

MIL-M-38510/52D
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SUPERSEDING
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MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, CMOS, NOR GATES,
MONOLITHIC SILICON, POSITIVE LOGIC

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, CMOS, NOR gate logic microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided and are reflected in the complete part number.

1.2 Part number. The part number shall be in accordance with MIL-M-38510.

1.2.1 Device type. The device type shall be as follows:

<u>Device type</u>	<u>Circuit</u>
01	Dual 3-input NOR gate (plus inverter)
02	Quad 2-input NOR gate
03	Dual 4-input NOR gate
04	Triple 3-input NOR gate
51	Dual 3-input NOR gate (plus inverter)
52	Quad 2-input NOR gate
53	Dual 4-input NOR gate
54	Triple 3-input NOR gate

1.2.2 Device class. The device class shall be the product assurance level as defined in MIL-M-38510.

1.2.3 Case outline. The case outline shall be designated as follows:

<u>Outline letter</u>	<u>Case outline (see MIL-M-38510, appendix C)</u>
A	F-1 (14-lead, 1/4" x 1/4"), flat package
C	D-1 (14-lead, 1/4" x 3/4"), dual-in-line package
D	F-2 (14-lead, 1/4" x 3/8"), flat package
X	F-1 (14-lead, 1/4" x 1/4"), flat package, except A dimension = 0.1" (2.54 mm) max.
Y	F-2 (14-lead, 1/4" x 3/8"), flat package, except A dimension = 0.1" (2.54 mm) max.

NOTES:

1. As an exception to nickel plate or undercoating paragraph of MIL-M-38510, for case outlines X and Y only, the leads of bottom brazed ceramic packages (i.e., configuration 2 of case outlines F-1 or F-2) may have electroless nickel undercoating which shall be 50 to 200 microinches (1.27 to 5.08 μ m) thick provided the lead finish is hot solder dip (i.e., finish letter A) and provided that, after any lead forming, an additional hot solder dip coating is applied which shall extend from the outer tip of the lead to no more than 0.015 inch (0.38 mm) from the package edge.
2. For bottom or side brazed packages, case outlines X and Y only, the S₁ dimension may go to .000 inch (.00 mm) minimum.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: George C. Marshall Space Flight Center, ATTN: EG02, Marshall Space Flight Center, Alabama 35812 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

1.3 Absolute maximum ratings.

Supply voltage range ($V_{PP}-V_{SS}$):	
Device types 01, 02, 03, and 04 - - - - -	-0.5 V dc to +15.5 V dc
Device types 51, 52, 53, and 54 - - - - -	-0.5 V dc to +18.0 V dc
Input current (each input) - - - - -	*10 mA
Input voltage range - - - - -	($V_{SS}-0.5$ V dc) $\leq V_I \leq (V_{DD}+0.5$ V dc)
Storage temperature range - - - - -	-65°C to +175°C
Maximum power dissipation (P_D) - - - - -	200 mW
Lead temperature (soldering, 10 seconds) - - - - -	+300°C
Thermal resistance, junction-to-case - - - - -	(See MIL-M-38510, appendix C)
Junction temperature (T_J) - - - - -	+175°C

1.4 Recommended operating conditions.

Supply voltage range ($V_{PP}-V_{SS}$):	
Device types 01, 02, 03, and 04 - - - - -	4.5 V dc to 12.5 V dc
Device types 51, 52, 53, and 54 - - - - -	4.5 V dc to 15 V dc
Input low voltage range (V_{IL}):	
Device types 01, 02, 03, and 04 - - - - -	0 to 0.85 V dc @ $V_{DD} = 5$ V dc; 0 to 2.0 V dc @ $V_{DD} = 10$ V dc; 0 to 2.1 V dc @ $V_{DD} = 12.5$ V dc;
Device types 51, 52, 53, and 54 - - - - -	0 to 1.5 V dc @ $V_{DD} = 5$ V dc; $V_{OL} = 10\% V_{DD}$; $V_{OH} = 90\% V_{DD}$; 0 to 2.0 V dc @ $V_{DD} = 10$ V dc; 0 to 4.0 V dc @ $V_{DD} = 15$ V dc
Input high voltage range (V_{IH}):	
Device types 01, 02, 03, and 04 - - - - -	3.95 to 5.0 V dc @ $V_{DD} = 5$ V dc; 8 to 10 V dc @ $V_{DD} = 10$ V dc; 10.0 to 12.5 V dc @ $V_{DD} = 12.5$ V dc;
Device types 51, 52, 53, and 54 - - - - -	3.5 to 5.0 V dc @ $V_{DD} = 5$ V dc; $V_{OL} = 10\% V_{DD}$; $V_{OH} = 90\% V_{DD}$; 8 to 10.0 V dc @ $V_{DD} = 10$ V dc; 11.0 to 15.0 V dc @ $V_{DD} = 15$ V dc
Ambient operating temperature range (T_A) - - - - -	-55°C to +125°C
Load capacitance - - - - -	50 pF maximum

2. APPLICABLE DOCUMENTS

2.1 Government specifications and standards. Unless otherwise specified, the following specifications and standards, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATION**MILITARY**

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD**MILITARY**

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Detail specification. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein. Although eutectic die bonding is preferred, epoxy die bonding may be performed. However, the resin used shall be Dupont 5504 Conductive Silver Paste, or equivalent, which is cured at $200^{\circ}\text{C} + 10^{\circ}\text{C}$ for a minimum of 2 hours. The use of equivalent epoxies or cure cycles shall be approved by the qualifying activity. Equivalency shall be demonstrated in data submitted to the qualifying activity for verification.

3.2.1 Logic diagram and terminal connections. The logic diagram and terminal connections shall be as specified on figure 1.

3.2.2 Truth tables and logic equations. The truth tables and logic equations shall be as specified on figure 2.

3.2.3 Schematic circuits. The schematic circuits shall be submitted to the preparing activity prior to inclusion of a manufacturer's device in this specification and shall be submitted to the qualifying activity as a prerequisite for qualification. All qualified manufacturers' schematics shall be maintained and available upon request.

3.2.4 Case outlines. The case outlines shall be as specified in 1.2.3.

3.3 Lead material and finish. The lead material and finish shall be in accordance with MIL-M-38510 and 6.4 herein.

3.4 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I, and apply over the full recommended ambient operating temperature range.

3.5 Electrical test requirements. The electrical test requirements for each device class shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table III.

3.6 Marking. Marking shall be in accordance with MIL-M-38510.

3.6.1. Total dose radiation hardness identifier. Total dose radiation hardness identifier shall be in accordance with MIL-M-38510 and 4.5.5 herein.

3.6.2 Serialization. All class S devices shall be serialized in accordance with MIL-M-38510.

3.6.3 Correctness of indexing and marking. All devices shall be subjected to the final electrical tests specified in table II after part number marking to verify that they are correctly indexed and identified by part number. Optionally, an approved electrical test may be devised especially for this requirement.

3.7 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 36 (see MIL-M-38510, appendix E).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and methods 5005 and 5007, as applicable, of MIL-STD-883, except as modified herein.

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

a. Delete the sequence specified in 3.1.9 through 3.1.13 of method 5004 and substitute lines 1 through 7 of table II herein.

b. Burn-in (method 1015 of MIL-STD-883).

(1) Static tests (test condition A) using circuit shown on figure 3, or equivalent. Ambient temperature shall be 125°C minimum. Test duration for each static test shall be 24 hours minimum for class S devices and in accordance with table I of method 1015 for class B devices.

- (2) Dynamic test (test condition D) using circuit shown on figure 4, or equivalent. Ambient temperature shall be 125°C minimum. Test duration shall be in accordance with table I of method 1015.
- c. Interim and final electrical parameters shall be as specified in table II herein.
- d. For class S devices, post dynamic burn-in, or class B devices, post static burn-in, electrical parameter measurements may, at the manufacturer's option, be performed separately or included in the final electrical parameter requirements.

4.2.1 Percent defective allowable (PDA).

- a. The PDA for class S devices shall be 5 percent for static burn-in and 5 percent for dynamic burn-in, based on the exact number of devices submitted to each separate burn-in.
- b. Static burn-in I and II failures shall be cumulative for determining PDA.
- c. The PDA for class B devices shall be in accordance with MIL-M-38510 for static burn-in. Dynamic burn-in is not required.
- d. Those devices whose measured characteristics, after burn-in, exceed the specified delta limits or electrical parameter limits specified in table III, subgroup 1, are defective and shall be removed from the lot. The verified failures divided by the total number of devices in the lot initially submitted to burn-in shall be used to determine the percent defective for the lot and the lot shall be accepted or rejected based on the specified PDA.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.3.1 Qualification extension. When authorized by the qualifying activity, if a manufacturer qualifies to a 51-54 device type which is manufactured identically to a 01-04 device type on this specification, then the 01-04 device type may be part I qualified by conducting only group A electrical tests and any electrical tests specified as additional group C subgroups and by submitting data in accordance with MIL-M-38510, appendix D (i.e. groups A, B, C, D, and E tests are not required).

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510 and as specified herein. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table I of method 5005 of MIL-STD-883 and as follows:

- a. Tests shall be performed in accordance with table II herein.
- b. Subgroups 5, 6, 7, and 8 of table I of method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 4 (C_i measurement) shall be measured only for initial qualification and after process or design changes which may affect input capacitance. Capacitance shall be measured between the designated terminal and V_{SS} at a frequency of 1 MHz.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II of method 5005 of MIL-STD-883 and as follows:

- a. Class S steady state life (accelerated) test circuits shall be submitted to the qualifying activity for approval. When the alternate steady state life test is used, the circuit on figure 4, or equivalent, shall be used.

Text continues on page 52.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $V_{SS} = 0 \text{ V}$ $-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ unless otherwise specified	Device	Limits		Units
				Min	Max	
Positive clamping Input to V_{DD}	$V_{IC(\text{pos})}$	$T_A = 25^\circ\text{C}$ $V_{DD} = \text{GND}$, $V_{SS} = \text{Open}$, Output = Open $I_I = 1 \text{ mA}$	All		1.5	Vdc
Negative clamping Input to V_{SS}	$V_{IC(\text{neg})}$	$T_A = 25^\circ\text{C}$ $V_{DD} = \text{Open}$, $V_{SS} = \text{GND}$, Output = Open $I_I = -1 \text{ mA}$			-6	Vdc
Quiescent supply current	I_{SS}	Any combination of Inputs	$V_{DD} = 15 \text{ Vdc}$ $V_{DD} = 18 \text{ Vdc}$	01, 02 03, 04 51, 52 53, 54	-750	nA
High level output voltage	V_{OH1}	$V_{DD} = 4.5 \text{ Vdc}$, $I_{OH} = .1 \text{ mA}$ All inputs = V_{IL} (see table III notes)	01, 02 03, 04	2.5		Vdc
	V_{OH2}	$V_{DD} = 5 \text{ Vdc}$, $I_{OH} = .13 \text{ mA}$ All inputs = V_{IL} (see table III notes)	01, 02 03, 04	4.2		Vdc
	V_{OH3}	$V_{DD} = 5 \text{ Vdc}$, $I_{OH} = 0$ All inputs = V_{IL} (see table III notes)	01, 02 03, 04	4.95		Vdc
	V_{OH4}	$V_{DD} = 12.5 \text{ Vdc}$, $I_{OH} = 0$ All inputs = V_{IL} (see table III notes)	01, 02 03, 04	11.25		Vdc
	V_{OH5}	$V_{DD} = 15 \text{ Vdc}$, $I_{OH} = 0$ All inputs = GND	51, 52 53, 54	14.95		Vdc
Low level output voltage	V_{OL1}	$V_{DD} = 5.5 \text{ Vdc}$, $I_{OL} = .23 \text{ mA}$ Any one input = V_{IH} (see table III notes)	01, 02 03, 04		0.5	Vdc
	V_{OL2}	$V_{DD} = 5 \text{ Vdc}$, $I_{OL} = .28 \text{ mA}$ Any one input = V_{IH} (see table III notes)	01, 02 03, 04		0.7	Vdc
	V_{OL3}	$V_{DD} = 5 \text{ Vdc}$, $I_{OL} = 0$ Any one input = V_{IH} (see table III notes)	01, 02 03, 04		50	mV
	V_{OL4}	$V_{DD} = 12.5 \text{ Vdc}$, $I_{OL} = 0$ Any one input = V_{IH} (see table III notes)	01, 02 03, 04		1.25	Vdc
	V_{OL5}	$V_{DD} = 5 \text{ Vdc}$, $I_{OL} = .56 \text{ mA}$ All inputs = V_{IH} (see table III notes and 4.4.1c.)	01, 02 03, 04		0.5	Vdc
	V_{OL6}	$V_{DD} = 15 \text{ Vdc}$ $I_{OL} = 0$ Input = 15 V	51, 52 53, 54		0.05	Vdc
Input high voltage	V_{IH1}	$V_{DD} = 5 \text{ Vdc}$ Any one input = 3.5 Vdc. All other inputs = 1.5 Vdc $ V_o = 0.5 \text{ V}$ $ I_o \leq 1 \mu\text{A}$	51, 52 53, 54	3.5		Vdc
	V_{IH2}	$V_{DD} = 10 \text{ Vdc}$ Any one input = 7.0 V. All other inputs = 3.0 V $V_o = 1.0 \text{ V}$ $ I_o \leq 1 \mu\text{A}$	51, 52 53, 54	7.0		Vdc
	V_{IH3}	$V_{DD} = 15 \text{ Vdc}$ Any one input = 11 V. All other inputs = 4.0 V $ I_o \leq 1 \mu\text{A}$	51, 52 53, 54	11.0		Vdc

