INCH-POUND

MIL-M-38510/50F
20 October 2004

SUPERSEDING
MIL-M-38510/50E
30 April 1984

MILITARY SPECIFICATION
MICROCIRCUITS, DIGITAL, CMOS, NAND GATES,
MONOLITHIC SILICON, POSITIVE LOGIC

Reactivated after 20 October 2004 and may be used for new and existing designs and acquisitions.

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

The requirements for acquiring the product herein shall consist of this specification sheet and MIL-PRF 38535

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, CMOS, logic microcircuits. Two product assurance classes and a choice of case outlines, lead finishes, and radiation hardness assurance (RHA) are provided and are reflected in the complete Part or Identifying Number (PIN). For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).

1.2 Part or identifying number (PIN). The PIN is in accordance with MIL-PRF-38535 and as specified herein.

1.2.1 Device types. The device types are as follows:

Device type	Circuit
01	Quadruple 2-input NAND gate
02	Dual 4-input NAND gate
03	Triple 3-input NAND gate
51	Quadruple 2-input NAND gate
52	Dual 4-input NAND gate
53	Triple 3-input NAND gate

1.2.2 Device class. The device class is the product assurance level as defined in MIL-PRF-38535.

1.2.3 Case outlines. The case outlines are as designated in MIL-STD-1835 and as follows:

Outline letter	Descriptive designator	Terminals	Package style
A	GDFP5-F14 or CDFP6-F14	14	Flat pack
C	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	Flat pack
T	CDFP3-F14	14	Flat pack
X 1/ 2/	GDFP5-F14 or CDFP6-F14	14	Flat pack, except A dimension equals 0.1" (2.54 mm) max
Y 1/ 2/	GDFP1-F14 or CDFP2-F14	14	Flat pack, except A dimension equals 0.1" (2.54 mm) max

1/ As an exception to MIL-PRF-38535, appendix A, for case outlines X and Y only, the leads of bottom brazed ceramic packages (i.e., configuration 2 of case outlines A or D) may have electroless nickel undercoating which is 50 to 200 microinches (1.27 to 5.08 μm) 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 extends 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 S_1 dimension may go to .000 inch (.00 mm) minimum.

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAC, P.O. Box 3990, Columbus, OH 43218-3990, or email CMOS@dscc.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at http://www.dodssp.daps.mil.

1.3 <u>Absolute maximum ratings</u>.

Supply voltage range ($V_{DD} - V_{SS}$):
  Device types 01, 02, 03... -0.5 V dc to +15.5 V dc
  Device types 51, 52, 53... -0.5 V dc to +18.0 V dc
Input current (each input) .... ±10 mA
Input voltage range.. $(V_{SS} - 0.5\ V) \leq V_I \leq (V_{DD} + 0.5\ V)$
Storage temperature range (T_{STG}).. -65° to +175°C
Maximum power dissipation (P_D) .... 200 mW
Lead temperature (soldering, 10 seconds) .... +300°C
Thermal resistance, junction to case (θ_{JC}).. See MIL-STD-1835
Junction temperature (T_J) .... 175°C

1.4 <u>Recommended operating conditions</u>.

Device types 01, 02, 03:
  Supply voltage range ($V_{DD} - V_{SS}$) .... 4.5 V dc to 12.5 V dc
  Input low voltage range (V_{IL}) .... 0.0 V to 0.85 V dc @ V_{DD} = 5.0 V dc
                                                                                    0.0 V to 2.0 V dc @ V_{DD} = 10.0 V dc
                                                                                    0.0 V to 2.1 V dc @ V_{DD} = 12.5 V dc
  Input high voltage range (V_{IH})... 3.95 V to 5.0 V dc @ V_{DD} = 5.0 V dc
                                                                                    8.0 V to 10.0 V dc @ V_{DD} = 10.0 V dc
                                                                                    10 V to 12.5 V dc @ V_{DD} = 12.5 V dc
Device types 51, 52, 53:
  Supply voltage range ($V_{DD} - V_{SS}$) .... 4.5 V dc to 15.0 V dc
  Input low voltage range (V_{IL}) .... V_{OL} = 10% V_{DD}, V_{OH} = 90% V_{DD}
                                                                                    0.0 V to 1.5 V dc @ V_{DD} = 5.0 V dc
                                                                                    0.0 V to 2.0 V dc @ V_{DD} = 10.0 V dc
                                                                                    0.0 V to 4.0 V dc @ V_{DD} = 15.0 V dc
  Input high voltage range (V_{IH}) .... V_{OL} = 10% V_{DD}, V_{OH} = 90% V_{DD}
                                                                                    3.5 V to 5.0 V dc @ V_{DD} = 5.0 V dc
                                                                                    8.0 V to 10.0 V dc @ V_{DD} = 10.0 V dc
                                                                                    11 V to 15.0 V dc @ V_{DD} = 15.0 V dc
Ambient operating temperature range (T_A) .... -55°C to +125°C
Load capacitance .... 50 pF maximum

2. APPLICABLE DOCUMENTS

  2.1 <u>General</u>. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

  2.2 <u>Government documents</u>.

  2.2.1 <u>Specifications and Standards</u>. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

  DEPARTMENT OF DEFENSE SPECIFICATION

    MIL-PRF-38535   -   Integrated Circuits (Microcircuits) Manufacturing, General Specification for.

  DEPARTMENT OF DEFENSE STANDARDS

    MIL-STD-883   -   Test Method Standard Microcircuits.
    MIL-STD-1835   -   Interface Standard Electronic Component Case Outlines.

  (Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch/ or www.dodssp.daps.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 <u>Order of precedence</u>. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 <u>Qualification</u>. Microcircuits furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.3 and 6.4).

3.2 <u>Item requirements</u>. The individual item requirements shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

3.3 <u>Design, construction, and physical dimensions.</u> The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 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°C ±10°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.

3.3.1 <u>Logic diagrams and terminal connections.</u> The logic diagrams and terminal connections shall be as specified on figure 1.

3.3.2 <u>Truth tables and logic equations</u>. The truth tables and logic equations shall be as specified on figure 2.

3.3.3 <u>Switching time test circuit and waveforms</u>. The switching time test circuit and waveforms shall be as specified on figure 3.

3.3.4 <u>Schematic circuits.</u> The schematic circuits shall be maintained by the manufacturer and made available to the qualifying activity or preparing activity upon request.

3.3.5 <u>Case outlines.</u> The case outlines shall be as specified in 1.2.3.

3.4 <u>Lead material and finish.</u> The lead material and finish shall be in accordance with MIL-PRF-38535 (see 6.6).

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

3.6 <u>Electrical test requirements.</u> 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.

3.7 <u>Marking.</u> Marking shall be in accordance with MIL-PRF-38535.

3.7.1 <u>Radiation hardness assurance identifier</u>. The radiation hardness assurance identifier shall be in accordance with MIL-PRF-38535 and 4.5.4 herein.

3.8 <u>Microcircuit group assignment.</u> The devices covered by this specification shall be in microcircuit group number 36 (see MIL-PRF-38535, appendix A).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ Vss = 0 V -55°C ≤ TA ≤ +125°C Unless otherwise specified		Device type	Limits		Unit
					Min	Max	
Positive clamping input to V_{DD}	$V_{IC\,(POS)}$	T_A = +25°C, V_{DD} = GND V_{SS} = Open, Output = Open I_{IN} = 1 mA		All		1.5	V dc
Negative clamping input to V_{SS}	$V_{IC\,(NEG)}$	T_A = +25°C, V_{DD} = Open V_{SS} = GND, Output = Open I_{IN} = -1 mA		All		-6.0	V dc
Quiescent supply current	I_{SS}	All input combinations	V_{DD} = 15 V dc	01, 02, 03		-750	nA
			V_{DD} = 18 V dc	51, 52, 53			
High level output voltage	V_{OH1}	V_{DD} = 5 V dc, I_{OH} = -175 µA Any one input = V_{IL} (see table III)		All	4.2		V dc
	V_{OH2}	V_{DD} = 5 V dc, I_{OH} = 0.0 A Any one input = V_{IL} (see table III)		All	4.95		
	V_{OH3}	V_{DD} = 12.5 V dc, I_{OH} = 0.0 A Any one input = V_{IL} (see table III)		All	11.25		
	V_{OH4}	V_{DD} = 15 V dc, I_{OH} = 0.0 A		51, 52, 53	14.95		
Low level output voltage	V_{OL1}	V_{DD} = 5 V dc, I_{OL} = 175 µA All inputs = V_{IH} (see table III)		01		0.5	V dc
		V_{DD} = 5 V dc, I_{OL} = 85 µA All inputs = V_{IH} (see table III)		02, 03		0.7	
	V_{OL2}	V_{DD} = 5 V dc, I_{OL} = 0.0 A All inputs = V_{IH} (see table III)		All		0.05	
	V_{OL3}	V_{DD} = 12.5 V dc, I_{OL} = 0.0 A All inputs = V_{IH} (see table III)		All		1.25	
	V_{OL4}	V_{DD} = 15 V dc, I_{OL} = 0.0 A		51, 52, 53		0.05	
Input high voltage	V_{IH1}	V_{DD} = 5 V dc V_O = 0.5 V $\lvert I_O \rvert \le 1µA$		51, 52, 53	3.5		V dc
	V_{IH2}	V_{DD} = 10 V dc V_O = 1.0 V $\lvert I_O \rvert \le 1µA$		51, 52, 53	7.0		V dc
	V_{IH3}	V_{DD} = 15 V dc V_O = 1.5 V $\lvert I_O \rvert \le 1µA$		51, 52, 53	11.0		V dc
Input low voltage	V_{IL1}	V_{DD} = 5 V dc V_O = 4.5 V dc $\lvert I_O \rvert \le 1µA$		51, 52, 53		1.5	V dc
	V_{IL2}	V_{DD} = 10 V dc V_O = 9.0 V dc $\lvert I_O \rvert \le 1µA$		51, 52, 53		3.0	V dc
	V_{IL3}	V_{DD} = 15 V dc V_O = 13.5 V dc $\lvert I_O \rvert \le 1µA$		51, 52, 53		4.0	V dc

See footnotes at end of the table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ V_{SS} = 0 V -55°C ≤ T_A ≤ +125°C Unless otherwise specified		Device type	Limits Min	Limits Max	Unit
Output low (sink) current	I_{OL1}	V_{DD} = 5 V dc V_{IN} = 5.0 V V_{OL} = 0.4 V dc		51, 52, 53	0.36		mA dc
	I_{OL2}	V_{DD} = 15 V dc V_{IN} = 15 V V_{OL} = 1.5 V dc		51, 52, 53	2.4		mA dc
Output high (source) current	I_{OH1}	V_{DD} = 5 V dc Any one input = V_{SS} All other inputs = V_{DD} V_{OH} = 4.6 V dc		51, 52, 53	-0.36		mA dc
	I_{OH2}	V_{DD} = 15 V dc Any one input = V_{SS} All other inputs = V_{DD} V_{OH} = 13.5 V dc		51, 52, 53	-2.4		mA dc
Input leakage current, high	I_{IH} 2/	Measure inputs sequentially	V_{DD} = 15 V dc	01, 02, 03		100.0	nA
			V_{DD} = 18 V dc	51, 52, 53			
Input leakage current, low	I_{IL} 2/	Measure inputs sequentially	V_{DD} = 15 V dc	01, 02, 03		-100.0	nA
			V_{DD} = 18 V dc	51, 52, 53			
Input capacitance	C_i	V_{DD} = 0 V dc, f = 1 MHz, T_A = 25°C		All		12	pF
Propagation delay time, high to low level	t_{PHL}	V_{DD} = 5 V dc, C_L = 50 pF R_L = 200 kΩ (See figure 3)		01	13	300	ns
				02	13	490	
				03	13	265	
				51	13	300	
				52	13	490	
				53	13	265	
Propagation delay time, low to high level	t_{PLH}			01, 03	13	225	ns
				02	13	375	
				51, 53	13	225	
				52	13	375	
Transition time, high to low level	t_{THL}	V_{DD} = 5 V dc, C_L = 50 pF R_L = 200 kΩ (See figure 3)		01	10	450	ns
				02	10	825	
				03	10	375	
				51	10	450	
				52	10	825	
				53	10	375	

See footnotes at end of the table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ V_{SS} = 0 V -55°C $\leq T_A \leq$ +125°C Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Transition time, low to high level	t_{TLH}	V_{DD} = 5 V dc, C_L = 50 pF R_L = 200 kΩ (See figure 3)	01	10	450	ns
			02	10	640	
			03	10	450	
			51	10	450	
			52	10	640	
			53	10	450	

1/ Complete terminal conditions shall be as specified in table III.
2/ Input current at one input node.

DEVICE TYPES 01 AND 51
CASES A,C,D,T,X AND Y

DEVICE TYPES 02 AND 52
CASES A,C,D,T,X AND Y

DEVICE TYPE 03 AND 53
CASES A,C,D,T,X AND Y
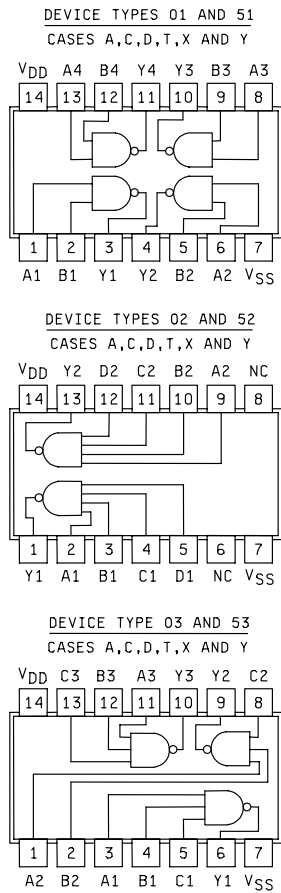
FIGURE 1. Logic diagrams and terminal connections.

