

INCH-POUND

MIL-M-38510/172C
04 June 2004

SUPERSEDING
MIL-M-38510/172B
30 April 1984

MILITARY SPECIFICATION
MICROCIRCUITS, DIGITAL, CMOS, AND-OR-INVERT, EXCLUSIVE-OR,
EXCLUSIVE-NOR GATES, MONOLITHIC SILICON, POSITIVE LOGIC

Reactivated after 04 June 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).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:

<u>Device type</u>	<u>Circuit</u>
01	Dual 2-wide, 2-input AND-OR-invert gate
02	Expandable 4-wide, 2-input AND-OR invert gate
03	Quad exclusive-OR gate
04	Quad exclusive-NOR 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:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
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 <u>1/ 2/</u>	GDFP5-F14 or CDFP6-F14	14	Flat pack, except A dimension equals 0.100" (2.54 mm) max
Y <u>1/ 2/</u>	GDFP1-F14 or CDFP2-F14	14	Flat pack, except A dimension equals 0.100" (2.54 mm) max

1/ As an exception to nickel plate or undercoating paragraph of 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 outline A or D) 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.

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@dscclia.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

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1.3 Absolute maximum ratings.

Supply voltage range ($V_{DD} - V_{SS}$).....	-0.5 V dc to +18.0 V dc
Input current (each input)	± 10 mA
Input voltage range	$(V_{SS} - 0.5) \leq V_I \leq (V_{DD} + 0.5)$
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 Recommended operating conditions.

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 at $V_{DD} = 5.0$ V dc 0.0 V to 2.0 V dc at $V_{DD} = 10.0$ V dc 0.0 V to 4.0 V dc at $V_{DD} = 15.0$ 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 at $V_{DD} = 5.0$ V dc 8.0 V to 10.0 V dc at $V_{DD} = 10.0$ V dc 11 V to 15.0 V dc at $V_{DD} = 15.0$ V dc
Ambient operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 General. 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 Government documents.

2.2.1 Specifications and Standards. 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 Order of precedence. 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 Qualification. 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 Item requirements. 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 Design, construction, and physical dimensions. 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 $200^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for a minimum of 2 hours. The use of equivalency 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 Logic diagrams and terminal connections. The logic diagrams and terminal connections shall be as specified on figure 1.

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

3.3.3 Switching waveforms and test circuit. The switching waveforms and test circuit shall be as specified on figure 3.

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

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

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

3.5 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.

3.6 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.

3.7 Marking. Marking shall be in accordance with MIL-PRF-38535.

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

3.8 Microcircuit group assignment. 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 $V_{SS} = 0\text{ V}$ $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Positive clamping input to V_{DD}	$V_{IC(POS)}$	$T_A = +25^{\circ}\text{C}$, $V_{DD} = \text{GND}$ $V_{SS} = \text{Open}$, Output = Open $I_{IN} = 1\text{ mA}$	All		1.5	V dc
Negative clamping input to V_{SS}	$V_{IC(NEG)}$	$T_A = +25^{\circ}\text{C}$, $V_{DD} = \text{GND}$ $V_{SS} = \text{GND}$, Output = Open $I_{IN} = -1\text{ mA}$	All		-6.0	V dc
Quiescent supply current	I_{SS} or I_{DD}	$V_{DD} = 18\text{ V dc}$ $V_{IN} = V_{SS}$ or V_{DD} All input combinations	All		-750	nA
High level output voltage	V_{OH1}	$V_{DD} = 15\text{ V dc}$ Any one input = V_{DD} All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	01, 02, 03	14.95		V dc
		$V_{DD} = 15\text{ V dc}$ $V_{IN} = V_{SS}$ $V_{IN} = V_{DD}$ $ I_O \leq 1\mu\text{A}$	04	14.95		
Low level output voltage	V_{OL1}	$V_{DD} = 15\text{ V dc}$ $V_{IN} = V_{DD}$ $ I_O \leq 1\mu\text{A}$	01, 02		0.05	V dc
		$V_{DD} = 15\text{ V dc}$ $V_{IN} = V_{DD}$ $V_{IN} = V_{SS}$ $ I_O \leq 1\mu\text{A}$	03		0.05	V dc
		$V_{DD} = 15\text{ V dc}$ Any one input = V_{DD} All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	04		0.05	V dc
Input high voltage	V_{IH1}	$V_{DD} = 5\text{ V dc}$ Any one input = 3.5 V dc All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	$V_O = 4.5\text{ Vdc}$ 01	3.5		V dc
			$V_O = 0.5\text{ Vdc}$ 02			
			$V_O = 4.5\text{ Vdc}$ 03			
			$V_O = 0.5\text{ Vdc}$ 04			
	V_{IH2}	$V_{DD} = 10\text{ V dc}$ Any one input = 7.0 V dc All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	$V_O = 9.0\text{ Vdc}$ 01	7.0		V dc
			$V_O = 1.0\text{ Vdc}$ 02			
			$V_O = 9.0\text{ Vdc}$ 03			
			$V_O = 1.0\text{ Vdc}$ 04			
	V_{IH3}	$V_{DD} = 15\text{ V dc}$ Any one input = 11.0 V dc All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	$V_O = 13.5\text{ Vdc}$ 01	11.0		V dc
			$V_O = 1.5\text{ Vdc}$ 02			
			$V_O = 13.5\text{ Vdc}$ 03			
			$V_O = 1.5\text{ Vdc}$ 04			