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $V_{SS} = 0 \text{ V}$ $-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ unless otherwise specified	Device	Limits		Units	
				Min	Max		
Input low voltage	V_{IL1}	$V_{DD} = 5 \text{ Vdc}$ All inputs = 1.5 Vdc $V_O = 4.5 \text{ V} I_O \leq 1 \mu\text{A}$	51, 52 53, 54		1.5	Vdc	
	V_{IL2}	$V_{DD} = 10 \text{ Vdc}$ All inputs = 3.0 Vdc $V_O = 9.0 \text{ V} I_O \leq 1 \mu\text{A}$	51, 52 53, 54		3.0	Vdc	
	V_{IL3}	$V_{DD} = 15 \text{ Vdc}$ All inputs = 4.0 Vdc $V_O = 13.5 \text{ V} I_O \leq 1 \mu\text{A}$	51, 52 53, 54		4.0	Vdc	
Output low (sink) current	I_{OL1}	$V_{DD} = 5 \text{ Vdc}$ $V_{IN} = 5 \text{ Vdc}$ $V_{OL} = 0.4 \text{ Vdc}$	51, 52 53, 54	0.36		mAdc	
	I_{OL2}	$V_{DD} = 15 \text{ Vdc}$ $V_{IN} = 15 \text{ Vd}$ $V_{OL} = 1.5 \text{ Vdc}$	51, 52 53, 54	2.4		mAdc	
Output high (source) current	I_{OH1}	$V_{DD} = 5 \text{ Vdc}$ All inputs = GND $V_{OH} = 4.6 \text{ V}$	51, 52 53, 54	-0.36		mAdc	
	I_{OH2}	$V_{DD} = 15 \text{ Vdc}$ All inputs = GND $V_{OH} = 13.5 \text{ Vdc}$	51, 52 53, 54	-2.4	-	mAdc	
Input leakage current ^{1/}	I_{IH}	Measure inputs sequentially	$V_{DD} = 15 \text{ Vdc}$	01, 02 03, 04		45	nA
			$V_{DD} = 18 \text{ Vdc}$	51, 52 53, 54			
	I_{II}	Measure inputs sequentially	$V_{DD} = 15 \text{ Vdc}$	01, 02 03, 04		-45	nA
			$V_{DD} = 18 \text{ Vdc}$	51, 52 53, 54			
Input test voltage	V_{ZAP}	$(C_1 = 100 \text{ pF} R_Z = 1.5 \text{ k}\Omega$ (see 4.5.3)	All	400			V
Input capacitance	C_I	$V_{DD} = 0 \text{ Vdc}, f = 1 \text{ MHz}$ $T_A = 25^\circ\text{C}$	All		12		pF
Propagation delay times High to low level	t_{PHL}	$V_{DD} = 5 \text{ Vdc}, CL = 50 \text{ pF}$ see figure 5	All	11	315		ns
	t_{PLH}		01, 51	14	415		
			02, 03, 04 52, 53, 54		315		ns
Transition times High to low level	t_{THL}	$V_{DD} = 5 \text{ Vdc}, CL = 50 \text{ pF}$ see figure 5	All	15	450		ns
	t_{TLH}		01, 51	23	675		
			02, 03, 04 52, 53, 54	21	615		

^{1/} input current of one input node.

TABLE II. Burn-in and electrical test requirements.

Line no.	Applicable tests and MIL-STD-883 test methods	Class S devices 1/				Class B devices 1/			
		Ref. par.	Table 2/ III sub-groups	Table 3/ IV delta limits	Test circuit figure	Ref. par.	Table 2/ III sub-groups	Table 3/ IV delta limits	Test circuit figure
1	Interim electrical parameters (method 5004)		1				1		
2	Static burn-in I (method 1015)	4.2b 4.5.2			3				
3	Same as line 1		1	Δ					
4	Static burn-in II (method 1015)	4.2b 4.5.2			3	4.2b 4.5.2	4/		3
5	Same as line 1	4.2.d	1*	Δ		4.2d	1*		Δ
6	Dynamic burn-in (method 1015)	4.2b 4.5.2			4				
7	Same as line 1	4.2	1*	Δ					
8	Final electrical parameters (method 5004)		1*,2,3,9				1*,2,3,9		
9	Group A end-point electrical parameters (method 5005)	4.4.1	1,2,3,4, 9,10,11			4.4.1	1,2,3, 4,9		
10	Group B end-point parameters (method 5005)	4.4.2	1,2,3,9, 10,11	Δ					
11	Group C end-point electrical parameters (method 5005)					4.4.3c	1,2,3		Δ
12	Additional group C tests, (method 5005)					4.4.3	10,11		
13	Group D end-point electrical parameters (method 5005)	4.4.4	1,2,3			4.4.4	1,2,3		

1/ Blank spaces indicate tests are not applicable.

2/ (*) indicated PDA applied to subgroup 1 (see 4.2.1).

3/ (Δ) indicates delta limit shall be required in table III subgroup 1, where specified, and delta values shall be computed with reference to the previous interim electrical parameters.

4/ The device manufacturer may at his option either perform delta measurements or within 24 hours after burn-in (or removal of bias), perform the final electrical parameter measurements.

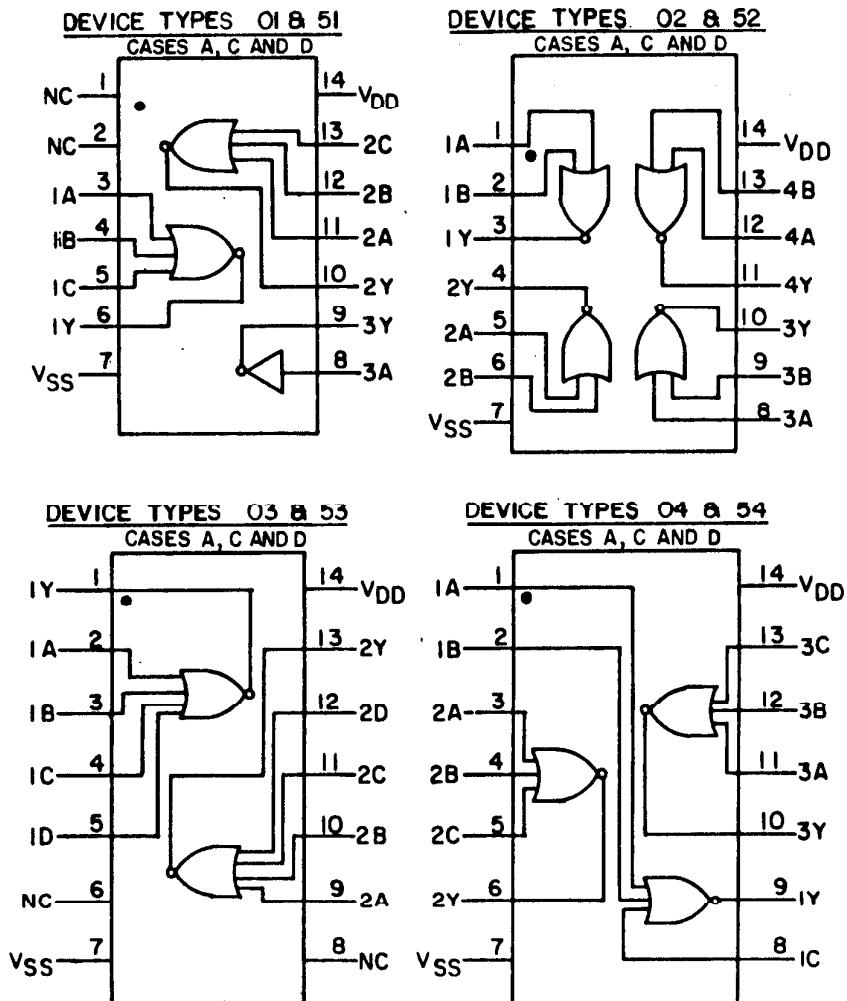


FIGURE 1. Logic diagrams and terminal connections.

Device types 01, 04, 51, and 54

Truth table each gate			
Input		Output	
A	B	C	Y
L	L	L	H
H	L	L	L
L	H	L	L
H	H	L	L
L	L	H	L
H	L	H	L
L	H	H	L
H	H	H	L

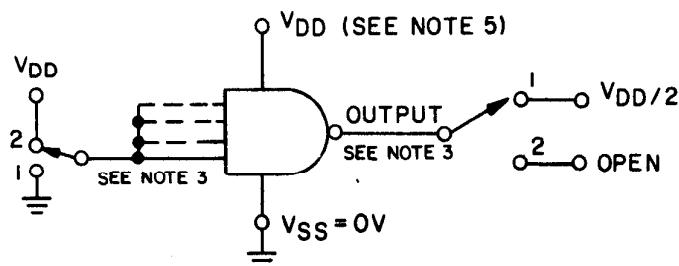
Positive logic $Y = \overline{A+B+C}$
 (01 Inverter $3Y = \overline{3A}$)

Device types 03 and 53

Truth table each gate				
Input				Output
A	B	C	D	Y
L	L	L	L	H
H	L	L	L	L
L	H	L	L	L
H	H	L	L	L
L	L	H	L	L
H	L	H	L	L
L	H	H	L	L
H	H	H	L	L
L	L	L	H	L
H	L	L	H	L
L	H	L	H	L
H	H	L	H	L
L	L	H	H	L
H	L	H	H	L
L	H	H	H	L
H	H	H	H	L

Positive logic $Y = \overline{A+B+C+D}$

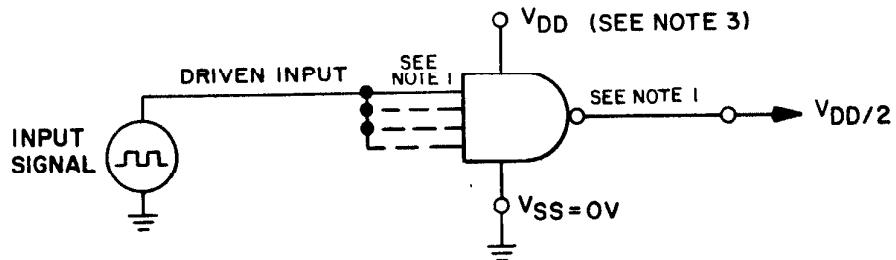
FIGURE 2. Truth tables and logic equations.



NOTES:

1. For static burn-in I, all inputs are connected to 0 volts, switch position 1.
2. For static burn-in II, all inputs are connected to V_{DD} , switch position 2.
3. Except for V_{DD} and V_{SS} , each terminal shall be connected through a resistor whose value is 2 k Ω or 47 k Ω . The actual measured value of the resistor selected shall not exceed $\pm 20\%$ of its branded value due to use, heat or age.
4. Output may be in switch position 1 or 2.
5. $V_{DD} = 12.5$ V minimum, 15.0 V maximum for device types 01, 02, 03, and 04.
 $V_{DD} = 15.0$ V minimum, 18.0 V maximum for device types 51, 52, 53, and 54.
 $V_{DD}/2 = V_{DD}/2 \pm 1.0$ V for all devices.
 $V_{SS} = 0.0$ V.

FIGURE 3. Static burn-in test circuits.

