

INCH-POUND

MIL-M-38510/77A
AMENDMENT 5
1 December 1992
SUPERSEDING
AMENDMENT 4
5 November 1987

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR, SCHOTTKY TTL,
DECODERS, MONOLITHIC SILICON

This amendment forms a part of MIL-M-38510/77A, dated
20 August 1984, and is approved for use by all
Departments and Agencies of the Department of Defense.

PAGE 1

Title: Delete and substitute as printed above.

1.2.3, add the following new case outlines:

- "2 C-2(20-terminal, .350" x .350") square chip carrier package.
- X C-2A(20-terminal, .350" x .350") square chip carrier package."

1.3, thermal resistance, junction-to-case (θ_{JC}), delete in its entirety and substitute the following:

"Thermal resistance, junction-to-case (θ_{JC})
Cases E, F, X, and 2 - - - - - (See MIL-M-38510, appendix C)."

PAGE 2

3.2.4, delete and substitute:

"3.2.4 Schematic circuits. Schematic circuits shall be submitted to the preparing activity prior to inclusion of a manufacturer's device in the specification and shall be submitted to the qualifying activity and agent activity (DESC-ECS) as a prerequisite for qualification. All qualified manufacturers' schematics shall be maintained by the agent activity and will be available upon request."

PAGE 3

* TABLE I, low level input current, all inputs, I_{IL} , minimum limits column: Delete "-1.0" and substitute "-0.75".

TABLE I, short-circuit output current, I_{OS} , maximum limits column: Delete "-100" and substitute "-110".

The attached insertable replacement pages listed below are replacements for stipulated pages. When the new pages have been entered in the document, insert the amendment as the cover sheet to the specification.

<u>Replacement page</u>	<u>Page replaced</u>
7	7
8	8
13	Reprinted without change
14	14

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PAGE 5

TABLE II, interim electrical parameters: Delete "(pre burn-in)".

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

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

3.7 and 3.8: Delete and substitute "3.6" and "3.7", respectively.

* 4.2a(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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* 4.4.3b(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, terminal designations, delete and substitute as follows:

Cases																
2, X <u>4</u> /	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20
E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	A	B	C	G2A	G2B	G1	Y7	GND	Y6	Y5	Y4	Y3	Y2	Y1	Y0	V _{CC}

* TABLE III, I_{IL}, test numbers 23 through 28, minimum limits column: Add "5".

TABLE III, test number 41, maximum limits column: Add "3".

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TABLE III, terminal designations, delete and substitute as follows:

Cases																
2, X <u>4</u> /	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20
E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	A	B	C	G2A	G2B	G1	Y7	GND	Y6	Y5	Y4	Y3	Y2	Y1	Y0	V _{CC}

TABLE III, terminal designations, delete and substitute as follows:

Cases																
2, X <u>4/</u>	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20
E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	A	B	C	G2A	G2B	G1	Y7	GND	Y6	Y5	Y4	Y3	Y2	Y1	Y0	V _{CC}

TABLE III, terminal designations, delete and substitute as follows:

Cases																
2, X <u>4/</u>	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20
E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	A	B	C	G2A	G2B	G1	Y7	GND	Y6	Y5	Y4	Y3	Y2	Y1	Y0	V _{CC}

TABLE III, footnote 1/: Delete "A = 2.8 volts" and substitute "A = 2.4 volts".

TABLE III, footnote 2/: Delete "H > 1.5 V" and "L < 1.5 V" and substitute "H ≥ 1.5 V" and "L ≤ 1.5 V".

TABLE III, following footnote 2/, add footnotes 3/ and 4/ as follows:

3/ For circuit B, I_{OS} (max) = -110 mA.

4/ Cases 2 and X pins not designated are NC."

* TABLE III, add footnote 5/ at end of table as follows:

5/ For circuit B, I_{IL} (min) = -0.75 mA."

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.