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 type	Limits		Unit
				Min	Max	
Input low voltage	V_{IL1}	$V_{DD} = 5\text{ V dc}$ Any one input = 1.5 V All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	$V_O = 4.5\text{ Vdc}$ 01, 04		1.5	V dc
			$V_O = 0.5\text{ Vdc}$ 02, 03			
	V_{IL2}	$V_{DD} = 10\text{ V dc}$ Any one input = 3.0 V All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	$V_O = 9.0\text{ Vdc}$ 01, 04		3.0	V dc
			$V_O = 1.0\text{ Vdc}$ 02, 03			
	V_{IL3}	$V_{DD} = 15\text{ V dc}$ Any one input = 4.0 V All other inputs = V_{SS} $ I_O \leq 1\mu\text{A}$	$V_O = 13.5\text{ Vdc}$ 01, 04		4.0	V dc
			$V_O = 1.5\text{ Vdc}$ 02, 03			
Output high (source) current	I_{OH1}	$V_{DD} = 5.0\text{ V dc}$ $V_{IN} = V_{SS}$ $V_{OH} = 4.6\text{ V dc}$	01, 02, 04	-0.36		mA dc
		$V_{DD} = 5.0\text{ V dc}$ Any one input = V_{DD} All other inputs = V_{SS} $V_{OH} = 4.6\text{ V dc}$	03			
	I_{OH2}	$V_{DD} = 15\text{ V dc}$ $V_{IN} = V_{SS}$ $V_{OH} = 13.5\text{ V dc}$	01, 02, 04	-2.4		mA dc
		$V_{DD} = 15\text{ V dc}$ Any one input = V_{DD} All other inputs = V_{SS} $V_{OH} = 13.5\text{ V dc}$	03			
Output low (sink) current	I_{OL1}	$V_{DD} = 5.0\text{ V dc}$ $V_{IN} = V_{SS}$ $V_{OL} = 0.4\text{ V dc}$	01, 02, 03	0.36		mA dc
		$V_{DD} = 5.0\text{ V dc}$ Any one input = V_{DD} All other inputs = V_{SS} $V_{OL} = 0.4\text{ V dc}$	04			
	I_{OL2}	$V_{DD} = 15\text{ V dc}$ $V_{IN} = V_{SS}$ $V_{OL} = 1.5\text{ V dc}$	01, 02, 03	2.4		mA dc
		$V_{DD} = 15\text{ V dc}$ Any one input = V_{DD} All other inputs = V_{SS} $V_{OL} = 1.5\text{ V dc}$	04			