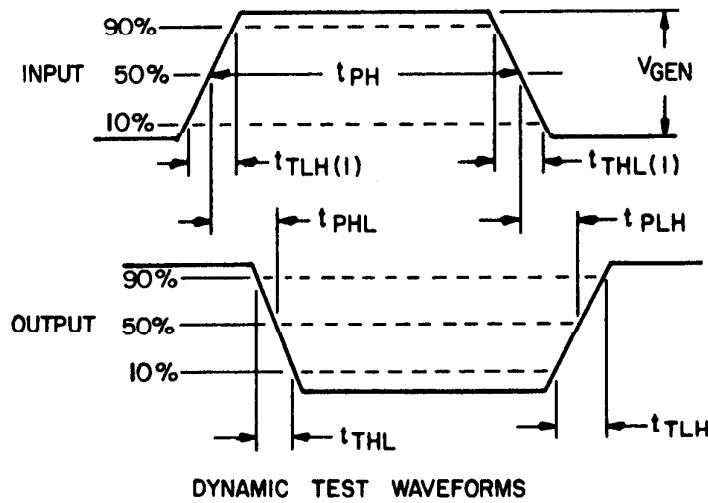
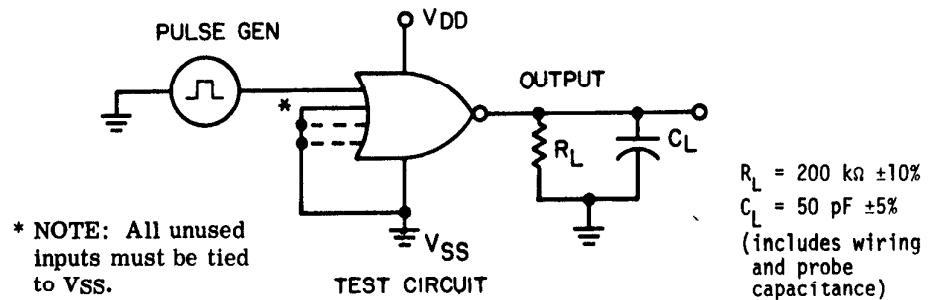


NOTES:

- NOTES:**

 1. Except for V_{DD} and V_{SS} , each terminal shall be connected through a resistor whose value is $2\text{ k}\Omega$ or $47\text{ k}\Omega$. The actual measured value of the resistor selected shall not exceed $\pm 20\%$ of its branded value due to use, heat or age.
 2. Input signal requirements:
 - a. Square wave. 50% duty cycle.
 - b. $25\text{ kHz} < PRR < 1\text{ MHz}$.
 - c. t_{THH} and $t_{THL} < 1\text{ }\mu\text{s}$.
 - d. Voltage level:
Minimum = $V_{SS} - 0.5\text{ V}$, $+10\% V_{DD}$.
Maximum = $V_{DD} + 0.5\text{ V}$, $-10\% V_{DD}$.
 3. $V_{DD} = 12.5\text{ V}$ minimum, 15.0 V maximum for device 01, 02, 03, and 04.
 $V_{DD} = 15\text{ V}$ minimum, 18 V maximum for device 51, 52, 53, and 54.
 $V_{DD}/2 = V_{DD}/2 \pm 1.0\text{ V}$.
 $V_{SS} = 0.0\text{ V}$.

FIGURE 4. Dynamic burn-in and steady state life test circuit.

Input pulse

$$V_{GEN} = V_{DD} \pm 1.0\%$$

$$t_{PH} = 1.0 \pm 0.1 \mu\text{s}$$

$$t_{THL(1)} = t_{TLH(1)} = 10 \pm 2 \text{ ns}$$

$$\text{Pulse repetition period} = 5.0 \pm 1 \mu\text{s}$$

FIGURE 5. Switching time test circuit and waveforms.

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TABLE III. Group A inspection for device type 01.

See notes at end of device type 04.

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TABLE III Group A inspection for device type 01 - Continued.

Symbol	MIL-STD-883 method	Test No.	Cases	TERMINAL CONDITIONS 1												Test limits						
				A	C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup T _A = 25°C T _A = 125°C T _A = -55°C	Subgroup 3
NC	NC	NC	A	1B	IC	V _{SS}	3A	3Y	2Y	2A	2B	2C	V _{DD}	5.5V	1Y	0.40	0.5	0.40	V _{dc}			
V ₀₁₁	3007	31																				
		32																				
		33																				
		34																				
		35																				
		36																				
		37																				
V ₀₁₂		38																				
		39																				
		40																				
		41																				
		42																				
		43																				
		44																				
V ₀₁₃		45																				
		46																				
		47																				
		48																				
		49																				
		50																				
		51																				
V ₀₁₄		52																				
		53																				
		54																				
		55																				
		56																				
		57																				
		58																				
V ₀₁₅		59																				
		60																				

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 01 - Continued.

Symbol	Cases A, C, D X, Y	MIL-STD- 883 method	Test No.	TERMINAL CONDITIONS L												Test limits			
				NC	1A	1B	IC	1Y	V _{SS}	3A	3Y	2Y	2A	2B	V _{DD}	13	14	Subgroup 1 T _A = 25°C I _A = 125°C	Subgroup 2 T _A = 125°C I _A = -35°C
I _H LL	61	3009		GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	15.0 V	All inputs together	7.0	nA	
	62																1A	-1.0	
	63																1B		
	64																1C		
	65																2A		
	66																2B		
	67																2C		
	68																3A		
I _H LL'	69	3010		15.0 V	15.0 V	15.0 V	15.0 V		15.0 V		15.0 V		15.0 V		15.0 V	All inputs together	7.0		
	70																1A		
	71																1B		
	72																1C		
	73																2A		
	74																2B		
	75																2C		
	76																3A		
C ₁	77	3012															Subgroup 4 T _A = 25°C		
	78																1A		
	79																1B		
	80																1C		
	81																2A		
	82																2B		
	83																2C		
																	3A		
																	pF		

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 01 - Continued.

Symbol	MIL-STD-883 method	Cases Test No.	TERMINAL CONDITIONS U												Test limits						
			1A, C, D, X, Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 9 T _A = 25°C T _A = 125°C T _A = -55°C	Subgroup 10 T _A = 25°C T _A = 125°C T _A = -55°C	Units
t _{TH1}	3003 Fig. 5	84																			ns
		85																			
		86																			
		87																			
		88																			
		89																			
		90																			
		91																			
		92																			
		93																			
		94																			
		95																			
		96																			
		97																			
		98																			
		99																			
		100																			
		101																			
		102																			
		103																			
		104																			
		105																			
		106																			
		107																			
		108																			
		109																			
		110																			
		111																			

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 02.

Cases	TERMINAL CONDITIONS 1/														Test limits					
	MIL-STD-883	1	2	3	4	5	6	7	8	9	10	11	12	13	14					
Symbol	V _{ic} (pos)	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	GND	I _A	Subgroup 1 T _A = 25°C	Subgroup 2 T _A = 125°C	Subgroup 3 T _A = -55°C	Units					
Test No.	V _{ic} (pos)	1A	1B	2Y	2A	2B	V _{ss}	3A	3B	3Y	4Y	4A	4B	V _{DD}	Meas terminal	Min	Max	Min	Max	V _{dc}
1	1 mA																			
2		1 mA																		
3			1 mA																	
4				1 mA																
5					1 mA															
6						1 mA														
7							1 mA													
8								1 mA												
9	-1 mA								GND											
10		-1 mA																		
11			-1 mA																	
12				-1 mA																
13					-1 mA															
14						-1 mA														
15							-1 mA													
16								-1 mA												
17	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	V _{SS}	-25.0	-7.50	-7.50	nA
18	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	V _{SS}	-25.0	-7.50	-7.50	nA	
19	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	V _{SS}	-25.0	-7.50	-7.50	nA	
20	3Y	3Y	4Y	4Y	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	1Y	2.5	2.5	2.5	V _{dc}	
21	4.5 V	4.5 V	4.5 V	4.5 V	3Y	3Y	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	2Y					
22					4.5 V	4.5 V	3Y	3Y	4.5 V	3Y										
23						4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	3Y					
24	3Y	3Y	3Y	3Y	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	1Y	4.2	4.2	4.2		
25	5.0 V	5.0 V	5.0 V	5.0 V	3Y	3Y	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	2Y					
26	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	3Y	3Y	5.0 V	3Y										
27	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	3Y					
28	3Y	3Y	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	1Y	4.95	4.95	4.95						
29	5.0 V	5.0 V	5.0 V	5.0 V	3Y	3Y	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	2Y					
30	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	3Y	3Y	5.0 V	3Y										

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TABLE III Group A inspection for device type 02 - Continued

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	TERMINAL CONDITIONS 1/												Test limits								
			1A	2B	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$	Units		
V_{013}	3006	31	5.0 V	5.0 V			5.0 V	5.0 V	GND	5.0 V	5.0 V					3Y	3	5.0 V	4Y	4.95	4.95	Vdc	
V_{014}		32	6V	6V			12.5 V	12.5 V		12.5 V	12.5 V						12.5 V	12.5 V	11.35	11.25			
		33	12.5 V	12.5 V					6V		12.5 V	12.5 V						12.5 V	12.5 V	2Y			
		34	12.5 V	12.5 V						12.5 V	12.5 V							12.5 V	12.5 V	3Y			
		35	12.5 V	12.5 V							12.5 V	12.5 V						6V	6V	4Y			
V_{015}	3007	36	7V	GND	8V				GND	GND							GND	GND	5.5V	1Y	0.50	0.40	
		37	GND	7V	8V				GND	GND									1Y				
		38	GND		8V														2Y				
		39			8V														2Y				
		40																	3Y				
		41																	3Y				
		42																	4Y				
		43																	4Y				
V_{016}		44	7V		15V				GND								GND	5.0 V	1Y	0.70	0.70		
		45	GND	7V	15V				GND										1Y				
		46	GND		15V				GND										2Y				
		47																	2Y				
		48																	3Y				
		49																	3Y				
		50																	4Y				
		51																	4Y				
V_{017}		52	7V	GND					GND	GND	GND						GND		1Y	0.70	0.70		
		53	GND	7V					GND	GND	GND								1Y				
		54		GND															2Y				
		55																	2Y				
		56																	3Y				
		57																	3Y				
		58																	4Y				
		59																	4Y				

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 02 - Continued.

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 02 – Continue.

Symbol	MIL-STD-883 method	Cases A, C, D X, Y Test No.	TERMINAL CONDITIONS 1												Test limits						
			1A	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 T _A = 25°C	Subgroup 2 T _A = 125°C	Subgroup 3 T _A = -55°C	Units
I _{uu}	3010 11/	86 87 88 89	GND GND GND GND	GND GND GND GND	GND GND GND GND	GND GND GND GND	GND GND GND GND	15.0 V 15.0 V 15.0 V 15.0 V	GND GND GND GND	GND GND GND GND	15.0 V 15.0 V 15.0 V 15.0 V	3A 3B 3A 3B	10 1B 2A 2B	45 nA nA nA					nA		
C	3012	90 91 92 93 94 95 96 97	12	12	12	12	12	12	12	12	12	12	12	12	12	12	GND GND GND GND GND GND GND GND	IA IB 2A 2B 3A 3B 4A 4B	IA IB 2A 2B 3A 3B 4A 4B	IA IB 2A 2B 3A 3B 4A 4B	pF
I _{uu}	Fig. 5	98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113	13 13/ GND 13/ GND 13/ GND 13/ GND 13/ GND 13/ GND 13/ GND 13/ GND 13/ GND	14 14/ GND 14/ GND 14/ GND 14/ GND 14/ GND 14/ GND 14/ GND 14/ GND 14/ GND	GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND GND	5.0 V 5.0 V	IA to 1Y IB to 1Y 2A to 2Y 2B to 2Y 3A to 3Y 3B to 3Y 4A to 4Y 4B to 4Y	30 30 2A 2B 3A 3B 4A 4B	2.0 2.0 3.9 3.9 3.5 3.5 15 15	2.0 2.0 3.9 3.9 3.5 3.5 2.0 2.0	Subgroup 9 T _A = 25°C	Subgroup 10 T _A = 125°C	Subgroup 11 T _A = -55°C					

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 02 - Continued.

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 03

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y Test No.	TERMINAL CONDITIONS /												Test limits							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$	Units	
V_{IC} (pos)		1	1 mA													GND	1A	1A				
		2		1 mA													IB					
		3			1 mA												IC					
		4				1 mA											ID					
		5					1 mA										2A					
		6						1 mA									2B					
		7							1 mA								2C					
		8								1 mA							2D					
V_{IC} (neg)		9	-1 mA																			
		10		-1 mA													IA					
		11			-1 mA												IB					
		12				-1 mA											IC					
		13					-1 mA										ID					
		14						-1 mA									2A					
		15							-1 mA								2B					
		16								-1 mA							2C					
		17									-1 mA						2D					
I_{SS}	3005	18																				
	2Y	19																				
		20																				
		21																				
V_{OH1}	3006	22	4Y	3Y	4.5V	4.5V	4.5V	4.5V	4.5V	1Y	2.5	2.5	2.5	nA								
		23	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	3Y	3Y	3Y	3Y	3Y						
V_{OH2}		24	5Y	3Y	5.0V	5.0V	5.0V	5.0V	5.0V	1Y	4.2	4.2	4.2									
		25	5.0V	.0V	5.0V	3Y	3Y	3Y	3Y	3Y		2Y	4.2	4.2	4.2							
V_{OH3}		26		3Y	5.0V	5.0V	5.0V	5.0V	5.0V		1Y	4.95	4.95	4.95								
		27	5.0V	.0V	5.0V	3Y	3Y	3Y	3Y	3Y		2Y	4.95	4.95	4.95							
V_{OH4}		28		6Y	12.5V	12.5V	12.5V	12.5V	12.5V		1Y	11.25	11.25	11.25								
		29		12.5V	6Y	6Y	6Y	6Y	6Y		2Y	11.25	11.25	11.25								

See notes at end of device type 04.

