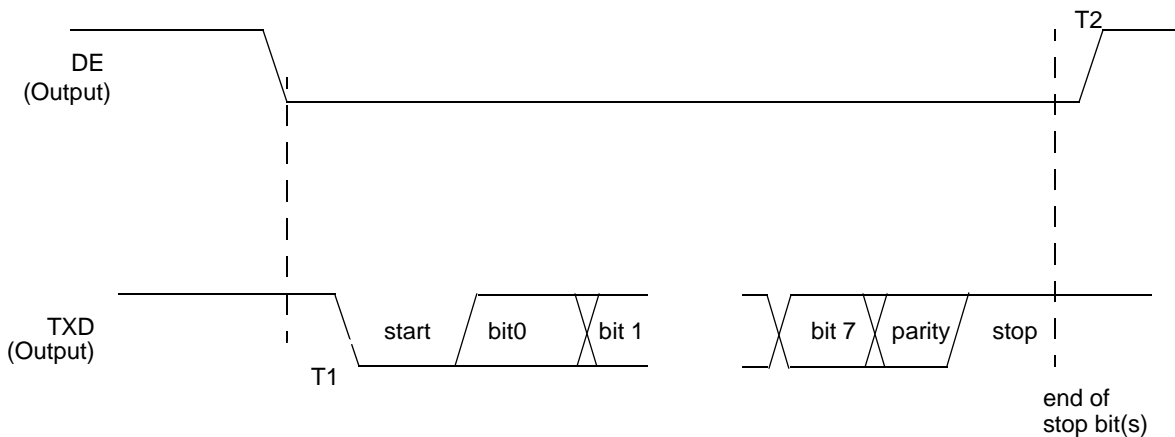


Figure 38. UART Timing Without CTS

Table 147. UART Timing Without CTS

Parameter	Abbreviation	Delay (ns)	
		Minimum	Maximum
UART			
T ₁	DE assertion to TXD falling edge (start bit) delay	1 * X _{IN} period	1 bit time
T ₂	End of Stop Bit(s) to DE deassertion delay (Tx Data Register is empty)	± 5	

Table 148. Z8 Encore! XP F082A Series Ordering Matrix

Part Number	Flash	RAM	NVDS	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Temperature Sensor	Description
Z8 Encore! XP F082A Series with 2 KB Flash, 10-Bit Analog-to-Digital Converter											
Standard Temperature: 0°C to 70°C											
Z8F022APB020SG	2 KB	512 B	64 B	6	14	2	4	1	1	1	PDIP 8-pin package
Z8F022AQB020SG	2 KB	512 B	64 B	6	14	2	4	1	1	1	QFN 8-pin package
Z8F022ASB020SG	2 KB	512 B	64 B	6	14	2	4	1	1	1	SOIC 8-pin package
Z8F022ASH020SG	2 KB	512 B	64 B	17	20	2	7	1	1	1	SOIC 20-pin package
Z8F022AHH020SG	2 KB	512 B	64 B	17	20	2	7	1	1	1	SSOP 20-pin package
Z8F022APH020SG	2 KB	512 B	64 B	17	20	2	7	1	1	1	PDIP 20-pin package
Z8F022ASJ020SG	2 KB	512 B	64 B	23	20	2	8	1	1	1	SOIC 28-pin package
Z8F022AHJ020SG	2 KB	512 B	64 B	23	20	2	8	1	1	1	SSOP 28-pin package
Z8F022APJ020SG	2 KB	512 B	64 B	23	20	2	8	1	1	1	PDIP 28-pin package
Extended Temperature: -40°C to 105°C											
Z8F022APB020EG	2 KB	512 B	64 B	6	14	2	4	1	1	1	PDIP 8-pin package
Z8F022AQB020EG	2 KB	512 B	64 B	6	14	2	4	1	1	1	QFN 8-pin package
Z8F022ASB020EG	2 KB	512 B	64 B	6	14	2	4	1	1	1	SOIC 8-pin package
Z8F022ASH020EG	2 KB	512 B	64 B	17	20	2	7	1	1	1	SOIC 20-pin package
Z8F022AHH020EG	2 KB	512 B	64 B	17	20	2	7	1	1	1	SSOP 20-pin package
Z8F022APH020EG	2 KB	512 B	64 B	17	20	2	7	1	1	1	PDIP 20-pin package
Z8F022ASJ020EG	2 KB	512 B	64 B	23	20	2	8	1	1	1	SOIC 28-pin package
Z8F022AHJ020EG	2 KB	512 B	64 B	23	20	2	8	1	1	1	SSOP 28-pin package
Z8F022APJ020EG	2 KB	512 B	64 B	23	20	2	8	1	1	1	PDIP 28-pin package