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 type	Limits		Unit
				Min	Max	
Input leakage <u>1</u> / current, high	I_{IH}	$V_{DD} = 18\text{ V dc}$ Measure inputs sequentially; connect all unused inputs to V_{SS}	01, 02, 04		45	nA
			03		100	nA
Input leakage <u>1</u> / current, low	I_{IL}	$V_{DD} = 18\text{ V dc}$ Measure inputs sequentially; connect all unused inputs to V_{DD}	01, 02, 04		-45	nA
			03		-100	nA
Input capacitance	C_i	$V_{DD} = 0\text{ V dc}$, $f = 1\text{ MHz}$, $T_A = 25^{\circ}\text{C}$	All		7.5	pF
Propagation delay times, high to low level	t_{PHL}	$V_{DD} = 5\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (See figure 3)	01, 02	15	630	ns
			03, 04	13	350	
		$V_{DD} = 10\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$, $T_A = 25^{\circ}\text{C}$ (See figure 3)	01, 02	6	180	ns
			03, 04	6	120	
Propagation delay times, low to high level	t_{PLH}	$V_{DD} = 5\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (See figure 3)	01	25	870	ns
			02	25	980	
			03, 04	13	350	
		$V_{DD} = 10\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$, $T_A = 25^{\circ}\text{C}$ (See figure 3)	01	10	250	ns
			02	14	280	
			03, 04	6	120	
Transition times, high to low level	t_{THL}	$V_{DD} = 5\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (See figure 3)	All	10	280	ns
		$V_{DD} = 10\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ $T_A = +25^{\circ}\text{C}$ (See figure 3)	All	5	100	ns
Transition times, low to high level	t_{TLH}	$V_{DD} = 5\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (See figure 3)	All	10	280	ns
		$V_{DD} = 10\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ $T_A = +25^{\circ}\text{C}$ (See figure 3)	All	5	100	ns

1/ Input current of one input node.