TABLE III. Group A inspection for device type 03 - Continued.

See notes at end of device type 04.

TABLE III. Group A inspection for device type 03 - Continued.

Symbol $V_{0.5}$	MIL-STD-883 method 3007	Cases A, C, D X, Y Test No. 1Y	TERMINAL CONDITIONS S 1/												Mess	Test limits						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$	Units		
I _{u11/}	3009	64														GND	GND	GND	15.0 V	0.40	0.40	nA
		65																	1Y	0.40	0.5	Vdc
		66																	2Y	0.40	0.5	Vdc
		67																	10/			
		68																	1/			
		69																				
		70																				
		71																				
		72																				
I _{u11/V}	3010	73	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	GND	GND	GND	15.0 V	0.40	0.40	pF
		74	15.0 V	GND																		
		75	15.0 V	GND																		
		76		GND	15.0 V	GND	GND	GND	15.0 V	GND	GND	GND	GND	GND	GND							
		77			GND	15.0 V	GND	GND	15.0 V	GND	GND	GND	GND	GND	GND							
		78				GND	15.0 V	GND	15.0 V	GND	GND	GND	GND	GND	GND							
		79					GND	15.0 V	15.0 V	GND	GND	GND	GND	GND	GND							
		80						GND	15.0 V	15.0 V	GND	GND	GND	GND	GND							
		81							GND	15.0 V	GND	GND	GND	GND	GND							
C ₁	3012	82														GND			1A	1B	1C	
		83																	1D	1E	1F	
		84																	2A	2B	2C	
		85																	2D	2E	2F	
		86																				
		87																				
		88																				
		89																				

See notes at end of device type 03.

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TABLE III Group A inspection for device type 03 -- Continued.

Symbol	Cases A,C,D. X,Y	MIL-STD- 883 method	Test No.	TERMINAL CONDITIONS 14												Test limits									
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	V _{an}	Meas terminal	Subgroup 9 T _a = 25°C	Subgroup 10 T _a = 125°C	Subgroup 11 T _a = .55°C	Units		
t _{inh}	90	3003 Fig. 5	1Y	1A	B	IC	ID	NC	V _{ss}	NC	2A	2B	2C	2D	2Y	5.0V	1A to Y	11	2D	16	315	11	210	ns	
	91		14	13	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND										
	92																								
	93																								
	94																								
	95																								
	96																								
	97																								
	98																								
	99																								
	100																								
	101																								
	102																								
	103																								
	104																								
	105																								
t _{inh}	106	3004 Fig. 5	14	13	GND	B/	GND	13/	GND	13/	GND	13/	GND	13/	GND	13/	GND		1Y	15	390	23	430	15	340
	107																								
	108																								
	109																								
	110																								
	111																								
	112																								
	113																								
t _{TLH}	114		14	B/	GND	13/	GND	13/	GND	13/	GND	13/	GND	13/	GND	13/	GND		1Y	21	410	31	615	21	410
	115																								
	116																								
	117																								
	118																								
	119																								
	120																								
	121																								

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-883 method	TERMINAL CONDITIONS L/U												Test limits						Subgroup 1		Subgroup 2		Subgroup 3		Units							
		Cases			A, C, D			X, Y			V _{SS}			V _{DD}			V _{BB}			Meas			T _A = 25°C		T _A = 125°C		T _A = -55°C						
Test No.	1A	1B	2A	2B	2C	3	4	5	6	7	8	9	10	11	12	13	14	1A	1B	1C	2A	2B	2C	3A	3B	3C	Max	Min	Max	Min	Max	Min	Vdc
V _{ic} (pos)	1	1 mA																GND	IA	1.5													
V _{ic} (neg)	2		1 mA																														
	3			1 mA																													
	4				1 mA																												
	5					1 mA																											
	6						1 mA																										
	7							1 mA																									
	8								1 mA																								
	9									1 mA																							
V _{ic} (neg)	10	-1 mA									1 mA								GND														
V _{ic} (pos)	11		-1 mA									1 mA																					
	12			-1 mA									1 mA																				
	13				-1 mA									1 mA																			
	14					-1 mA									1 mA																		
	15						-1 mA									1 mA																	
	16							-1 mA									1 mA																
	17								-1 mA																								
	18									-1 mA																							
V _{DD}	19	15.0 V	GND	15.0 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	15.0 V	GND	15.0 V	V _{SS}	-25.0	-750			nA						
	20	GND	15.0 V	GND	15.0 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	15.0 V	GND	15.0 V												
	21	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	15.0 V	GND	15.0 V												
	22	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	15.0 V	GND	15.0 V												
V _{BB}	23	3Y	3Z	4Y	4Z	4J	4L	4V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	1Y	2.5	2.5	2.5	2.5	2.5	Vdc				
	24	4.5 V	4.5 V	3Y	3Z	3J	3L	3V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	2Y	2.5	2.5	2.5	2.5	2.5					
	25	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	3Y	2.5	2.5	2.5	2.5	2.5					
V _{BB}	26	3Y	3Z	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	1Y	4.2	4.2	4.2	4.2	4.2					
	27	5.0 V	5.0 V	3Y	3Z	3J	3L	3V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	2Y	4.2	4.2	4.2	4.2	4.2					
	28	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	3Y	4.2	4.2	4.2	4.2	4.2					
V _{BB}	29	3Y	3Z	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	1Y	4.95	4.95	4.95	4.95	4.95					
	30	5.0 V	5.0 V	3Y	3Z	3J	3L	3V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	2Y	4.95	4.95	4.95	4.95	4.95					
	31	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	3Y	4.95	4.95	4.95	4.95	4.95					

See notes at end of device type 04.

TABLE III. Group A inspection for device type 04 -Continued.

Symbol	MIL-STD-883 method	Test No.	Notes a C.D. x Y	TERMINAL CONDITIONS 1/												Test limits					
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Min	Max	Units
V_{064}	3006	32	g' GND	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	GND	g'	12.5 V	1Y	11.25	11.25	11.25	Vdc					
		33	12.5 V GND	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V		12.5 V	2Y	11.25	11.25	11.25							
		34	12.5 V GND	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V		12.5 V	3Y	11.25	11.25	11.25							
V_{067}	3007	35	z' GND	GND	GND	GND	GND	GND		g'	GND	GND	GND	GND	GND	GND	5.5 V	1Y	0.40	0.5	0.40
		36	z' GND	GND	GND	GND	GND	GND		g'	GND	GND	GND	GND	GND	GND	5.5 V	1Y	0.40	0.5	0.40
		37																1Y	0.40	0.5	0.40
		38																2Y	0.40	0.5	0.40
		39																2Y	0.40	0.5	0.40
		40																2Y	0.40	0.5	0.40
		41																3Y	0.40	0.5	0.40
		42																3Y	0.40	0.5	0.40
		43																3Y	0.40	0.5	0.40
V_{012}		44	z' GND	GND	GND	GND	GND	GND			z'	GND	GND	GND	GND	GND	z'	1Y	0.7	0.7	0.7
		45	z' GND	GND	GND	GND	GND	GND			z'	GND	GND	GND	GND	GND	z'	1Y	0.7	0.7	0.7
		46																1Y	0.7	0.7	0.7
		47																2Y	0.7	0.7	0.7
		48																2Y	0.7	0.7	0.7
		49																2Y	0.7	0.7	0.7
		50																3Y	0.7	0.7	0.7
		51																3Y	0.7	0.7	0.7
		52																3Y	0.7	0.7	0.7
V_{013}		53	z' GND	GND	GND	GND	GND	GND										GND	1Y	50	50
		54	z' GND	GND	GND	GND	GND	GND											1Y	50	50
		55																	1Y	50	50
		56																	2Y	50	50
		57																	2Y	50	50
		58																	3Y	50	50
		59																	3Y	50	50
		60																	3Y	50	50
		61																	3Y	50	50

See notes at end of device type 04

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TABLE III. Group 1 inspection for device type 04 - Continued

Symbol	MIL-STD-883	Cases A, C, D.	TERMINAL CONDITIONS 1												Test limits						
			1A	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 T _A = 25°C	Subgroup 2 T _A = 125°C	Subgroup 3 T _A = 55°C	Units
V _{0.4}	3007	62	2	GND	GND	GND	1.25	1.25	1.25	Vdc											
		63	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	1Y	1Y	1Y	
		64	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	2Y	GND	2Y	2Y	2Y	
		65																		2Y	
		66																		2Y	
		67																		2Y	
		68																		2Y	
		69																		2Y	
		70																		3Y	
V _{0.5}		71	2Y	2Y	GND	GND	2Y	2Y	GND	2Y	2Y	2Y	GND	2Y	2Y	2Y	2Y	2Y	2Y	2Y	0.4
		72	GND	GND	2Y	2Y	GND	GND	2Y	2Y	2Y	2Y	GND	2Y	2Y	2Y	2Y	2Y	2Y	2Y	0.4
		73	GND	GND	GND	GND	2Y	2Y	GND	2Y	2Y	2Y	GND	2Y	2Y	2Y	2Y	2Y	2Y	2Y	0.4
I _{0.11}	3009	74																			
		75																			
		76																			
		77																			
		78																			
		79																			
		80																			
		81																			
		82																			
		83																			
I _{in}	3010	84	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	15.0V	All inputs together
		85	15.0V	GND	GND	GND	1A	1A	1A	45											
		86	GND	15.0V	GND	GND	GND	1B	1B	1B											
		87			GND	GND	GND	1C	1C	1C											
		88																2A	2A	2A	
		89																2B	2B	2B	
		90																3A	3A	3A	
		91																3B	3B	3B	
		92																3C	3C	3C	
		93																			

See notes at end of device type 04.

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TABLE III. Group A inspection for device type 04—Continued.

Symbol	MIL-STD-883 method	Test No.	Test No.	TERMINAL CONDITIONS 1/												Test limits						Units		
				1 A, C, D Y, Y	2 B	3 A	4 B	5 C	6 2Y	V _{ss}	1C	1Y	3Y	3A	3B	3C	V _{DD}	12	13	14	Meas terminal	Subgroup T _A = 25°C	Subgroup T _A = 25°C	
C	3012	94	12/							GND							GND	1A	1B	1C		pF		
		95																						
		96																						
		97																						
		98																						
		99																						
		100																						
		101																						
		102																						
t _{PLH}	3012	103	13/	GND	13/	GND	GND	GND	GND	GND	14/	GND	GND	GND	GND	GND	5.0 V	1A to 1Y	11	210	313	11	210	ns
	Fig. 5	104									14/	GND	13/	14/	GND	GND	GND		1B to 1Y					
		105																	1C to 1Y					
		106																	2A to 2Y					
		107																	2B to 2Y					
		108																	2C to 2Y					
		109																	3A to 3Y					
		110																	3B to 3Y					
		111																	3C to 3Y					
t _{PLH}	3003	112	13/																					
	Fig. 5	113	GND	13/	GND	GND																		
		114																						
		115																						
		116																						
		117																						
		118																						
		119																						
		120																						

See notes at end of device type 04.

TABLE III. Group A inspection for device type 04 - Continued.

Symbol	MIL-STD-883 method	Test No.	Cases	TERMINAL CONDITIONS \downarrow												Test limits							
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	V_{in}	Meas terminal	Subgroup 1 T _A = 25°C T _A = -55°C	Subgroup 2 T _A = 125°C T _A = -55°C	Subgroup 3 T _A = -55°C	Units
t _{THH}	3004 Fig. 5	121	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	5.0 V	1Y	1Y	1Y	1Y	ns	
		122	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		123	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		124	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		125	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		126	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		127	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		128	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		129	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
t _{THH}		130	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		131	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		132	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		133	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		134	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		135	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		136	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		137	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	
		138	13/ GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	13/	14/	13/	14/	13/	

\downarrow Input pins not designated may be tied to V_{cc} or GND or may be left open provided they do not influence the outcome of the measurement. Output pins not designated may be tied to the loads or may be left open provided they do not influence the outcome of the measurement. Except as follows: V_c (pos) tests: the V_{ss} terminals shall be open. V_{ic} (neg. tests): the V_{in} terminal shall be open. I_{ss} tests: the output terminals shall be open.

