

MIL-M-38510/78A
AMENDMENT 5

PAGE 7

*TABLE I. t_{PHL8} , maximum limit column delete "36" ns and substitute "42" ns.

PAGE 10

TABLE II, MIL-STD-883 test requirements, interim electrical parameters: Delete "(pre burn-in)".

TABLE II, group A test requirements, class B devices: Add "8".

TABLE II, additional electrical subgroups for group C periodic inspections: Delete in its entirety.

4.3.a(1), delete and substitute as follows: (alter change made by previous amendment)

"(1) Test condition D or E, using the circuit shown on figure 4, or equivalent. Test condition A and the applicable test circuit shall be allowed with the approval of the qualifying activity."

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TABLE III, device type 01, test numbers 17 through 22, pin 8: Delete "0.5 V" and substitute "5.5 V".

TABLE III, device type 01, terminal designations, delete and substitute the following:

Cases																													
X,3 <u>5</u> /	2	3	4	5	6	7	8	9	11	12	13	14	16	17	18	19	20	22	23	24	25	26	27	28					
J,K,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
	\bar{B}_0	\bar{A}_0	S_3	S_2	S_1	S_0	C_n	M	\bar{F}_0	\bar{F}_1	\bar{F}_2	GND	\bar{F}_3	A=B	\bar{P}	C_{n+4}	\bar{G}	\bar{B}_3	\bar{A}_3	\bar{B}_2	\bar{A}_2	\bar{B}_1	\bar{A}_1	V_{CC}					

Make these same changes on pages 25 through 33.

PAGE 25

TABLE III, test number 65, pin \bar{A}_0 : Delete "," and substitute "4.5 V".

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TABLE III, test number 289, pin \bar{A}_3 : Delete "," and substitute "2.7 V".

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* TABLE III. t_{PHL8} , subgroups 10 and 11 tests numbers 387 through 394: maximum limits column delete "36" ns and substitute "42" ns.

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Footnote 2/: Delete in its entirety and substitute the following:

"2/ Inputs: A = 2.4 V, B = 0.4 V."

Footnote 3/: Delete in its entirety and substitute the following:

"3/ Outputs: H \geq 1.5 V, L \leq 1.5 V."

Following footnote 4/, add footnote 5/:

"5/ Cases 3 and X pins not designated are NC."

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Footnote 2/: Delete in its entirety and substitute the following:

"2/ Inputs: $A = 2.4 \text{ V}$, $B = 0.4 \text{ V}$."

Footnote 3/, delete in its entirety and substitute the following:

"3/ Outputs: $H \geq 1.5 \text{ V}$, $L \leq 1.5 \text{ V}$."

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4.4.2, following first sentence: Add "Electrical parameters shall be as specified in table II herein."

4.4.3.b(1), delete and substitute as follows: (alter change made by previous amendment)

"(1) Test condition D or E, using the circuit shown on figure 4, or equivalent. Test condition A and the applicable test circuit shall be allowed with the approval of the qualifying activity."

4.4.3.b(3): Delete "Appendix B of MIL-M-38510 and".

NOTE: The margins of this amendment are marked with asterisks to indicate where changes from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

CONCLUDING MATERIAL

Custodians:

Army - ER
Navy - EC
Air Force - 17

Review activities:

Army - AR, MI
Navy - OS, SH, TD
Air Force - 19, 85, 99
DLA - ES

User activities:

Army - SM
Navy - AS, CG, MC

Preparing activity:
Air Force - 17

Agent:
DLA - ES

(Project 5962-1380)

