Zilog - Z8018233FSC1838TR Datasheet

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Understanding Embedded - Microprocessors

Embedded microprocessors are specialized computing chips designed to perform specific tasks within an embedded system. Unlike general-purpose microprocessors found in personal computers, embedded microprocessors are tailored for dedicated functions within larger systems, offering optimized performance, efficiency, and reliability. These microprocessors are integral to the operation of countless electronic devices, providing the computational power necessary for controlling processes, handling data, and managing communications.

Applications of Embedded - Microprocessors

Embedded microprocessors are utilized across a broad spectrum of applications, making them indispensable in

Details	
Product Status	Obsolete
Core Processor	Z80180
Number of Cores/Bus Width	1 Core, 8-Bit
Speed	33MHz
Co-Processors/DSP	-
RAM Controllers	DRAM
Graphics Acceleration	No
Display & Interface Controllers	-
Ethernet	-
SATA	-
USB	-
Voltage - I/O	5.0V
Operating Temperature	0°C ~ 70°C (TA)
Security Features	-
Package / Case	100-QFP
Supplier Device Package	100-QFP
Purchase URL	https://www.e-xfl.com/product-detail/zilog/z8018233fsc1838tr

EMULATION SIGNALS

EV1, EV2. *Emulation Select (input).* These two pins determine the emulation mode of the Z180 MPU (Table 1).

Table 1. Evaluation Modes

Mode	EV2	EV1	Description
0	0	0	Normal mode, on-chip Z180 bus master
1	0	1	Emulation Adapter Mode
2	1	0	Emulator Probe Mode
3	1	1	Reserved for Test

SYSTEM CONTROL SIGNALS

ST. *Status (output, active High).* This signal is used with the /M1 and /HALT output to decode the status of the CPU machine cycle. If unused, this pin should be pulled to V_{DD}.

/RESET. *Reset Signal (input, active Low).* /RESET signal is used for initializing the MPU and other devices in the system. It must be kept in the active state for a period of at least three system clock cycles.

IEI. *Interrupt Enable Signal (input, active High).* IEI is used with the IEO to form a priority daisy chain when there is more than one interrupt-driven peripheral.

IEO. *Interrupt Enable Output Signal (output, active High).* In the daisy-chain interrupt control, IEO controls the interrupt of external peripherals. IEO is active when IEI is 1 and the CPU is not servicing an interrupt from the on-chip peripherals. This pin is multiplexed with /IOCS on the /IOCS/IEO pin. The /IOCS function is the default on Power On or Reset conditions and is changed by programming bit 2 in the Interrupt Edge/Pin MUX Register.

/IOCS. *Auxiliary Chip Select Output Signal (output, active Low).* This pin is multiplexed with /IEO on the /IOCS/IEO pin. /IOCS is an auxiliary chip select that decodes A7, A6, /IORQ, /M1 and effectively decodes the address space xx80H to xxBFH for I/O transactions. A15 through A8 are not decoded so that the chip select is active in all pages of I/O address space. The /IOCS function is the default on the /IOCS/IEO pin after Power On or Reset conditions and is changed by programming bit 2 in the Interrupt Edge/Pin MUX Register.

/RAMCS. *RAM Chip Select (output, active Low).* Signal used to access RAM based upon the Address and the RAMLBR and RAMUBR registers and /MREQ.

/ROMCS. *ROM Chip Select (output, active Low).* Signal used to access ROM based upon the address and the ROMBR register and /MREQ.

E. *Enable Clock (output, active High).* Synchronous machine cycle clock output during bus transactions.

XTAL. *Crystal (input, active High).* Crystal oscillator connection. This pin should be left open if an external clock is used instead of a crystal. The oscillator input is not a TTL level (reference DC characteristics).

EXTAL. *External Clock/Crystal (input, active High).* Crystal oscillator connections to an external clock can be input to the Z80180 on this pin when a crystal is not used. This input is Schmitt triggered.

PHI. *System Clock (output, active High).* The output is used as a reference clock for the MPU and the external system. The frequency of this output is reflective of the functional speed of the processor. In clock divide-by-two mode, the pHI frequency is half that of the crystal or input clock. If divide-by-one mode is enabled, the PHI frequency is equivalent to that of crystal or input frequency. The PHI frequency is also fed to the ESCC core. If running over 20 MHz (5V) or 10 MHz (3V) the PHI-ESCC frequency divider should be enabled to divide the PHI clock by two prior to feeding into the ESCC core.

Z85230 ESCC™ FUNCTIONAL DESCRIPTION

The Zilog Enhanced Serial Communication Controller ESCC™ is a dual channel, multiprotocol data communication peripheral. The ESCC functions as a serial-to-parallel, parallel-to-serial converter/controller. The ESCC can be software-configured to satisfy a wide variety of serial communications applications. The device contains a variety of new, sophisticated internal functions including on-chip baud rate generators, digital phase-lock loops, and crystal oscillators, which dramatically reduce the need for external logic.

The ESCC handles asynchronous formats, synchronous byte-oriented protocols such as IBM® Bisync, and synchronous bit-oriented protocols such as HDLC and IBM SDLC. This versatile device supports virtually any serial data transfer application (telecommunication, LAN, etc.)

The device can generate and check CRC codes in any synchronous mode and can be programmed to check data integrity in various modes. The ESCC also has facilities for modem control in both channels in applications where these controls are not needed, the modem controls can be used for general-purpose I/O.

With access to 14 Write registers and 7 Read registers per channel (number of the registers varies depending on the version), the user can configure the ESCC to handle all synchronous formats regardless of data size, number of stop bits, or parity requirements. The ESCC also accommodates all synchronous formats including character, byte, and bit-oriented protocols.

Within each operating mode, the ESCC also allows for protocol variations by checking odd or even parity bits, character insertion or deletion, CRC generation, checking break and abort generation and detection, and many other protocol-dependent features.

The ESCC (Enhanced SCC) is pin and software compatible to the CMOS SCC version. The following enhancements were made to the CMOS SCC:

- Deeper Transmit FIFO (4 bytes)
- Deeper Receive FIFO (8 bytes)
- Programmable FIFO interrupt and DMA request level
- Seven enhancements to improve SDLC link layer supports:
  - Automatic transmission of the opening flag
  - Automatic reset of Tx Underrun/EOM latch
  - Deactivation of /RTS pin after closing flag
  - Automatic CRC generator preset
  - Complete CRC reception
  - TxD pin automatically forced High with NRZI encoding when using mark idle
  - Status FIFO handles better frames with an ABORT
  - Receive FIFO automatically unlocked for special receive interrupts when using the SDLC status FIFO
- Delayed bus latching for easier microprocessor interface
- New programmable features added with Write Register 7' (WR seven prime)
- Write registers, 3, 4, 5 and 10 are now readable
- Read register 0 latched during access
- DPLL counter output available as jitter-free transmitter clock source
- Enhanced /DTR, /RTS deactivation timing

Z85230 ESCC™ BLOCK DIAGRAM

For a detailed description of the Z85230 ESCC, refer to the ESCC Technical Manual. The following figure is the block diagram of the discrete ESCC, which was integrated into the Z182. The /INT line is internally connected to "INTO of the Z182.

