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Errata to MC68307 Integrated Multiple-Bus Processor User Manual

This errata to the initial release of the MC68307 UM/AD User's Manual provides corrections to the original text. This document and other information on this product is maintained on the AESOP BBS, which can be reached at (800) 843-3451 (from the U.S. and Canada) or (512) 891-3650. Configure modem for up to 14.4Kbaud, 8 bits, 1 stop bit, and no parity. Terminal software should support VT100 emulation. Internet access is provided by telnetting to pirs.aus.sps.mot.com [129.38.233.1] or through the World Wide Web at <http://pirs.aus.sps.mot.com>.

Tues, 25th July 1995.

p. 3-14: Section 3.1.7., 8051-Bus Operation. The 8051-compatible read and write cycles should be as follows:

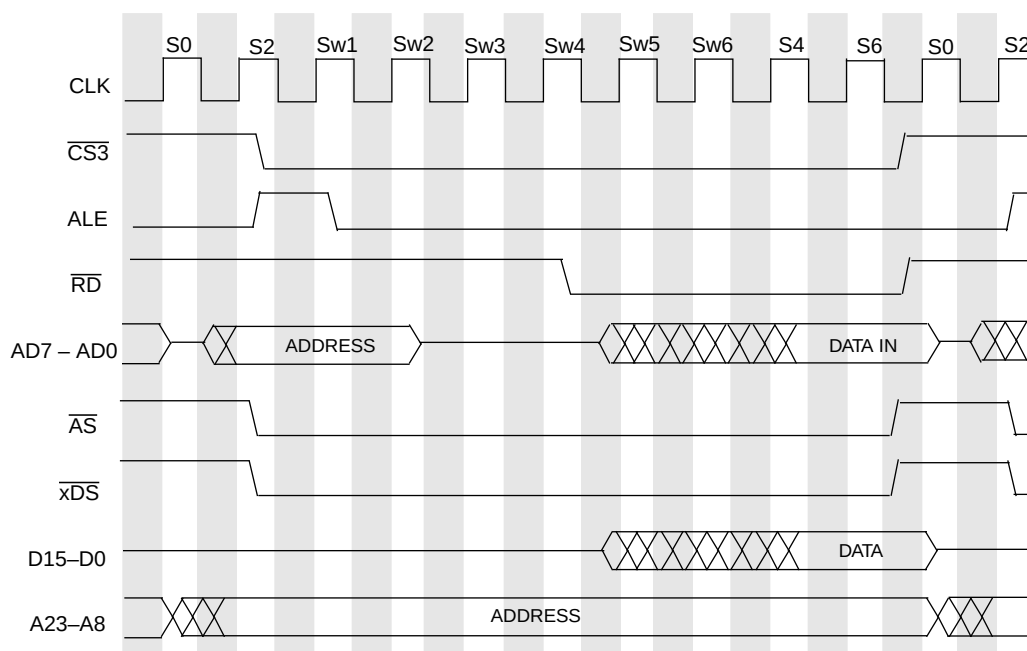


Figure 3-12. 8051-Compatible Read Cycle Signals

ColdFire is a trademark of Motorola.

¹. I²C bus is a proprietary Philips interface bus.

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SEMICONDUCTOR PRODUCT INFORMATION