6

Device types 01 and 51

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

Positive logic Y = $\overline{A \bullet B}$

Device types 02 and 52

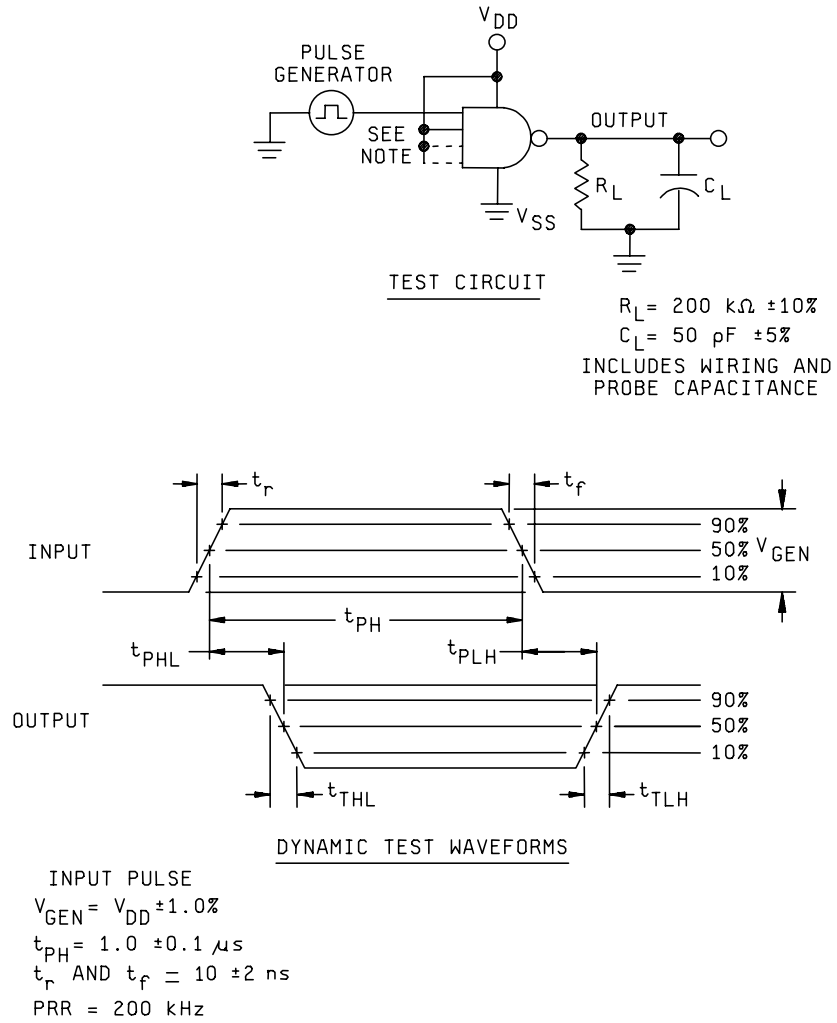| Truth table, each gate				
Input				Output
A	B	C	D	Y
L	L	L	L	H
H	L	L	L	H
L	H	L	L	H
H	H	L	L	H
L	L	H	L	H
H	L	H	L	H
L	H	H	L	H
H	H	H	L	H
L	L	L	H	H
H	L	L	H	H
L	H	L	H	H
H	H	L	H	H
L	L	H	H	H
H	L	H	H	H
L	H	H	H	H
H	H	H	H	L

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

Device types 03 and 53

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

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

FIGURE 2. Truth tables and logic equations.

TEST CIRCUIT

R_L = 200 kΩ ±10%
C_L = 50 pF ±5%
INCLUDES WIRING AND
PROBE CAPACITANCE

DYNAMIC TEST WAVEFORMS

INPUT PULSE
V_{GEN} = V_{DD} ±1.0%
t_{PH} = 1.0 ±0.1 μs
t_r AND t_f = 10 ±2 ns
PRR = 200 kHz

NOTE: All unused inputs must be tied to V_{DD}.

FIGURE 3. Switching time test circuit and waveforms.

8

4. VERIFICATION

4.1 <u>Sampling and inspection.</u> Sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

4.2 <u>Screening.</u> Screening shall be in accordance with MIL-PRF-38535 and shall be conducted on all devices prior to qualification and conformance inspection. The following additional criteria shall apply:

   a. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

   b. Delete the sequence specified as interim (pre-burn-in) electrical parameters through interim (post-burn-in) electrical parameters of table IA of MIL-PRF-38535 and substitute lines 1 through 7 of table II herein.

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

      (1) Unless otherwise specified in the manufacturers QM plan for static tests (test condition A), ambient temperature (T_A) 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.

         i. For static burn-in I, all inputs shall be connected to 0.0 V.

         ii. For static burn-in II, all inputs shall be connected to V_{DD}.

         iii. Except for V_{DD} and V_{SS}, the terminal shall be connected through resistors whose value is 2 kΩ to 47 kΩ. The actual measured value of the resistor selected shall not exceed ±20% of its branded value due to use, heat or age.

         iv. Output may be open or connected to V_{DD}/2.

         v. V_{DD} = 12.5 V minimum, 15 V maximum for device types 01, 02, 03.
            V_{DD} = 15 V minimum, 18 V maximum for device types 51, 52, 53.
            V_{DD}/2 = V_{DD}/2 ±1.0 V; V_{SS} = 0.0 V.

      (2) Unless otherwise specified in the manufacturers QM plan for dynamic test (test condition D), ambient temperature shall be +125°C minimum. Test duration shall be in accordance with table I of method 1015.

         i. Except for V_{DD} and V_{SS}, the terminals shall be connected through resistors whose value is 2 kΩ to 47 kΩ. The actual measured value of the resistor selected shall not exceed ±20% of its branded value due to use, heat or age.

         ii. Input signal requirements: Square wave, 50% duty cycle; 25 kHz < PRR < 1 MHz; t_{TLH} and t_{THL} < 1 μs. Voltage level: Minimum = V_{SS} – 0.5 V, +10% V_{DD}; Maximum = V_{DD} + 0.5 V, -10% V_{DD}.

         iii. For device types 01 and 51:
            (a) Connect pins 14, 2, and 11 together.
            (b) Connect pins 7, 4, and 9 together.
            (c) Connect pins 13 and 8 together.
            (d) Connect pins 1 and 5 together.

iv V_{DD} = 12.5 V minimum, 15 V maximum for device types 01, 02, 03.
V_{DD} = 15 V minimum, 18 V maximum for device types 51, 52, 53.
$V_{DD}/2$ = $V_{DD}/2 \pm 1.0$ V; V_{SS} = 0.0 V.

d. Interim and final electrical test parameters shall be as specified in table II.

e. 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.

TABLE II. Electrical test requirements.

Line no.	MIL-PRF-38535 test requirements	Class S device 1/			Class B device 1/		
		Ref. par.	Table III Subgroups 2/	Table IV delta limits 3/	Ref. par.	Table III subgroups 2/	Table IV delta limits 3/
1	Interim electrical parameters		1			1	
2	Static burn-in I (method 1015)	4.2c 4.5.2					
3	Same as line 1		1	Δ			
4	Static burn-in II (method 1015)	4.2c 4.5.2			4.2c 4.5.2	4/	
5	Same as line 1	4.2e	1*	Δ	4.2e	1*	Δ
6	Dynamic burn-in (method 1015)	4.2c 4.5.2					
7	Same as line 1	4.2e	1*	Δ			
8	Final electrical parameters (method 5004)		1*, 2, 3, 9			1*, 2, 3, 9	
9	Group A test requirements (method 5005)	4.4.1	1, 2, 3, 4, 9, 10, 11		4.4.1	1, 2, 3, 4, 9, 10, 11	
10	Group B test when using method 5005 QCI option	4.4.2	1, 2, 3, 9, 10, 11	Δ			
11	Group C end-point electrical parameters (method 5005)				4.4.3	1, 2, 3	Δ
12	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/ * indicates PDA applies to subgroup 1 (see 4.2.1).

3/ Δ indicates delta limits shall be required only on table III subgroup 1, where specified, and the 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.

4.2.1 <u>Percent defective allowable (PDA)</u>.

    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 failure shall be cumulative for determining the PDA.

    c. The PDA for class B devices shall be in accordance with MIL-PRF-38535 for static burn-in. Dynamic burn-in is not required.

    d. Those devices whose measured characteristics, after burn-in, exceed the specified delta (Δ) 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 <u>Qualification inspection.</u> Qualification inspection shall be in accordance with MIL-PRF-38535.

4.3.1 <u>Qualification extension</u>. When authorized by the qualifying activity, if a manufacturer qualifies to a 51, 52, or 53 device type which is manufactured identically to a 01, 02, or 03 device type on this specification, then the 01, 02, or 03 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 submitting data in accordance with MIL-PRF-38535.

4.4 <u>Technology Conformance inspection (TCI)</u>. Technology conformance inspection shall be in accordance with MIL-PRF-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.4.1 <u>Group A inspection.</u> Group A inspection shall be in accordance with table III of MIL-PRF-38535 and as follows:

    a. Tests shall be performed in accordance with table II herein.

    b. Subgroups 5, 6, 7, and 8 shall be omitted.

    c. Subgroup 4 (C_i measurement) shall be measured only for initial qualification and after process or design changes that may affect input capacitance. Capacitance shall be measured between the designated terminal and V_{SS} at a frequency of 1 MHz.

    d. Subgroups 9 and 11 shall be measured only for initial qualification and after process or design changes which may affect dynamic performance.

    e. When device types 01 through 03 are qualified by extension (see 4.3.1), these device types will be inspected (QCI) according to the requirements for device types 51 through 53, respectively.

4.4.2 <u>Group B inspection.</u> Group B inspection shall be in accordance with table II of MIL-PRF-38535.

4.4.3 <u>Group C inspection.</u> Group C inspection shall be in accordance with table IV of MIL-PRF-38535 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. The steady-state life test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

    c. When device types 01 through 03 are qualified by extension (see 4.3.1), these device types will be inspected (QCI) according to the requirements for device types 51 through 53, respectively.

TABLE III. <u>Group A inspection for device type 01.</u>

Symbol	MIL-STD-883 method	Test no.	1 (1A)	2 (1B)	3 (1Y)	4 (2Y)	5 (2B)	6 (2A)	7 (Vss)	8 (3A)	9 (3B)	10 (3Y)	11 (4Y)	12 (4B)	13 (4A)	14 (VDD)	Measured terminal	SG1 T_A=25°C Min	SG1 Max	SG2 T_A=125°C Min	SG2 Max	SG3 T_A=-55°C Min	SG3 Max	Unit
$V_{IC(pos)}$ 1/		1	1mA													GND	1A		1.5					V
"		2		1mA												"	1B		"					"
"		3					1mA									"	2B		"					"
"		4						1mA								"	2A		"					"
"		5								1mA						"	3A		"					"
"		6									1mA					"	3B		"					"
"		7												1mA		"	4B		"					"
"		8													1mA	"	4A		"					"
$V_{IC(neg)}$ 1/		9	-1mA						GND								1A		-6.0					"
"		10		-1mA					"								1B		"					"
"		11					-1mA		"								2B		"					"
"		12						-1mA	"								2A		"					"
"		13							"	-1mA							3A		"					"
"		14							"		-1mA						3B		"					"
"		15							"					-1mA			4B		"					"
"		16							"						-1mA		4A		"					"
I_{SS} 1/	3005	17	GND	15.0V			15.0V	GND	"	GND	15.0V			15.0V	GND	15.0V	V_{SS}		-25.0		-750.0			nA
"	"	18	15.0V	"			"	15.0V	"	15.0V				"	15.0V	"	"		"		"			"
"	"	19		GND			GND				GND			GND			"							"
V_{OH1}	3006	20	V_{IL1}	5.0V	I_{OH1}		"	GND	"	GND	"			"	GND	5.0V	1Y	4.2		4.2		4.2		V
"	"	21	5.0V	V_{IL1}	"				"	"	"			"	"	"	1Y	"		"		"		"
"	"	22	GND	GND		I_{OH1}	V_{IL1}	5.0V	"	"	"			"	"	"	2Y	"		"		"		"
"	"	23	"	"		"	5.0V	V_{IL1}	"	"	"			"	"	"	2Y	"		"		"		"
"	"	24	"	"			GND	GND	"	V_{IL1}	5.0V			"	"	"	3Y	"		"		"		"
"	"	25	"	"			"	"	"	5.0V	V_{IL1}	I_{OH1}		"	"	"	3Y	"		"		"		"
"	"	26	"	"			"	"	"	GND	GND		I_{OH1}	V_{IL1}	5.0V	"	4Y	"		"		"		"
"	"	27	"	"			"	"	"	"	"		"	5.0V	V_{IL1}	"	4Y	"		"		"		"
V_{OH2}	"	28	V_{IL1}	5.0V			"	"	"	"	"			GND	GND	"	1Y	4.95		4.95		4.95		"
"	"	29	5.0V	V_{IL1}			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"	"	30	GND	GND			V_{IL1}	5.0V	"	"	"			"	"	"	2Y	"		"		"		"
"	"	31	"	"			5.0V	V_{IL1}	"	"	"			"	"	"	2Y	"		"		"		"
"	"	32	"	"			GND	GND	"	V_{IL1}	5.0V			"	"	"	3Y	"		"		"		"
"	"	33	"	"			"	"	"	5.0V	V_{IL1}			"	"	"	3Y	"		"		"		"
"	"	34	"	"			"	"	"	GND	GND			V_{IL1}	5.0V	"	4Y	"		"		"		"
"	"	35	"	"			"	"	"	"	"			5.0V	V_{IL1}	"	4Y	"		"		"		"
V_{OH3}	"	36	V_{IL2}	12.5V			"	"	"	"	"			GND	GND	12.5V	1Y	11.25		11.25		11.25		"
"	"	37	12.5V	V_{IL2}			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"	"	38	GND	GND			V_{IL2}	12.5V	"	"	"			"	"	"	2Y	"		"		"		"
"	"	39	"	"			12.5V	V_{IL2}	"	"	"			"	"	"	2Y	"		"		"		"
"	"	40	"	"			GND	GND	"	V_{IL2}	12.5V			"	"	"	3Y	"		"		"		"
"	"	41	"	"			"	"	"	12.5V	V_{IL2}			"	"	"	3Y	"		"		"		"
"	"	42	"	"			"	"	"	GND	GND			V_{IL2}	12.5V	"	4Y	"		"		"		"
"	"	43	"	"			"	"	"	"	"			12.5V	V_{IL2}	"	4Y	"		"		"		"
V_{OL1}	3007	44	V_{IH1}	V_{IH1}	I_{OL1}		"	"	"	"	"			GND	GND	5.0V	1Y		0.5		0.5		0.5	"
"	"	45	GND	GND		I_{OL1}	V_{IH1}	V_{IH1}	"	"	"			"	"	"	2Y		"		"		"	"
"	"	46	"	"			GND	GND	"	V_{IH1}	V_{IH1}	I_{OL1}		"	"	"	3Y		"		"		"	"
"	"	47	"	"			"	"	"	GND	GND		I_{OL1}	V_{IH1}	V_{IH1}	"	4Y		"		"		"	"

See footnotes at end of device type 03.