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Pin designations

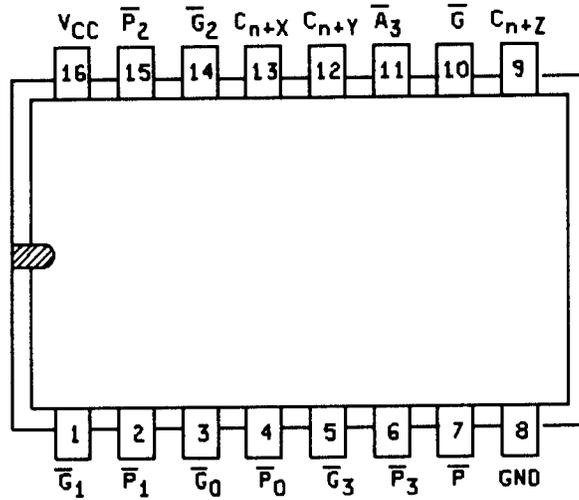
Designation	Pin numbers	Function
$\bar{A}3, \bar{A}2, \bar{A}1, \bar{A}0$	19, 21, 23, 2	Word A inputs
$\bar{B}3, \bar{B}2, \bar{B}1, \bar{B}0$	18, 20, 22, 1	Word B inputs
S3, S2, S1, S0	3, 4, 5, 6	Function-select inputs
C_n	7	Inv. carry output
M	8	Mode control input
$\bar{F}3, \bar{F}2, \bar{F}1, \bar{F}0$	13, 11, 10, 9	Function outputs
A = B	14	Comparator output
\bar{P}	15	Carry propagate output
C_{n+4}	16	Inv. carry output
\bar{G}	17	Carry generate output
V_{CC}	24	Supply voltage
GND	12	Ground

FIGURE 1. Terminal connections and pin designations - Continued.

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Device type 02

Cases E AND F

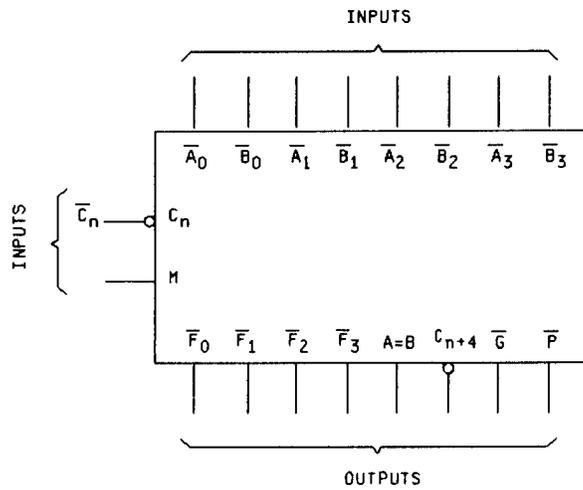


Pin designations

Designation	Pin numbers	Function
C_n	13	Carry input
$\bar{G}_0, \bar{G}_1, \bar{G}_2, \bar{G}_3$	3, 1, 14, 5	Carry generate inputs
$\bar{P}_0, \bar{P}_1, \bar{P}_2, \bar{P}_3$	4, 2, 15, 6	Carry propagate inputs
$C_{n+X}, C_{n+Y}, C_{n+Z}$	12, 11, 9	Carry outputs
\bar{G}	10	Carry generate output
\bar{P}	7	Carry propagate output

FIGURE 1. Terminal connections and pin designations - Continued.

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	Selection $S_3 S_2 S_1 S_0$				Active high data <u>3/</u>		
					M = H logic functions	M = L; arithmetic operations	
						$\bar{C}_n, C_n = 0$ $C_n = 1 = H$	$\bar{C}_n, C_n = 1$ $C_n = 0 = L$
0	L	L	L	L	$F = \bar{A}$	$F = A$	$F = A \text{ plus } 1$
1	L	L	L	H	$F = \overline{A + B}$	$F = A + B$	$F = (A + B) \text{ plus } 1$
2	L	L	H	L	$F = \bar{A}B$	$F = A + \bar{B}$	$F = (A + \bar{B}) \text{ plus } 1$
3	L	L	H	H	$F = 0$	$F = \text{minus } 1 \text{ (2's compl)}$	$F = \text{zero}$
4	L	H	L	L	$F = \bar{A}B$	$F = A \text{ plus } \bar{A}B$	$F = A \text{ plus } \bar{A}B \text{ plus } 1$
5	L	H	L	H	$F = \bar{B}$	$F = (A + B) \text{ plus } \bar{A}B$	$F = (A + B) \text{ plus } \bar{A}B \text{ plus } 1$
<u>2/</u> 6	L	H	H	L	$F = A \oplus B$	$F = A \text{ minus } B \text{ minus } 1$	$F = A \text{ minus } B$
7	L	H	H	H	$F = \bar{A}B$	$F = \bar{A}B \text{ minus } 1$	$F = \bar{A}B$