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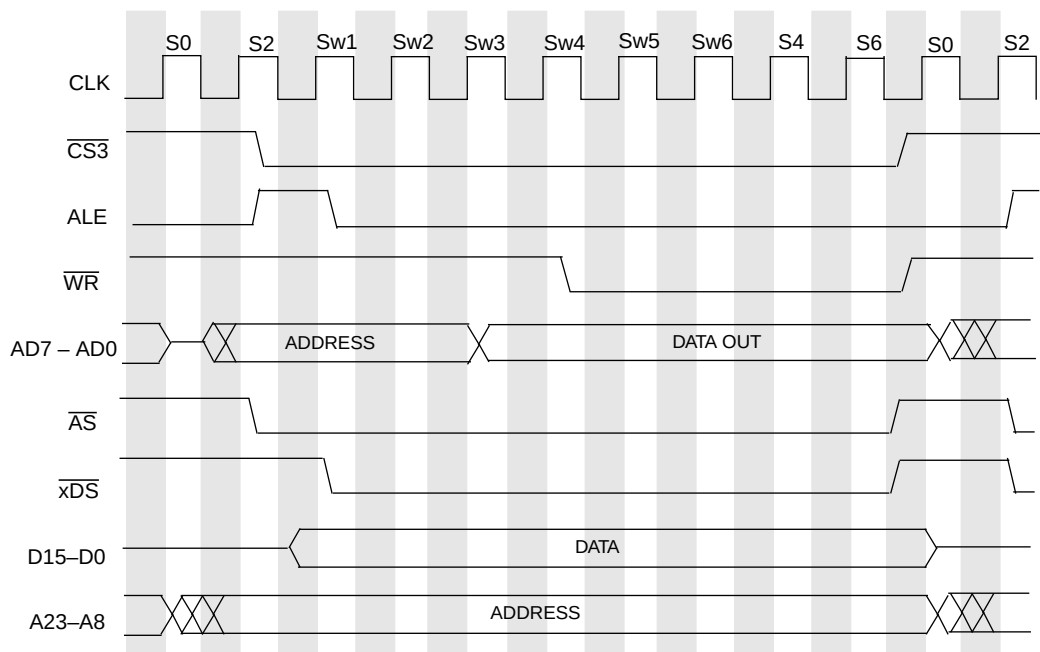


Figure 3-13. 8051-Compatible Write Cycle Signals

p. 5-40: Section 5.2.4.2. The peripheral interrupt control register (PICR) does not specify the peripheral interrupt-pending bits.

PICR													MBASE+\$024		
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
PI_T1	T1IPL(2-0)			PI_T2	T2IPL(2-0)			PI_UA	UA IPL(2-0)			PI_MB	MBIPL(2-0)		
Reset															
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Read/Write													Supervisor or User		

Interrupt Priority Level Timer 1, Timer 2, UART, MBUS, T1IPL2-0, T2IPL2-0, MBIPL2-0, UA IPL2-0

These bits allow users to specify the IPL for the corresponding on-chip peripheral module interrupt input line (Timer 1, Timer 2, UART and M-bus respectively). When an interrupt occurs, the interrupt controller logic asserts the correct priority code on the EC000 interrupt-level inputs and responds to the subsequent acknowledge cycle by coordinating the return of the appropriate vector, as programmed into the programmable interrupt vector register or UART interrupt vector register.

- 000 =The corresponding interrupt source is inhibited and cannot generate interrupts.
- 001-111 = The corresponding interrupt source is enabled and can generate an interrupt to the EC000 core processor with the indicated priority level.

Pending Interrupt – PI_T1, PI_T2, PI_UA, PI_MB

These read-only bits (bits 15, 11, 7, 3) indicate when the peripherals have an interrupt pending. Writes to these bits are ignored.

- Read-Only Value
- 0 = No interrupt pending.
- 1 = Interrupt pending.

p. 6-7: Section 6.3.2.2., watchdog counter register (WCR). The WCR has a reset value of 0.

p. 9-2: Section 9.1, Overview. The boundary scan register has 116 bits.

p. 9-2: Section 9.1, Figure 9-1. The Test Access Port Block diagram should show the TCK pin with an internal pullup resistor, and not an internal pulldown resistor.

p. 9-2: Section 9.1, Overview. The TCK pin has an internal pullup resistor not a pulldown.

TCK—test clock input to synchronize the test logic (with pullup).

p. 9-4: Section 9.3, Table 9-1. The boundary scan control bit numbers are wrong. Use the corrected table and paragraphs overleaf:

"The MC68307 IEEE 1149.1 implementation has a 116-bit boundary scan register. This register contains bits for all device signal and clock pins and associated control signals. The XTAL, EXTAL and $\overline{\text{RSTIN}}$ pins are associated with analog signals and are not included in the boundary scan register.