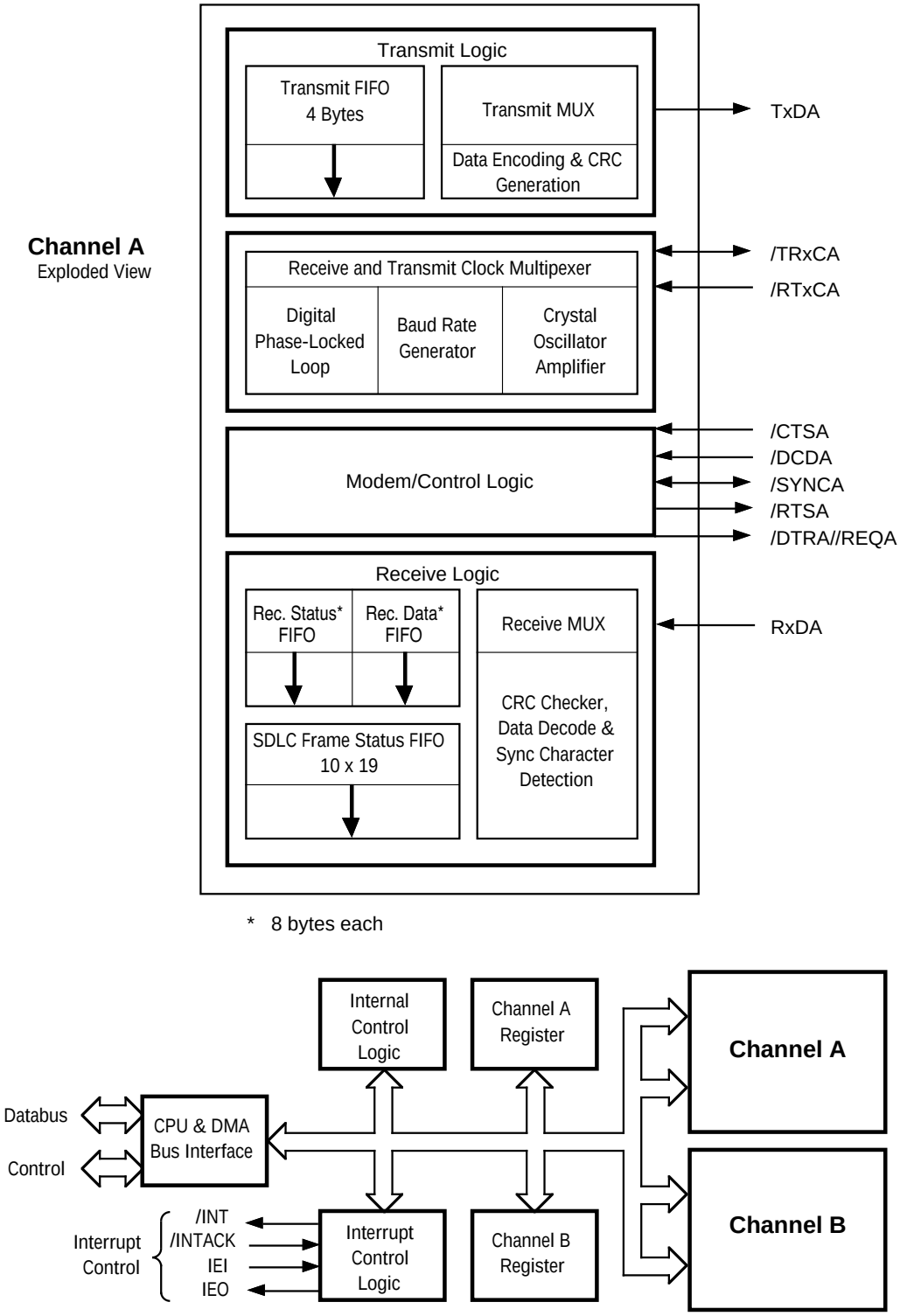


Figure 5. ESCC Block Diagram

16550 MIMIC INTERFACE FUNCTIONAL DESCRIPTION

The Z80182/Z8L182 has a 16550 MIMIC interface that allows it to mimic the 16550 device. It has all the interface pins necessary to connect to the PC/XT/AT bus. It contains the complete register set of the part with the same interrupt structure. The data path allows parallel transfer of data to and from the register set by the internal Z80180 of the Z80182/Z8L182. There is no shift register associated with the mimic of the 16550 UART. This interface saves the application from doing a serial transfer before performing data compression or error correction on the data.

Control of the register set is maintained by six priority encoded interrupts to the Z80182/Z8L182. When the PC/XT/AT writes to THR, MCR, LCR, DLL, DLM, FCR or reads the RBR, an interrupt to the Z80182/Z8L182 is generated. Each interrupt can be individually masked off or all interrupts can be disabled by writing a single bit. Both mode 0 and mode 2 interrupts are supported by the 16550 MIMIC interface.

Two eight-bit timers are also available to control the data transfer rate of the 16550 MIMIC interface. Their input is tied to the ESCC channel B divide clock, so a down count of 24 bits is possible. An additional two eight bit timers are available for programming the FIFO timeout feature (Four Character Time Emulation) for both Receive and Transmit FIFO's.

The 16550 MIMIC interface supports the PC/XT/AT interrupt structure as well as an additional mode that allows for a wired Logic AND interrupt structure.

The 16550 MIMIC interface is also capable of high speed parallel DMA transfers by using two control lines and the transmit and receive registers of the 16550 MIMIC interface.

All registers of the 16550 MIMIC interface are accessible in any page of I/O space since only the lowest eight address lines are decoded. See Figure 6 for a block diagram of the 16550 MIMIC interface.

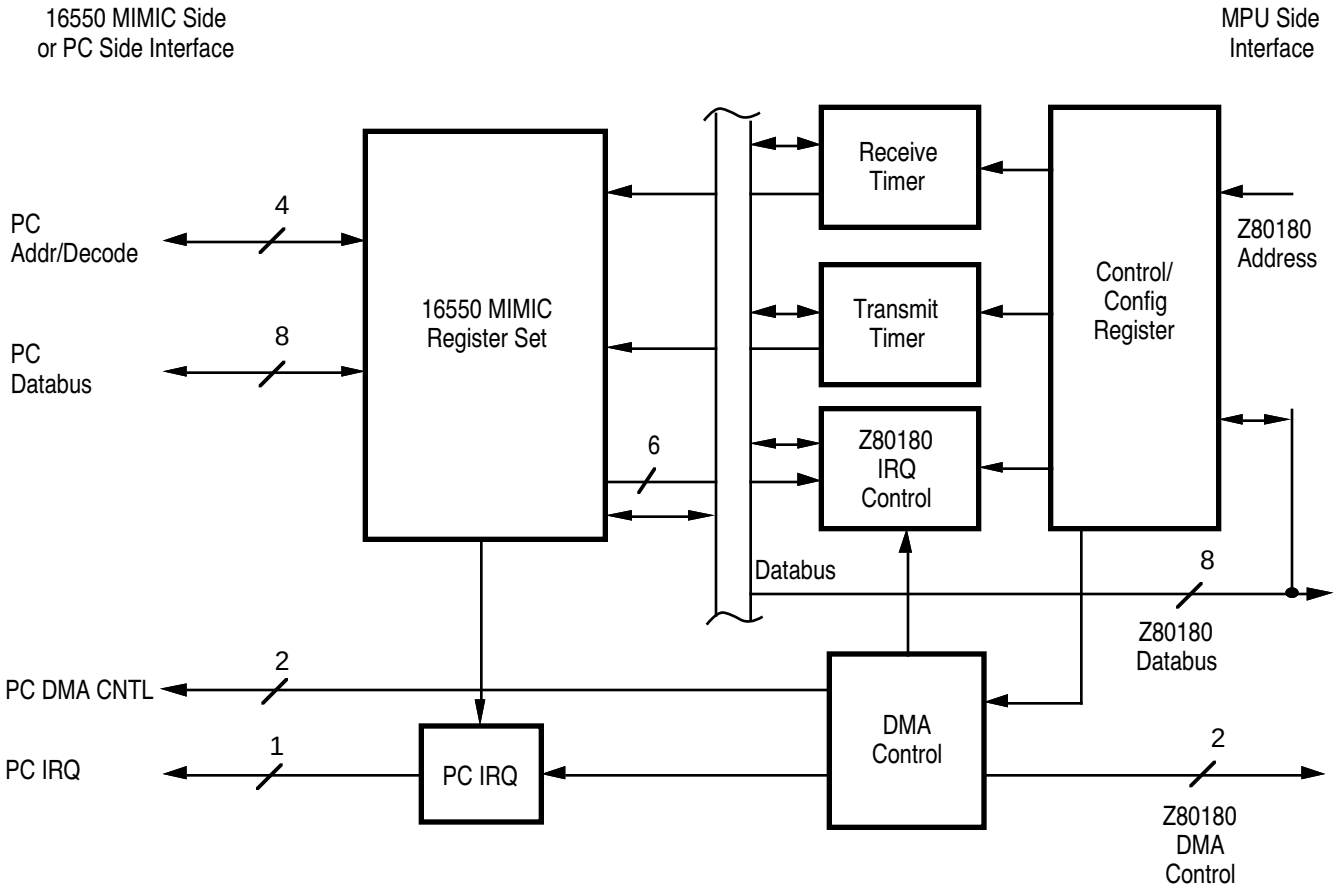


Figure 6. 16550 MIMIC Block Diagram

Z80182 MIMIC DOUBLE BUFFERING FOR THE TRANSMITTER

The Z80182 Rev DA implements double buffering for the transmitter in 16450 mode and sets the TEMT bit in the LSR Register automatically.