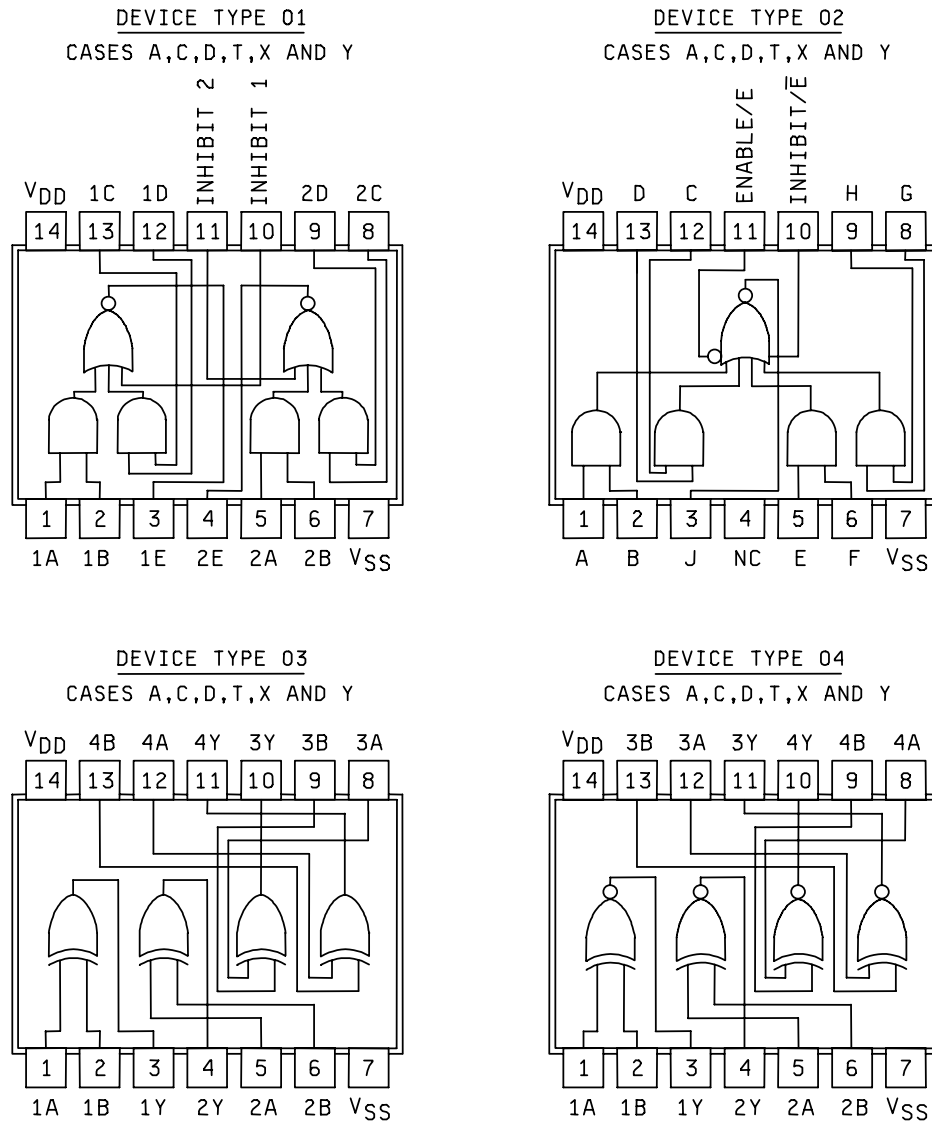


FIGURE 1. Logic diagrams and terminal connections.

Device type 01

Truth table					
Inputs					Output
A	B	C	D	I	E
L	L	L	L	L	H
L	L	L	L	H	L
H	H	L	L	L	L
L	L	H	H	L	L
H	H	H	H	L	L
H	L	H	L	L	H
L	H	L	H	L	H

$$E = \overline{\text{Inhibit}} + AB + CD$$

Device type 02

Truth table											
Inputs										Output	
A	B	C	D	E	F	G	H	I	E	J	
L	L	L	L	L	L	L	L	L	H	H	
L	L	L	L	L	L	L	L	H	H	L	
L	L	L	L	L	L	L	L	L	L	L	
H	H	H	H	H	H	H	H	L	H	L	
H	H	L	L	L	L	L	L	L	H	L	
L	L	H	H	L	L	L	L	L	H	L	
L	L	H	H	L	L	L	L	L	H	L	
L	L	L	L	H	H	L	L	L	H	L	
L	L	L	L	L	L	H	H	L	H	L	
H	L	H	L	H	L	H	L	L	H	H	

$$J = \overline{\text{Inhibit}} + \text{Enable} + AB + CD + EF + GH$$

Device type 03

Truth table		
Inputs		Output
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