"All MC68307 bidirectional pins, except the open-drain I/O pins ($\overline{\text{HALT}}$, $\overline{\text{DTACK}}$, $\overline{\text{RESET}}$, SCL and SDA), have a register bit for the output path and another for the input path. In addition, SCL and SDA have a third bit that controls these pins. All open drain I/O pins have a single register bit for pin data and no associated control bit. To ensure proper operation, the open-drain pins require external pullups. Thirty-two control bits in the boundary scan register define the output enable signal (1=output) for associated groups of bidirectional and three-state pins. The control bits and their bit positions are listed in Table 3-1.

Table 3-1. Boundary Scan Control Bits

Name	Bit Number	Name	Bit Number	Name	Bit Number	Name	Bit Number
bus.ctl	3	pa3.ctl	56	pb11.ctl	72	pb3.ctl	88
rw.ctl	10	pa2.ctl	58	pb10.ctl	74	pb2.ctl	90
adb.ctl	21	pa1.ctl	60	pb9.ctl	76	pb1.pu	92
ab.ctl	45	pa0.ctl	62	pb8.ctl	78	pb1.ctl	93
pa7.ctl	48	pb15.ctl	64	pb7.ctl	80	pb0.pu	95
pa6.ctl	50	pb14.ctl	66	pb6.ctl	82	pb0.ctl	96
pa5.ctl	52	pb13.ctl	68	pb5.ctl	84	dhi.ctl	98
pa4.ctl	54	pb12.ctl	70	pb4.ctl	86	dlo.ctl	107

"Boundary scan bit definitions are shown in Table 10-2. The first column in Table 10-2 defines the bit's ordinal position in the boundary scan register. The shift register bit nearest TDO (i.e., first to be shifted out) is defined as bit 0; the last bit to be shifted out is bit 115."

p. 9-5: Section 9.3, Table 9-2. The boundary scan bit definitions is incorrect. The corrected table follows:

Table 10-2. Boundary Scan Bit Definitions

Bit Num	Cell Type	Signal	Control	Bit Num	Cell Type	Signal	Control
0	O.Cell	ALE	—	45	En.Cell	ab.ctl	—
1	O.Cell	$\overline{RD}$	—	46	IO.Cell	A23	ab.ctl
2	O.Cell	$\overline{WR}$	—	47	I.Cell	$\overline{IRQ7}$	—
3	En.Cell	bus.ctl	—	48	En.Cell	pa7.ctl	—
4	IO.Cell	$\overline{AS}$	bus.ctl	49	IO.Cell	$\overline{BGACK}$	pa7.ctl
5	IO.Cell	$\overline{UDS}$	bus.ctl	50	En.Cell	pa6.ctl	—
6	IO.Cell	$\overline{LDS}$	bus.ctl	51	IO.Cell	$\overline{BG}$	pa6.ctl
7	IO.Cell	$\overline{RW}$	rw.ctl	52	En.Cell	pa5.ctl	—
8	O.Cell	$\overline{DTACK}$	—	53	IO.Cell	$\overline{BR}$	pa5.ctl
9	I.Cell	$\overline{DTACK}$	—	54	En.Cell	pa4.ctl	—
10	En.Cell	rw.ctl	—	55	IO.Cell	TOUT2	pa4.ctl
11	O.Cell	$\overline{HALT}$	—	56	En.Cell	pa3.ctl	—
12	I.Cell	$\overline{HALT}$	—	57	IO.Cell	TOUT1	pa3.ctl
13	O.Cell	$\overline{RESET}$	—	58	En.Cell	pa2.ctl	—
14	I.Cell	$\overline{RESET}$	—	59	IO.Cell	$\overline{CS2D}$	pa2.ctl
15	O.Cell	$\overline{CS0}$	—	60	En.Cell	pa1.ctl	—
16	O.Cell	$\overline{CS1}$	—	61	IO.Cell	$\overline{CS2C}$	pa1.ctl
17	O.Cell	$\overline{CS2}$	—	62	En.Cell	pa0.ctl	—
18	O.Cell	$\overline{CS3}$	—	63	IO.Cell	$\overline{CS2B}$	pa0.ctl
19	O.Cell	CLKOUT	—	64	En.Cell	pb15.ctl	—
20	I.Cell	BUSW	—	65	IO.Cell	$\overline{INT8}$	pb15.ctl
21	En.Cell	adb.ctl	—	66	En.Cell	pb14.ctl	—
22	IO.Cell	AD0	adb.ctl	67	IO.Cell	$\overline{INT7}$	pb14.ctl
23	IO.Cell	AD1	adb.ctl	68	En.Cell	pb13.ctl	—
24	IO.Cell	AD2	adb.ctl	69	IO.Cell	$\overline{INT6}$	pb13.ctl
25	IO.Cell	AD3	adb.ctl	70	En.Cell	pb12.ctl	—
26	IO.Cell	AD4	adb.ctl	71	IO.Cell	$\overline{INT5}$	pb12.ctl
27	IO.Cell	AD5	adb.ctl	72	En.Cell	pb11.ctl	—
28	IO.Cell	AD6	adb.ctl	73	IO.Cell	$\overline{INT4}$	pb11.ctl
29	IO.Cell	AD7	adb.ctl	74	En.Cell	pb10.ctl	—
30	IO.Cell	A8	ab.ctl	75	IO.Cell	$\overline{INT3}$	pb10.ctl
31	IO.Cell	A9	ab.ctl	76	En.Cell	pb9.ctl	—
32	IO.Cell	A10	ab.ctl	77	IO.Cell	$\overline{INT2}$	pb9.ctl
33	IO.Cell	A11	ab.ctl	78	En.Cell	pb8.ctl	—
34	IO.Cell	A12	ab.ctl	79	IO.Cell	$\overline{INT1}$	pb8.ctl
35	IO.Cell	A13	ab.ctl	80	En.Cell	pb7.ctl	—
36	IO.Cell	A14	ab.ctl	81	IO.Cell	TIN2	pb7.ctl
37	IO.Cell	A15	ab.ctl	82	En.Cell	pb6.ctl	—
38	IO.Cell	A16	ab.ctl	83	IO.Cell	TIN1	pb6.ctl
39	IO.Cell	A17	ab.ctl	84	En.Cell	pb5.ctl	—
40	IO.Cell	A18	ab.ctl	85	IO.Cell	$\overline{CTS}$	pb5.ctl
41	IO.Cell	A19	ab.ctl	86	En.Cell	pb4.ctl	—
42	IO.Cell	A20	ab.ctl	87	IO.Cell	$\overline{RTS}$	pb4.ctl
43	IO.Cell	A21	ab.ctl	88	En.Cell	pb3.ctl	—
44	IO.Cell	A22	ab.ctl	89	IO.Cell	RXD	pb3.ctl
90	En.Cell	pb2.ctl	—	103	IO.Cell	D11	dhi.ctl

Table 10-2. Boundary Scan Bit Definitions (Continued)