When this feature is enabled and character delay emulation is being used (see Figure 9):

1. The PC THRE bit in the LSR Register is set when the THR Register is empty;
2. PC Host writes to the 16450 THR Register;
3. Whenever the Z80182 TSR buffer is empty and one character delay timer is in a timed-out state, the byte from the THR Register is transferred to the TSR buffer; the timer is in timed-out state after FIFO Reset or after Host TEMT is set. This allows a dual write to THR when Host TEMT is set.
4. Restart character delay timer (timer reloads and counts down) with byte transfer from THR Register to the TSR buffer;
5. Whenever the TSR buffer is full, the TEMT bit in MPU LSR Register is reset with no delay;
6. MPU reads TSR buffer;
7. TEMT bit in LSR Register for MPU is set with no delay whenever the TSR buffer is empty;
8. When the TSR buffer is read by MPU and THR Register is empty and one character delay timer reaches zero, the TEMT bit in the LSR Register for Host is set from 0 to 1.

The PC THRE bit in the LSR Register is reset whenever the THR Register is full and set whenever THR Register is empty.

MPU IREQ and DMA Request for the transmit data is trigger whenever TSR buffer is full and cleared whenever TSR buffer is empty.

If character delay emulation is not used the TEMT bit in the LSR Register is set whenever both the THR Register and the TSR buffer are both empty. The Host TEMT bit is clear if there is data in either the TSR buffer of THR Register.

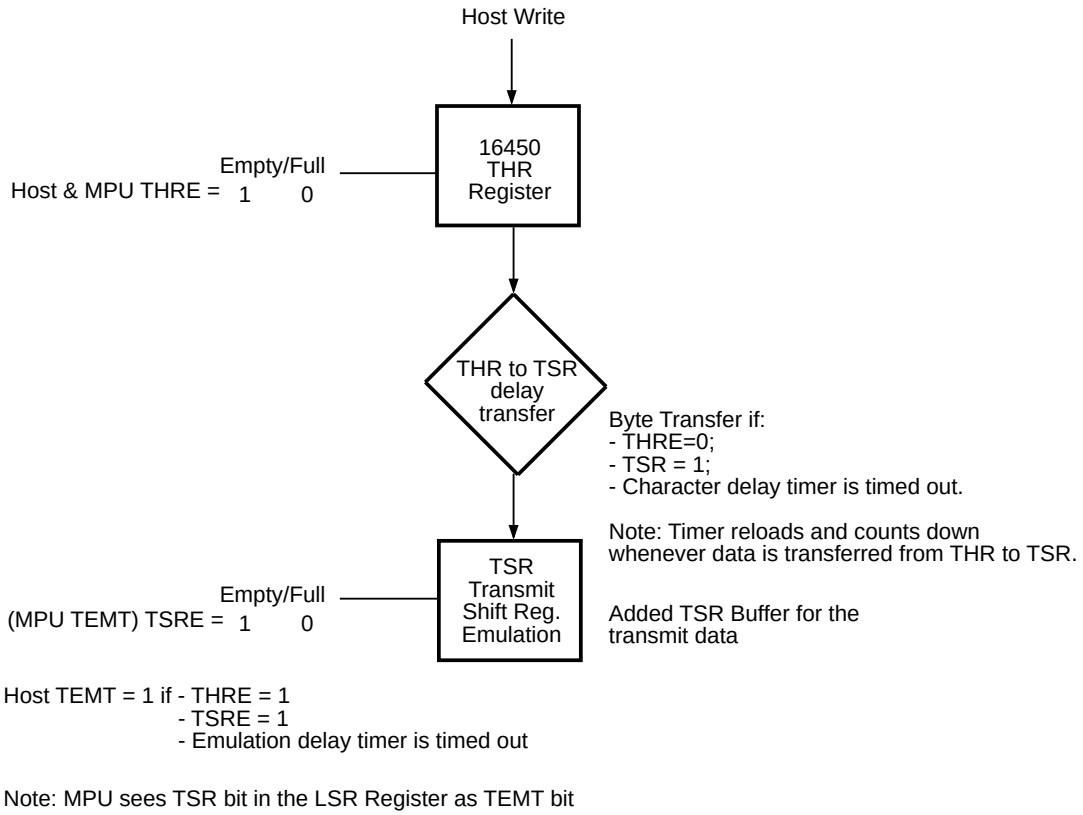


Figure 9. TEMT Emulation Logic Implementation

ASCI CHANNELS CONTROL REGISTERS (Continued)

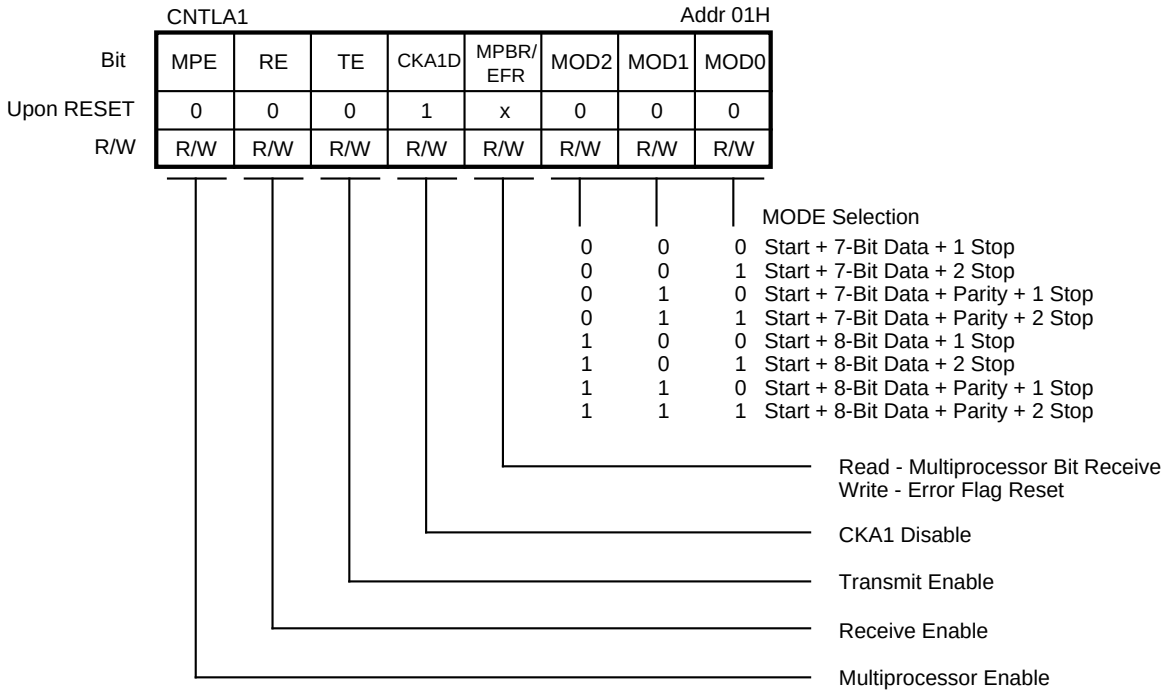
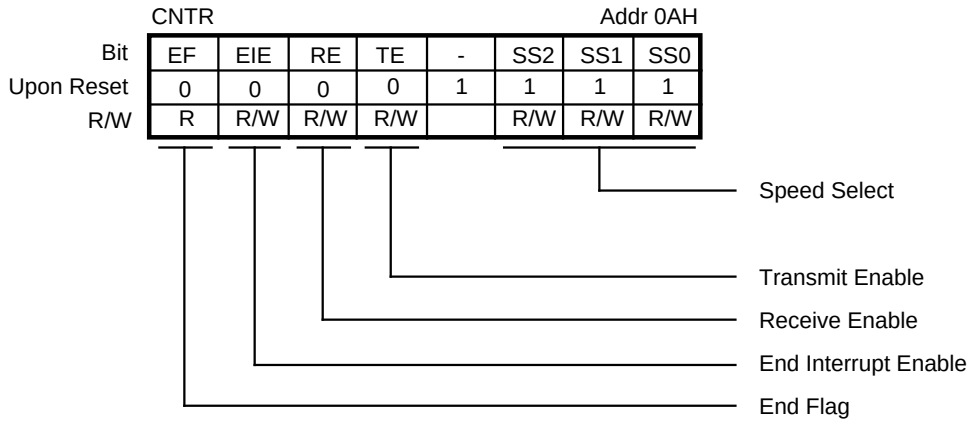