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

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y Test no.	1 1A	2 1B	3 1Y	4 2Y	5 2B	6 2A	7 Vss	8 3A	9 3B	10 3Y	11 4Y	12 4B	13 4A	14 VDD	Measured terminal	Sub 1 TA=25°C Min	Sub 1 Max	Sub 2 TA=125°C Min	Sub 2 Max	Sub 3 TA=-55°C Min	Sub 3 Max	Unit
V_OL2	3007	48	V_IH1	V_IH1			GND	GND	GND	GND	GND			GND	GND	5.0V	1Y		0.05		0.05		0.05	V
"	"	49	GND	GND			V_IH1	V_IH1	"	"	"			"	"	"	2Y		"		"		"	"
"	"	50	"	"			GND	GND	"	V_IH1	V_IH1			"	"	"	3Y		"		"		"	"
"	"	51					"	"	"	GND	GND			V_IH1	V_IH1	"	4Y		"		"		"	"
V_OL3	3007	52	V_IH2	V_IH2			"	"	"	"	"			GND	GND	12.5V	1Y		1.25		1.25		1.25	"
"	"	53	GND	GND			V_IH2	V_IH2	"	"	"			"	"	"	2Y		"		"		"	"
"	"	54	"				GND	GND	"	V_IH2	V_IH2			"	"	"	3Y		"		"		"	"
"	"	55	"						"	GND	GND			V_IH2	V_IH2	"	4Y		"		"		"	"
I_IH1 2/	3010	56	15.0V	15.0V			15.0V	15.0V	"	15.0V	15.0V			15.0V	15.0V	15.0V	All together		800					nA
I_IH2	"	57	"	"			"	"	"	"	"			"	"	"	1A		100.0		100.0			"
"	"	58	"	"			"	"	"	"	"			"	"	"	1B		"		"			"
"	"	59	"	"			"	"	"	"	"			"	"	"	2B		"		"			"
"	"	60	"	"			"	"	"	"	"			"	"	"	2A		"		"			"
"	"	61	"	"			"	"	"	"	"			"	"	"	3A		"		"			"
"	"	62	"	"			"	"	"	"	"			"	"	"	3B		"		"			"
"	"	63	"	"			"	"	"	"	"			"	"	"	4B		"		"			"
"	"	64	"	"			"	"	"	"	"			"	"	"	4A		"		"			"
I_IL1 2/	3009	65	GND	GND			GND	GND	"	GND	GND			GND	GND	"	All together		-800					"
I_IL2	"	66	"	15.0V			15.0V	15.0V	"	15.0V	15.0V			15.0V	15.0V	"	1A		-100.0		-100.0			"
"	"	67	15.0V	GND				"	"	"	"			"	"	"	1B		"		"			"
"	"	68	"	15.0V			GND	"	"	"	"			"	"	"	2B		"		"			"
"	"	69	"	"			15.0V	GND	"	"	"			"	"	"	2A		"		"			"
"	"	70	"	"			"	15.0V	"	GND	"			"	"	"	3A		"		"			"
"	"	71	"	"			"	"	"	15.0V	GND			"	"	"	3B		"		"			"
"	"	72	"	"			"	"	"	"	15.0V			GND	"	"	4B		"		"			"
"	"	73	"	"			"	"	"	"	"			15.0V	GND	"	4A		"		"			"

Symbol	MIL-STD-883 method	Test no.	1 1A	2 1B	3 1Y	4 2Y	5 2B	6 2A	7 Vss	8 3A	9 3B	10 3Y	11 4Y	12 4B	13 4A	14 VDD	Measured terminal	Sub 4 TA=25°C Min	Sub 4 Max					Unit
C_I	3012	74	F						GND							GND	1A		12.0					pF
"	"	75		F					"							"	1B		"					"
"	"	76					F		"							"	2B		"					"
"	"	77						F	"							"	2A		"					"
"	"	78							"	F						"	3A		"					"
"	"	79							"		F					"	3B		"					"
"	"	80							"					F		"	4B		"					"
"	"	81							"						F	"	4A		"					"

Symbol	MIL-STD-883 method	Test no.	1 1A	2 1B	3 1Y	4 2Y	5 2B	6 2A	7 Vss	8 3A	9 3B	10 3Y	11 4Y	12 4B	13 4A	14 VDD	Measured terminal	Sub 9 TA=25°C Min	Sub 9 Max	Sub 10 TA=125°C Min	Sub 10 Max	Sub 11 TA=-55°C Min	Sub 11 Max	Unit
t_PHL	3003 Fig. 3	82	IN	5.0V	OUT		5.0V	5.0V	GND	5.0V	5.0V			5.0V	5.0V	5.0V	1A to 1Y	13	200	18	300	13	200	ns
"	"	83	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	84	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	85	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2A to 2Y	"	"	"	"	"	"	"
"	"	86	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	87	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	88	"	"			"	"	"	"	5.0V		OUT	IN	5.0V	"	4B to 4Y	"	"	"	"	"	"	"
"	"	89	"	"			"	"	"	"	5.0V		OUT	5.0V	IN	"	4A to 4Y	"	"	"	"	"	"	"

See footnotes at end of device type 03.

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

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y	For terminal conditions and limits, see 1/ and 3/													Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9 $T_A = 25°C$		Subgroup 10 $T_A = 125°C$		Subgroup 11 $T_A = -55°C$		
	method	Test no.	1A	1B	1Y	2Y	2B	2A	V_{SS}	3A	3B	3Y	4Y	4B	4A	V_{DD}		Min	Max	Min	Max	Min	Max	
t_{PLH}	3003 Fig. 3	90	IN	5.0V	OUT		5.0V	5.0V	GND	5.0V	5.0V			5.0V	5.0V	5.0V	1A to 1Y	13	150	18	225	13	150	ns
"	"	91	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	92	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	93	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2A to 2Y	"	"	"	"	"	"	"
"	"	94	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	95	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	96	"	"			"	"	"	"	5.0V		OUT	IN	"	"	4B to 4Y	"	"	"	"	"	"	"
"	"	97	"	"			"	"	"	"	"		OUT	5.0V	IN	"	4A to 4Y	"	"	"	"	"	"	"
t_{THL}	3004 Fig. 3	98	IN	"	OUT		"	"	"	"	"			"	5.0V	"	1Y	10	300	14	450	10	300	"
"	"	99	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
"	"	100	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	101	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	102	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	103	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	104	"	"			"	"	"	"	5.0V		OUT	IN	"	"	4Y	"	"	"	"	"	"	"
"	"	105	"	"			"	"	"	"	"		OUT	5.0V	IN	"	4Y	"	"	"	"	"	"	"
t_{TLH}	"	106	IN	"	OUT		"	"	"	"	"			"	5.0V	"	1Y	10	"	14	"	10	"	"
"	"	107	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
"	"	108	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	109	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	110	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	111	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	112	"	"			"	"	"	"	5.0V		OUT	IN	"	"	4Y	"	"	"	"	"	"	"
"	"	113	"	"			"	"	"	"	"		OUT	5.0V	IN	"	4Y	"	"	"	"	"	"	"

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y / Test no.	1 (1Y)	2 (1A)	3 (1B)	4 (1C)	5 (1D)	6 (NC)	7 (V_{SS})	8 (NC)	9 (2A)	10 (2B)	11 (2C)	12 (2D)	13 (2Y)	14 (V_{DD})	Measured terminal	SG1 T_A=25°C Min	Max	SG2 T_A=125°C Min	Max	SG3 T_A=-55°C Min	Max	Unit
$V_{IC(pos)}$ 1/		1		1mA												GND	1A		1.5					V
"		2			1mA											"	1B		"					"
		3				1mA										"	1C		"					"
"		4					1mA									"	1D		"					"
"		5									1mA					"	2A		"					"
"		6										1mA				"	2B		"					"
"		7											1mA			"	2C		"					"
"		8												1mA		"	2D		"					"
$V_{IC(neg)}$ 1/		9		-1mA					GND								1A		-6.0					"
"		10			-1mA				"								1B		"					"
		11				-1mA			"								1C		"					"
"		12					-1mA		"								1D		"					"
"		13							"		-1mA						2A		"					"
"		14							"			-1mA					2B		"					"
"		15							"				-1mA				2C		"					"
"		16							"					-1mA			2D		"					"
I_{SS} 1/	3005	17		GND	15.0V	15.0V	15.0V		"		GND	15.0V	15.0V	15.0V		15.0V	V_{SS}		-25.0		-750.0			nA
"	"	18		15.0V	GND	"	"		"		15.0V	GND	"	"		"	"		"		"			"
"	"	19		"	15.0V	GND	"		"		"	15.0V	GND	"		"	"		"		"			"
"	"	20		"	"	15.0V	GND		"		"	"	15.0V	GND		"	"		"		"			"
	"	21		"	"	"	15.0V		"		"	"	"	15.0V		"	"		"		"			"
V_{OH1}	3006	22	I_{OH1}	V_{IL1}	5.0V	5.0V	5.0V		"		GND	GND	GND	GND		5.0V	1Y	4.2		4.2		4.2		V
"	"	23	"	5.0V	V_{IL1}	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	24	"	"	5.0V	V_{IL1}	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	25	"	"	"	5.0V	V_{IL1}		"		"	"	"	"		"	1Y	"		"		"		"
"	"	26		GND	GND	GND	GND		"		V_{IL1}	5.0V	5.0V	5.0V	I_{OH1}	"	2Y	"		"		"		"
'	"	27		"	"	"	"		"		5.0V	V_{IL1}	"	"	"	"	2Y	"		"		"		"
'	"	28		"	"	"	"		"		"	5.0V	V_{IL1}	"	"	"	2Y	"		"		"		"
"	"	29		"	"	"	"		"		"	"	5.0V	V_{IL1}		"	2Y	"		"		"		"
V_{OH2}	"	30		V_{IL1}	5.0V	5.0V	5.0V		"		GND	GND	GND	GND		"	1Y	4.95		4.95		4.95		"
"	"	31		5.0V	V_{IL1}	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	32		"	5.0V	V_{IL1}	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	33		"	"	5.0V	V_{IL1}		"		"	"	"	"		"	1Y	"		"		"		"
"	"	34		GND	GND	GND	GND		"		V_{IL1}	5.0V	5.0V	5.0V		"	2Y	"		"		"		"
"	"	35		"	"	"	"		"		5.0V	V_{IL1}	"	"		"	2Y	"		"		"		"
"	"	36		"	"	"	"		"		"	5.0V	V_{IL1}	"		"	2Y	"		"		"		"
"	"	37		"	"	"	"		"		"	"	5.0V	V_{IL1}		"	2Y	"		"		"		"
V_{OH3}	"	38		V_{IL2}	12.5V	12.5V	12.5V		"		GND	GND	GND	GND		12.5V	1Y	11.25		11.25		11.25		"
"	"	39		12.5V	V_{IL2}	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	40		"	12.5V	V_{IL2}	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	41		"	"	12.5V	V_{IL2}		"		"	"	"	"		"	1Y	"		"		"		"
"	"	42		GND	GND	GND	GND		"		V_{IL2}	12.5V	12.5V	12.5V		"	2Y	"		"		"		"
"	"	43		"	"	"	"		"		12.5V	V_{IL2}	"	"		"	2Y	"		"		"		"
"	"	44		"	"	"	"		"		"	12.5V	V_{IL2}	"		"	2Y	"		"		"		"
"	"	45		"	"	"	"		"		"	"	12.5V	V_{IL2}		"	2Y	"		"		"		"
V_{OL1}	3007	46	I_{OL2}	V_{IH1}	V_{IH1}	V_{IH1}	V_{IH1}		"		GND	GND	GND	GND		5.0V	1Y		0.7		0.7		0.7	"
"	"	47		GND	GND	GND	GND		"		V_{IH1}	V_{IH1}	V_{IH1}	V_{IH1}	I_{OL2}	"	2Y		"		"		"	"

See footnotes at end of device type 03.

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

Cases column = A, C, D, T, X, Y (applies to all rows).

Terminal columns 1–14 correspond to: 1 = 1Y, 2 = 1A, 3 = 1B, 4 = 1C, 5 = 1D, 6 = NC, 7 = Vss, 8 = NC, 9 = 2A, 10 = 2B, 11 = 2C, 12 = 2D, 13 = 2Y, 14 = VDD.

Symbol	MIL-STD-883 method	Test no.	1 (1Y)	2 (1A)	3 (1B)	4 (1C)	5 (1D)	6 (NC)	7 (Vss)	8 (NC)	9 (2A)	10 (2B)	11 (2C)	12 (2D)	13 (2Y)	14 (VDD)	Measured terminal	SG1 Min (25°C)	SG1 Max	SG2 Min (125°C)	SG2 Max	SG3 Min (-55°C)	SG3 Max	Unit
V_{OL2}	3007	48		V_{IH1}	V_{IH1}	V_{IH1}	V_{IH1}		GND		GND	GND	GND	GND		5.0V	1Y		0.05		0.05		0.05	V
"	"	49		GND	GND	GND	GND		"		V_{IH1}	V_{IH1}	V_{IH1}	V_{IH1}		"	2Y		"		"		"	"
V_{OL3}	"	50		V_{IH2}	V_{IH2}	V_{IH2}	V_{IH2}		"		GND	GND	GND	GND		12.5V	1Y		1.25		1.25		1.25	"
"	"	51		GND	GND	GND	GND		"		V_{IH2}	V_{IH2}	V_{IH2}	V_{IH2}		"	2Y		"		"		"	"
I_{IH1} 2/	3010	52		15.0V	15.0V	15.0V	15.0V		"		15.0V	15.0V	15.0V	15.0V		15.0V	All together		800					nA
I_{IH2}	"	53		"	"	"	"		"		"	"	"	"		"	1A		100.0		100.0			"
"	"	54		"	"	"	"		"		"	"	"	"		"	1B		"		"			"
"	"	55		"	"	"	"		"		"	"	"	"		"	1C		"		"			"
"	"	56		"	"	"	"		"		"	"	"	"		"	1D		"		"			"
"	"	57		"	"	"	"		"		"	"	"	"		"	2A		"		"			"
"	"	58		"	"	"	"		"		"	"	"	"		"	2B		"		"			"
"	"	59		"	"	"	"		"		"	"	"	"		"	2C		"		"			"
"	"	60		"	"	"	"		"		"	"	"	"		"	2D		"		"			"
I_{IL1} 2/	3009	61		GND	GND	GND	GND		"		GND	GND	GND	GND		"	All together		-800					"
I_{IL2}	"	62		"	15.0V	15.0V	15.0V		"		15.0V	15.0V	15.0V	15.0V		"	1A		-100.0		-100.0			"
"	"	63		15.0V	GND	"	"		"		"	"	"	"		"	1B		"		"			"
"	"	64		"	15.0V	GND	"		"		"	"	"	"		"	1C		"		"			"
"	"	65		"	"	15.0V	GND		"		"	"	"	"		"	1D		"		"			"
"	"	66		"	"	"	15.0V		"		GND	"	"	"		"	2A		"		"			"
"	"	67		"	"	"	"		"		15.0V	GND	"	"		"	2B		"		"			"
"	"	68		"	"	"	"		"		"	15.0V	GND	"		"	2C		"		"			"
"	"	69		"	"	"	"		"		"	"	15.0V	GND		"	2D		"		"			"

Subgroup 4, $T_A = 25°C$ (Min / Max):

Symbol	MIL-STD-883 method	Test no.	1 (1Y)	2 (1A)	3 (1B)	4 (1C)	5 (1D)	6 (NC)	7 (Vss)	8 (NC)	9 (2A)	10 (2B)	11 (2C)	12 (2D)	13 (2Y)	14 (VDD)	Measured terminal	SG4 Min	SG4 Max	Unit
C_i	3012	70		F					GND							GND	1A		12.0	pF
"	"	71			F				"							"	1B		"	"
"	"	72				F			"							"	1C		"	"
"	"	73					F		"							"	1D		"	"
"	"	74							"		F					"	2A		"	"
"	"	75							"			F				"	2B		"	"
"	"	76							"				F			"	2C		"	"
"	"	77							"					F		"	2D		"	"

Subgroup 9 ($T_A = 25°C$), Subgroup 10 ($T_A = 125°C$), Subgroup 11 ($T_A = -55°C$):

Symbol	MIL-STD-883 method	Test no.	1 (1Y)	2 (1A)	3 (1B)	4 (1C)	5 (1D)	6 (NC)	7 (Vss)	8 (NC)	9 (2A)	10 (2B)	11 (2C)	12 (2D)	13 (2Y)	14 (VDD)	Measured terminal	SG9 Min	SG9 Max	SG10 Min	SG10 Max	SG11 Min	SG11 Max	Unit
t_{PHL}	3003 Fig. 3	78	OUT	IN	5.0V	5.0V	5.0V		GND		5.0V	5.0V	5.0V	5.0V		5.0V	1A to 1Y	13	325	18	490	13	325	ns
"	"	79	"	5.0V	IN	5.0V	"		"		"	"	"	"		"	1B to 1Y	"	"	"	"	"	"	"
"	"	80	"	"	5.0V	IN	5.0V		"		"	"	"	"		"	1C to 1Y	"	"	"	"	"	"	"
"	"	81	"	"	"	5.0V	IN		"		"	"	"	"		"	1D to 1Y	"	"	"	"	"	"	"
"	"	82		"	"	"	5.0V		"		IN	"	"	"	OUT	"	2A to 2Y	"	"	"	"	"	"	"
"	"	83		"	"	"	"		"		5.0V	IN	"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	84		"	"	"	"		"		"	5.0V	IN	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	85		"	"	"	"		"		"	"	5.0V	IN	"	"	2D to 2Y	"	"	"	"	"	"	"

See footnotes at end of device type 03.