91	IO.Cell	TXD	pb2.ctl	104	IO.Cell	D10	dhi.ctl
92	En.Cell	pb1.pu	—	105	IO.Cell	D9	dhi.ctl
93	En.Cell	pb1.ctl	—	106	IO.Cell	D8	dhi.ctl
94	IO.Cell	SDA	pb1.ctl/ pb1.pu	107	En.Cell	dlo.ctl	—
95	En.Cell	pb0.pu	—	108	IO.Cell	D7	dlo.ctl
96	En.Cell	pb0.ctl	—	109	IO.Cell	D6	dlo.ctl
97	IO.Cell	SCL	pb0.ctl/ pb0.pu	110	IO.Cell	D5	dlo.ctl
98	En.Cell	dhi.ctl	—	111	IO.Cell	D4	dlo.ctl
99	IO.Cell	D15	dhi.ctl	112	IO.Cell	D3	dlo.ctl
100	IO.Cell	D14	dhi.ctl	113	IO.Cell	D2	dlo.ctl
101	IO.Cell	D13	dhi.ctl	114	IO.Cell	D1	dlo.ctl
102	IO.Cell	D12	dhi.ctl	115	IO.Cell	D0	dlo.ctl

p. 9-10: Sections 9.4.1 (EXTEST), 9.4.2 (SAMPLE/PRELOAD), and 9.4.3 (BYPASS) should state "the 116-bit boundary scan register" and not 117 bit.

p. 10-19: Section 10.3.7.1, Software Listing 1 - Mbus Master Software. The WRITE1 subroutine is missing a line which writes to the MBDR. It should be as follows:

```

WRITE1      BTST      #5, MBSR          TEST MBB BIT,
           BNE        WRITE1          AND WAIT UNTIL IT IS CLEAR

TXSTART

           BSET       #4, MBSR          SET TRANSMIT MODE
           BSET       #5, MBSR          SET MASTER MODE (GENERATE START)
           BSET       #6, MBSR          Enable MBUS Interrupts
           MOVE.B     (V_CHIPAD), MBDR  TRANSMIT THE SLAVE CHIP ADDRESS
           MOVE.W     #$2000, SR        ENABLE INTERRUPTS BY SETTING TO LEVEL 0

MBFREE      BTST      #5, MBSR          TEST MBB BIT,
           BEQ        MBFREE          If bus is still free, wait until busy
           RTS

```

p. 11-1: Section 11.1, Maximum Ratings. The table should include both standard operating temperature and extended operating temperature details:

Rating	Symbol	Value	Unit
Supply Voltage ^{1, 2}	V _{CC}	−0.3 to + 7.0	V
Input Voltage ^{1, 2}	V _{in}	−0.3 to + 7.0	V
Standard Operating Temperatures	T _A	0 to 70	°C
Extended Operating Temperatures	"	−40 to 85	°C
Storage Temperature Range	T _{stg}	−55 to +150	°C

This device contains protective circuitry against damage due to high static voltages or electrical fields; however, it is advised that normal precautions be taken to avoid application of any voltages higher than maximum-rated voltages to this high-impedance circuit. Reliability of operation is enhanced if unused inputs are tied to an appropriate logic voltage level (e.g., either GND or V_{CC}).

NOTES:

1. Permanent damage can occur if maximum ratings are exceeded. Exposure to voltages or currents in excess of recommended values affects device reliability. Device modules may not operate normally while being exposed to electrical extremes.
2. Although sections of the device contain circuitry to protect against damage from high static voltages or electrical fields, normal precautions should be taken to avoid exposure to voltages higher than maximum-rated voltages.

p. 12-1: Section 12.1, Standard Ordering Information. The temperature ranges are incorrect. The corrected values are as follows:

Package Type	Frequency (MHz)	Supply Voltage (V)	Temperature	Order Number
100-Pin Plastic Quad Flat Pack (FG Suffix)	16.67	5	0°C to 70°C	MC68307FG16
100-Pin Thin Quad Flat Pack (PU Suffix)	16.67	5	0°C to 70°C	MC68307PU16
100-Pin Plastic Quad Flat Pack (FG Suffix)	16.67	5	-40°C to 85°C	MC68307CFG16
100-Pin Plastic Quad Flat Pack (FG Suffix)	16.67	3.3	0°C to 70°C	MC68307FG16V
100-Pin Thin Quad Flat Pack (PU Suffix)	8.33	3.3	0°C to 70°C	MC68307PU8V
100-Pin Thin Quad Flat Pack (PU Suffix)	16.67	3.3	0°C to 70°C	MC68307PU16V