Figure 10b. ASCI Control Register A (Ch. 1)

CSI/O REGISTERS



SS2, 1, 0	Baud Rate
000	Ø ÷ 20
001	Ø ÷ 40
010	Ø ÷ 80
011	Ø ÷ 100

SS2, 1, 0	Baud Rate
100	Ø ÷ 320
101	Ø ÷ 640
110	Ø ÷ 1280
111	External Clock (Frequency < Ø ÷ 20)

Figure 21. CSI/O Control Register

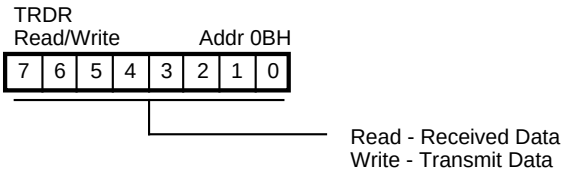
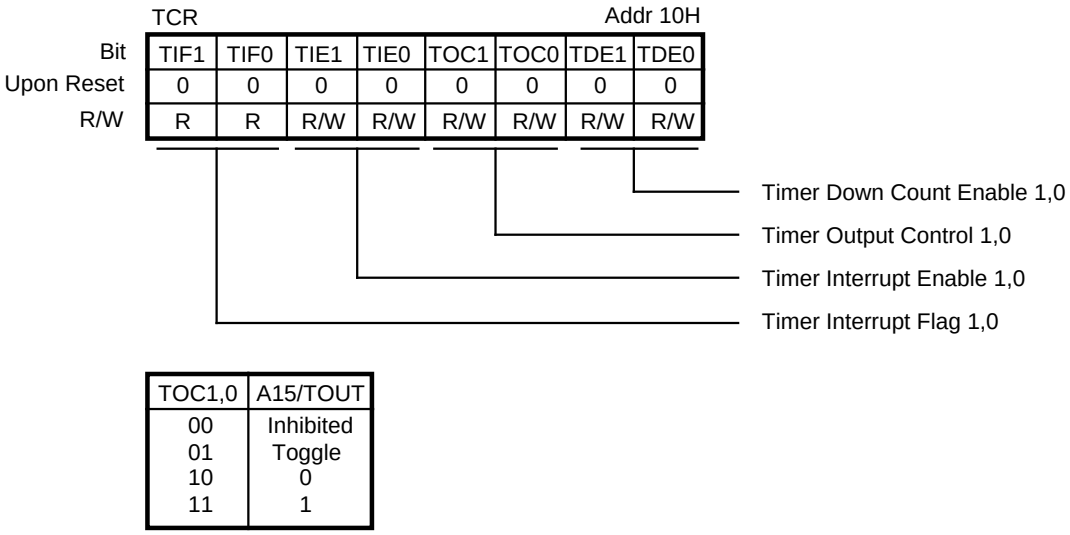


Figure 22. CSI/O Transmit/Receive Data Register

TIMER CONTROL REGISTER



TOC1,0	A15/TOUT
00	Inhibited
01	Toggle
10	0
11	1

Figure 31. Timer Control Register

CONTROL REGISTERS (Continued)

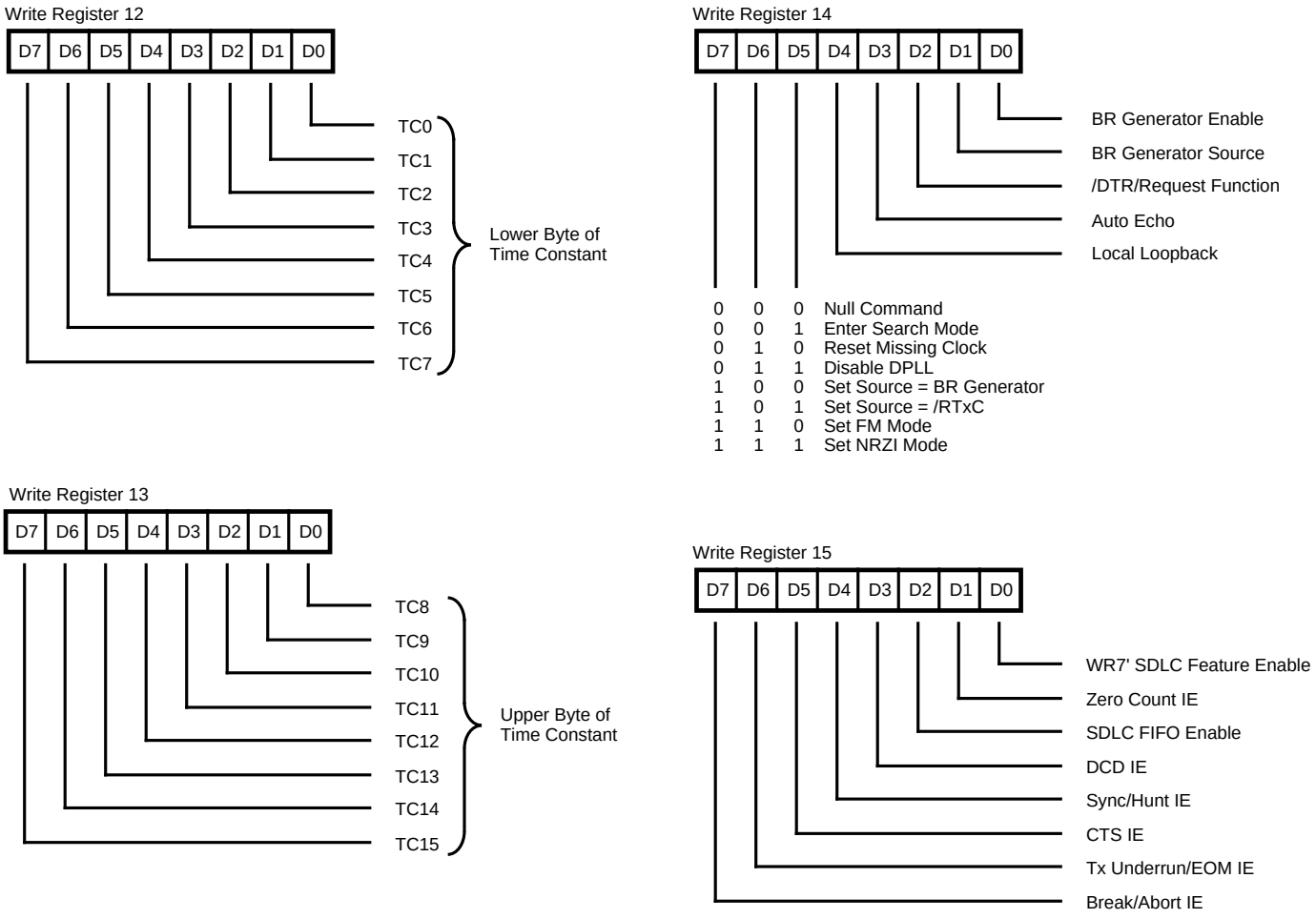


Figure 52. Write Register Bit Functions (Continued)

/RAMCS AND /ROMCS REGISTERS (Continued)

RAMUBR, RAMLBR RAM Upper Boundary Range, RAM Lower Boundary Range

These two registers specify the address range for the /RAMCS signal. When accessed memory addresses are less than or equal to the value programmed in the RAMUBR and greater than or equal to the value programmed in the RAMLBR, /RAMCS is asserted. The A18 signal from the CPU is taken before it is multiplexed with T_{OUT}. In the case that these registers are programmed to overlap, /ROMCS takes priority over /RAMCS (/ROMCS is asserted and /RAMCS is inactive).

Chip Select signals are going active for the address range:

/ROMCS: (ROMBR) >= A19-A12 >= 0
/RAMCS: (RAMUBR) >= A19-A12 >= (RAMLBR)

These registers are set to FFH at POR, and the boundary addresses of ROM and RAM are as follows:

ROM lower boundary address (fixed) = 00000H

ROM upper boundary address (ROMBR register) = 0FFFFFH

RAM lower boundary address (RAMLBR register) = 0FFFFFH

RAM upper boundary address (RAMUBR register) = 0FFFFFH

Because /ROMCS takes priority over /RAMCS, the latter will never be asserted until the value in the ROMBR and RAMLBR registers are re-initialized to lower values.