FIGURE 2. Truth tables and logic equations for device type 01.

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Selection $S_3 S_2 S_1 S_0$	Active high data <u>3/</u>			
	M = H logic functions	M = L; arithmetic operations		
		$\bar{C}_n = 0$ $C_n = 1 = H$	$\bar{C}_n = 1$ $C_n = 0 = L$	
8	H L L L	$F = \bar{A} + B$	F = A plus AB	F = A plus AB plus 1
9	H L L H	$F = \overline{A \oplus B}$	F = A plus B	F = A plus B plus 1
10	H L H L	F = B	F = (A + \bar{B}) plus AB	F = (A + \bar{B}) plus AB plus 1
11	H L H H	F = AB	F = AB minus 1	F = AB
12	H H L L	F = 1	F = A plus A <u>1/</u>	F = A plus A plus 1
13	H H L H	$F = A + \bar{B}$	F = (A + B) plus A	F = (A + B) plus A plus 1
14	H H H L	F = A + B	F = (A + \bar{B}) plus A	F = (A + \bar{B}) plus A plus 1
15	H H H H	F = A	F = A minus 1	F = A

1/ Each bit is shifted to the next more significant position.

2/ This device (ALU) can be used as a comparator when placed in the subtract mode (i.e., $S_3S_2S_1S_0$ are at logical levels LHHL, respectively) and the following expressions are valid:

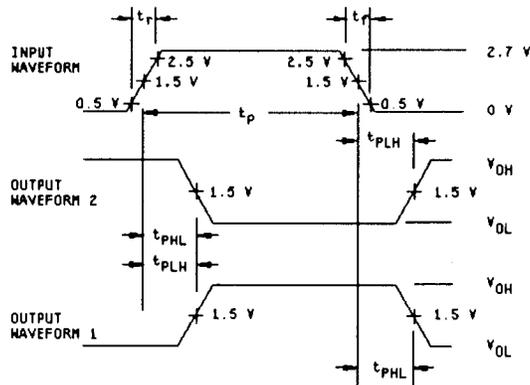
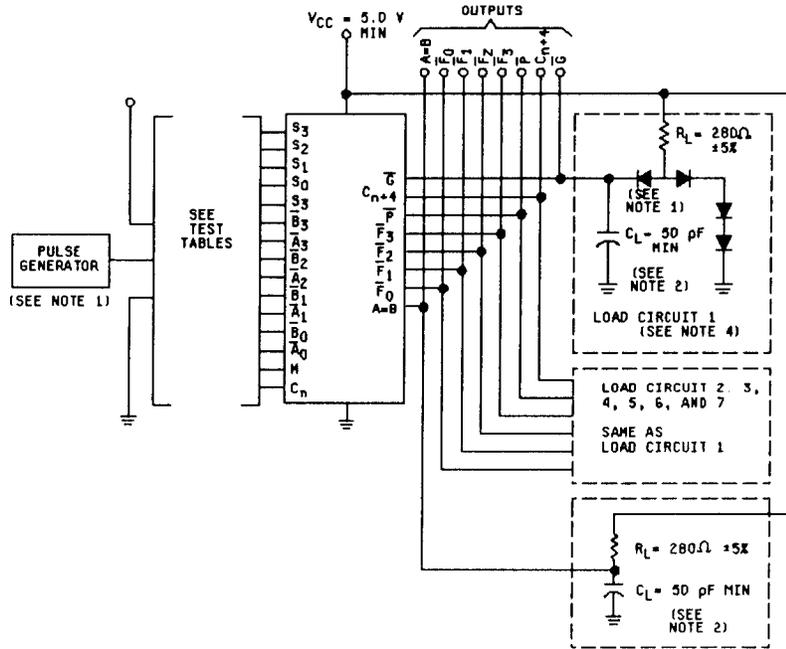
Active high data