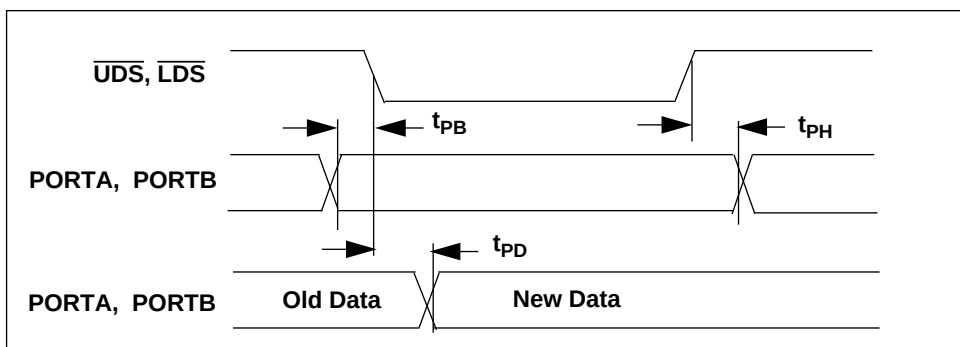
p. 11-16: Section 11.14, AC Electrical Characteristics - Port Timing. The 8MHz and 16.67MHz timing values should be changed and the tPD time referenced to UDS/LDS assertion as follows:

11.14 AC ELECTRICAL CHARACTERISTICS—PORT TIMING

(See Figure 11-13..)

Characteristic	Symbol	3.3V		3.3 V or 5 V		Unit
		8.33 MHz		16.67 MHz		
		Min	Max	Min	Max	
Port Input Setup Time to $\overline{UDS}$, $\overline{LDS}$ Asserted	tPS	0	—	0	—	ns
Port Input Hold Time from $\overline{UDS}$, $\overline{LDS}$ Negated	tPH	0	—	0	—	ns
Port Output Valid from $\overline{UDS}$, $\overline{LDS}$ Asserted	tPD	—	20	—	10	ns

NOTE: Test conditions for port outputs: $C_L = 50$ pF, $R_L = 27$ k Ω to V_{CC} .



11-13. Port Timing

p11-17: Section 11.15, IEEE 1149.1 Electrical Characteristics. The 8MHz and 16.67MHz timing columns should be swapped as follows:

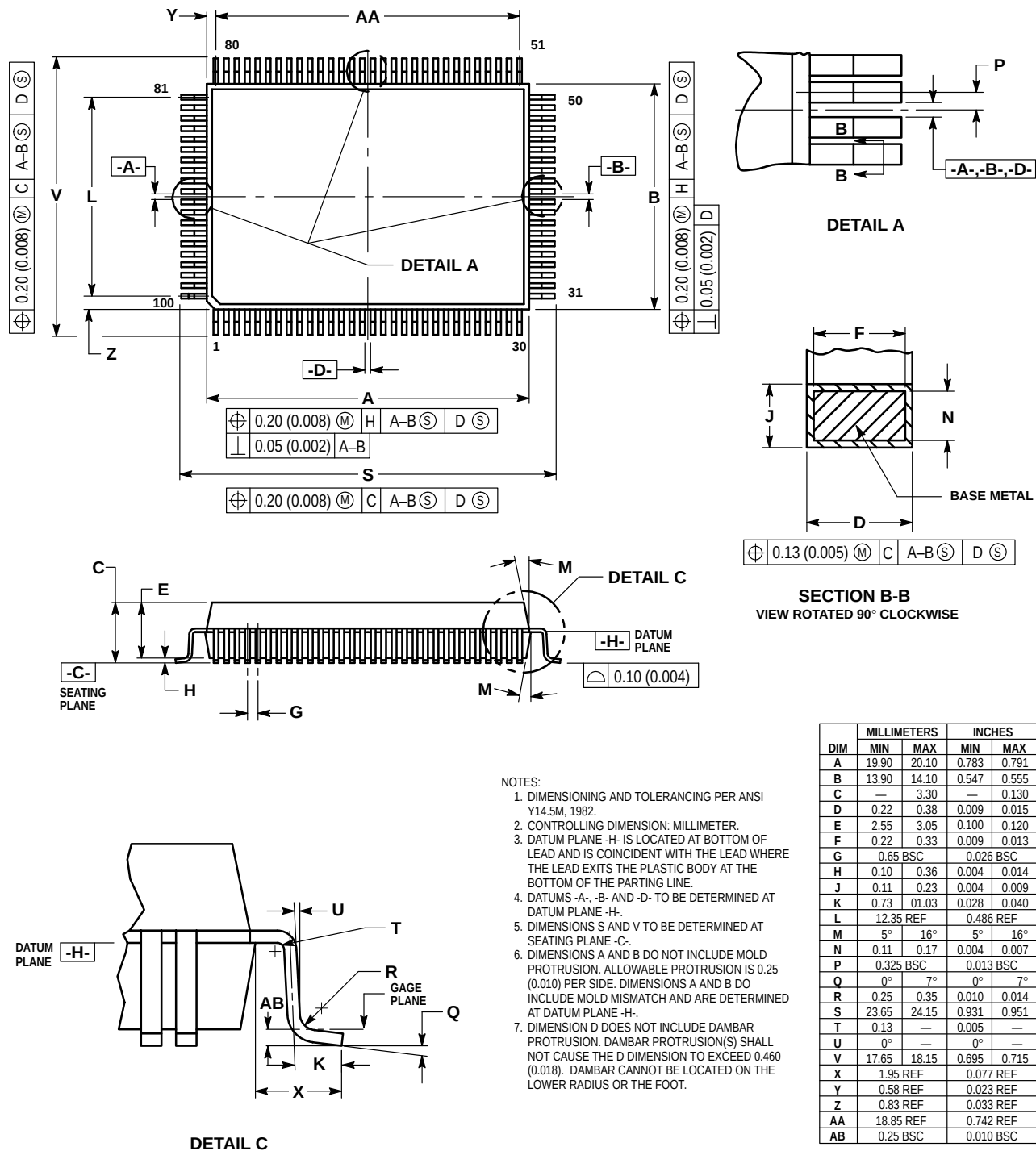
11.15 IEEE 1149.1 ELECTRICAL CHARACTERISTICS

(See Figure 11-14, Figure 11-15, and Figure 11-16.)

Num.	Characteristic	3.3V		3.3 V or 5 V		Unit
		8.33 MHz		16.67 MHz		
		Min	Max	Min	Max	
	TCK Frequency of Operation	0	5.0	0	10.0	MHz
1	TCK Cycle Time	200	—	100	—	ns
2	TCK Clock Pulse Width Measured at 1.5 V	45	—	45	—	ns
3	TCK Rise and Fall Times	0	10	0	5	ns
6	Boundary Scan Input Data Setup Time	30	—	15	—	ns
7	Boundary Scan Input Data Hold Time	30	—	15	—	ns
8	TCK Low to Output Data Valid	0	160	0	80	ns
9	TCK Low to Output High Impedance	0	160	0	80	ns
10	TMS, TDI Data Setup Time	30	—	15	—	ns
11	TMS, TDI Data Hold Time	30	—	15	—	ns
12	TCK Low to TDO Data Valid	0	60	0	30	ns
13	TCK Low to TDO High Impedance	0	60	0	30	ns

Change History:

Rev 1.0	Tue, 21st Feb 1995	Original Release
Rev 1.1	Thur, 31st Mar 1995	Update
Rev 1.2	Tues, 25th Mar 1995	Update



This package replaces the one shown on page 12-3 of the MC68307 User's Manual.





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