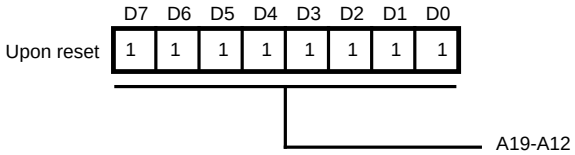


Figure 57. ROMBR
(Z180 MPU Read/Write, Address xxE8H)

ROMBR ROM Address Boundary Register

This register specifies the address range for the /ROMCS signal. When accessed, memory addresses are less than or equal to the value programmed in this register, the /ROMCS signal is asserted.

The A18 signal from the CPU is obtained before it is multiplexed with T_{OUT}. This signal can be forced to a "1" (inactive state) by setting bit 3 in the System Configuration Register, to allow the user to overlay the RAM area over the ROM area.

Z80182 Improvement to the Wait State Generator

A separate Wait State Generator is provided for access memory using /ROMCS and /RAMCS. A single 8-bit register is added to enable/disable this feature as well as provide two 3-bit fields that provide 1 to 8 waits for each chip select.

WSG Chip Select Register (Z80182 address D8H)

Bit 7 /RAMCS Wait State Generator Enable. Disable on power-up or reset.

Bits 6-4 /RAMCS Wait States 1 to 8. Eight wait states on power-up or reset.

Bit 3 /ROMCS Wait State Generator Enable. Disable on power-up or reset.

Bits 2-0 /ROMCS Wait States 1 to 8. Eight wait states on power-up or reset.

There are two wait state generators in the Z182. The actual number of wait states inserted is the greatest number of both the Z180 WSG and the chip select WSG. In order to use the Chip Select WSG, the Z180 WSG should be programmed to 0 wait states.

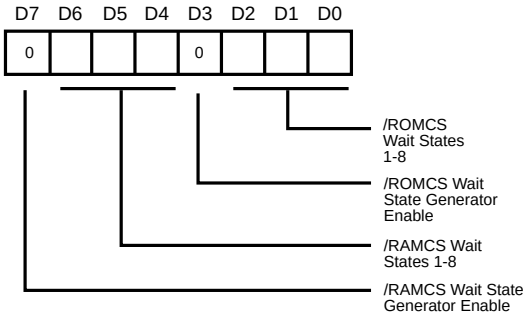


Figure 58. WSG Chip Select Register
(Z180 MPU Read/Write, Address xxD8H)

Interrupt Vector Register (Continued)

Table 16. Interrupt Status Bits

Bits 3, 2, 1	Interrupt Request
000	NO IRQ
001	FCR or Tx OVRN IRQ
010	DLL/DLM IRQ
011	LCR IRQ*
100	MCR IRQ*
101	RBR IRQ
110	TTO IRQ
111	THR IRQ

Note: * The order of LCR and MCR does not follow that of the IE Register.

Bit 0 0/Opcode (Read/Write)
This bit is always 0 when the VIS bit is 1. If the VIS bit is 0, this bit reads back what was last written to it.

The Interrupt Vector Register serves both interrupt modes. When the VIS bit is 0, the last value written to the register can be read back. If the VIS bit is 1, and an interrupt is pending, the value read is the last value written to the upper nibble plus the status for the interrupt that is pending. If no interrupt is pending, then the last value written to the upper nibble plus the lower nibble is read from the register.

If the vector includes the status, then the lower four bits of the vector change asynchronously depending on the interrupting source. Since this vector changes asynchronously, then the interrupt service routine to read the IVEC register might read the source of the most recent IRQ/INTACK cycle if that IRQ does not have its IUS set.

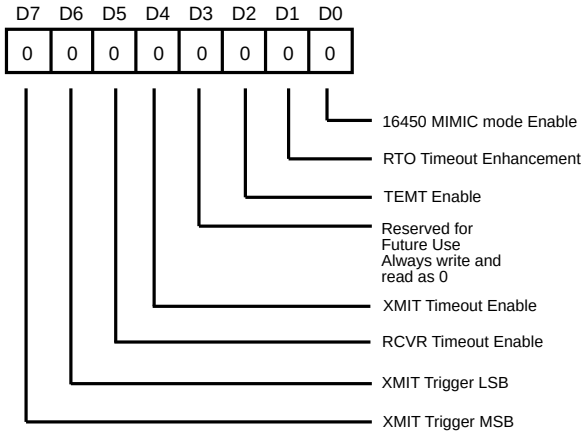


Figure 64. FIFO Status and Control Register
(Z180 MPU Read/Write, Address xxECH)

Bit 7 and Bit 6 XMIT Trigger MSB,LSB
This field determines the number of bytes available to read in the transmitter FIFO before an interrupt occurs to the MPU (Table 17).

Table 17. Transmitter Trigger Level

b7	b6	Level (# bytes)
0	0	1
0	1	4
1	0	8
1	1	14

Bit 5 Receive Timeout Enable
This bit enables the Z80182/Z8L182 Receive Timeout Timer that is used to emulate the four character timeout delay that is specified by the 16550. If no read or write to the RCVR FIFO has taken place and data bytes are available, but are below the PC trigger level. If this timer reaches zero, an interrupt is sent to the PC.

Bit 4 Transmitter Timeout Enable
This bit enables the Z80182/Z8L182 timer that is used to interrupt the Z180 MPU if characters are available, but are below the trigger level. The timer is enabled to count down if this bit is 1 and the number of bytes is below the set transmitter trigger level. The timer will timeout and interrupt the MPU if no read or write to the XMIT FIFO takes place within the timer interval.

Bit 3 Reserved. Program to zero.

Bit 2 (Reset value = 0) TEMT/Double Buffer
When enabled the Tx buffer can hold one extra byte (2 bytes total in 16450 mode). **(Do not enable in 16550 mode.)**

TEMT Emulation
If character delay emulation is not used the TEMT bit is automated. (Refer to page 26 for TEMT/Double Buffer information.)

Bit 1 RTO Timeout Enhancement
(Reset value = 0) Setting this bit will enable the RTO timeout to emulate the 16550 device. When enabling this feature, the receive timeout timer will not begin counting down until the character emulation timer for each byte of data in the Rx FIFO has expired.

Z80182/Z8L182 MIMIC DMA CONSIDERATIONS

For the PC Interface, the 16550 device has two modes of operation that need to be supported by the MIMIC. In single transfer mode, the DMA request line for the receiver goes active whenever there is at least one character in the RCVR FIFO. For the transmitter, the DMA request line is active on an empty XMIT FIFO and inactive on non-empty.

In multi-transfer mode, the RCVR DMA goes active at the trigger level and inactive on RCVR FIFO empty. The XMIT DMA is active on non-full XMIT FIFO and inactive on a full XMIT FIFO.

Bit 3 in the FCR controls the DMA mode for the PC interface. If a 1 is programmed into this bit, multi-byte DMA is enabled. A 0 in this bit (default) enables single byte DMA.

As specified, the 16550 does not have any means of handling the error status bits in the FIFO in this multi-transfer mode. Such DMA transfers would require blocks with some checksum or other error checking scheme.

For the MPU interface, the DMA is controlled by a non-empty transmit FIFO and by a non-full receive FIFO conditions (THRE and the DR bits in the LSR). If the delay timers are enabled, the respective shadow bits are used for DMA control. The effect of the DMA logic is to request DMA service when at least one byte of data is available to be read or written to the FIFO's by the Z180. The Z180's DMA channel can be programmed to trigger on edge or on level.

EMULATION MODES

The Z80182/Z8L182 provides four modes of operation. The modes are selected by the EV1 and EV2 pins. These four modes allow the system development and commercial production to be done with the same device. The four emulation modes are shown in Table 20.

Table 20. EV2 and EV1, Emulation Mode Control

	EV2	EV1	EV Description
Mode 0	0	0	Normal Mode, on-chip Z180 bus master
Mode 1	0	1	Emulation Adapter Mode
Mode 2	1	0	Emulator Probe Mode
Mode 3	1	1	RESERVED, for Test Use Only

Mode 0 Normal Mode

This is the normal operating mode for the Z80182/Z8L182.