\downarrow When performing quiescent supply current measurements (I_{ss}), the meter shall be placed so that all currents flow thru the meter.

\downarrow $V_{in} = 1.1$ V at 25°C, 0.85 V at 125°C, 1.35 V at -55°C. For device type 01, $V_{in} = 0.9$ V at 25°C, 0.65 V at 125°C, and 0.95 V at -55°C.

\downarrow $I_{on} = -.10$ mA at 25°C, -.10 mA at -125°C, -.10 mA at -55°C.

\downarrow $I_{on} = -.20$ mA at 25°C, -.13 mA at 125°C, -.25 mA at -55°C.

\downarrow $V_{in} = 2.50$ V at 25°C, .20 V at 125°C, 2.65 V at -55°C. For device type 01, $V_{in} = 2.25$ V at 25°C, 1.95 V at 125°C, and 2.40 V at -55°C.

\uparrow $V_{in} = 3.80$ V at 25°C, 3.65 V at 125°C, 3.95 V at -55°C. For device type 01, $V_{in} = 3.95$ V at 25°C, 3.85 V at 125°C, and 4.05 V at -55°C.

\uparrow $I_{oi} = .23$ mA at 25°C, .25 mA at 125°C, .23 mA at -55°C.

\uparrow $V_{in} = 9.50$ V at 25°C, 9.25 V at 125°C, 9.75 V at -55°C. For device type 01, $V_{in} = 10.25$ V at 25°C, 10.00 V at 125°C, and 10.50 V at -55°C.

\uparrow $I_{oi} = 0.8$ mA at 25°C, 0.56 mA at 125°C, 1.0 mA at -55°C.

\downarrow * indicates the device manufacturer may, at his option, measure I_{in} and I_{th} at 25°C for each individual input or measure all inputs together.

\downarrow Capacitance bridge between measured terminal and V_{ss} ; frequency = 1 MHz.

\downarrow Pulse conditions - See figure 5.

\downarrow Loading conditions - See figure 5.

\downarrow $I_{oi} = .40$ mA at 25°C, .38 mA at 125°C, .50 mA at -55°C.

TABLE III. Group A inspection for device type 51.

Symbol method	Test No.	Cases A, C, D, X, Y	TERMINAL CONDITIONS J												TEST LIMITS							
			MIL-STD- 883	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas. terminal	Subgroup 1 $T_A = 23^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = 55^\circ\text{C}$	Unit Vdc
V _E (pos)																		1A	1.5			
V _E (neg)																		1B				
V _{G5}	9																	1C				
V _{G5}	10																	3A				
V _{G5}	11																	2A				
V _{G5}	12																	2B				
V _{G5}	13																	2C				
V _{G5}	14																					
V _{G5}	15																					
V _{G5}	16																					
V _{G5}	17																					
V _{G5}	18																					
V _{G6}	19																					
V _{G6}	20																					
V _{G6}	21																					
V _{G6}	22																					
V _{G6}	23																					
V _{G6}	24																					
V _{G6}	25																					
V _{G6}	26																					
V _{G6}	27																					
V _{G6}	28																					

See notes at end of table.

TABLE III. Group A inspection for devite type 51—Continued.

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	TERMINAL CONDITIONS /V												Test limits									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = 55^\circ\text{C}$	Unit			
V_{H11}	3007	29	3.5 V	1.5 V	1.5 V	GND	GND	GND	GND	GND	GND	5 V	1 Y	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Vdc			
		30	1.5 V	3.5 V	1.5 V																			
		31	1.5 V	1.5 V	3.5 V	GND	GND	GND	GND	GND	GND													
		32										35 V	1.5 V	1.5 V	2 Y									
		33										15 V	3.5 V	1.5 V	2 Y									
		34										15 V	1.5 V	3.5 V	2 Y									
		35										3.5 V				GND	GND	3 Y						
		36										7.0 V	3.0 V	3.0 V	GND				10 V	1 Y	1.0	1.0		
		37										3.0 V	7.0 V	3.0 V						1 Y	1 Y			
		38										3.0 V	3.0 V	7.0 V	GND	GND			7.0 V	3.0 V	2 Y			
		39																30 V	7.0 V	3.0 V	2 Y			
		40																30 V	3.0 V	7.0 V	2 Y			
		41																3.0 V	3.0 V	7.0 V	2 Y			
		42																7.0 V	GND	GND	3 Y			
		43																						
		44																						
		45																						
		46																						
		47																						
		48																						
		49																						
		50																						
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See notes at end of table.

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TABLE III. Group A inspection for device type 51 – Continued.

Symbol	MIL-STD-883 method	Cases A, C, D X, Y Test No.	TERMINAL CONDITIONS L												Test limits						
			Subgroup 1				Subgroup 2				Subgroup 3				Unit						
			$I_A = 25^\circ\text{C}$	$I_A = 125^\circ\text{C}$	$I_A = 55^\circ\text{C}$	$I_A = -55^\circ\text{C}$	$I_A = 25^\circ\text{C}$	$I_A = 125^\circ\text{C}$	$I_A = 55^\circ\text{C}$	$I_A = -55^\circ\text{C}$	V_{op}	V_{op}	V_{op}	V_{op}	Meas terminal	Min	Max	Min	Max	mA	
I_{011}		59	5 V	GND	GND	0.4 V	GND	GND	GND	GND	5 V	1Y	0.51	0.36	0.64						
		60	GND	5 V	GND	0.4 V	GND	GND	GND	GND	5 V	1Y									
		61	GND	5 V	GND	0.4 V	GND	GND	GND	GND	5 V	1Y									
		62	GND	CND							0.4 V	5 V	2Y								
		63									0.4 V	GND	5 V	2Y							
		64									0.4 V	GND	5 V	2Y							
		65									0.4 V	GND	5 V	3Y							
I_{012}		66	15 V	↑	1.5 V	GND					5 V	1Y	3.4	2.4	4.2						
		67	GND	15 V	↓	1.5 V	GND	15 V	1.5 V	1.5 V	15 V	1Y									
		68	GND	15 V	↓	1.5 V	GND	15 V	1.5 V	1.5 V	15 V	2Y									
		69									1.5 V	GND	15 V	2Y							
		70									1.5 V	GND	15 V	2Y							
		71									1.5 V	GND	15 V	3Y							
		72									1.5 V	GND	15 V	3Y							
I_{013}		73		↑	↓	4.6 V	5 V	5 V	5 V	5 V	5 V	5 V	1Y	-0.51	-0.36	-0.64					
I_{014}		74	5 V	5 V	5 V	5 V	5 V	4.6 V	4.6 V	5 V	4.6 V	GND	GND	5 V	2Y	-0.51	-0.36	-0.64			
I_{015}		75	5 V	5 V	5 V	5 V	5 V	4.6 V	4.6 V	5 V	4.6 V	GND	GND	5 V	3Y	-0.51	-0.36	-0.64			
I_{016}		76	GND	GND	13.5 V	15 V	15 V	15 V	15 V	15 V	15 V	15 V	15 V	1Y	3.4	-2.4	-4.2				
I_{017}		77	15 V	15 V	15 V	15 V	15 V	13.5 V	13.5 V	15 V	15 V	GND	GND	15 V	2Y	3.4	-2.4	-4.2			
I_{018}		78	15 V	15 V	15 V	15 V	15 V	GND	B.5 V	15 V	15 V	15 V	15 V	15 V	3Y	-3.4	-2.4	-4.2			
I_{u1}	3009	79										GND	GND	GND	18 V	All inputs together	-7.0				
		80													1A	-1.0	-4.5				
		81													1B						
		82													1C						
		83													2A						
		84													2B						
		85													2C						
															3A						
																				86	

See notes at end of table.

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TABLE III. Group A inspection for device type 51 – Continued.

Symbol	Cases MIL-STD- 881 method	A.C. I. X,Y Test No.	TERMINAL CONDITIONS 1/												Test limits					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$	Units
I_{in}	3010	87																		nA
I_{in}	3/	88																		
C_1	3012	95																		
C_1		96																		
t_{PH}	Fig. 5	102																		
t_{PH}		103																		
t_{PH}		104																		
t_{PH}		105																		
t_{PH}		106																		
t_{PH}		107																		
t_{PH}		108																		

See notes at end of table.

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TABLE III. Group A inspection for device type 51—Continued.

Symbol	Cases A, C, D X, Y Test No.	TERMINAL CONDITIONS 1/												Test limits					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 $T_A = 125^\circ\text{C}$	Subgroup 2 $T_A = -55^\circ\text{C}$	
t_{RH}	3003 Fig. 5	109	X	Y	NC	NC	1A	1B	IC	1Y	V _{ss}	3A	3Y	2Y	2A	2B	2C	V _{dd}	
		110																	
		111																	
		112																	
		113																	
		114																	
		115																	
t_{RH}	3004 Fig. 5	116																	
		117																	
		118																	
		119																	
		120																	
		121																	
		122																	
t_{RH}		123																	
		124																	
		125																	
		126																	
		127																	
		128																	
		129																	

See notes at end of table.



TABLE III. Group A inspection for device type 52.

Symbol	MIL-STD-883 method	Cases Test No.	TERMINAL CONDITIONS J												Vdc							
			A, C, D X, Y	1	2	3	4	5	6	7	8	9	10	II	12	13	14	Subgroup 1 T ₀ = 25°C T _a = 125°C T _a = -55°C Units				
V _r (pos)		1	1 mA														GND	1A	1.5			
		2		1 mA													1B					
		3			1 mA												2A					
		4				1 mA											2B					
		5					1 mA										3A					
		6						1 mA									3B					
		7							1 mA								4A					
		8								1 mA							4B					
V _r (neg)		9	-1 mA														1mA	4B				
		10		-1 mA													1A					
		11															1B					
		12															2A					
		13															2B					
		14															3A					
		15															3B					
		16															4A					
I _{ss}	3005	17	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	V _{ss}	-25	-750		
Z	3005	18	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	18 V					
	3005	19	GND		GND		GND		GND		GND		GND		GND		GND					
V _{shs}	3006	20															15 V	15 V	15 V	1Y	14.95	
		21	15 V	15 V	GND	GND	15 V	2Y														
		22	15 V														15 V	15 V	15 V	3Y		
		23	15 V														15 V	15 V	15 V	4Y		
V _{ols}	3007	24															GND	GND	1Y	0.05	0.05	
		25	GND	15 V	GND	GND	15 V	1Y														
		26	GND		GND		GND		GND		GND		GND		GND		GND		2Y			
		27																	3Y			
		28																	4Y			
		29																				
		30																				
		31																				

See notes at end of table

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TABLE III. Group A inspection for device type 52 - Continued.

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y Test No.	TERMINAL CONDITIONS I/												Test limits							
			1	2	3	4	5	6	7	8	9	10	1	12	13	14	Meas terminal	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$	Units	
V_{IN1}		32	3.5 V	1.5 V				GND	GND	GND	GND					5 V	1Y	1Y	2Y	2Y		
		33	1.5 V	3.5 V				3.5 V	1.5 V													
		34	GND	GND				1.5 V	3.5 V													
		35						GND	GND	3.5 V	1.5 V											
		36									1.5 V	3.5 V										
		37									GND	GND	3.5 V	1.5 V								
		38									GND	GND	1.5 V	3.5 V								
		39									GND	GND	1.5 V	3.5 V								
V_{IN2}		40	7.0 V	3.0 V				GND	GND	GND	GND					10 V	1Y	1Y	2Y	2Y		
		41	3.0 V	7.0 V				GND	GND	GND	GND											
		42	GND	GND				7.0 V	3.0 V													
		43						GND	GND	7.0 V	3.0 V											
		44								3.0 V	7.0 V											
		45								GND	GND	3.0 V	7.0 V									
		46																				
		47																				
V_{IN3}		48	11 V	4.0 V													15 V	1Y	1Y	2Y	2Y	
		49	4.0 V	11 V																		
		50	GND	GND																		
		51																				
		52																				
		53																				
		54																				
		55																				
V_{IL1}		56	1.5 V																			
		57	GND	GND																		
		58	GND	GND																		
		59	GND	GND																		