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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 5962-1318)

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- c. Requirements for certificate of compliance, if applicable.
- d. Requirements for notification of change of product or process to the contracting activity in addition to notification to the qualifying activity, if applicable.
- e. Requirements for failure analysis (including required test condition of method 5003 MIL-STD-883), corrective action and reporting of results, if applicable.
- f. Requirements for product assurance options.
- g. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
- h. Requirements for "JAN" marking.

6.3 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-M-38510, MIL-STD-1331, and as follows:

GND - - - - - Ground zero voltage potential.
V_{IN} - - - - - Voltage level at an input terminal.
V_{IC} - - - - - Input clamp voltage.
I_{IN} - - - - - Current flowing into an input terminal.

6.4 Logistic support. Lead materials and finishes (see 3.3), are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2), lead material and finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

6.5 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information shall not be deemed as permitting substitution of generic-industry types of MIL-M-38510 types or as a waiver of any of the provisions of MIL-M-38510.

<u>Military device types</u>	<u>Generic-industry types</u>
01	54S138
02	54S139

6.6 Manufacturers' designators. Manufacturers' circuits which form a part of this specification are designated with an "X" as shown in table IV herein.

TABLE IV. Manufacturers' designation.

Device type	Circuits			
	A	C	E	B
	Texas Instruments	National Semiconductor	Fairchild Semiconductor	Signetics
01	X	X	X	X
02		X	X	

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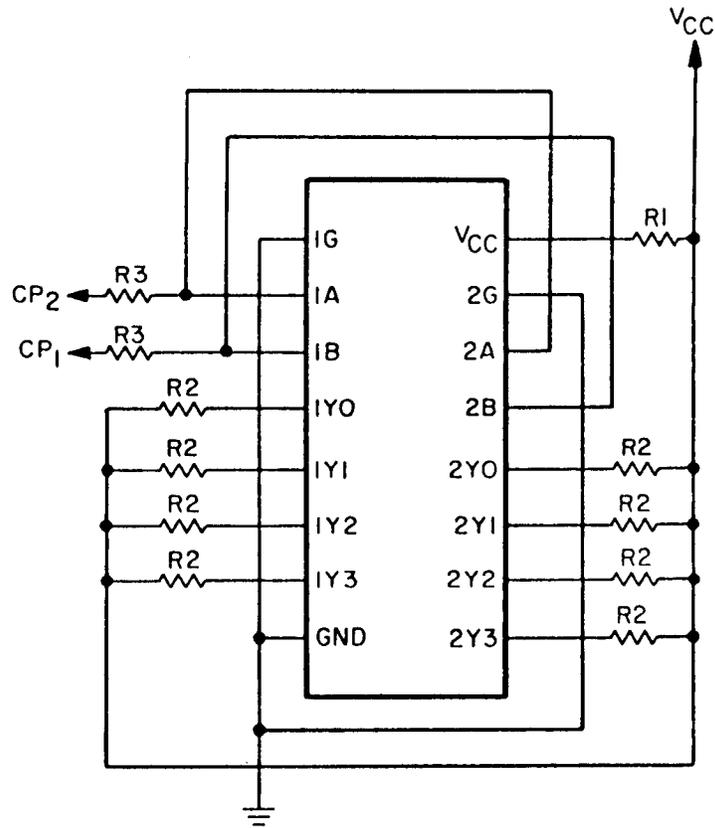
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Pin number		Pin name		
Cases		Device type 01		Device type 02
E and F	2	E and F	2	E and F
1	1	A	NC	1G
2	2	B	A	1A
3	3	C	B	1B
4	4	G2A	C	1Y0
5	5	G2B	G2A	1Y1
6	6	G1	NC	1Y2
7	7	Y7	G2B	1Y3
8	8	GND	G1	GND
9	9	Y6	Y7	2Y3
10	10	Y5	GND	2Y2
11	11	Y4	NC	2Y1
12	12	Y3	Y6	2Y0
13	13	Y2	Y5	2B
14	14	Y1	Y4	2A
15	15	Y0	Y3	2G
16	16	V _{CC}	NC	V _{CC}
	17		Y2	
	18		Y1	
	19		Y0	
	20		V _{CC}	

FIGURE 1. Terminal connections.