TABLE III. <u>Group A inspection for device type 02</u> – Continued.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y	For terminal conditions and limits, see 1/ and 3/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9 TA = 25°C		Subgroup 10 TA = 125°C		Subgroup 11 TA = -55°C		
		Test no.	1Y	1A	1B	1C	1D	NC	Vss	NC	2A	2B	2C	2D	2Y	VDD		Min	Max	Min	Max	Min	Max	
t_PLH	3003 Fig. 3	86	OUT	IN	5.0V	5.0V	5.0V		GND		5.0V	5.0V	5.0V	5.0V		5.0V	1A to 1Y	13	250	18	375	13	250	ns
"	"	87	"	5.0V	IN	"	"		"		"	"	"	"		"	1B to 1Y	"	"	"	"	"	"	"
"	"	88	"	"	5.0V	IN	"		"		"	"	"	"		"	1C to 1Y	"	"	"	"	"	"	"
"	"	89	"	"	"	5.0V	IN		"		"	"	"	"		"	1D to 1Y	"	"	"	"	"	"	"
"	"	90		"	"	"	5.0V		"		IN	"	"	"	OUT	"	2A to 2Y	"	"	"	"	"	"	"
"	"	91		"	"	"	"		"		5.0V	IN	"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	92		"	"	"	"		"		"	5.0V	IN	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	93		"	"	"	"		"		"	"	5.0V	IN	"	"	2D to 2Y	"	"	"	"	"	"	"
t_THL	3004 Fig. 3	94	OUT	IN	5.0V	5.0V	"		"		"	"	"	5.0V		"	1Y	10	550	14	825	10	550	"
"	"	95	"	5.0V	IN	"	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	96	"	"	5.0V	IN	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	97	"	"	"	5.0V	IN		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	98		"	"	"	5.0V		"		IN	"	"	"	OUT	"	2Y	"	"	"	"	"	"	"
"	"	99		"	"	"	"		"		5.0V	IN	"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	100		"	"	"	"		"		"	5.0V	IN	"	"	"	2Y	"	"	"	"	"	"	"
"	"	101		"	"	"	"		"		"	"	5.0V	IN	"	"	2Y	"	"	"	"	"	"	"
t_TLH	"	102	OUT	IN	"	"	"		"		"	"	"	5.0V		"	1Y	10	425	14	640	10	425	"
"	"	103	"	5.0V	IN	"	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	104	"	"	5.0V	IN	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	105	"	"	"	5.0V	IN		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	106		"	"	"	5.0V		"		IN	"	"	"	OUT	"	2Y	"	"	"	"	"	"	"
"	"	107		"	"	"	"		"		5.0V	IN	"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	108		"	"	"	"		"		"	5.0V	IN	"	"	"	2Y	"	"	"	"	"	"	"
"	"	109		"	"	"	"		"		"	"	5.0V	IN	"	"	2Y	"	"	"	"	"	"	"

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-883 method	Test no.	1 (2A)	2 (2B)	3 (1A)	4 (1B)	5 (1C)	6 (1Y)	7 (Vss)	8 (2C)	9 (2Y)	10 (3Y)	11 (3A)	12 (3B)	13 (3C)	14 (VDD)	Measured terminal	SG1 Min (TA=25°C)	SG1 Max	SG2 Min (TA=125°C)	SG2 Max	SG3 Min (TA=-55°C)	SG3 Max	Unit
$V_{IC(pos)}$ 1/		1	1mA													GND	2A		1.5					V
"		2		1mA												"	2B		"					"
"		3								1mA						"	2C		"					"
"		4			1mA											"	1A		"					"
"		5				1mA										"	1B		"					"
"		6					1mA									"	1C		"					"
"		7											1mA			"	3A		"					"
"		8												1mA		"	3B		"					"
"		9													1mA	"	3C		"					"
$V_{IC(neg)}$ 1/		10	-1mA						GND								2A		-6.0					"
"		11		-1mA					"								2B		"					"
"		12							"	-1mA							2C		"					"
"		13			-1mA				"								1A		"					"
"		14				-1mA			"								1B		"					"
"		15					-1mA		"								1C		"					"
"		16							"				-1mA				3A		"					"
"		17							"					-1mA			3B		"					"
"		18							"						-1mA		3C		"					"
I_{SS} 1/	3005	19	GND	15.0V	GND	15.0V	15.0V		"	15.0V			GND	15.0V	15.0V	15.0V	Vss		-25.0		-750			nA
"	"	20	15.0V	"	15.0V	"	"		"	"			15.0V	"	"	"	"		"		"			"
"	"	21	"	GND	"	GND	"		"	"			"	GND	"	"	"		"		"			"
"	"	22	"	15.0V	"	"	GND		"	GND			"	15.0V	GND	"	"		"		"			"
V_{OH1}	3006	23	V_{IL1}	5.0V	GND	GND	"		"	5.0V	I_{OH1}		GND	GND	GND	5.0V	2Y	4.2		4.2		4.2		V
"	"	24	5.0V	V_{IL1}	"	"	"		"	"	"		"	"	"	"	2Y	"		"		"		"
"	"	25	"	5.0V	"	"	"		"	V_{IL1}	"		"	"	"	"	2Y	"		"		"		"
"	"	26	GND	GND	V_{IL1}	5.0V	5.0V	I_{OH1}	"	GND			"	"	"	"	1Y	"		"		"		"
"	"	27	"	"	5.0V	V_{IL1}	"	"	"	"			"	"	"	"	1Y	"		"		"		"
"	"	28	"	"	5.0V	5.0V	V_{IL1}	"	"	"			"	"	"	"	1Y	"		"		"		"
"	"	29	"	"	GND	GND	GND		"	"		I_{OH1}	V_{IL1}	5.0V	5.0V	"	3Y	"		"		"		"
"	"	30	"	"	"	"	"		"	"		"	5.0V	V_{IL1}	5.0V	"	3Y	"		"		"		"
"	"	31	"	"	"	"	"		"	"		"	5.0V	5.0V	V_{IL1}	"	3Y	"		"		"		"
V_{OH2}	"	32	V_{IL1}	5.0V	"	"	"		"	5.0V			GND	GND	GND	5.0V	2Y	4.95		4.95		4.95		"
"	"	33	5.0V	V_{IL1}	"	"	"		"	"			"	"	"	"	2Y	"		"		"		"
"	"	34	"	5.0V	"	"	"		"	V_{IL1}			"	"	"	"	2Y	"		"		"		"
"	"	35	GND	GND	V_{IL1}	5.0V	5.0V		"	GND			"	"	"	"	1Y	"		"		"		"
"	"	36	"	"	5.0V	V_{IL1}	"		"	"			"	"	"	"	1Y	"		"		"		"
"	"	37	"	"	5.0V	5.0V	V_{IL1}		"	"			"	"	"	"	1Y	"		"		"		"
"	"	38	"	"	GND	GND	GND		"	"			V_{IL1}	5.0V	5.0V	"	3Y	"		"		"		"
"	"	39	"	"	"	"	"		"	"			5.0V	V_{IL1}	5.0V	"	3Y	"		"		"		"
"	"	40	"	"	"	"	"		"	"			"	5.0V	V_{IL1}	"	3Y	"		"		"		"
V_{OH3}	"	41	V_{IL2}	12.5V	"	"	"		"	12.5V			GND	GND	GND	12.5V	2Y	11.25		11.25		11.25		"
"	"	42	12.5V	V_{IL2}	"	"	"		"	"			"	"	"	"	2Y	"		"		"		"
"	"	43	"	12.5V	"	"	"		"	V_{IL2}			"	"	"	"	2Y	"		"		"		"
"	"	44	GND	GND	V_{IL2}	12.5V	12.5V		"	GND			"	"	"	"	1Y	"		"		"		"
"	"	45	"	"	12.5V	V_{IL2}	"		"	"			"	"	"	"	1Y	"		"		"		"
"	"	46	"	"	12.5V	12.5V	V_{IL2}		"	"			"	"	"	"	1Y	"		"		"		"
"	"	47	"	"	GND	GND	GND		"	"			V_{IL2}	12.5V	12.5V	"	3Y	"		"		"		"
"	"	48	"	"	"	"	"		"	"			12.5V	V_{IL2}	"	"	3Y	"		"		"		"
"	"	49	"	"	"	"	"		"	"			"	12.5V	V_{IL2}	14	3Y	"		"		"		"

.See footnotes at end of device type 03.

TABLE III. <u>Group A inspection for device type 03</u> – Continued.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y / Test no.	1 (2A)	2 (2B)	3 (1A)	4 (1B)	5 (1C)	6 (1Y)	7 (V_{SS})	8 (2C)	9 (2Y)	10 (3Y)	11 (3A)	12 (3B)	13 (3C)	14 (V_{DD})	Measured terminal	SG1 $T_A=25°C$ Min	SG1 Max	SG2 $T_A=125°C$ Min	SG2 Max	SG3 $T_A=-55°C$ Min	SG3 Max	Unit
V_{OL1}	3007	50	V_{IH1}	V_{IH1}	GND	GND	GND		GND	V_{IH1}	I_{OL1}		GND	GND	GND	5.0V	2Y		0.7		0.7		0.7	V
"	"	51	GND	GND	V_{IH1}	V_{IH1}	V_{IH1}	I_{OL1}	"	GND			"	"	"	"	1Y		"		"		"	"
"	"	52	"	"	GND	GND	GND		"	"		I_{OL1}	V_{IH1}	V_{IH1}	V_{IH1}	"	3Y		"		"		"	"
V_{OL2}	"	53	V_{IH1}	V_{IH1}	"	"	"		"	V_{IH1}			GND	GND	GND	"	2Y		0.05		0.05		0.05	"
"	"	54	GND	GND	V_{IH1}	V_{IH1}	V_{IH1}		"	GND			"	"	"	"	1Y		"		"		"	"
"	"	55			GND	GND	GND		"	"			V_{IH1}	V_{IH1}	V_{IH1}	"	3Y		"		"		"	"
V_{OL3}	"	56	V_{IH2}	V_{IH2}	"	"	"		"	V_{IH2}			GND	GND	GND	12.5V	2Y		1.25		1.25		1.25	"
"	"	57	GND	GND	V_{IH2}	V_{IH2}	V_{IH2}		"	GND			"	"	"	"	1Y		"		"		"	"
"	"	58			GND	GND	GND		"	"			V_{IH2}	V_{IH2}	V_{IH2}	"	3Y		"		"		"	"
I_{IH1} 2/	3010	59	15.0V	15.0V	15.0V	15.0V	15.0V		"	15.0V			15.0V	15.0V	15.0V	15.0V	All together		900					nA
I_{IH2}	"	60	"	"	"	"	"		"	"			"	"	"	"	2A		100.0		100.0			"
"	"	61	"	"	"	"	"		"	"			"	"	"	"	2B		"		"			"
"	"	62	"	"	"	"	"		"	"			"	"	"	"	2C		"		"			"
"	"	63	"	"	"	"	"		"	"			"	"	"	"	1A		"		"			"
"	"	64	"	"	"	"	"		"	"			"	"	"	"	1B		"		"			"
"	"	65	"	"	"	"	"		"	"			"	"	"	"	1C		"		"			"
"	"	66	"	"	"	"	"		"	"			"	"	"	"	3A		"		"			"
"	"	67	"	"	"	"	"		"	"			"	"	"	"	3B		"		"			"
"	"	68	"	"	"	"	"		"	"			"	"	"	"	3C		"		"			"
I_{IL1} 2/	"	69	GND	GND	GND	GND	GND		"	GND			GND	GND	GND	"	All together		-900					"
I_{IL2}	"	70	"	15.0V	15.0V	15.0V	15.0V		"	15.0V			15.0V	15.0V	15.0V	"	2A		-100.0		-100.0			"
"	"	71	15.0V	GND	"	"	"		"	"			"	"	"	"	2B		"		"			"
"	"	72	"	15.0V	"	"	"		"	GND			"	"	"	"	2C		"		"			"
"	"	73	"	"	GND	"	"		"	15.0V			"	"	"	"	1A		"		"			"
"	"	74	"	"	15.0V	GND	"		"	"			"	"	"	"	1B		"		"			"
"	"	75	"	"	"	15.0V	GND		"	"			"	"	"	"	1C		"		"			"
"	"	76	"	"	"	"	15.0V		"	"			GND	"	"	"	3A		"		"			"
"	"	77	"	"	"	"	"		"	"			15.0V	GND	"	"	3B		"		"			"
"	"	78	"	"	"	"	"		"	"			"	15.0V	GND	"	3C		"		"			"

																		Subgroup 4 $T_A=25°C$ Min	Max					
C_i	3012	79	F						GND							GND	2A		12.0					pF
"	"	80		F					"							"	2B		"					"
"	"	81							"	F						"	2C		"					"
"	"	82			F				"							"	1A		"					"
"	"	83				F			"							"	1B		"					"
"	"	84					F		"							"	1C		"					"
"	"	85							"				F			"	3A		"					"
"	"	86							"					F		"	3B		"					"
"	"	87							"						F	"	3C		"					"

See footnotes at end of device type 03.