See notes at end of table

TABLE III. Group A inspection for device type 52 - Continued

Symbol	MIL-STD-883 method	TERMINAL CONDITIONS /V														Test limits				
		Case A, C, D X, Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal V	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$
V_{h2}	60	3.0 V	3.0 V	1B	1Y	2A	2Y	GND	GND	GND	GND	GND	GND	GND	GND	10 V	9.0	9.0	9.0	Vdc
	61	GND	GND					3.0 V	3.0 V	GND	GND	GND	GND	GND	GND	2Y				
	62	GND	GND					GND	GND	3.0 V	3.0 V	-	-	GND	GND	3Y				
	63	GND	GND					GND	GND	GND	GND	GND	GND	GND	GND	3.0 V	3.0 V	4Y		
	64	4.0 V	4.0 V					GND	GND	GND	GND	GND	GND	GND	GND	15 V	13.5	13.5	13.5	
	65	GND	GND					GND	GND	4.0 V	4.0 V	GND	GND	GND	GND	2Y				
	66	GND	GND					GND	GND	4.0 V	4.0 V	GND	GND	GND	GND	3Y				
	67	GND	GND					GND	GND	4.0 V	4.0 V	GND	GND	GND	GND	4Y				
	68	5V	0.4 V													GND	GND	5 V	1Y	0.36
	69	GND	5 V	0.4 V														0.51	0.64	mA
	70		GND	0.4 V	0.4 V													1Y	1Y	
	71																	2Y	2Y	
	72																	3Y	3Y	
	73																	4Y	4Y	
	74																	4Y	4Y	
	75																	4Y	4Y	
	76	1.5V	1.5V															1Y	3.4	2.4
	77	GND	1.5 V	1.5 V														1Y	1Y	4.2
	78		GND	1.5 V	1.5 V													2Y	2Y	
	79																	2Y	2Y	
	80																	3Y	3Y	
	81																	3Y	3Y	
	82																	4Y	4Y	
	83																	4Y	4Y	
	84																	1Y	0.51	
	85																	2Y	2Y	
	86																	3Y	3Y	
	87																	4Y	4Y	
	88	GND	CND	13.5 V	13.5 V			4.6 V	4.6 V	GND	GND	5 V	5 V	GND	GND	5 V	5 V	1Y	0.36	
	89																	2Y	2Y	
	90																	3Y	3Y	
	91																	4Y	4Y	

See notes at end of table

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TABLE III. Group A inspection for device type 52 - Continued.

Symbol	MIL-STD-883 method	Cases A, C, D X, Y	TERMINAL CONDITIONS /												Test limits							
			Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$	Units	
I _h 3J	3009	92	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	18.0 V	All inputs together	Meas terminal	Min Max	Min Max	Min Max		
		93														IA	-8.0					
		94														IA	-1.0					
		95														IB						
		96															2A					
		97															3A					
		98															3B					
		99															4A					
		100															4B					
I _h 3J	3010	101	18.0 V	18.0 V													All inputs together					
		102	18.0 V	GND													IA	8.0				
		103	GND	18.0 V													IB	+1.0				
		104		GND													2A					
		105															2B					
		106															3A					
		107															3B					
		108															4A					
		109															4B					
C	3012	110																				
		111																				
		112																				
		113																				
		114																				
		115																				
		116																				
		117																				

See notes at end of table.

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TABLE III. Group A inspection for device type 52 - Continued.

Symbol	MIL-STD-883 method	Cases A C D. X, Y	TERMINAL CONDITIONS L												Test limits										
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 9 $T_A = 25^\circ\text{C}$	Subgroup 10 $T_A = 125^\circ\text{C}$	Subgroup 11 $T_A = -55^\circ\text{C}$	Units				
t _{RH}	3003 Fig. 5	118	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	5.0 V	1A to 1Y	11	210	16	210	ns			
		119	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	1B to 1Y									
		120															2A to 2Y								
		121															2B to 2Y								
		122															3A to 3Y								
		123															3B to 3Y								
		124															4A to 4Y								
		125															4B to 4Y								
t _{RH}	3003 Fig. 5	126															GND	1A to 1Y	11	210	16	315	11	210	ns
		127	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	1B to 1Y									
		128															2A to 2Y								
		129															2B to 2Y								
		130															3A to 3Y								
		131															3B to 3Y								
		132															4A to 4Y								
		133															4B to 4Y								
t _{RH}	3004 Fig. 5	134															GND	1Y	300	23	450	15	300		
		135	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	1Y									
		136															2Y								
		137															2Y								
		138															3Y								
		139															3Y								
		140															4Y								
		141															GND	1Y	21	410	31	615	21	410	
t _{RH}	3004 Fig. 5	142	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	1Y								
		143															2Y								
		144															3Y								
		145															3Y								
		146															4Y								
		147															4Y								
		148															4Y								
		149															4Y								

See notes at end of table.

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TABLE III. Group A inspection for device type 53.

Symbol	MIL-STD-883 method	Cases A, C, D X, Y	TERMINAL CONDITIONS JV												Test limits					
			1 Test No. 1Y	2 IA	3 IB	4 IC	5 ID	6 NC	7 V _{ss}	8 NC	9 2A	10 2B	11 2C	12 2D	13 2Y	14 V _{dd}	Subgroup 1 T _a = 25°C	Subgroup 2 T _a = 125°C	Subgroup 3 T _a = -55°C	Units
V _{ic} (pos)		1	1 mA												GND	1A	1.5			V _{cc}
		2		1 mA													1B			
		3			1 mA												1C			
		4				1 mA											1D			
		5					1 mA										2A			
		6						1 mA									2B			
		7							1 mA								2C			
		8								1 mA							2D			
V _{ic} (neg)		9	-1 mA														1A	-6		
		10		-1 mA													1B			
		11			-1 mA												1C			
		12				-1 mA											1D			
		13					-1 mA										2A			
		14						-1 mA									2B			
		15							-1 mA								2C			
		16								-1 mA							2D			
I _{ss}	3005	17	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	18 V	V _{ss}	-25	-750	da	
		18		GND	GND	18 V														
		19		GND	18 V	GND														
		20		18 V	GND	GND														
		21		18 V	GND	GND														
V _{ohs}	3006	22	GND	GND	CND	GND	GND	GND	15 V	15 V	15 V	15 V	15 V	15 V	1Y	14.95	14.95	14.95	Vdc	
V _{ohc}	3006	23	15 V	15 V	15 V	15 V	15 V	15 V	GND	GND	GND	GND	GND	GND	2Y	14.95	14.95	14.95		
V _{obs}	3007	24	15 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	1Y	0.05	0.05	0.05		
		25	GND	15 V	CND	GND										1Y				
		26		GND	15 V	GND										1Y				
		27			GND	15 V										1Y				
		28				GND											2Y			
		29					GND										2Y			
		30						GND									2Y			
		31							GND									2Y		

See notes at end of table.

TABLE III Group A inspection for device type 53 - Continued.

Symbol	MIL-STD-883 method	Cases A, C,D, X,Y	TERMINAL CONDITIONS 1/												Test limits							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$	Units	
V_{H11}		32	3.5 V	1.5 V	1.5 V	1.5 V	1.5 V	GND	1.5 V	1.5 V	1.5 V	5 V	1 Y	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Vdc	
		33	1.5 V	1.5 V	1.5 V	1.5 V	1.5 V							1 Y	1 Y	1 Y	1 Y	1 Y	1 Y	1 Y	1 Y	
		34		1.5 V	3.5 V	1.5 V	1.5 V															
		35			1.5 V	3.5 V	1.5 V															
		36				1.5 V	3.5 V															
		37					1.5 V															
		38						3.5 V														
		39							15 V	3.5 V												
		40								15 V	1.5 V	3.5 V										
		41	3.0 V	7.0 V	3.0 V	3.0 V																
		42		3.0 V	7.0 V	3.0 V																
		43			3.0 V	7.0 V																
		44				3.0 V																
		45					7.0 V															
		46						3.0 V	7.0 V													
		47							3.0 V	3.0 V	7.0 V											
		48								3.0 V	3.0 V	7.0 V										
		49	4.0 V	11 V	4.0 V	4.0 V																
		50			4.0 V	11 V																
		51				4.0 V	11 V															
		52					4.0 V															
		53						4.0 V														
		54							4.0 V	4.0 V	11 V											
		55								4.0 V	4.0 V	11 V										
		56								5 V	5 V	5 V										
		57									1.5 V	1.5 V	1.5 V									
		V_{H12}										1.5 V	1.5 V	1.5 V								
		V_{H12}										3.0 V	3.0 V	3.0 V								
		V_{H12}										10 V	10 V	10 V								
		V_{H12}											3.0 V	3.0 V	3.0 V							
		V_{H12}											15 V	15 V	15 V							
		V_{H12}												4.0 V	4.0 V	4.0 V						

See notes at end of table.

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TABLE III. Group A inspection for device type 53 - Continued.

Symbol	MIL-STD-883 method	Case ^a A, C, D X, Y	TERMINAL CONDITIONS /												Test limits											
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 T _A = 25°C	Subgroup 2 T _A = 125°C	Subgroup 3 T _A = -55°C	Min	Max	Min	Max	Units	
I _{0,L}			62	0.4 V	5 V	GND	5 V	1Y	0.51	0.36	0.54					mA										
			63		GND	5 V	GND	5 V	1Y																	
			64														1Y									
			65														1Y									
			66														2Y									
			67													0.4 V										
			68														2Y									
			69														2Y									
I _{0,L2}			70	1.5 V	15 V																					
			71		GND	15 V																				
			72			GND	15 V																			
			73				GND	15 V																		
			74					GND	15 V																	
			75						GND	15 V																
			76							GND	15 V															
			77								GND	15 V														
I _{0H}			78	4.6 V								5 V	5 V	5 V	5 V	5 V	5 V	1Y	-0.51	-0.36	-0.64					
I _{0H1}			79	5 V								GND	GND	GND	GND	4.6 V	5 V	2Y	-0.51	-0.36	-0.64					
I _{0H2}			80	13.5 V								15 V	15 V	15 V	15 V	15 V	15 V	1Y	-3.4	-2.4	-4.2					
I _{0H2}			81	15 V								GND	GND	GND	GND	13.5 V	15 V	2Y	-3.4	-2.4	-4.2					
I _{0L3}	3009		82		CND	GND	18.0 V	All inputs together		-8.0							mA									
																		1A	-1.0							
																		1B								
																		IC								
																		ID								
																		2A								
																		2B								
																		2C								
																		2D								

See notes at end of table.

TABLE III. Group A inspection for device type 53 - Continued.

Symbol	MIL-STD-883 method	TERMINAL CONDITIONS <i>J</i>												Test limits					
		Case: A C, D X Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = -55^\circ\text{C}$
I_{th}	3010	91	18.0 V	18.0 V	18.0 V	18.0 V	GND	18.0 V	All inputs together	8.0	1.0	45	nA						
		92	18.0 V	GND	1A	1B	IC	1D											
		93	GND	18.0 V	GND	1C	1D	2A	2B										
		94	GND	18.0 V	GND	2A	2B	2C	2D										
		95	GND	18.0 V	GND	2C	2D	Subgroup 4 $T_A = 25^\circ\text{C}$											
		96	GND	18.0 V	GND	2D													
		97	GND	18.0 V	GND														
		98	GND	18.0 V	GND														
		99	GND	18.0 V	GND														
C	3012	100	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	pF												
		101	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$													
		102	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$													
		103	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$													
		104	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$													
		105	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$													
		106	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$													
		107	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$	$\frac{A}{Y}$													
t_{PHL}	3003 Fig. 5	108	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	Subgroup 9 $T_A = 25^\circ\text{C}$												
		109	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	Subgroup 10 $T_A = 125^\circ\text{C}$												
		110	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	Subgroup 11 $T_A = -55^\circ\text{C}$												
		111	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$													
		112	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$													
		113	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$													
		114	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$													
		115	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$	$\frac{S}{Y}$													

See notes at end of table.

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TABLE III. Group A inspection for device type 53—Continued.

Symbol	MIL-STD-883 method	Cases X, Y	TERMINAL CONDITIONS 1)												Test limits							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Subgroup 9 $T_A = 25^\circ\text{C}$	Subgroup 10 $T_A = 125^\circ\text{C}$	Subgroup 11 $T_A = -55^\circ\text{C}$			
Test No.	1Y	1A	1B	IC	ID	NC	V _S	NC	2A	2B	2C	2D	2Y	V _{DD}	Meas terminal	Min	Max	Min	Max			
t _{PLH}	3003 Fig. 5	116	6/	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	5.0 V	1A to 1Y	11	210	16	315		
		117		GND	5/	GND										1B to 1Y						
		118			GND	5/										1C to 1Y						
		119				GND	5/									1D to 1Y						
		120					GND	5/								2A to 2Y						
		121						GND	5/							2B to 2Y						
		122							GND	5/						2C to 2Y						
		123								GND	5/					2D to 2Y						
t _{PLH}	3004 Fig. 5	124	6/	5/						GND						1Y	15	300	23	450		
		125		GND	5/					GND	5/					1Y			15	300		
		126			GND	5/					GND	5/					1Y					
		127				GND	5/					GND	5/					1Y				
		128					GND	5/					GND	5/			2Y					
		129						GND	5/					GND	5/			2Y				
		130							GND	5/							2Y					
		131								GND	5/							2Y				
t _{PLH}		132	6/	5/							GND						GND	1Y	21	410		
		133		GND	5/													1Y				
		134			GND	5/												1Y				
		135				GND	5/											1Y				
		136					GND	5/										2Y				
		137						GND	5/									2Y				
		138							GND	5/								2Y				
		139								GND	5/							2Y				

See notes at end of device type 04.