Mode 1 Emulation Adapter Mode

The Emulation Adaptor Mode enables system development for the Z182 with a readily available Z180 emulator. The Emulator provides the Z180™ MPU and Z180 peripheral functions to the target system, with their signals passing through the emulation adapter. In Emulation Adaptor Mode the Z182s, Z180 MPU and Z180 peripheral signals are tri-state or physically disconnected. The Z182 continues to provide its ESCC, MIMIC, chip select, and Port functions and signals to the target system. The Mode 1 effects on the Z182 are shown in Table 21. Note that INT1-2 Edge Detect Logic cannot be used in Emulation Adaptor EV Mode 2.

EMULATION MODES (Continued)

Table 21. Emulation Mode 1

Signal	Normal Mode 0	Emulation Adaptor Mode 1
PHI	Output	Input
/M1	Output	Input
/MREQ,/MRD	Output	Input
/IORQ	Output	Input
/RD	Output	Input
/WR	Output	Input
/RFSH	Output	Input
/HALT	Output	Input
ST	Output	Input
E	Output	Tri-state
/BUSACK	Output	Input
/WAIT	Input	Output
A19,A18/T_{OUT}	Output	Input
A17-A0	Output	Input
D7-D0	Input/Output	Input/Output
TxA0	Output	Tri-state
/RTS0	Output	Tri-state
TxA1	Output	Tri-state
/INT0	Input	Output, Open-Drain

Mode 2 Emulation Probe Mode
In the Emulator Probe Mode all of the Z182 output signals are tri-state. This scheme allows a Z182 emulator probe to grab on to the Z182 package leads on the target system.

Mode 3 RESERVED (for test purposes only)
This mode is reserved for test purpose only, do not use.

Notes:
Z182 has two branches of reset. /RESET controls the Z182 overall configuration, RAM and ROM boundaries, plus the ESCC, Port and the 16550 MIMIC interface. In Normal Mode, a "one shot" circuit samples the input of the /RESET pin to assert the internal reset to its proper duration. In Adapter Mode, this "one shot" circuit is bypassed. Note also that the Z180's crystal oscillator is disabled in Mode 1 and Mode 2.

In Mode 1 the emulator must provide /MREQ on the (/MREQ,/MRD) Z80182/Z8L182 pin (not /MRD); and A18 (not T_{OUT}) on the A18/T_{OUT} pin.

SLEEP, HALT EFFECT ON MIMIC AND 182 SIGNALS

The following Z80182/Z8L182 signals are driven High when Z180™ MPU enters a SLEEP or HALT state:

- /MRD when selected in the Interrupt Edge/Pin MUX Register.
- /MWR when selected in the Interrupt Edge/Pin MUX Register.
- /ROMCS,/RAMCS always High in SLEEP or HALT.

The following signals are High-Z during SLEEP and HALT:

- /IOCS when so selected in the Interrupt Edge/Pin MUX Register.
- /RD and /WR.

A0-A19 (A18 if selected) always High-Z in power down.

D0-D7 always High-Z in power down modes.

The MIMIC logic of the 182 is disabled during power down modes of the Z180.

TIMING DIAGRAMS

Z180 MPU Timing

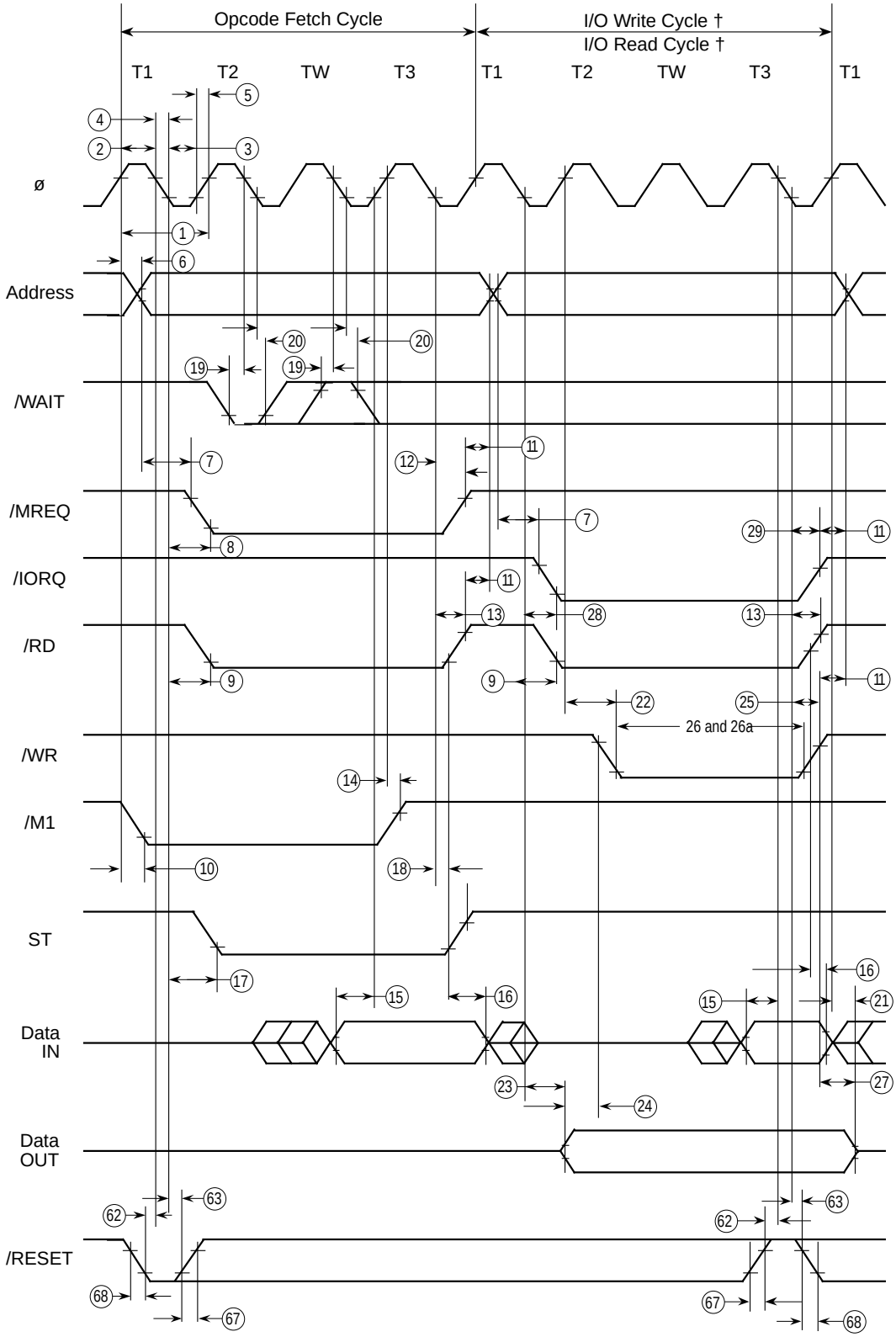


Figure 90. CPU Timing
(Opcode Fetch Cycle, Memory Read/Write Cycle
I/O Read/Write Cycle)

Table C. Z85230 General Timing Table

No.	Symbol	Parameter	20 MHz Min	20 MHz Max	Notes
1	TdPC(REQ)	/PCLK to W/REQ Valid		70	
2	TdPC(W)	/PCLK to Wait Inactive		170	
3	TsRxC(PC)	/RxC to /PCLK Setup Time	N/A		[1,4]
4	TsRxD(RxCr)	RxD to /RxC Setup Time		0	[1]
5	ThRxD(RxCr)	RxD to /RxC Hold Time	45		[1]
6	TsRxD(RxCf)	RxD to /RxC Setup Time	0		[1,5]
7	ThRxD(RxCf)	RxD to /RxC Hold Time	45		[1,5]
8	TsSY(RxC)	/SYNC to /RxC Setup Time	–90		[1]
9	ThSY(RXC)	/SYNC to/RxC Hold Time	5TcPc		[1]
10	TsTxC(PC)	/TxC to /PCLK Setup Time	N/A		[2,4]
11	TdTxCf(TXD)	/TxC to TxD Delay		70	[2]
12	TdTxCr(TXD)	/TxC to TxD Delay		70	[2,5]
13	TdTxD(TRX)	TxD to TRxC Delay		70	
14	TwRTxh	RTxC High Width	70		[6]
15	TwRTxl	TRxC Low Width	70		[6]
16a	TcRTx	RTxC Cycle Time	200		[6,7]
16b	TxRx(DPLL)	DPLL Cycle Time Min	50		[7,8]
17	TcRTxx	Crystal Osc. Period	61	1000	[3]
18	TwTRxh	TRxC High Width	70		[6]
19	TwTRxl	TRxC Low Width	70		[6]
20	TcTRx	TRxC Cycle Time	200		[6,7]
21	TwExT	DCD or CTS Pulse Width	60		
22	TwSY	SYNC Pulse Width	60		

Notes:
These AC parameter values are preliminary and subject to change without notice.
[1] RxC is /RTxC or /TRxC, whichever is supplying the receive clock.
[2] TxC is /TRxC or /RTxC, whichever is supplying the transmit clock.
[3] Both /RTxC and /SYNC have 30 pF capacitors to ground connected to them.
[4] Synchronization of RxC to PCLK is eliminated in divide by four operation.
[5] Parameter applies only to FM encoding/decoding.
[6] Parameter applies only for transmitter and receiver; DPLL and baud rate generator timing requirements are identical to case PCLK requirements.
[7] The maximum receive or transmit data rate is 1/4 PCLK.
[8] Applies to DPLL clock source only. Maximum data rate of 1/4 PCLK still applies. DPLL clock should have a 50% duty cycle.