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

Symbol	MIL-STD-883 method	Test no.	1 — 2A	2 — 2B	3 — 1A	4 — 1B	5 — 1C	6 — 1Y	7 — V_{SS}	8 — 2C	9 — 2Y	10 — 3Y	11 — 3A	12 — 3B	13 — 3C	14 — V_{DD}	Measured terminal	Subgroup 9 T_A=25°C Min	Max	Subgroup 10 T_A=125°C Min	Max	Subgroup 11 T_A=-55°C Min	Max	Unit
t_{PHL}	3003 Fig. 3	88	IN	5.0V	5.0V	5.0V	5.0V		GND	5.0V	OUT		5.0V	5.0V	5.0V	5.0V	2A to 2Y	13	175	18	265	13	175	ns
"	"	89	5.0V	IN	"	"	"		"	"	"		"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	90	"	5.0V	"	"	"		"	IN	"		"	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	91	"	"	IN	"	"	OUT	"	5.0V			"	"	"	"	1A to 1Y	"	"	"	"	""	"	"
"	"	92	"	"	5.0V	IN	"	"	"	"			"	"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	93	"	"	"	5.0V	IN	"	"	"			"	"	"	"	1C to 1Y	"	"	"	"	"	"	"
"	"	94	"	"	"	"	"		"	"		OUT	IN	"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	95	"	"	"	"	"		"	"		"	5.0V	IN	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	96	"	"	"	"	"		"	"		"	"	5.0V	IN	"	3C to 3Y	"	"	"	"	"	"	"
t_{PLH}	"	97	IN	"	"	"	"		"	"	OUT		"	"	5.0V	"	2A to 2Y	"	150	"	225	"	150	"
"	"	98	5.0V	IN	"	"	"		"	"	"		"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	99	"	5.0V	"	"	"		"	IN	"		"	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	100	"	"	IN	"	"	OUT	"	5.0V			"	"	"	"	1A to 1Y	"	"	"	"	"	"	"
"	"	101	"	"	5.0V	IN	"	"	"	"			"	"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	102	"	"	"	5.0V	IN	"	"	"			"	"	"	"	1C to 1Y	"	"	"	"	"	"	"
"	"	103	"	"	"	"	"		"	"		OUT	IN	"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	104	"	"	"	"	"		"	"		"	5.0V	IN	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	105	"	"	"	"	"		"	"		"	"	5.0V	IN	"	3C to 3Y	"	"	"	"	"	"	"
t_{THL}	3004 Fig. 3	106	IN	"	"	"	"		"	"	OUT		"	"	5.0V	"	2Y	10	250	14	375	10	250	"
"	"	107	5.0V	IN	"	"	"		"	"	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	108	"	5.0V	"	"	"		"	IN	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	109	"	"	IN	"	"	OUT	"	5.0V			"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	110	"	"	5.0V	IN	"	"	"	"			"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	111	"	"	"	5.0V	IN	"	"	"			"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	112	"	"	"	"	"		"	"		OUT	IN	"	"	"	3Y	"	"	"	"	"	"	"
"	"	113	"	"	"	"	"		"	"		"	5.0V	IN	"	"	3Y	"	"	"	"	"	"	"
"	"	114	"	"	"	"	"		"	"		"	"	5.0V	IN	"	3Y	"	"	"	"	"	"	"
t_{TLH}	"	115	IN	"	"	"	"		"	"	OUT		"	"	5.0V	"	2Y	10	300	14	450	10	300	"
"	"	116	5.0V	IN	"	"	"		"	"	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	117	"	5.0V	"	"	"		"	IN	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	118	"	"	IN	"	"	OUT	"	5.0V			"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	119	"	"	5.0V	IN	"	"	"	"			"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	120	"	"	"	5.0V	IN	"	"	"			"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	121	"	"	"	"	"		"	"		OUT	IN	"	"	"	3Y	"	"	"	"	"	"	"
"	"	122	"	"	"	"	"		"	"		"	5.0V	IN	"	"	3Y	"	"	"	"	"	"	"
"	"	123	"	"	"	"	"		"	"		"	"	5.0V	IN	"	3Y	"	"	"	"	"	"	"

1/ Pins not designated may be "High" level logic, "Low" level logic, or open. Exceptions are as follows:
   a. $V_{IC(pos)}$ tests, the V_{SS} terminal shall be open.
   b. $V_{IC(neg)}$ tests, the V_{DD} terminal shall be open.
   c. I_{SS} tests, the output terminal shall be open.

2/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.

3/

Symbol	V_{IH1}	V_{IL1}	V_{IH2}	V_{IL2}	I_{OH1}	I_{OL1}	I_{OL2}	F
Temperature								
T_A = 25°C	3.95 V	0.9 V	10.25 V	2.25 V	-0.25 mA	0.25 mA	0.12 mA	See 4.4.1.c.
T_A = 125°C	3.85 V	0.65 V	10.00 V	1.95 V	-0.175 mA	0.175 mA	0.085 mA	
T_A = -55°C	4.05 V	0.95 V	10.50 V	2.40 V	-0.31 mA	0.31 mA	0.15 mA	

TABLE III. Group A inspection for device type 51.

Symbol	MIL-STD-883 method	Test no.	1 (1A)	2 (1B)	3 (1Y)	4 (2Y)	5 (2B)	6 (2A)	7 (Vss)	8 (3A)	9 (3B)	10 (3Y)	11 (4Y)	12 (4B)	13 (4A)	14 (VDD)	Measured terminal	SG1 TA=25°C Min	SG1 Max	SG2 TA=125°C Min	SG2 Max	SG3 TA=-55°C Min	SG3 Max	Unit
V_IC(pos) 1/		1	1mA													GND	1A		1.5					V
"		2		1mA												"	1B		"					"
"		3					1mA									"	2B		"					"
"		4						1mA								"	2A		"					"
"		5								1mA						"	3A		"					"
"		6									1mA					"	3B		"					"
"		7												1mA		"	4B		"					"
"		8													1mA	"	4A		"					"
V_IC(neg) 1/		9	-1mA						GND								1A		-6.0					"
"		10		-1mA					"								1B		"					"
"		11					-1mA		"								2B		"					"
"		12						-1mA	"								2A		"					"
"		13							"	-1mA							3A		"					"
"		14							"		-1mA						3B		"					"
"		15							"					-1mA			4B		"					"
"		16							"						-1mA		4A		"					"
I_SS 1/	3005	17	GND	18.0V			18.0V	GND	"	GND	18.0V			18.0V	GND	18.0V	Vss		-25		-750			nA
"	"	18	18.0V	"			"	18.0V	"	18.0V	"			"	18.0V	"	"		"		"			"
"	"	19	"	GND			GND	"	"	"	GND			GND	"	"	"		"		"			"
V_OH4	3006	20	GND	15V			"	GND	"	GND	"			"	GND	15V	1Y	14.95		14.95		14.95		V
"	"	21	15V	GND			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"	"	22	GND	"			"	15V	"	"	"			"	"	"	2Y	"		"		"		"
"	"	23	"	"			15V	GND	"	"	"			"	"	"	2Y	"		"		"		"
"	"	24	"	"			GND	"	"	"	15V			"	"	"	3Y	"		"		"		"
"	"	25	"	"			"	"	"	15V	GND			"	"	"	3Y	"		"		"		"
"	"	26	"	"			"	"	"	GND	"			GND	15V	"	4Y	"		"		"		"
"	"	27	"	"			"	"	"	"	"			15V	GND	"	4Y	"		"				"
V_OL4	3007	28	15V	15V			"	"	"	"	"			GND	"	"	1Y		0.05		0.05		0.05	"
"	"	29	GND	GND			15V	15V	"	"	"			"	"	"	2Y		"		"		"	"
"	"	30	"	"			GND	GND	"	15V	15V			"	"	"	3Y		"		"		"	"
"	"	31	"	"			"	"	"	GND	GND			15V	15V	"	4Y		"		"		"	"
V_IH1		32	3.5V	3.5V			"	"	"	"	"			GND	GND	5V	1Y		0.5		0.5		0.5	"
"		33	GND	GND			3.5V	3.5V	"	"	"			"	"	"	2Y		"		"		"	"
"		34	"	"			GND	GND	"	3.5V	3.5V			"	"	"	3Y		"		"		"	"
"		35	"	"			"	"	"	GND	GND			3.5V	3.5V	"	4Y		"		"		"	"
V_IH2		36	7.0V	7.0V			"	"	"	"	"			GND	GND	10V	1Y		1.0		1.0		1.0	"
"		37	GND	GND			7.0V	7.0V	"	"	"			"	"	"	2Y		"		"		"	"
"		38	"	"			GND	GND	"	7.0V	7.0V			"	"	"	3Y		"		"		"	"
"		39	"	"			"	"	"	GND	GND			7.0V	7.0V	"	4Y		"		"		"	"
V_IH3		40	11V	11V			"	"	"	"	"			GND	GND	15V	1Y		1.5		1.5		1.5	"
"		41	GND	GND			11V	11V	"	"	"			"	"	"	2Y		"		"		"	"
"		42	"	"			GND	GND	"	11V	11V			"	"	"	3Y		"		"		"	"
"		43	"	"			"	"	"	GND	GND			11V	11V	"	4Y		"		"		"	"

See footnotes at end of device type 53.

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

Cases A,C,D,T,X,Y

For terminal conditions, see 1/

Symbol	MIL-STD-883 method	Test no.	1 (1A)	2 (1B)	3 (1Y)	4 (2Y)	5 (2B)	6 (2A)	7 (V_{SS})	8 (3A)	9 (3B)	10 (3Y)	11 (4Y)	12 (4B)	13 (4A)	14 (V_{DD})	Measured terminal	Subgroup 1 $T_A=25°C$ Min	Max	Subgroup 2 $T_A=125°C$ Min	Max	Subgroup 3 $T_A=-55°C$ Min	Max	Unit
V_{IL1}		44	1.5V	1.5V			GND	GND	GND	GND	GND			GND	GND	5V	1Y	4.5		4.5		4.5		V
"		45	3.5V	"			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		46	1.5V	3.5V			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		47	GND	GND			1.5V	1.5V	"	"	"			"	"	"	2Y	"		"		"		"
"		48	"	"			3.5V	"	"	"	"			"	"	"	2Y	"		"		"		"
"		49	"	"			1.5V	3.5V	"	"	"			"	"	"	2Y	"		"		"		"
"		50	"	"			GND	GND	"	1.5V	1.5V			"	"	"	3Y	"		"		"		"
"		51	"	"			"	"	"	3.5V	"			"	"	"	3Y	"		"		"		"
"		52	"	"			"	"	"	1.5V	3.5V			"	"	"	3Y	"		"		"		"
"		53	"	"			"	"	"	GND	GND			1.5V	1.5V	"	4Y	"		"		"		"
"		54	"	"			"	"	"	"	"			3.5V	"	"	4Y	"		"		"		"
"		55	"	"			"	"	"	"	"			1.5V	3.5V	"	4Y	"		"		"		"
V_{IL2}		56	3.0V	3.0V			"	"	"	"	"			GND	GND	10V	1Y	9.0		9.0		9.0		"
"		57	7.0V	"			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		58	3.0V	7.0V			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		59	GND	GND			3.0V	3.0V	"	"	"			"	"	"	2Y	"		"		"		"
"		60	"	"			7.0V	"	"	"	"			"	"	"	2Y	"		"		"		"
"		61	"	"			3.0V	7.0V	"	"	"			"	"	"	2Y	"		"		"		"
"		62	"	"			GND	GND	"	3.0V	3.0V			"	"	"	3Y	"		"		"		"
"		63	"	"			"	"	"	7.0V	"			"	"	"	3Y	"		"		"		"
"		64	"	"			"	"	"	3.0V	7.0V			"	"	"	3Y	"		"		"		"
"		65	"	"			"	"	"	GND	GND			3.0V	3.0V	"	4Y	"		"		"		"
"		66	"	"			"	"	"	"	"			7.0V	3.0V	"	4Y	"		"		"		"
"		67	"	"			"	"	"	"	"			3.0V	7.0V	"	4Y	"		"		"		"
V_{IL3}		68	4.0V	4.0V			"	"	"	"	"			"	"	15V	1Y	13.5		13.5		13.5		"
"		69	11V	"			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		70	4.0V	11V			"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		71	GND	GND			4.0V	4.0V	"	"	"			"	"	"	2Y	"		"		"		"
"		72	"	"			11V	"	"	"	"			"	"	"	2Y	"		"		"		"
"		73	"	"			4.0V	11V	"	"	"			"	"	"	2Y	"		"		"		"
"		74	"	"			GND	GND	"	4.0V	4.0V			"	"	"	3Y	"		"		"		"
"		75	"	"			"	"	"	11V	"			"	"	"	3Y	"		"		"		"
"		76	"	"			"	"	"	4.0V	11V			"	"	"	3Y	"		"		"		"
"		77	"	"			"	"	"	GND	GND			4.0V	4.0V	"	4Y	"		"		"		"
"		78	"	"			"	"	"	"	"			11V	"	"	4Y	"		"		"		"
"		79	"	"			"	"	"	"	"			4.0V	11V	"	4Y	"		"		"		"
I_{OL1}		80	5V	5V	0.4V		"	"	"	"	"			GND	GND	5V	1Y	0.51		0.36		0.64		mA
"		81	GND	GND		0.4V	5V	5V	"	"	"			"	"	"	2Y	"		"		"		"
"		82	"	"			GND	GND	"	5V	5V	0.4V		"	"	"	3Y	"		"		"		"
"		83	"	"			"	"	"	GND	GND		0.4V	5V	5V	"	4Y	"		"		"		"
I_{OL2}		84	15V	15V	1.5V		"	"	"	"	"			GND	GND	15V	1Y	3.4		2.4		4.2		"
"		85	GND	GND		1.5V	15V	15V	"	"	"			"	"	"	2Y	"		"		"		"
"		86	"	"			GND	GND	"	15V	15V	1.5V		"	"	"	3Y	"		"		"		"
"		87	"	"			"	"	"	GND	GND		1.5V	15V	15V	"	4Y	"		"		"		"
I_{OH1}		88	5.0V	"	4.6V		"	"	"	"	"			GND	GND	5V	1Y	-0.51		-0.36		-0.64		"
"		89	GND	5.0V	4.6V		"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		90	"	GND		4.6V	5.0V	"	"	"	"			"	"	"	2Y	"		"		"		"
"		91	"	"		4.6V	GND	5.0V	"	"	"			"	"	"	2Y	"		"		"		"
"		92	"	"			"	GND	"	5.0V	"	4.6V		"	"	"	3Y	"		"		"		"
"		93	"	"			"	"	"	GND	5.0V	4.6V		"	"	"	3Y	"		"		"		"
"		94	"	"			"	"	"	"	GND		4.6V	5.0V	"	"	4Y	"		"		"		"
"		95	"	"			"	"	"	"	"		4.6V	GND	5.0V	"	4Y	"		"		"		"

See footnotes at end of device type 53.

22

TABLE III. <u>Group A inspection for device type 51</u> – Continued.