Table 148. Z8 Encore! XP F082A Series Ordering Matrix

Part Number	Flash	RAM	NVDS	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Temperature Sensor	Description
Z8 Encore! XP F082A Series with 2 KB Flash											
Standard Temperature: 0°C to 70°C											
Z8F021APB020SG	2 KB	512 B	64 B	6	13	2	0	1	1	0	PDIP 8-pin package
Z8F021AQB020SG	2 KB	512 B	64 B	6	13	2	0	1	1	0	QFN 8-pin package
Z8F021ASB020SG	2 KB	512 B	64 B	6	13	2	0	1	1	0	SOIC 8-pin package
Z8F021ASH020SG	2 KB	512 B	64 B	17	19	2	0	1	1	0	SOIC 20-pin package
Z8F021AHH020SG	2 KB	512 B	64 B	17	19	2	0	1	1	0	SSOP 20-pin package
Z8F021APH020SG	2 KB	512 B	64 B	17	19	2	0	1	1	0	PDIP 20-pin package
Z8F021ASJ020SG	2 KB	512 B	64 B	25	19	2	0	1	1	0	SOIC 28-pin package
Z8F021AHJ020SG	2 KB	512 B	64 B	25	19	2	0	1	1	0	SSOP 28-pin package
Z8F021APJ020SG	2 KB	512 B	64 B	25	19	2	0	1	1	0	PDIP 28-pin package
Extended Temperature: -40°C to 105°C											
Z8F021APB020EG	2 KB	512 B	64 B	6	13	2	0	1	1	0	PDIP 8-pin package
Z8F021AQB020EG	2 KB	512 B	64 B	6	13	2	0	1	1	0	QFN 8-pin package
Z8F021ASB020EG	2 KB	512 B	64 B	6	13	2	0	1	1	0	SOIC 8-pin package
Z8F021ASH020EG	2 KB	512 B	64 B	17	19	2	0	1	1	0	SOIC 20-pin package
Z8F021AHH020EG	2 KB	512 B	64 B	17	19	2	0	1	1	0	SSOP 20-pin package
Z8F021APH020EG	2 KB	512 B	64 B	17	19	2	0	1	1	0	PDIP 20-pin package
Z8F021ASJ020EG	2 KB	512 B	64 B	25	19	2	0	1	1	0	SOIC 28-pin package
Z8F021AHJ020EG	2 KB	512 B	64 B	25	19	2	0	1	1	0	SSOP 28-pin package
Z8F021APJ020EG	2 KB	512 B	64 B	25	19	2	0	1	1	0	PDIP 28-pin package

- read program memory (0BH) 189
- read program memory CRC (0EH) 190
- read register (09H) 189
- read runtime counter (03H) 187
- step instruction (10H) 190
- stuff instruction (11H) 190
- write data memory (0CH) 189
- write OCD control register (04H) 188
- write program counter (06H) 188
- write program memory (0AH) 189
- write register (08H) 188
- on-chip debugger (OCD) 180
- on-chip debugger signals 11
- on-chip oscillator 198
- ONE-SHOT mode 87
- opcode map
 - abbreviations 223
 - cell description 222
 - first 224
 - second after 1FH 225
- Operational Description 22, 32, 36, 55, 70, 93, 99, 120, 124, 139, 140, 144, 146, 159, 176, 180, 193, 198, 203
- OR 210
- ordering information 246
- ORX 210
- oscillator signals 11

P

- p 206
- Packaging 245
- part selection guide 2
- PC 207
- peripheral AC and DC electrical characteristics 233
- pin characteristics 12
- Pin Descriptions 8
- polarity 206
- POP 210
- pop using extended addressing 210
- POPX 210
- port availability, device 36
- port input timing (GPIO) 240
- port output timing, GPIO 241

- power supply signals 12
- Power-on and Voltage Brownout electrical characteristics and timing 233
- Power-On Reset (POR) 24
- program control instructions 211
- program counter 207
- program memory 15
- PUSH 210
- push using extended addressing 210
- PUSHX 210
- PWM mode 87, 88
- PxADDR register 45
- PxCTL register 46

R

- R 206
- r 206
- RA
 - register address 206
- RCF 209, 210
- receive
 - IrDA data 122
- receiving UART data-interrupt-driven method 104
- receiving UART data-pollled method 103
- register 206
 - ADC control (ADCCTL) 134, 135
 - ADC data high byte (ADCDH) 136
 - ADC data low bits (ADC DL) 137
 - flash control (FCTL) 155, 161, 162
 - flash high and low byte (FFREQH and FRE-EQL) 157
 - flash page select (FPS) 156, 157
 - flash status (FSTAT) 155
 - GPIO port A-H address (PxADDR) 45
 - GPIO port A-H alternate function sub-registers 47
 - GPIO port A-H control address (PxCTL) 46
 - GPIO port A-H data direction sub-registers 46
 - OCD control 191
 - OCD status 192
 - UARTx baud rate high byte (UxBRH) 117
 - UARTx baud rate low byte (UxBRL) 117
 - UARTx Control 0 (UxCTL0) 111, 117