16550 MIMIC TIMING (Continued)

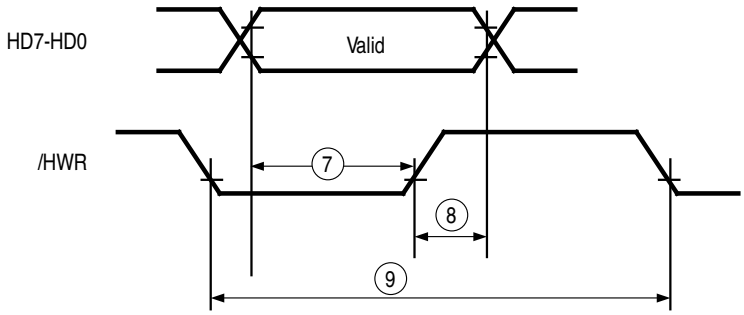


Figure 111. Data Setup and Hold, Output Delay, Write Cycle

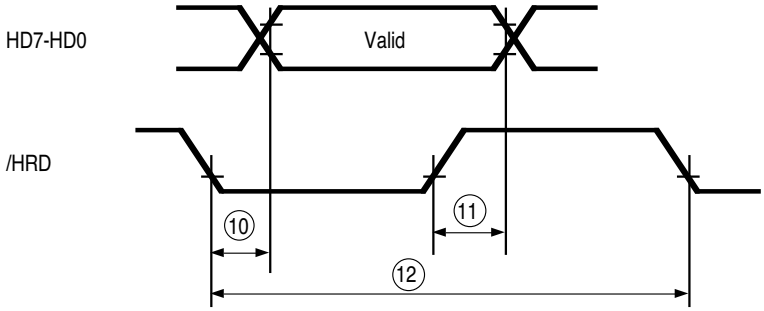


Figure 112. Data Setup and Hold, Output Delay, Read Cycle

Table I. Data Setup and Hold, Output Delay, Read Cycle

			Z8L182 20 MHz		Z80182 33 MHz		
No.	**Sym**	**Parameter**	**Min**	**Max**	**Min**	**Max**	**Units**
7	tDs	Data Setup Time	30		30		ns
8	tDh	Data Hold Time	30		30		ns
9	tWc	Write Cycle Delay	2.5 MPU Clock Cycles		2.5 MPU Clock Cycles		ns
10	tRvD	Delay from /HRD to Data		125		125	ns
11	tHz	/HRD to Floating Delay		100		100	ns
12	tRc	Read Cycle Delay	125		125		ns

Note:
These AC parameter values are preliminary and are subject to change without notice.

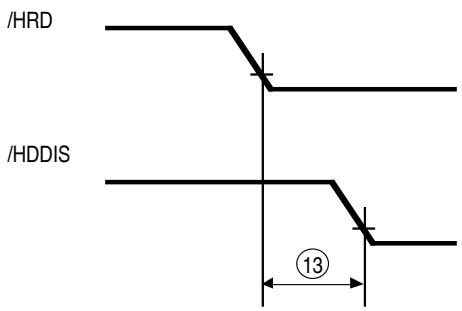


Figure 113. Driver Enable Timing

Table J. Driver Enable Timing

No.	Sym	Parameter	Z8L182 20 MHz Min	Z8L182 20 MHz Max	Z80182 33 MHz Min	Z80182 33 MHz Max	Units
13	tRDD	/HRD to Driver Enable/Disable		60		60	ns

Note:
These AC parameter values are preliminary and are subject to change without notice.

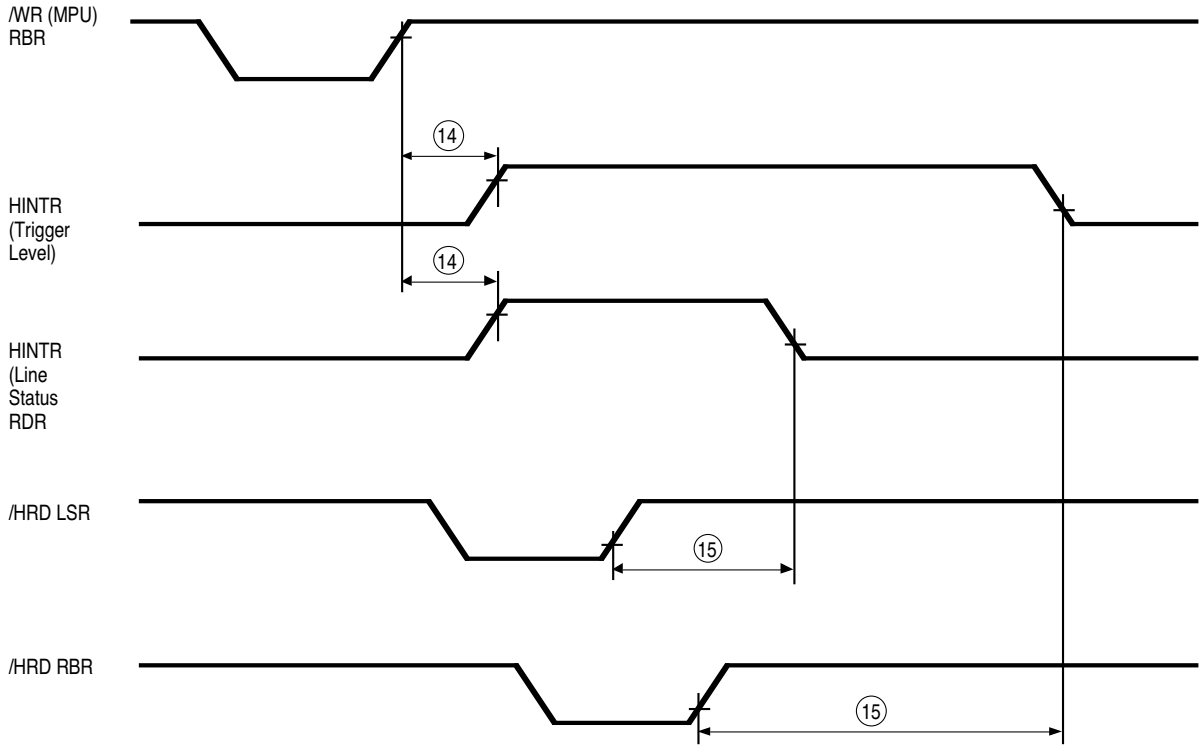


Figure 114. Interrupt Timing RCVR FIFO

16550 MIMIC TIMING (Continued)

Table K. Interrupt Timing RCVR FIFO

No.	Sym	Parameter	Z8L182 20 MHz Min	Z8L182 20 MHz Max	Z80182 33 MHz Min	Z80182 33 MHz Max
14	tSINT	Delay from Stop to Set Interrupt		2 MPU Clock Cycles		2 MPU Clock Cycles
15	tRINT	Delay from /HRD (RD RBR or RD LSR) to Reset Interrupt		2 MPU Clock Cycles		2 MPU Clock Cycles

Note:
These AC parameter values are preliminary and are subject to change without notice.