Symbol	MIL-STD-883 method	Test no.	1 (1A)	2 (1B)	3 (1Y)	4 (2Y)	5 (2B)	6 (2A)	7 (Vss)	8 (3A)	9 (3B)	10 (3Y)	11 (4Y)	12 (4B)	13 (4A)	14 (Vdd)	Measured terminal	SG1 Min (25°C)	SG1 Max	SG2 Min (125°C)	SG2 Max	SG3 Min (-55°C)	SG3 Max	Unit
I_{OH2}		96	15V	GND	13.5V		GND	GND	GND	GND	GND			GND	GND	15V	1Y	-3.4		-2.4		-4.2		mA
"		97	GND	15V	13.5V		"	"	"	"	"			"	"	"	1Y	"		"		"		"
"		98	"	GND		13.5V	15V	"	"	"	"			"	"	"	2Y	"		"		"		"
"		99	"	"		13.5V	GND	15V	"	"	"			"	"	"	2Y	"		"		"		"
"		100	"	"			"	GND	"	15V	GND	13.5V		"	"	"	3Y	"		"		"		"
"		101	"	"			"	"	"	GND	15V	13.5V		"	"	"	3Y	"		"		"		"
"		102	"	"			"	"	"	"	GND		13.5V	15V	"	"	4Y	"		"		"		"
"		103	"	"			"	"	"	"	"		13.5V	GND	15V	"	4Y	"		"		"		"
I_{IH1} 2/	3010	104	18V	18V			18V	18V	"	18V	18V			18V	18V	18V	All inputs together		800					nA
I_{IH2}	"	105	"	"			"	"	"	"	"			"	"	"	1A		100.0		100.0			"
"	"	106	"	"			"	"	"	"	"			"	"	"	1B		"		"			"
"	"	107	"	"			"	"	"	"	"			"	"	"	2B		"		"			"
"	"	108	"	"			"	"	"	"	"			"	"	"	2A		"		"			"
"	"	109	"	"			"	"	"	"	"			"	"	"	3A		"		"			"
"	"	110	"	"			"	"	"	"	"			"	"	"	3B		"		"			"
"	"	111	"	"			"	"	"	"	"			"	"	"	4B		"		"			"
"	"	112	"	"			"	"	"	"	"			"	"	"	4A		"		"			"
I_{IL1} 2/	3009	113	GND	GND			GND	GND	"	GND	GND			GND	GND	"	All inputs together		-800					"
I_{IL2}	"	114	"	18V			18V	18V	"	18V	18V			18V	18V	"	1A		-100.0		-100.0			"
"	"	115	18V	GND			"	"	"	"	"			"	"	"	1B		"		"			"
"	"	116	"	18V			GND	"	"	"	"			"	"	"	2B		"		"			"
"	"	117	"	"			18V	GND	"	"	"			"	"	"	2A		"		"			"
"	"	118	"	"			"	18V	"	GND	"			"	"	"	3A		"		"			"
"	"	119	"	"			"	"	"	18V	GND			"	"	"	3B		"		"			"
"	"	120	"	"			"	"	"	"	18V			GND	"	"	4B		"		"			"
"	"	121	"	"			"	"	"	"	"			18V	GND	"	4A		"		"			"
																		Subgroup 4 TA=25°C Min	Max					
C_i	3012	122	3/							GND							GND	1A		12.0					pF
"	"	123		3/						"							"	1B		"					"
"	"	124					3/			"							"	2B		"					"
"	"	125						3/		"							"	2A		"					"
"	"	126								3/							"	3A		"					"
"	"	127									3/						"	3B		"					"
"	"	128												3/			"	4B		"					"
"	"	129													3/		"	4A		"					"

See footnotes at end of device type 53.

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

Symbol	MIL-STD-883 method	Test no.	1 (1A)	2 (1B)	3 (1Y)	4 (2Y)	5 (2B)	6 (2A)	7 (V_{SS})	8 (3A)	9 (3B)	10 (3Y)	11 (4Y)	12 (4B)	13 (4A)	14 (V_{DD})	Measured terminal	SG9 T_A=25°C Min	Max	SG10 T_A=125°C Min	Max	SG11 T_A=-55°C Min	Max	Unit
t_{PHL}	3003 Fig. 3	130	IN	5.0V	OUT		5.0V	5.0V	GND	5.0V	5.0V			5.0V	5.0V	5.0V	1A to 1Y	13	200	18	300	13	200	ns
"	"	131	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	132	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	133	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2A to 2Y	"	"	"	"	"	"	"
"	"	134	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	135	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	136	"	"			"	"	"	"	5.0V		OUT	IN	"	"	4B to 4Y	"	"	"	"	"	"	"
"	"	137	"	"			"	"	"	"	"		OUT	5.0V	IN	"	4A to 4Y	"	"	"	"	"	"	"
t_{PLH}	"	138	IN	5.0V	OUT		"	"	"	"	"			"	5.0V	"	1A to 1Y	13	150	18	225	13	150	"
"	"	139	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	140	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	141	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2A to 2Y	"	"	"	"	"	"	"
"	"	142	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	143	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	144	"	"			"	"	"	"	5.0V		OUT	IN	"	"	4B to 4Y	"	"	"	"	"	"	"
"	"	145	"	"			"	"	"	"	"		OUT	5.0V	IN	"	4A to 4Y	"	"	"	"	"	"	"
t_{THL}	3004 Fig. 3	146	IN	"	OUT		"	"	"	"	"			"	5.0V	"	1Y	10	300	14	450	10	300	"
"	"	147	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
"	"	148	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	149	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	150	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	151	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	152	"	"			"	"	"	"	5.0V		OUT	IN	"	"	4Y	"	"	"	"	"	"	"
"	"	153	"	"			"	"	"	"	"		OUT	5.0V	IN	"	4Y	"	"	"	"	"	"	"
t_{TLH}	"	154	IN	"	OUT		"	"	"	"	"			"	5.0V	"	1Y	"	"	"	"	"	"	"
"	"	155	5.0V	IN	OUT		"	"	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
"	"	156	"	5.0V		OUT	IN	"	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	157	"	"		OUT	5.0V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
"	"	158	"	"			"	5.0V	"	IN	"	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	159	"	"			"	"	"	5.0V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
"	"	160	"	"			"	"	"	"	5.0V		OUT	IN	"	"	4Y	"	"	"	"	"	"	"
"	"	161	"	"			"	"	"	"	"		OUT	5.0V	IN	"	4Y	"	"	"	"	"	"	"

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 52.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y Test no.	1 1Y	2 1A	3 1B	4 1C	5 1D	6 NC	7 Vss	8 NC	9 2A	10 2B	11 2C	12 2D	13 2Y	14 VDD	Measured terminal	S1 TA=25°C Min	S1 Max	S2 TA=125°C Min	S2 Max	S3 TA=-55°C Min	S3 Max	Unit
V_IC(pos) 1/		1		1mA												GND	1A		1.5					V
"		2			1mA				"							"	1B		"					"
"		3				1mA			"							"	1C		"					"
"		4					1mA		"							"	1D		"					"
"		5							"		1mA					"	2A		"					"
"		6							"			1mA				"	2B		"					"
"		7							"				1mA			"	2C		"					"
"		8							"					1mA		"	2D		"					"
V_IC(neg) 1/		9		-1mA					GND								1A		-6.0					"
"		10			-1mA				"								1B		"					"
"		11				-1mA			"								1C		"					"
"		12					-1mA		"								1D		"					"
"		13							"		-1mA						2A		"					"
"		14							"			-1mA					2B		"					"
"		15							"				-1mA				2C		"					"
"		16							"					-1mA			2D		"					"
I_SS 1/		17		GND	18.0V	18.0V	18.0V		"		GND	18.0V	18.0V	18.0V		18.0V	Vss		-25.0		-750.0			nA
"		18		18.0V	GND	"	"		"		18.0V	GND	"	"		"	"		"		"			"
"		19		"	18.0V	GND	"		"		"	18.0V	GND	"		"	"		"		"			"
"		20		"	"	18.0V	GND		"		"	"	18.0V	GND		"	"		"		"			"
"		21		"	"	"	18.0V		"		"	"	"	18.0V		"	"		"		"			"
V_OH4	3006	22		GND	15V	15V	15V		"		GND	GND	GND	GND		15.0V	1Y	14.95		14.95		14.95		V
"	"	23		15V	GND	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	24		"	15V	GND	"		"		"	"	"	"		"	1Y	"		"		"		"
"	"	25		"	"	15V	GND		"		"	"	"	"		"	1Y	"		"		"		"
"	"	26		GND	GND	GND	"		"		"	15V	15V	15V		"	2Y	"		"		"		"
"	"	27		"	"	"	"		"		15V	GND	"	"		"	2Y	"		"		"		"
"	"	28		"	"	"	"		"		"	15V	GND	"		"	2Y	"		"		"		"
"	"	29		"	"	"	"		"		"	"	15V	GND		"	2Y	"		"		"		"
V_OL4	3007	30		15V	15V	15V	15V		"		GND	GND	GND	"		"	1Y		0.05		0.05		0.05	"
"	"	31		GND	GND	GND	GND		"		15V	15V	15V	15V		"	2Y		"		"		"	"
V_IH1		32		3.5V	3.5V	3.5V	3.5V		"		GND	GND	GND	GND		5V	1Y		0.5		0.5		0.5	"
"		33		GND	GND	GND	GND		"		3.5V	3.5V	3.5V	3.5V		"	2Y		"		"		"	"
V_IH2		34		7.0V	7.0V	7.0V	7.0V		"		GND	GND	GND	GND		10V	1Y		1.0		1.0		1.0	"
"		35		GND	GND	GND	GND		"		7.0V	7.0V	7.0V	7.0V		"	2Y		"		"		"	"
V_IH3		36		11V	11V	11V	11V		"		GND	GND	GND	GND		15V	1Y		1.5		1.5		1.5	"
"		37		GND	GND	GND	GND		"		11V	11V	11V	11V		"	2Y		"		"		"	"
V_IL1		38		1.5V	3.5V	3.5V	3.5V		"		GND	GND	GND	GND		5V	1Y	4.5		4.5		4.5		"
"		39		3.5V	1.5V	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"		40		"	3.5V	1.5V	"		"		"	"	"	"		"	1Y	"		"		"		"
"		41		"	"	3.5V	1.5V		"		"	"	"	"		"	1Y	"		"		"		"
"		42		GND	GND	GND	GND		"		1.5V	3.5V	3.5V	3.5V		"	2Y	"		"		"		"
"		43		"	"	"	"		"		3.5V	1.5V	"	"		"	2Y	"		"		"		"
"		44		"	"	"	"		"		"	3.5V	1.5V	"		"	2Y	"		"		"		"
"		45		"	"	"	"		"		"	"	3.5V	1.5V		"	2Y	"		"		"		"

See footnotes at end of device type 53.

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

Symbol	MIL-STD-883 method	Test no.	1 (1Y)	2 (1A)	3 (1B)	4 (1C)	5 (1D)	6 (NC)	7 (Vss)	8 (NC)	9 (2A)	10 (2B)	11 (2C)	12 (2D)	13 (2Y)	14 (VDD)	Measured terminal	SG1 (T_A=25°C) Min	SG1 Max	SG2 (T_A=125°C) Min	SG2 Max	SG3 (T_A=-55°C) Min	SG3 Max	Unit
V_{IL2}		46		3.0V	7.0V	7.0V	7.0V		GND		GND	GND	GND	GND		10V	1Y	9.0		9.0		9.0		V
"		47		7.0V	3.0V	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"		48		"	7.0V	3.0V	"		"		"	"	"	"		"	1Y	"		"		"		"
"		49		"	"	7.0V	3.0V		"		"	"	"	"		"	1Y	"		"		"		"
"		50		GND	GND	GND	GND		"		3.0V	7.0V	7.0V	7.0V		"	2Y	"		"		"		"
"		51		"	"	"	"		"		7.0V	3.0V	"	"		"	2Y	"		"		"		"
"		52		"	"	"	"		"		"	7.0V	3.0V	"		"	2Y	"		"		"		"
"		53		"	"	"	"		"		"	"	7.0V	3.0V		"	2Y	"		"		"		"
V_{IL3}		54		4.0V	11V	11V	11V		"		GND	GND	GND	GND		15V	1Y	13.5		13.5		13.5		"
"		55		11V	4.0V	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"		56		"	11V	4.0V	"		"		"	"	"	"		"	1Y	"		"		"		"
"		57		"	"	11V	4.0V		"		"	"	"	"		"	1Y	"		"		"		"
"		58		GND	GND	GND	GND		"		4.0V	11V	11V	11V		"	2Y	"		"		"		"
"		59		"	"	"	"		"		11V	4.0V	"	"		"	2Y	"		"		"		"
"		60		"	"	"	"		"		"	11V	4.0V	"		"	2Y	"		"		"		"
"		61		"	"	"	"		"		"	"	11V	4.0V		"	2Y	"		"		"		"
I_{OL1}		62	0.4V	5.0V	5.0V	5.0V	5.0V		"		GND	GND	GND	GND		5.0V	1Y	0.51		0.36		0.64		"
"		63		GND	GND	GND	GND		"		5.0V	5.0V	5.0V	5.0V	0.4V	"	2Y	"		"		"		"
I_{OL2}		64	1.5V	15V	15V	15V	15V		"		GND	GND	GND	GND		15V	1Y	3.4		2.4		4.2		"
"		65		GND	GND	GND	GND		"		15V	15V	15V	15V	1.5V	"	2Y	"		"		"		"
I_{OH1}		66	4.6V	"	5.0V	5.0V	5.0V		"		GND	GND	GND	GND		5.0V	1Y	-0.51		-0.36		-0.64		"
"		67	"	5.0V	GND	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"		68	"	"	5.0V	GND	"		"		"	"	"	"		"	1Y	"		"		"		"
"		69	"	"	"	5.0V	GND		"		"	"	"	"		"	1Y	"		"		"		"
"		70		GND	GND	GND	"		"		"	5.0V	5.0V	5.0V	4.6V	"	2Y	"		"		"		"
"		71		"	"	"	"		"		5.0V	GND	"	"		"	2Y	"		"		"		"
"		72		"	"	"	"		"		"	5.0V	GND	"		"	2Y	"		"		"		"
"		73		"	"	"	"		"		"	"	5.0V	GND		"	2Y	"		"		"		"
I_{OH2}		74	13.5V	"	15V	15V	15V		"		GND	GND	GND	GND		15V	1Y	-3.4		-2.4		-4.2		"
"		75	"	15V	GND	"	"		"		"	"	"	"		"	1Y	"		"		"		"
"		76	"	"	15V	GND	"		"		"	"	"	"		"	1Y	"		"		"		"
"		77	"	"	"	15V	GND		"		"	"	"	"		"	1Y	"		"		"		"
"		78		GND	GND	GND	"		"		"	15V	15V	15V	13.5V	"	2Y	"		"		"		"
"		79		"	"	"	"		"		15V	GND	"	"		"	2Y	"		"		"		"
"		80		"	"	"	"		"		"	15V	GND	"		"	2Y	"		"		"		"
"		81		"	"	"	"		"		"	"	15V	GND		"	2Y	"		"		"		"
I_{IH1} 2/	3010	82		18V	18V	18V	18V		"		18V	18V	18V	18V		18V	All inputs together		800					nA
I_{IH2}	"	83		"	"	"	"		"		"	"	"	"		"	1A		100.0		100.0			"
"	"	84		"	"	"	"		"		"	"	"	"		"	1B		"		"			"
"	"	85		"	"	"	"		"		"	"	"	"		"	1C		"		"			"
"	"	86		"	"	"	"		"		"	"	"	"		"	1D		"		"			"
"	"	87		"	"	"	"		"		"	"	"	"		"	2A		"		"			"
"	"	88		"	"	"	"		"		"	"	"	"		"	2B		"		"			"
"	"	89		"	"	"	"		"		"	"	"	"		"	2C		"		"			"
"	"	90		"	"	"	"		"		"	"	"	"		"	2D		"		"			"

See footnotes at end of device type 53.