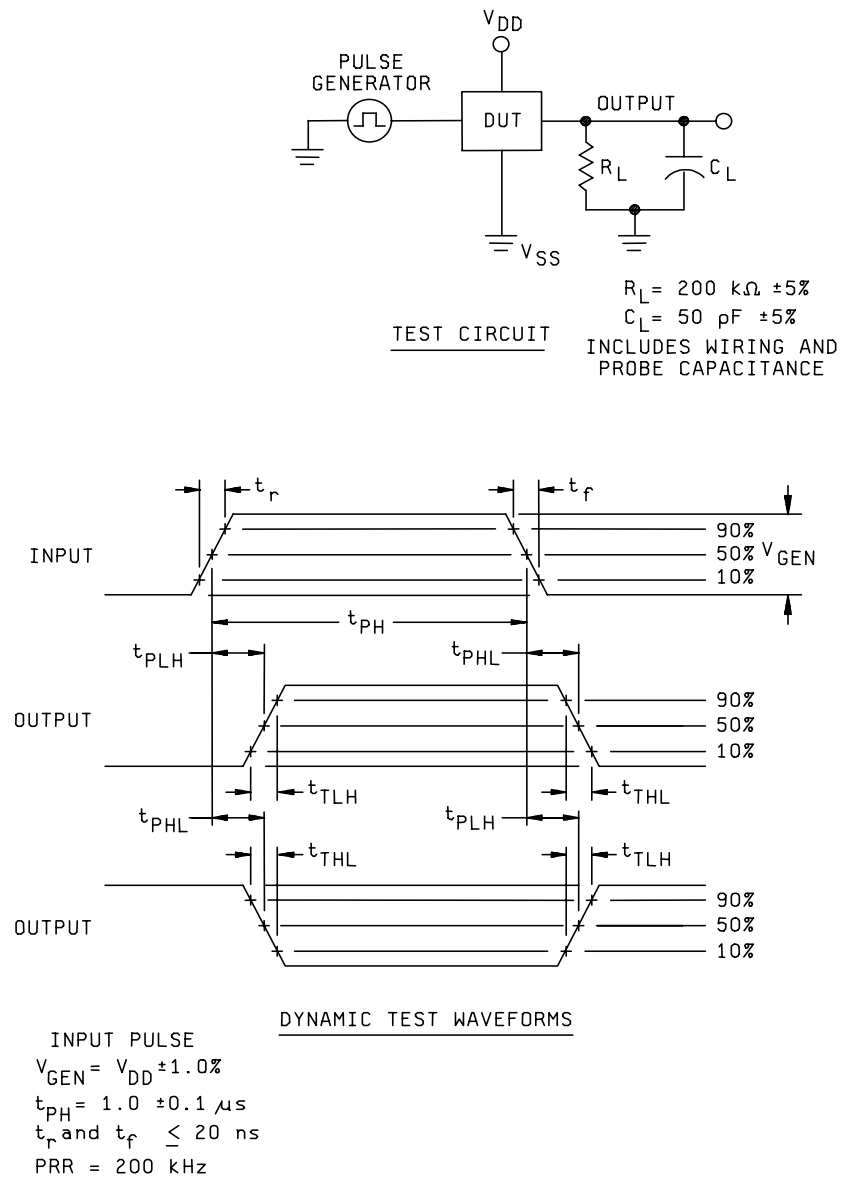
$$Y = A \oplus B$$

Device type 04

Truth table		
Inputs		Output
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	H

$$Y = \overline{A \oplus B}$$

FIGURE 2. Truth tables and logic equations.



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

FIGURE 3. Switching waveforms and test circuit.

4. VERIFICATION

4.1 Sampling and inspection. 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 Screening. Screening shall be in accordance with, MIL-PRF-38535 and shall be conducted on all devices prior to qualification and quality 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 initial (pre-burn-in) electrical parameters through interim (post-burn-in) electrical parameters of method 5004 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} . V_{DD} = 15 V minimum and 18 V maximum.
 - iii. Except for V_{DD} and V_{SS} , terminals shall be connected through resistors which value is 2 k Ω to 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.
 - iv. Output may be open or connected to $V_{DD}/2$.
 - (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} , terminals shall be connected through resistors which value is 2 k Ω to 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.
 - ii. Input signal requirements: Square wave, 50% duty cycle; $25 \text{ kHz} \leq \text{PRR} \leq 1 \text{ MHz}$; t_{TLH} and $t_{THL} \leq 1 \mu\text{s}$. Voltage level: Minimum = $V_{SS} - 0.5 \text{ V}$, +10% V_{DD} ; maximum = $V_{DD} + 0.5 \text{ V}$, -10% V_{DD} .
 - iii. V_{DD} = 15.0 V minimum, 18.0 V maximum; $V_{DD}/2 = V_{DD}/2 \pm 1.0 \text{ V}$; $V_{SS} = 0.0 \text{ V}$.
- 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 <u>1/</u>			Class B device <u>1/</u>		
		Ref. par.	Table III Subgroups <u>2/</u>	Table IV delta limits <u>3/</u>	Ref. par.	Table III subgroups <u>2/</u>	Table IV delta limits <u>3/</u>
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	<u>4/</u>	
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, 10, 11	
9	Group A test requirements (method 5005)	4.4.1	1, 2, 3, 4, 9, 10, 11, 12		4.4.1	1, 2, 3, 4, 9	
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 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 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 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.

4.4 Technology Conformance inspection (TCI). 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 Group A inspection. 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. Subgroup 12 shall be added to the group A inspection requirements for class S devices using sample size series of 15 (acceptance 0) and consist of procedures, test conditions, and limits specified in table III.
- e. Subgroups 9 and 11 shall be measured only for initial qualification and after process or design changes which may affect dynamic performance.