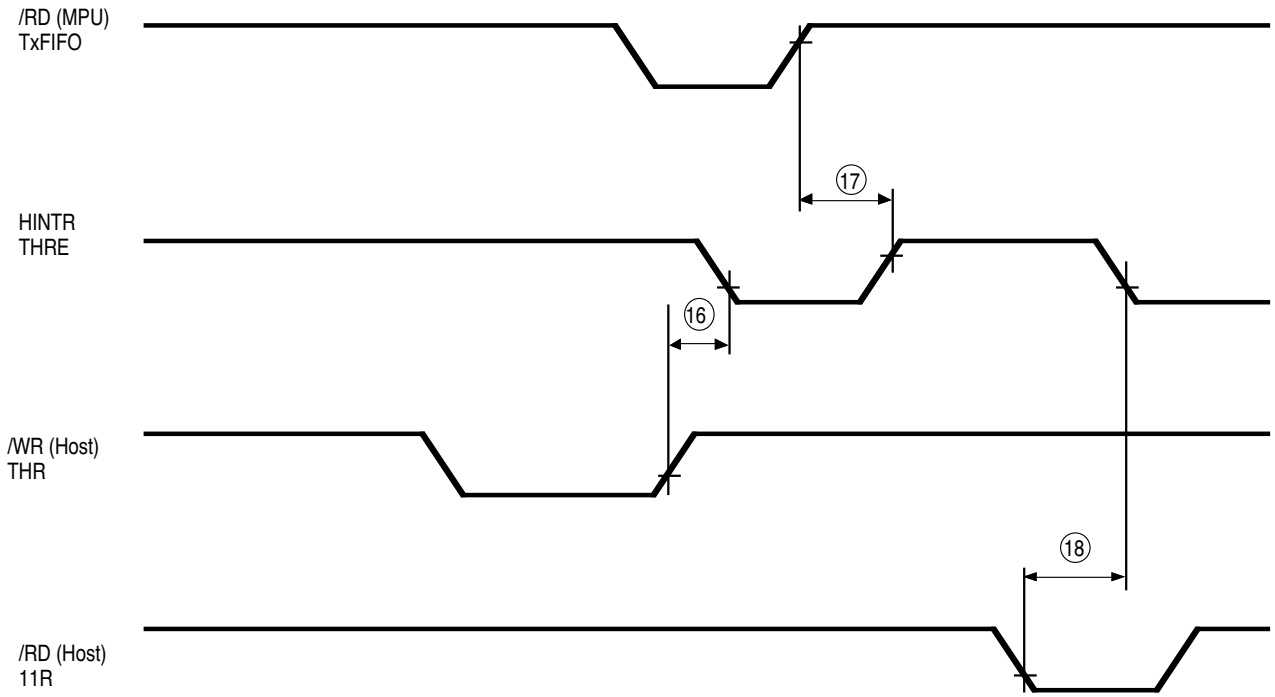


Figure 115. Interrupt Timing Transmitter FIFO

Table L. Interrupt Timing Transmitter FIFO

No.	Sym	Parameter	Z8L182 20 MHz Min	Z8L182 20 MHz Max	Z80182 33 MHz Min	Z80182 33 MHz Max
16	tHR	Delay from /WR (WR THR) to Reset Interrupt		2.5 MPU Clock Cycles		2.5 MPU Clock Cycles
17	TSTI	Delay from Stop to Interrupt (THRE)	2 MPU Clock Cycles		2 MPU Clock Cycles	
18	TIR	Delay from /RD (RD IIR) to Reset Interrupt (THRIE)		75		75

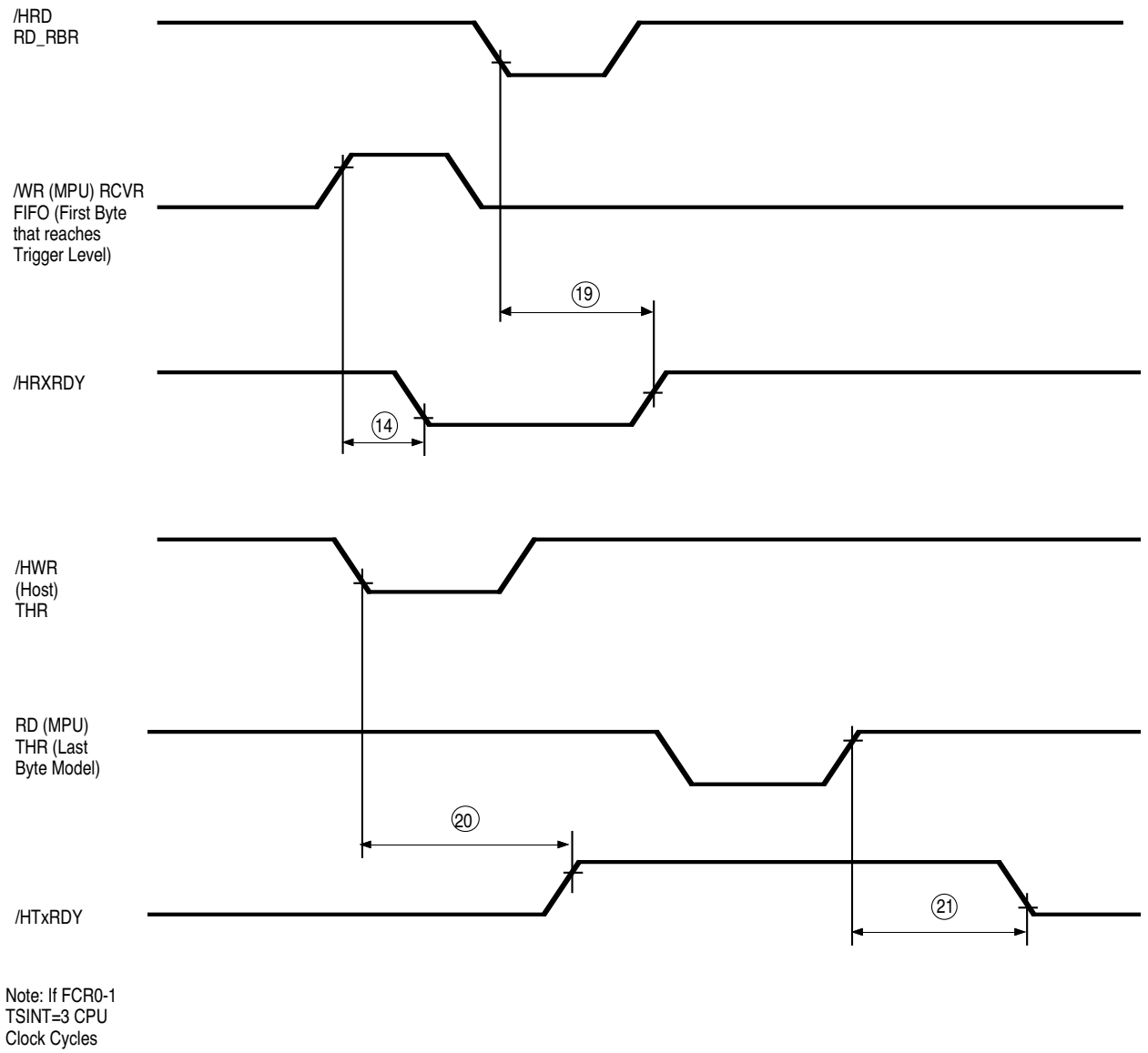


Figure 116 RCVR FIFO Bytes Other Than First

ORDERING INFORMATION

Z8L182	Z80182
20 MHz	**33 MHz**
Z8L18220ASC	Z8018233ASC
Z8L18220FSC	Z8018233FSC

For fast results, contact your local Zilog sales office for assistance in ordering the part(s) desired.

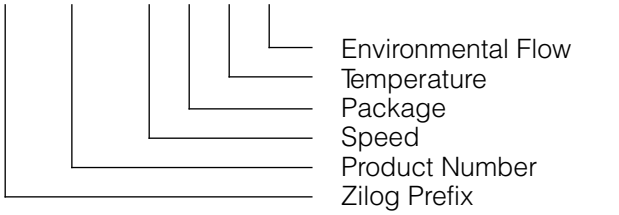
Preferred Package
A = VQFP (Very Small QFP)
F = Plastic Quad Flatpack

Preferred Temperature
S = 0°C to +70°C

Speeds
20 = 20 MHz
33 = 33 MHZ

Environmental
C = Plastic Standard
D = Plastic Stressed
E = Hermetric Standard

Example:
Z 80182 20 F S C is a Z80182, 20 MHz, QFP, 0°C to +70°C, Plastic Standard Flow



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