TABLE III. <u>Group A inspection for device type 52</u> – Continued.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y Test no.	1 1Y	2 1A	3 1B	4 1C	5 1D	6 NC	7 Vss	8 NC	9 2A	10 2B	11 2C	12 2D	13 2Y	14 VDD	Measured terminal	Min	Max	Min	Max	Min	Max	Unit
																		Subgroup 1 TA=25°C		Subgroup 2 TA=125°C		Subgroup 3 TA=-55°C		
I_{IL1} 2/	3009	91		GND	GND	GND	GND		GND		GND	GND	GND	GND		18V	All inputs together		-800					nA
I_{IL2}	"	92		"	18V	18V	18V		"		18V	18V	18V	18V		"	1A		-100.0		-100.0			"
"	"	93		18V	GND	"	"		"		"	"	"	"		"	1B		"		"			"
"	"	94		"	18V	GND	"		"		"	"	"	"		"	1C		"		"			"
"	"	95		"	"	18V	GND		"		"	"	"	"		"	1D		"		"			"
"	"	96		"	"	"	18V		"		GND	"	"	"		"	2A		"		"			"
"	"	97		"	"	"	"		"		18V	GND	"	"		"	2B		"		"			"
"	"	98		"	"	"	"		"		"	18V	GND	"		"	2C		"		"			"
"	"	99		"	"	"	"		"		"	"	18V	GND		"	2D		"		"			"
																		Subgroup 4 TA=25°C Min	Max					
C_i	3012	100		3/					GND							GND	1A		12.0					pF
"	"	101			3/				"							"	1B		"					"
"	"	102				3/			"							"	1C		"					"
"	"	103					3/		"							"	1D		"					"
"	"	104							"		3/					"	2A		"					"
"	"	105							"			3/				"	2B		"					"
"	"	106							"				3/			"	2C		"					"
"	"	107							"					3/		"	2D		"					"
																		Subgroup 9 TA=25°C Min Max		Subgroup 10 TA=125°C Min Max		Subgroup 11 TA=-55°C Min Max		
t_{PHL}	3003 Fig. 3	108	OUT	IN 5.0V	5.0V	5.0V	5.0V		GND		5.0V	5.0V	5.0V	5.0V		5.0V	1A to 1Y	13	325	18	490	13	325	ns
"	"	109	"	5.0V	IN 5.0V	"	"		"		"	"	"	"		"	1B to 1Y	"	"	"	"	"	"	"
"	"	110	"	"	5.0V	IN 5.0V	"		"		"	"	"	"		"	1C to 1Y	"	"	"	"	"	"	"
"	"	111	"	"	"	5.0V	IN 5.0V		"		"	"	"	"		"	1D to 1Y	"	"	"	"	"	"	"
"	"	112		"	"	"	"		"		IN 5.0V	"	"	"	OUT	"	2A to 2Y	"	"	"	"	"	"	"
"	"	113		"	"	"	"		"		5.0V	IN 5.0V	"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	114		"	"	"	"		"		"	5.0V	IN 5.0V	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	115		"	"	"	"		"		"	"	5.0V	IN	"	"	2D to 2Y	"	"	"	"	"	"	"
t_{PLH}	"	116	OUT	IN 5.0V	"	"	"		"		"	"	"	5.0V		"	1A to 1Y	13	250	18	375	13	250	"
"	"	117	"	5.0V	IN 5.0V	"	"		"		"	"	"	"		"	1B to 1Y	"	"	"	"	"	"	"
"	"	118	"	"	5.0V	IN 5.0V	"		"		"	"	"	"		"	1C to 1Y	"	"	"	"	"	"	"
"	"	119	"	"	"	5.0V	IN 5.0V		"		"	"	"	"		"	1D to 1Y	"	"	"	"	"	"	"
"	"	120		"	"	"	"		"		IN 5.0V	"	"	"	OUT	"	2A to 2Y	"	"	"	"	"	"	"
"	"	121		"	"	"	"		"		5.0V	IN 5.0V	"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	122		"	"	"	"		"		"	5.0V	IN 5.0V	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	123		"	"	"	"		"		"	"	5.0V	IN	"	"	2D to 2Y	"	"	"	"	"	"	"

See footnotes at end of device type 53.

TABLE III. <u>Group A inspection for device type 52</u> – Continued.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y / Test no.	1 / 1Y	2 / 1A	3 / 1B	4 / 1C	5 / 1D	6 / NC	7 / Vss	8 / NC	9 / 2A	10 / 2B	11 / 2C	12 / 2D	13 / 2Y	14 / VDD	Measured terminal	Subgroup 9 TA = 25°C Min	Max	Subgroup 10 TA = 125°C Min	Max	Subgroup 11 TA = -55°C Min	Max	Unit
tTHL	3004 Fig. 3	124	OUT	IN	5.0V	5.0V	5.0V		GND		5.0V	5.0V	5.0V	5.0V		5.0V	1Y	10	550	14	825	10	550	ns
"	"	125	"	5.0V	IN	"	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	126	"	"	5.0V	IN	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	127	"	"	"	5.0V	IN		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	128		"	"	"	5.0V		"		IN	"	"	"	OUT	"	2Y	"	"	"	"	"	"	"
"	"	129		"	"	"	"		"		5.0V	IN	"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	130		"	"	"	"		"		"	5.0V	IN	"	"	"	2Y	"	"	"	"	"	"	"
"	"	131		"	"	"	"		"		"	"	5.0V	IN	"	"	2Y	"	"	"	"	"	"	"
tTLH	"	132	OUT	IN	"	"	"		"		"	"	"	5.0V		"	1Y	10	425	14	640	10	425	"
"	"	133	"	5.0V	IN	"	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	134	"	"	5.0V	IN	"		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	135	"	"	"	5.0V	IN		"		"	"	"	"		"	1Y	"	"	"	"	"	"	"
"	"	136		"	"	"	5.0V		"		IN	"	"	"	OUT	"	2Y	"	"	"	"	"	"	"
"	"	137		"	"	"	"		"		5.0V	IN	"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	138		"	"	"	"		"		"	5.0V	IN	"	"	"	2Y	"	"	"	"	"	"	"
"	"	139		"	"	"	"		"		"	"	5.0V	IN	"	"	2Y	"	"	"	"	"	"	"

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 53.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y Test no.	1 (2A)	2 (2B)	3 (1A)	4 (1B)	5 (1C)	6 (1Y)	7 (Vss)	8 (2C)	9 (2Y)	10 (3Y)	11 (3A)	12 (3B)	13 (3C)	14 (VDD)	Measured terminal	SG1 $T_A=25°C$ Min	Max	SG2 $T_A=125°C$ Min	Max	SG3 $T_A=-55°C$ Min	Max	Unit
$V_{IC(pos)}$ 1/		1	1mA													GND	2A		1.5					V
"		2		1mA												"	2B		"					"
"		3								1mA						"	2C		"					"
"		4			1mA											"	1A		"					"
"		5				1mA										"	1B		"					"
"		6					1mA									"	1C		"					"
"		7											1mA			"	3A		"					"
"		8												1mA		"	3B		"					"
"		9													1mA	"	3C		"					"
$V_{IC(neg)}$ 1/		10	-1mA						GND								2A		-6.0					"
"		11		-1mA					"								2B		"					"
"		12							"	-1mA							2C		"					"
"		13			-1mA				"								1A		"					"
"		14				-1mA			"								1B		"					"
"		15					-1mA		"								1C		"					"
"		16							"				-1mA				3A		"					"
"		17							"					-1mA			3B		"					"
"		18							"						-1mA		3C		"					"
I_{SS} 1/	3005	19	GND	18V	GND	18V	18V		"	18V			GND	18V	18V	18V	Vss		-25		-750			nA
"	"	20	18V	"	18V	"	"		"	"			18V	"	"	"	"		"		"			"
"	"	21	"	GND	"	GND	"		"	"			"	GND	"	"	"		"		"			"
"	"	22	"	18V	"	18V	GND		"	GND			"	18V	GND	"	"		"		"			"
V_{OH4}	3006	23	GND	15V	GND	GND	"		"	15V			GND	GND	"	15V	2Y	14.95		14.95		14.95		V
"	"	24	15V	GND	"	"	"		"	"			"	"	"	"	2Y	"		"		"		"
"	"	25	"	15V	"	"	"		"	GND			"	"	"	"	2Y	"		"		"		"
"	"	26	GND	GND	"	15V	15V		"	"			"	"	"	"	1Y	"		"		"		"
"	"	27	"	"	15V	GND	"		"	"			"	"	"	"	1Y	"		"		"		"
"	"	28	"	"	"	15V	GND		"	"			"	"	"	"	1Y	"		"		"		"
"	"	29	"	"	GND	GND	"		"	"			"	15V	15V	"	3Y	"		"		"		"
"	"	30	"	"	"	"	"		"	"			15V	GND	"	"	3Y	"		"		"		"
"	"	31	"	"	"	"	"		"	"			"	15V	GND	"	3Y	"		"		"		"
V_{OL4}	3007	32	15V	15V	"	"	"		"	15V			GND	GND	"	"	2Y		0.05		0.05		0.05	"
"	"	33	GND	GND	15V	15V	15V		"	GND			"	"	"	"	1Y		"		"		"	"
"	"	34	"	"	GND	GND	GND		"	"			15V	15V	15V	"	3Y		"		"		"	"
V_{IH1}		35	3.5V	3.5V	"	"	"		"	3.5V			GND	GND	GND	5V	2Y		0.5		0.5		0.5	"
"		36	GND	GND	3.5V	3.5V	3.5V		"	GND			"	"	"	"	1Y		"		"		"	"
"		37	"	"	GND	GND	GND		"	"			3.5V	3.5V	3.5V	"	3Y		"		"		"	"
V_{IH2}		38	7.0V	7.0V	"	"	"		"	7.0V			GND	GND	GND	10V	2Y		1.0		1.0		1.0	"
"		39	GND	GND	7.0V	7.0V	7.0V		"	GND			"	"	"	"	1Y		"		"		"	"
"		40	"	"	GND	GND	GND		"	"			7.0V	7.0V	7.0V	"	3Y		"		"		"	"
V_{IH3}		41	11V	11V	"	"	"		"	11V			GND	GND	GND	15V	2Y		1.5		1.5		1.5	"
"		42	GND	GND	11V	11V	11V		"	GND			"	"	"	"	1Y		"		"		"	"
"		43	"	"	GND	GND	GND		"	"			11V	11V	11V	"	3Y		"		"		"	"

See footnotes at end of device type 53.

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

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y / Test no.	1 (2A)	2 (2B)	3 (1A)	4 (1B)	5 (1C)	6 (1Y)	7 (Vss)	8 (2C)	9 (2Y)	10 (3Y)	11 (3A)	12 (3B)	13 (3C)	14 (VDD)	Measured terminal	SG1 $T_A=25°C$ Min	SG1 Max	SG2 $T_A=125°C$ Min	SG2 Max	SG3 $T_A=-55°C$ Min	SG3 Max	Unit
V_{IL1}		44	1.5V	3.5V	GND	GND	GND		GND	3.5V			GND	GND	GND	5V	2Y	4.5		4.5		4.5		V
"		45	3.5V	1.5V	"	"	"		"	"			"	"	"	"	2Y	"		"		"		"
"		46		3.5V	"	"	"		"	1.5V			"	"	"	"	2Y	"		"		"		"
"		47	GND	GND	1.5V	3.5V	3.5V		"	GND			"	"	"	"	1Y	"		"		"		"
"		48	"	"	3.5V	1.5V	"		"	"			"	"	"	"	1Y	"		"		"		"
"		49	"	"	"	3.5V	1.5V		"	"			"	"	"	"	1Y	"		"		"		"
"		50	"	"	GND	GND	GND		"	"			1.5V	3.5V	3.5V	"	3Y	"		"		"		"
"		51	"	"	"	"	"		"	"			3.5V	1.5V	"	"	3Y	"		"		"		"
"		52	"	"	"	"	"		"	"			"	3.5V	1.5V	"	3Y	"		"		"		"
V_{IL2}		53	3.0V	7.0V	"	"	"		"	7.0V			GND	GND	GND	10V	2Y	9.0		9.0		9.0		"
"		54	7.0V	3.0V	"	"	"		"	"			"	"	"	"	2Y	"		"		"		"
"		55		7.0V	"	"	"		"	3.0V			"	"	"	"	2Y	"		"		"		"
"		56	GND	GND	3.0V	7.0V	7.0V		"	GND			"	"	"	"	1Y	"		"		"		"
"		57	"	"	7.0V	3.0V	"		"	"			"	"	"	"	1Y	"		"		"		"
"		58	"	"	"	7.0V	3.0V		"	"			"	"	"	"	1Y	"		"		"		"
"		59	"	"	GND	GND	GND		"	"			3.0V	7.0V	7.0V	"	3Y	"		"		"		"
"		60	"	"	"	"	"		"	"			7.0V	3.0V	"	"	3Y	"		"		"		"
"		61	"	"	"	"	"		"	"			"	7.0V	3.0V	"	3Y	"		"		"		"
V_{IL3}		62	4.0V	11V	"	"	"		"	11V			GND	GND	GND	15V	2Y	13.5		13.5		13.5		"
"		63	11V	4.0V	"	"	"		"	"			"	"	"	"	2Y	"		"		"		"
"		64		11V	"	"	"		"	4.0V			"	"	"	"	2Y	"		"		"		"
"		65	GND	GND	4.0V	11V	11V		"	GND			"	"	"	"	1Y	"		"		"		"
"		66	"	"	11V	4.0V	"		"	"			"	"	"	"	1Y	"		"		"		"
"		67	"	"	"	11V	4.0V		"	"			"	"	"	"	1Y	"		"		"		"
"		68	"	"	GND	GND	GND		"	"			4.0V	11V	11V	"	3Y	"		"		"		"
"		69	"	"	"	"	"		"	"			11V	4.0V	"	"	3Y	"		"		"		"
"		70	"	"	"	"	"		"	"			"	11V	4.0V	"	3Y	"		"		"		"
I_{OL1}		71	5.0V	5.0V					"	5.0V	0.4V		GND	GND	GND	5V	2Y	0.51		0.36		0.641		mA
"		72	GND	GND	5.0V	5.0V	5.0V	0.4V	"	GND			"	"	"	"	1Y	"		"		"		"
"		73	"	"	GND	GND	GND		"	"		0.4V	5.0V	5.0V	5.0V	"	3Y	"		"		"		"
I_{OL2}		74	15.0V	15.0V	"	"	"		"	15.0V	1.5V		GND	GND	GND	15V	2Y	3.4		2.4		4.2		"
"		75	GND	GND	15.0V	15.0V	15.0V	1.5V	"	GND			"	"	"	"	1Y	"		"		"		"
"		76	"	"	GND	GND	GND		"	"		1.5V	15.0V	15.0V	15.0V	"	3Y	"		"		"		"
I_{OH1}		77	"	5.0V	"	"	"		"	5.0V	4.6V		GND	GND	GND	5V	2Y	-0.51		-0.36		-0.64		"
"		78	5.0V	GND	"	"	"		"	"	"		"	"	"	"	2Y	"		"		"		"
"		79	"	5.0V	"	"	"		"	GND			"	"	"	"	2Y	"		"		"		"
"		80	GND	GND	"	5.0V	5.0V	4.6V	"	"			"	"	"	"	1Y	"		"		"		"
"		81	"	"	5.0V	GND	"		"	"			"	"	"	"	1Y	"		"		"		"
"		82	"	"	"	5.0V	GND	"	"	"			"	"	"	"	1Y	"		"		"		"
"		83	"	"	GND	GND	"		"	"		4.6V	"	5.0V	5.0V	"	3Y	"		"		"		"
"		84	"	"	"	"	"		"	"		"	5.0V	GND	"	"	3Y	"		"		"		"
"		85	"	"	"	"	"		"	"		"	"	5.0V	GND	"	3Y	"		"		"		"
I_{OH2}		86	"	15.0V	"	"	"		"	15.0V	13.5V		GND	GND	GND	15V	2Y	-3.4		-2.4		-4.2		"
"		87	15.0V	GND	"	"	"		"	"	"		"	"	"	"	2Y	"		"		"		"
"		88	"	15.0V	"	"	"		"	GND	"		"	"	"	"	2Y	"		"		"		"
"		89	GND	GND	"	15.0V	15.0V	13.5V	"	"			"	"	"	"	1Y	"		"		"		"
"		90	"	"	15.0V	GND	"		"	"			"	"	"	"	1Y	"		"		"		"
"		91	"	"	"	15.0V	GND	"	"	"			"	"	"	"	1Y	"		"		"		"
"		92	"	"	GND	GND	"		"	"		13.5V	"	15.0V	15.0V	"	3Y	"		"		"		"
"		93	"	"	"	"	"		"	"		"	15.0V	GND	"	"	3Y	"		"		"		"
"		94	"	"	"	"	"		"	"		"	"	15.0V	GND	"	3Y	"		"		"		"

See footnotes at end of device type 53.