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See notes at end of table.

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TABLE III. Group A inspection for device type 54—Continued.

Symbol	MIL-STD-883 method	Test No.	Cases A, C, D X, Y	TERMINAL CONDITIONS L												Test limits							
				1	2	3	4	5	6	7	8	V _{ss}	IC	1Y	3Y	3A	3B	GND	GND	15V	2Y	0.05	Vdc
V _{ols}	3007	31	GND	1A	2A	2B	2C	2Y	GND	GND	GND	15V	GND	GND	GND	GND	GND	15V	15V	3Y	0.05	0.05	
		32							GND	GND	GND												
		33																					
		34																					
V _{hi1}		35	3.5V	3.5V	1.5V	1.5V	1.5V	1.5V				1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	1Y	0.5	0.5	
		36	1.5V	3.5V	3.5V	1.5V	1.5V	1.5V				1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	1Y	0.5	0.5	
		37		1.5V	1.5V	1.5V	1.5V	1.5V				3.5V	3.5V	3.5V	3.5V	3.5V	3.5V	3.5V	3.5V	3.5V	2Y	0.5	0.5
		38																					
		39																					
		40																					
		41																					
		42																					
		43																					
V _{hi2}		44	7.0V	3.0V	3.0V	3.0V	3.0V	3.0V				3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	1Y	1.0	1.0	
		45	3.0V	7.0V	7.0V	7.0V	7.0V	7.0V				3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	1Y	1.0	1.0	
		46		3.0V	3.0V	3.0V	3.0V	3.0V				7.0V	7.0V	7.0V	7.0V	7.0V	7.0V	7.0V	7.0V	1Y	1.0	1.0	
		47																					
		48																					
		49																					
		50																					
		51																					
		52																					
V _{hi3}		53	11V	4.0V	4.0V	4.0V	4.0V	4.0V				4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	1Y	1.5	1.5	
		54	4.0V	11V	4.0V	4.0V	4.0V	4.0V				4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	1Y	1.5	1.5	
		55		4.0V	4.0V	4.0V	4.0V	4.0V				11V	11V	11V	11V	11V	11V	11V	11V	1Y	1.5	1.5	
		56																					
		57																					
		58																					
		59																					
		60																					
		61																					

TABLE III. Group A inspection for device type 54 - Continued.

Symbol	Cases A, C, D, X, Y Test No. 883	TERMINAL CONDITIONS 1/												Test limits						
		MIL-STD- 883 method	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Subgroup 1 $T_A = 25^\circ\text{C}$	Subgroup 2 $T_A = 125^\circ\text{C}$	Subgroup 3 $T_A = 55^\circ\text{C}$	Unit
			1A	1B	2A	2B	2Y	V _{ss}	1C	1Y	3Y	3A	3B	3C	V _{DD}	Meas terminal	Min	Max	Min	Max
V _{U11}		62	1.5 V	1.5 V	5 V	5 V	GND	1.5 V		5 V	5 V	-5 V	5 V	5 V	1Y	4.5	4.5	4.5	4.5	V _{dc}
V _{U12}		63	5 V	5 V	1.5 V	1.5 V		5 V		5 V	5 V	5 V	5 V	5 V	2Y					
V _{U12}		64	5 V	5 V	5 V	5 V		5 V		1.5 V	1.5 V	1.5 V	1.5 V	5 V	3Y					
V _{U12}		65	3.0 V	3.0 V	10 V	10 V		3.0 V		10 V	1Y	9.0	9.0	9.0	9.0	V _{dc}				
V _{U12}		66	10 V	10 V	3.0 V	3.0 V		10 V		10 V	2Y									
V _{U12}		67	10 V	10 V	10 V	10 V		10 V		10 V	10 V	3.0 V	3.0 V	10 V	3Y					
V _{U13}		68	4.0 V	4.0 V	15 V	15 V		4.0 V		15 V	1Y	13.5	13.5	13.5	13.5	V _{dc}				
V _{U13}		69	15 V	15 V	4.0 V	4.0 V		15 V		15 V	2Y									
V _{U13}		70	15 V	15 V	15 V	15 V		15 V		15 V	15 V	4.0 V	4.0 V	15 V	3Y					
I _{O11}		71	5 V	GND	GND	GND		GND		GND	0.4 V	GND	GND	5 V	1Y	0.51	0.36	0.64	mA	
I _{O11}		72	GND	5 V		GND			GND	0.4 V		GND	GND	5 V	1Y					
I _{O11}		73			GND				5 V	0.4 V		GND			1Y					
I _{O11}		74				5 V			0.4 V						2Y					
I _{O11}		75					GND	5 V		0.4 V					2Y					
I _{O11}		76						GND	5 V	0.4 V					2Y					
I _{O11}		77							GND						3Y					
I _{O11}		78										0.4 V	GND	5 V	3Y					
I _{O11}		79											0.4 V	GND	5 V	3Y				
I _{O2}		80	15 V									1.5 V		GND	15 V	1Y	3.4	2.4	4.2	
I _{O2}		81		GND	15 V							1.5 V			1Y					
I _{O2}		82			GND							15 V	1.5 V	GND						
I _{O2}		83				15 V						1.5 V								
I _{O2}		84					GND	15 V		1.5 V										
I _{O2}		85						GND	15 V	1.5 V										
I _{O2}		86							GND					1.5 V	15 V					
I _{O2}		87								GND					1.5 V	GND	15 V	3Y		
I _{O2}		88									GND					1.5 V	GND	15 V	3Y	

See notes at end of table.

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TABLE III. Group A inspection for device type 54. -Continued.

Symbol	Cases A, C, D X, Y	TERMINAL CONDITIONS ¹												Test limits		nA				
		MIL-STD-883 method	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas terminal	Subgroup 1 $T_a = 25^\circ\text{C}$	Subgroup 2 $T_a = 25^\circ\text{C}$	Subgroup 3 $T_a = 35^\circ\text{C}$
I_{OH}	89	GND	GND	5 V	5 V	5 V	GND	GND	4.6 V	5 V	5 V	5 V	5 V	5 V	5 V	1 Y	-0.51	-0.36	-0.64	mA
I_{OH}	90	5 V	5 V	GND	GND	4.6 V			5 V	5 V	5 V	5 V	5 V	5 V	5 V	2 Y	-0.51	-0.36	-0.64	
I_{OH}	91	5 V	5 V	5 V	5 V	5 V			5 V	4.6 V	GND	GND	GND	GND	5 V	3 Y	-0.51	-0.36	-0.64	
I_{OH}	92	GND	GND	10 V	10 V	10 V	GND	GND	13.5 V	10 V	10 V	10 V	10 V	10 V	15 V	1 Y	-3.4	-2.4	-4.2	
I_{OH}	93	10 V	10 V	GND	GND	13.5 V			10 V	10 V	10 V	10 V	10 V	10 V	15 V	2 Y	-3.4	-2.4	-4.2	
I_{OH}	94	10 V	10 V	10 V	10 V	10 V			10 V	3.5 V	GND	GND	GND	GND	15 V	3 Y	-3.4	-2.5	-4.2	
I_{OH}	95	GND	GND	GND	GND	GND			GND	GND	GND	GND	GND	GND	18.0 V	All inputs together	-0.90	-0.90	-0.90	
I_{OH}	96	GND	GND	GND	GND	GND			GND	GND	GND	GND	GND	GND	18.0 V	1 A	-1.0	-4.5	-4.5	
I_{OH}	97															1 B				
I_{OH}	98																1 C			
I_{OH}	99																2 A			
I_{OH}	100																2 B			
I_{OH}	101																2 C			
I_{OH}	102																3 A			
I_{OH}	103																3 B			
I_{OH}	104																3 C			
I_{OH}	105	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	GND	GND	18.0 V						18.0 V	18.0 V	All inputs together	9.0	9.0	
I_{OH}	106	18.0 V	GND	GND	GND	GND			GND	GND	GND	GND	GND	GND	18.0 V	1 A	-1.0	-4.5	-4.5	
I_{OH}	107	GND	18.0 V	GND						GND							1 B			
I_{OH}	108		GND	GND							18.0 V						1 C			
I_{OH}	109											GND					2 A			
I_{OH}	110											18.0 V					2 B			
I_{OH}	111												GND				2 C			
I_{OH}	112													GND			3 A			
I_{OH}	113														GND		3 B			
I_{OH}	114																3 C			

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TABLE III. Group A inspection for device type 54 - Continued.

Symbol	MIL-STD-883 method	Cases A, C, D X, Y	TERMINAL CONDITIONS Σ												Test limits					
			1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	Subgroup 4 $T_A = 25^\circ\text{C}$ Min. Meas. terminal	Units		
C ₁	3012	115	4/ <i>z</i>														12	pF		
		116		4/ <i>z</i>																
		117																		
		118				4/ <i>z</i>														
		119					4/ <i>z</i>													
		120						4/ <i>z</i>												
		121							4/ <i>z</i>											
		122								4/ <i>z</i>										
		123									4/ <i>z</i>									
t _{PL}	3012	124	5/ <i>z</i>	GND	GND	5.0 V	IA to Y	Subgroup 9 $T_A = 25^\circ\text{C}$ Min. Meas. Max.	Subgroup 0 $T_A = 125^\circ\text{C}$ Min. Meas. Max.											
	Fig. 5	125	GND	5/ <i>z</i>	GND											IB to Y	IC to Y			
		126			5/ <i>z</i>	GND										2A to 2Y				
		127				5/ <i>z</i>	GND									2B to 2Y				
		128					5/ <i>z</i>	GND								2C to 1Y				
		129						5/ <i>z</i>	GND							3A to 1Y				
		130							5/ <i>z</i>	GND						3B to 1Y				
		131								5/ <i>z</i>	GND					3C to 1Y				
		132									5/ <i>z</i>	GND								
		133										5/ <i>z</i>	GND							
t _{PLH}	3003	134	5/ <i>z</i>	GND	5/ <i>z</i>	GND	5/ <i>z</i>	GND	5/ <i>z</i>	GND	5/ <i>z</i>	GND	5/ <i>z</i>	GND	5.0 V	IA to 1Y	11	20	16	3.5
	Fig. 5	135														IB to 1Y	IC to 1Y		210	ns
		136														2A to 2Y				
		137														2B to 2Y				
		138														2C to 2Y				
		139														3A to 3Y				
		140														3B to 3Y				
		141														3C to 3Y				

TABLE III. Group inspection for device type 54 - Continued

Symbol	Cases A,C,D X,Y	TERMINAL CONDITIONS 1												Test limits						Subgroup I $T_A = 25^\circ C$				Units		
		1004 Test No.	142 1A	143 1B	144 1A	145 1B	146 1C	147 1D	148 1E	149 1F	150 1G	151 1H	152 1I	153 1J	154 1K	155 1L	156 1M	157 1N	158 1O	159 1P	14 Meas terminal V_{DD}	Subgroup II $T_A = 125^\circ C$	Subgroup III $T_A = -55^\circ C$	Subgroup IV $T_A = -55^\circ C$	Subgroup V $T_A = -55^\circ C$	ns
Symbol	Cases A,C,D X,Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	ns
I_{INH}																										
V_{IC}																										
V_{OC}																										
V_{SS}																										
I_{OUT}																										
V_{DD}																										
GND																										
S_1																										
S_2																										
S_3																										
S_4																										
S_5																										
S_6																										
S_7																										
S_8																										
S_9																										
S_{10}																										
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S_{18}																										
S_{19}																										
S_{20}																										
S_{21}																										
S_{22}																										
S_{23}																										
S_{24}																										
S_{25}																										
S_{26}																										

NOTES:

1. Input pins not designated may be tied to V_{CC} or GND or may be left open provided they do not influence the outcome of the measurement. Output pins not designated may be tied to the loads or may be left open provided they do not influence the outcome of the measurement, except as follows. V_{IC} (pos) test: the V_{SS} terminals shall be open. V_{IC} (neg) test: the V_{DD} terminal shall be open. I_{SS} test: the output terminals shall be open.

2. When performing quiescent supply current measurements (I_{SS}), the meter shall be placed so that all currents flow thru the meter.

3. The device manufacturer may, at his option, measure I_{IN} and I_{IN} at $25^\circ C$ for each individual input or measure all inputs together.