- When C_n is high and C_{n+4} is high, then $A \leq B$
- When C_n is low and C_{n+4} is high, then $A < B$
- When C_n is high and C_{n+4} is low, then $A > B$
- When C_n is low and C_{n+4} is low, then $A \geq B$

3/ The table shown applies for positive logic. If negative logic is used, active high data becomes active low data.

FIGURE 2. Truth tables and logic equations for device type 01 - Continued.

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NOTES:

1. The input pulse has the following characteristics:
 $PRR \leq 1 \text{ MHz}$, $t_r = t_f \leq 2.5 \text{ ns}$. $Z_{OUT} \approx 50\Omega$.
2. C_L includes probe and jig capacitance.
3. All diodes are 1N3064 or equivalent.
4. Load circuit is required on a given output only where table III indicates "OUT" on that output. Load circuits may otherwise be omitted.

FIGURE 5. Waveforms for propagation delay time and test circuit for device type 01 - Continued.

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SUM MODE TEST TABLE

FUNCTION INPUTS: $S_0 = S_3 = 2.7 \text{ V}$, $S_1 = S_2 = M = 0 \text{ V}$

Test	Input under test	Other input same bit		Other data inputs		Output under test	Output waveform
		Apply 2.7 V	Apply GND	Apply 2.7 V	Apply GND		
t_{PLH1}	\bar{A}_i	\bar{B}_i	None	Remaining A and B	C_n	Any \bar{F}_i	1
t_{PHL1}	1/						
t_{PLH1}	\bar{B}_i	\bar{A}_i	None	Remaining A and B	C_n	Any \bar{F}_i	1
t_{PHL1}							
t_{PLH3}	\bar{A}_i	\bar{B}_i	None	None	Remaining A and B C_n	\bar{P}	1
t_{PHL3}							
t_{PLH3}	\bar{B}_i	\bar{A}_i	None	None	Remaining A and B C_n	\bar{P}	1
t_{PHL3}							
t_{PLH5}	\bar{A}_i	None	\bar{B}_i	Remaining B	Remaining A, C_n	\bar{G}	1
t_{PHL5}							

1/ In A_i , B_i , and F_i , $i = 0, 1, 2$, or 3 .

FIGURE 5. Waveforms for propagation delay time and test circuit for device type 01 - Continued.

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FUNCTION INPUTS: $S_0 = S_3 = 2.7 \text{ V}$, $S_1 = S_2 = M = 0 \text{ V}$

Test	Input under test	Other input same bit		Other data inputs		Output under test	Output waveform
		Apply 2.7 V	Apply GND	Apply 2.7 V	Apply GND		
t_{PLH5}	\bar{B}_i	None	\bar{A}_i	Remaining B	Remaining A, C_n	\bar{G}	1
t_{PHL5}							
t_{PLH7}	C_n	None	None	All \bar{A}	All \bar{B}	Any \bar{F}_i	1
t_{PHL7}							
t_{PLH9}	C_n	None	None	All \bar{A}	All \bar{B}	C_{n+4}	1
t_{PHL9}							
t_{PLH11}	\bar{A}_i	None	\bar{B}_i	Remaining B	Remaining A and C_n	C_{n+4}	2
t_{PHL11}							
t_{PLH11}	\bar{B}_i	None	\bar{A}_i	Remaining B	Remaining A and C_n	C_{n+4}	2
t_{PHL11}							

1/ In A_i , B_i , and F_i , $i = 0, 1, 2$, or 3 .

FIGURE 5. Waveforms for propagation delay time and test circuit for device type 01 - Continued.