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

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y / Test no.	For terminal conditions, see 1/															Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14			Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
			2A	2B	1A	1B	1C	1Y	V_SS	2C	2Y	3Y	3A	3B	3C	V_DD		Min	Max	Min	Max	Min	Max	
I_{IH1} 2/	3010	95	18.0V	18.0V	18.0V	18.0V	18.0V		GND	18.0V			18.0V	18.0V	18.0V	18.0V	All inputs together		900					nA
I_{IH2} "	"	96	"	"	"	"	"		"	"			"	"	"	"	2A		100.0		100.0			"
"	"	97	"	"	"	"	"		"	"			"	"	"	"	2B		"		"			"
"	"	98	"	"	"	"	"		"	"			"	"	"	"	2C		"		"			"
"	"	99	"	"	"	"	"		"	"			"	"	"	"	1A		"		"			"
"	"	100	"	"	"	"	"		"	"			"	"	"	"	1B		"		"			"
"	"	101	"	"	"	"	"		"	"			"	"	"	"	1C		"		"			"
"	"	102	"	"	"	"	"		"	"			"	"	"	"	3A		"		"			"
"	"	103	"	"	"	"	"		"	"			"	"	"	"	3B		"		"			"
"	"	104	"	"	"	"	"		"	"			"	"	"	"	3C		"		"			"
I_{IL1} 2/	3009	105	GND	GND	GND	GND	GND		"	GND			GND	GND	GND	"	All input together		-900					"
I_{IL2} "	"	106	"	18.0V	18.0V	18.0V	18.0V		"	18.0V			18.0V	18.0V	18.0V	"	2A		-100.0		-100.0			"
"	"	107	18.0V	GND	"	"	"		"	"			"	"	"	"	2B		"		"			"
"	"	108	"	18.0V	"	"	"		"	GND			"	"	"	"	2C		"		"			"
"	"	109	"	"	GND	"	"		"	18.0V			"	"	"	"	1A		"		"			"
"	"	110	"	"	18.0V	GND	"		"	"			"	"	"	"	1B		"		"			"
"	"	111	"	"	"	18.0V	GND		"	"			"	"	"	"	1C		"		"			"
"	"	112	"	"	"	"	18.0V		"	"			GND	"	"	"	3A		"		"			"
"	"	113	"	"	"	"	"		"	"			18.0V	GND	18.0V	"	3B		"		"			"
"	"	114	"	"	"	"	"		"	"			"	18.0V	GND	"	3C		"		"			"

																			Subgroup 4 T_A = 25°C						
																			Min	Max					
C_i	3012	115	3/						GND							GND	2A		12.0					pF
"	"	116		3/					"							"	2B		"					"
"	"	117							"	3/						"	2C		"					"
"	"	118			3/				"							"	1A		"					"
"	"	119				3/			"							"	1B		"					"
"	"	120					3/		"							"	1C		"					"
"	"	121							"				3/			"	3A		"					"
"	"	122							"					3/		"	3B		"					"
"	"	123							"						3/	"	3C		"					"

																			Subgroup 9 T_A = 25°C		Subgroup 10 T_A = 125°C		Subgroup 11 T_A = -55°C		
																			Min	Max	Min	Max	Min	Max	
t_{PHL} "	3003 Fig. 3	124	IN 5.0V	5.0V	5.0V	5.0V	5.0V		GND	5.0V	OUT		5.0V	5.0V	5.0V	5.0V	2A to 2Y	13	175	18	265	13	175	ns
"	"	125	5.0V	IN 5.0V	"	"	"		"	"	"		"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	126	"	5.0V	IN 5.0V	"	"		"	IN 5.0V			"	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	127	"	"	IN 5.0V	IN 5.0V	"	OUT	"	"			"	"	"	"	1A to 1Y	"	"	"	"	"	"	"
"	"	128	"	"	"	IN 5.0V	IN 5.0V	"	"	"			"	"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	129	"	"	"	"	IN 5.0V		"	"			"	"	"	"	1C to 1Y	"	"	"	"	"	"	"
"	"	130	"	"	"	"	"		"	"	OUT		IN 5.0V	"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	131	"	"	"	"	"		"	"	"		5.0V	IN 5.0V	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	132	"	"	"	"	"		"	"			"	5.0V	IN	"	3C to 3Y	"	"	"	"	"	"	"

See footnotes at end of device type 53.

TABLE III. <u>Group A inspection for device type 53</u> – Continued.

Symbol	MIL-STD-883 method	Cases A,C,D,T,X,Y — Test no.	1 (2A)	2 (2B)	3 (1A)	4 (1B)	5 (1C)	6 (1Y)	7 (Vss)	8 (2C)	9 (2Y)	10 (3Y)	11 (3A)	12 (3B)	13 (3C)	14 (VDD)	Measured terminal	Subgroup 9 $T_A=25°C$ Min	Max	Subgroup 10 $T_A=125°C$ Min	Max	Subgroup 11 $T_A=-55°C$ Min	Max	Unit
t_{PLH}	3003 Fig. 3	133	IN	5.0V	5.0V	5.0V	5.0V		GND	5.0V	OUT		5.0V	5.0V	5.0V	5.0V	2A to 2Y	13	150	18	225	13	150	ns
"	"	134	5.0V	IN	"	"	"		"	"	"		"	"	"	"	2B to 2Y	"	"	"	"	"	"	"
"	"	135	"	5.0V	"	"	"		"	IN	"		"	"	"	"	2C to 2Y	"	"	"	"	"	"	"
"	"	136	"	"	IN	"	"	OUT	"	5.0V	"		"	"	"	"	1A to 1Y	"	"	"	"	"	"	"
"	"	137	"	"	5.0V	IN	"	"	"	"	"		"	"	"	"	1B to 1Y	"	"	"	"	"	"	"
"	"	138	"	"	"	5.0V	IN	"	"	"	"		"	"	"	"	1C to 1Y	"	"	"	"	"	"	"
"	"	139	"	"	"	"	5.0V		"	"	"	OUT	IN	"	"	"	3A to 3Y	"	"	"	"	"	"	"
"	"	140	"	"	"	"	"		"	"	"	"	5.0V	IN	"	"	3B to 3Y	"	"	"	"	"	"	"
"	"	141	"	"	"	"	"		"	"	"	"	"	5.0V	IN	"	3C to 3Y	"	"	"	"	"	"	"
t_{THL}	3004 Fig. 3	142	IN	"	"	"	"		"	"	OUT		"	"	5.0V	"	2Y	13	250	18	375	13	250	"
"	"	143	5.0V	IN	"	"	"		"	"	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	144	"	5.0V	"	"	"		"	IN	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	145	"	"	IN	"	"	OUT	"	5.0V	"		"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	146	"	"	5.0V	IN	"	"	"	"	"		"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	147	"	"	"	5.0V	IN	"	"	"	"		"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	148	"	"	"	"	5.0V		"	"	"	OUT	IN	"	"	"	3Y	"	"	"	"	"	"	"
"	"	149	"	"	"	"	"		"	"	"	"	5.0V	IN	"	"	3Y	"	"	"	"	"	"	"
"	"	150	"	"	"	"	"		"	"	"	"	"	5.0V	IN	"	3Y	"	"	"	"	"	"	"
t_{TLH}	3004 Fig. 3	151	IN	"	"	"	"		"	"	OUT		"	"	5.0V	"	2Y	13	300	18	450	13	300	"
"	"	152	5.0V	IN	"	"	"		"	"	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	153	"	5.0V	"	"	"		"	IN	"		"	"	"	"	2Y	"	"	"	"	"	"	"
"	"	154	"	"	IN	"	"	OUT	"	5.0V	"		"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	155	"	"	5.0V	IN	"	"	"	"	"		"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	156	"	"	"	5.0V	IN	"	"	"	"		"	"	"	"	1Y	"	"	"	"	"	"	"
"	"	157	"	"	"	"	5.0V		"	"	"	OUT	IN	"	"	"	3Y	"	"	"	"	"	"	"
"	"	158	"	"	"	"	"		"	"	"	"	5.0V	IN	"	"	3Y	"	"	"	"	"	"	"
"	"	159	"	"	"	"	"		"	"	"	"	"	5.0V	IN	"	3Y	"	"	"	"	"	"	"

1/ Pins not designated may be high level logic, low level logic, or open. Exceptions are as follows:
    a. $V_{IC(pos)}$ tests, the V_{SS} terminal shall be open.
    b. $V_{IC(neg)}$ tests, the V_{DD} terminal shall be open.
    c. I_{SS} tests, the output terminal shall be open.
2/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.
3/ See 4.4.1c.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table V of MIL-PRF-38535. 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 parts intended to be marked as radiation hardness assured (see 3.7 herein). RHA levels for device classes B and S shall be as specified in MIL-PRF-38535 and 4.5.4 herein.

4.5 Methods of inspection. Methods of inspection shall be specified and 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.

4.5.2 Burn-in and life test cool down procedures. When the 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.

TABLE IV. Delta limits at 25°C.

Parameter 1/	Device types	
	01, 02, 03	51, 52, 53
I_{SS}	±10 nA	±10 nA
V_{OL1}	±0.04 V	
V_{OH1}	±0.08 V	
I_{OL1}		±15%
I_{OH1}		±15%

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

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

4.5.4 Radiation hardness assurance (RHA) testing. The RHA testing shall be performed in accordance with test procedures and sampling specified in MIL-PRF-38535 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 VII 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-PRF-38535 for the radiation hardness assurance level being tested, and meet the end-point electrical parameters as defined in table V 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 VII and on figure 4. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VI and the 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 V. Radiation hardened end-point electrical parameters at 25°C.

Parameter	All device types	V_{DD} Device types	
		01, 02, 03	51, 52, 53
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 max	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 VI. Bias during exposure to radiation.

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

1/ Pins not designated are open, or may be tied to 10 V dc through a 30 kΩ to 60 kΩ resistor.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department of Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.
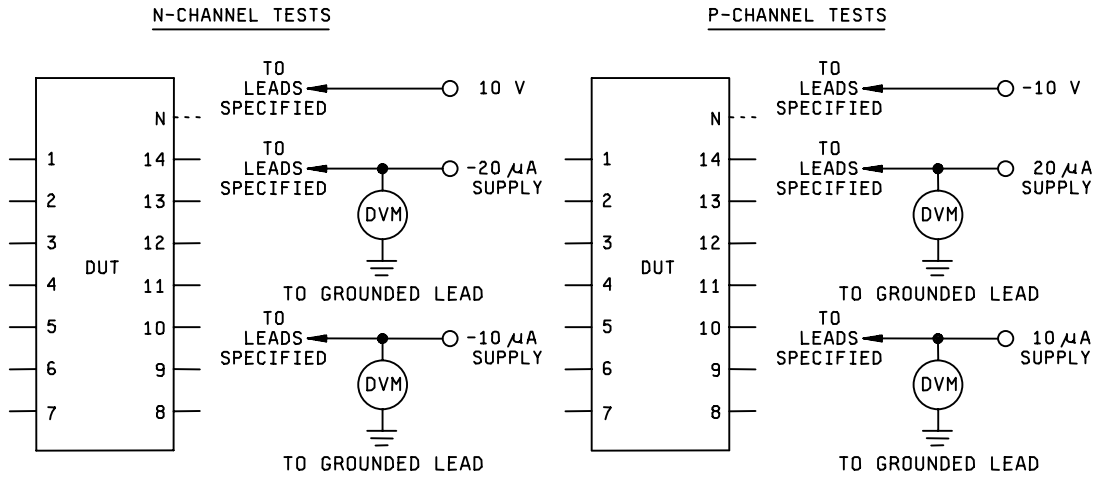
MIL-M-38510/50F

FIGURE 4. Threshold-voltage test circuit.

TABLE VII. Threshold-voltage test circuit conditions.

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

35

6.2 Acquisition requirements. Acquisition documents should specify the following:

    a.   Title, number, and date of the specification.

    b.   PIN and compliance identifier, if applicable (see 1.2).

    c.   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.

    d.   Requirements for certificate of compliance, if applicable.

    e.   Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.

    f.   Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.

    g.   Requirements for product assurance and radiation hardness assurance options.

    h.   Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements should not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.

    i.   Requirements for "JAN" marking.

    j.   Packaging requirements. (see 5.1)

6.3 Superseding information. The requirements of MIL-M-38510 have been superseded to take advantage of the available Qualified Manufacturer Listing (QML) system provided by MIL-PRF-38535. Previous references to MIL-M-38510 in this document have been replaced by appropriate references to MIL-PRF-38535. All technical requirements now consist of this specification and MIL-PRF-38535. The MIL-M-38510 specification sheet number and PIN have been retained to avoid adversely impacting existing government logistics systems and contractors parts lists.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, P.O. Box 3990, Columbus, Ohio 43218-3990.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535, MIL-HDBK-1331, and as follows:

C_I	Input terminal-to-GND capacitance.
GND	Ground zero voltage potential.
I_{SS}	Quiescent supply current.
T_A	Free air temperature.
V_{DD}	Positive supply voltage.
V_{SS}	Negative supply voltage.

6.6 Logistic support. Lead materials and finishes (see 3.4) 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 B for Department of Defense (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.

6.7 Data reporting. When specified in the purchase order or contract, a copy of the following data, as applicable, will 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 3.6).

     b.   A copy of each radiograph.

     c.   The technology conformance inspection (TCI) data (see 4.4).

     d.   Parameter distribution data on parameters evaluated during burn-in (see 3.6).

     e.   Final electrical parameters data (see 4.2d).

     f.   RHA delta limits.

6.8 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, post irradiation performance 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 should 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-PRF-38535.

Military device type	Generic-industry type
01	4011A
02	4012A
03	4023A
51	4011B
52	4012B
53	4023B

6.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians: Preparing activity:
 Army - CR   DLA - CC
 Navy - EC
 Air Force - 11   (Project 5962-2043)
 DLA - CC

Review activities:
 Army - MI, SM
 Navy - AS, CG, MC, SH, TD
 Air Force – 03, 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at www.dodssp.daps.mil.