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Device type 02



NOTES:

1. $R1 = 10\Omega$ maximum; $R2 = 270\Omega \pm 5\%$; $R3 = 27\Omega$ maximum.
2. V_{CC} shall be high enough to insure that 5.0 V minimum is present at V_{CC} device terminal.
3. Timing waveform as follows:
 CP_1 duty cycle = 50% $\pm 15\%$;
 $V_{IL} = -0.5$ V minimum to 0.8 V maximum; $V_{IH} = 2.0$ V minimum to 5.5 V maximum.

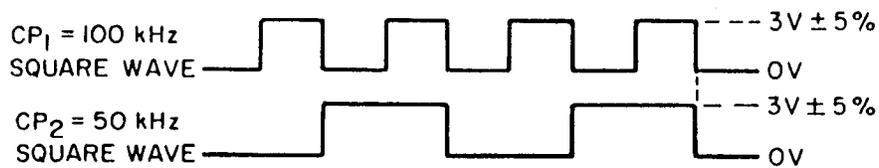
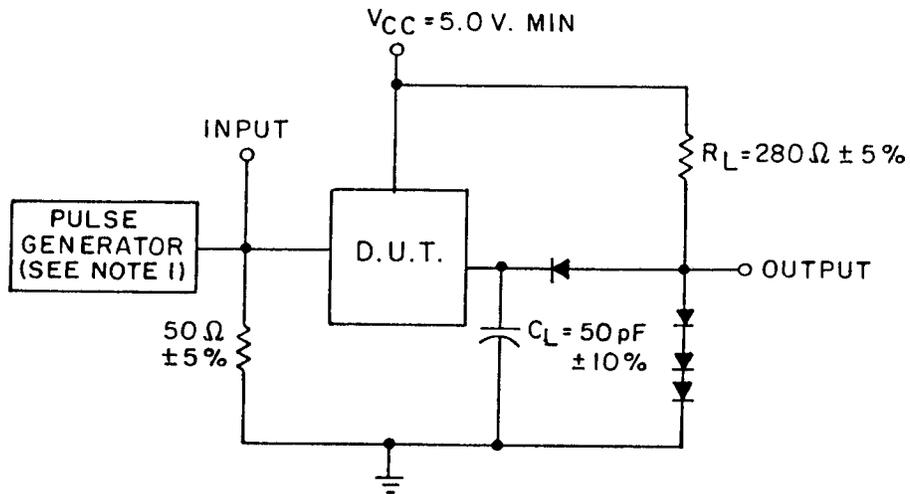
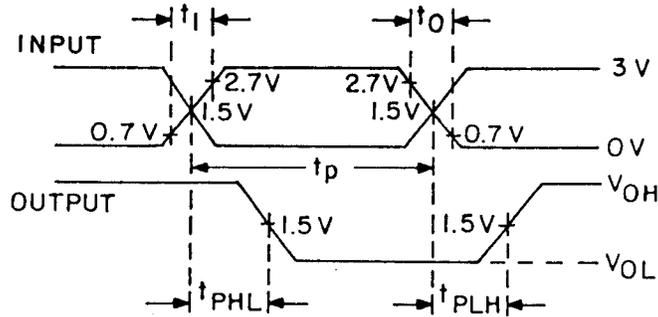


FIGURE 4. Burn-in and life test circuits - Continued.



TEST CIRCUIT



NOTES:

1. Pulse generator has the following characteristics:
 $t_1 = t_0 < 2.5 \text{ ns}$, $t_p = 60 - 200 \text{ ns}$, $Z_{\text{OUT}} \approx 50 \Omega$.
2. $C_L = 50 \text{ pF} \pm 10\%$, including scope probe, wiring, and stray capacitance, without package in test fixture.
3. Voltage measurements are to be made with respect to network ground terminal.
4. All diodes are 1N3064, or equivalent.

FIGURE 5. Switching time test circuit and waveforms for device types 01 and 02.