4. Capacitance bridge between measured terminal and V_{SS} ; frequency = 1 MHz.

5. Pulse conditions - See figure 5.
6. Loading conditions - See figure 5.

b. A special subgroup shall be added using an LTPD of 15 for classes S and B, and shall be performed on each inspection lot for initially qualified device types 01 through 04, and measured only for initial qualification and after process or design changes for initially qualified device types 51 through 54. This subgroup shall consist of a high voltage test of the input protection circuits, V_{ZAP} (see 4.5.3).

c. End-point electrical parameters shall be as specified in table II herein and shall consist only of those subgroups specified in table IIa of test method 5005 of MIL-STD-883, and table II herein. Delta limits shall apply only to subgroup 5 of group B inspections and shall consist of tests specified in table IV herein.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table III of method 5005 of MIL-STD-883 and as follows:

a. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 1 of group C inspection and shall consist of tests specified in table IV herein.

b. Steady-state life test (method 1005 of MIL-STD-883) conditions:

(1) Test condition D and as specified in 4.5.2 herein and as shown on figure 4, or equivalent.

(2) T_A = +125°C minimum.

(3) Test duration, 1,000 hours, except as permitted by appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

c. Subgroups 3 and 4 shall be added to the group C inspection requirements for class B devices, and shall consist of the tests, conditions, and limits as specified for subgroups 10 and 11 of group A.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical parameters shall be as specified in table II herein.

4.4.5 Group E inspection. Group E inspection is required only for device types intended to be marked as radiation hardened (see 3.6.1). When group E testing is performed it shall be in accordance with table V of method 5005 of MIL-STD-883 and 4.5.5 herein.

4.5 Methods of inspection. Methods of inspection shall be specified as follows:

4.5.1 Voltage and current. Unless otherwise specified, all voltages given are referenced to the microcircuit V_{SS} terminal. Currents given are conventional current and positive when flowing into the referenced terminal.

TABLE IV. Delta limits at 25°C.

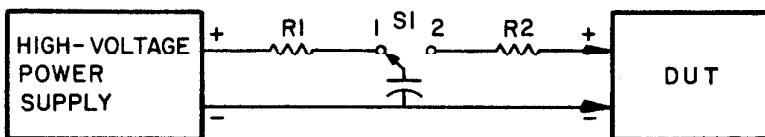
Parameter 1/	Device types	
	01-04	51-54
I _{SS}	±10 nA	±10 nA
V _{O1}	±.04 V	---
V _{OH1}	±.08 V	---
I _{OL1}	---	±15%
I _{OH1}	---	±15%

1/ Each of the above parameters shall be recorded before and after the required burn-in or life tests to determine deltas (Δ).

4.5.2 Burn-in and life test cool down procedures. When burn-in and life tests are completed and prior to removal of bias voltages, the devices under test (DUT) shall be cooled to a temperature of 25°C ±3°C; then, electrical parameter end-point measurements shall be performed.

4.5.3 High voltage (V_{ZAP}) test of input protection circuits. All input terminals (up to a maximum of 4) of the DUT shall be subjected to a voltage pulse from a 100 pF source charged to 400 V. This destructive test shall be conducted as follows using the test circuit shown on figure 6.

- a. Measure I_{IL} and I_{IH} at the inputs selected, as stated above, at 25°C. The test limit for each input tested shall be ± 10 nA at the specified V_{DD} . Measure I_{SS} on the DUT at 25°C. The test limit for this measurement shall be increased a maximum of 20 percent of the specified I_{SS} table III limit at the specified V_{DD} .



NOTES:

1. $V_{ZAP} = 400$ V charge on C_1 .
2. $1 \text{ M}\Omega \leq R_1 \leq 50 \text{ M}\Omega$.
3. $R_2 = 1.5 \text{ k}\Omega$.
4. $C_1 = 100 \text{ pF}$.
5. $S_1 = \text{Hg-wetter "bounceless" relay.}$

FIGURE 6. High voltage (V_{ZAP}) test circuit.

- b. V_{ZAP} is applied to DUT in the following modes (see table V) by changing C_1 to V_{ZAP} with S_1 in position 1 and then switching to position 2.

TABLE V. Modes for high voltage test.

Mode	+ Terminal	- Terminal
1	V_{DD}	Input
2	Input	V_{SS}
3	Input	Associated output

- c. Within 24 hours repeat the I_{SS} , I_{IL} , and I_{IH} measurements on the same terminals as performed above. If a DUT exhibits leakage currents in excess of the specified limits after the V_{ZAP} test, it shall be classified as a failure.

4.5.4 Quiescent supply current (I_{SS}) test. When performing quiescent supply current measurements, the meter shall be placed so that all currents flow through the meter.

4.5.5 Radiation hardness assurance (RHA) testing. The RHA testing shall be performed in accordance with test procedures and sampling specified in table V of method 5005 of MIL-STD-883 and herein:

- a. Before irradiation, selected samples shall be assembled in qualified packages and pass the governing electrical parameters (group A subgroup 1 at 25°C) and also be subjected to the threshold voltage test in table VIII in order to calculate the delta threshold (ΔV_T) after irradiation.
- b. The devices shall be subjected to a total radiation dose as specified in MIL-M-38510 for the RHA level being tested, and meet the end-point electrical parameters as defined in table VI at 25°C, after exposure. The start and completion of the end-point electrical parameter measurements shall not exceed 2 hours following irradiation.
- c. Threshold voltage test circuit conditions shall be as specified in table VIII and figure 7. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VII and bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.

d. After irradiation, the devices shall pass the truth table test as specified in subgroup 7 in table III or if subgroup 7 is not required, then an equivalent truth table test shall be performed.

TABLE VI. Radiation hardening end-point electrical parameters at 25°C.

Parameter	All device types	V_{DD}	
		Device types	Device types
		01, 04	51, 54
V_{TN}	0.3 V min	10 V	10 V
V_{TP}	2.8 V max	10 V	10 V
ΔV_T	1.4 V	10 V	10 V
I_{SS}	100 x max limit	15 V	18 V
t_{PLH}	1.35 x max limit	5 V	5 V
t_{PHL}	1.35 x max limit	5 V	5 V

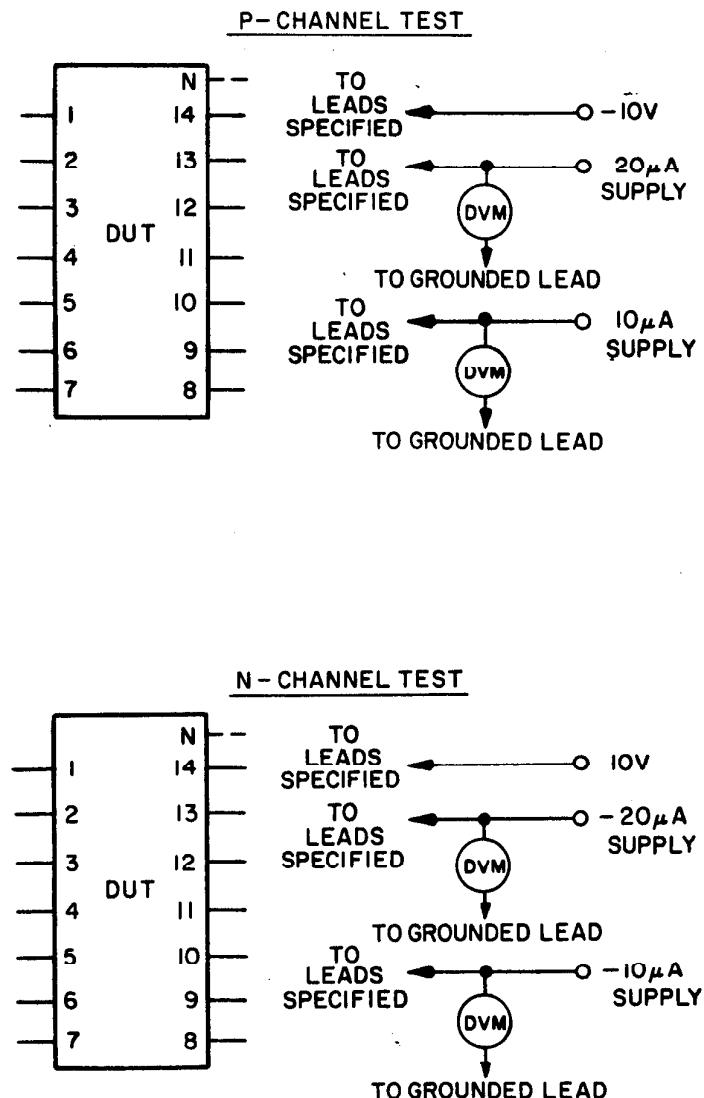
TABLE VII. Bias during exposure to radiation.

Device type	Pin connections		
	$V_{DD} = 10$ V dc (through a 30- to 60-k Ω resistor)	$V_{SS} = GND$	$V_{DD} = 10$ V dc
01, 51	3, 4, 5, 8, 11, 12, 13	7	14
02, 52	1, 2, 5, 6, 8, 9, 12, 13	7	14
03, 53	2, 3, 4, 5, 9, 10, 11, 12	7	14
04, 54	1, 2, 3, 4, 5, 8, 11, 12, 13	7	14

Pins not designated are open or connected to 10 V dc through a 30- to 60-kilohm resistor.

TABLE VIII. Threshold voltage circuit conditions.

Device type	GND	10 V	V_{TN} measured at		GND	-10 V	V_{TP} measured at	
			20 μ A supply	10 μ A supply			20 μ A supply	10 μ A supply
01, 51	3	14		1, 2, 4, 5, 7, 8, 11-13	3	1, 2, 4, 5, 7, 8, 11-13		14
02, 52	1	14		2, 5-9, 12, 13	1	2, 5-9, 12, 13		14
03, 53	2	14		3-5, 7, 9-12	2	3-5, 7, 9-12		14
04, 54	3	14		1, 2, 4, 5, 7, 8, 11-13	3	1, 2, 4, 5, 7, 8, 11-13		14

FIGURE 7. Threshold-voltage test circuit conditions.

4.6 Data reporting. When specified in the purchase order or contract, a copy of the following data, as applicable, shall be supplied.

- a. Attributes data for all screening tests (see 4.2) and variables data for all static burn-in, dynamic burn-in, and steady state life tests (see 3.5).
- b. A copy of each radiograph (see 4.2).
- c. The quality conformance inspection data (see 4.4).
- d. Parameter distribution data on parameters evaluated during burn-in (see 3.5).
- e. Final electrical parameters data (see 4.2c).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510. These devices require electrostatic protection.

6. NOTES

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design application and logistic support of existing equipment.

6.2 Ordering data. The acquisition document should specify the following:

- a. Complete part number (see 1.2).
- b. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- 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 of 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 shall not apply to direct purchase by, or direct shipment to the Government.
- h. Requirements for "JAN" marking.
- i. Requirements for total dose radiation testing (see 3.6.1 and 4.5.5), if applicable.

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:

C_i	- - - - -	Input terminal-to-VSS capacitance.
GND	- - - - -	Ground zero voltage potential.
I _{SS}	- - - - -	Quiescent supply current.
T _A	- - - - -	Free air temperature.
V _{DD}	- - - - -	Positive supply voltage.
V _{IC(pos)}	- - - - -	Positive clamping input to V _{DD} .
V _{IC(neg)}	- - - - -	Negative clamping input to V _{SS} .
V _{SS}	- - - - -	Negative supply voltage.
V _{ZAP}	- - - - -	Input test voltage.

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 S for National Aeronautics and Space Administration or class D for Department of Defense (see 1.2.2), lead 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 for MIL-M-38510 types or as a waiver of any of the provisions of MIL-M-38510.

Military device type	Generic-industry type
01	4000A
02	4001A
03	4002A
04	4025A
51	4000B
52	4001B
53	4002B
54	4025B

6.6 Handling. MOS devices must be handled with certain precautions to avoid damage due to accumulation of static charge. Input protective devices have been designed in the chip to minimize the effect of this static buildup. However, the following handling practices are recommended:

- a. Devices should be handled on benches with conductive and grounded surface.
- b. Ground test equipment and tools.
- c. Do not handle devices by the leads.
- d. Store devices in conductive foam or carriers.
- e. Avoid use of plastic, rubber, or silk in MOS areas.
- f. Maintain relative humidity above 50 percent, if practical.

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - ER
Navy - EC
Air Force - 17
NASA - NA

Preparing activity:

NASA - NA
(Project 5962-0638-2)

Review activities:

Army - MI
Air Force - 11, 19, 85, 99
DLA - ES

User activities:

Army - AR, SM
Navy - AS, CG, MC, OS, SH

Agent:

DLA - ES