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

4.4.3 Group C inspection. 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.

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 $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$; then, electrical parameter end-point measurements shall be performed.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y	Terminal conditions 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			
			Symbol	1A	1B	1E	2E	2A	2B	V _{SS}	2C	2D	1I	2I	1C	1D		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																						
V _{IC} (pos)	1	2	1 mA	1 mA												GND	1A	1.5	"					V _{DD}	
"		3														"	1B							"	
"		4														"	1C							"	
"		5														"	1D							"	
"		6														"	1I							"	
"		7														"	2I							"	
"		8					1 mA									"	2A							"	
"		9						1 mA								"	2B							"	
"		10								1 mA						"	2C							"	
"											1 mA					"	2D							"	
V _{IC} (neg)	11	12	-1 mA	-1 mA					GND								1B	-6.0	"					"	
"		13							"								1C							"	
"		14							"								1D							"	
"		15							"								1I							"	
"		16							"								2I							"	
"		17							"								2A							"	
"		18					-1 mA		"								2B							"	
"		19						-1 mA	"								2C							"	
"		20							"								2D							"	
"											-1 mA													"	
I _{SS} 2/	3005	21	GND	GND				GND	GND	"		GND	GND	18.0V	18.0V	GND	V _{SS}	-25	"		"			nA	
"	"	22	GND	GND				GND	GND	"		GND	GND	GND	GND	"	"							"	
"	"	23	18.0V	GND				18.0V	GND	"		18.0V	GND	18.0V	GND	"	"							"	
"	"	24	GND	18.0V				GND	18.0V	"		GND	18.0V	"	GND	18.0V	"							"	
"	"	25	GND	GND				GND	GND	"		18.0V	18.0V	"	18.0V	18.0V	"							"	
"	"	26	18.0V	18.0V				18.0V	18.0V	"		GND	GND	"	GND	GND	"							"	
"	"	27	18.0V	18.0V				18.0V	18.0V	"		18.0V	18.0V	18.0V	18.0V	18.0V	"							"	
"	"																"								
V _{OL1}	3007	28	GND	GND				GND	GND	"		GND	GND	15.0V	GND	GND	15.0V	0.05	"		"			V _{DD}	
"	"	29	15.0V	15.0V				"	"	"		"	"	GND	GND	"	"							"	
"	"	30	GND	GND				"	"	"		"	"	15.0V	15.0V	"	"							"	
"	"	31	15.0V	15.0V				"	"	"		"	"	15.0V	15.0V	"	"							"	
"	"	32	GND	GND				"	"	"		"	"	15.0V	GND	"	"							"	
"	"	33	"	"				"	"	"		"	"	"	GND	"	"							"	
"	"	34	"	"				15.0V	15.0V	"		15.0V	15.0V	"	"	"	"							"	
"	"	35	"	"				15.0V	15.0V	"		15.0V	15.0V	"	"	"	"							"	
V _{OH1}	3006	36	"	"				GND	GND	"		GND	GND	"	"	"	1E	14.95	"	"		"		"	
"	"	37	"	"				"	"	"		"	"	"	"	"	2E	"						"	
"	"	38	15.0V	"				"	"	"		"	"	15.0V	"	"	1E	"						"	
"	"	39	GND	15.0V				"	"	"		"	"	GND	15.0V	"	1E	"						"	
"	"	40	GND	GND				15.0V	"	"		15.0V	"	GND	GND	"	2E	"						"	
"	"	41	GND	GND				GND	15.0V	"		GND	15.0V	GND	GND	"	2E	"						"	
"	"																"	"							
"	"																"	"							

See footnotes at end of device type 01.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1		Subgroup 2		Subgroup 3			
			Symbol	1A	1B	1E	2E	2A	2B	V _{SS}	2C	2D	1I	2I	1C	1D		V _{DD}	T _A = 25°C		T _A = 125°C		T _A = -55°C		
			Test No.																Min	Max	Min	Max	Min		Max
V _{IL1}		42	1.5V	1.5V			1.5V	1.5V	GND	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	5.0V	1E	4.5						Vdc	
V _{IH1}	43		3.5V	1.5V										3.5V	1.5V			4.5		4.5		4.5			
		44	1.5V	3.5V										1.5V	3.5V			4.5		4.5		4.5	0.5		
		45	3.5V	3.5V										1.5V					0.5		0.5				
		46	1.5V	1.5V										3.5V											
		47	3.5V	3.5V										3.5V											
		48	3.5V	3.5V								3.5V		3.5V											
		49	1.5V	1.5V								3.5V		1.5V		1.5V									
		50										1.5V						2E	4.5		4.5		4.5		
		51					3.5V			3.5V									4.5		4.5		4.5		
		52					1.5V	3.5V		1.5V	3.5V								4.5		4.5		4.5		
		53					3.5V	3.5V		1.5V	1.5V								4.5	0.5	4.5	0.5	4.5	0.5	
		54					1.5V	1.5V		3.5V	3.5V														
	55					3.5V	3.5V		3.5V	3.5V															
	56					3.5V	3.5V		3.5V	3.5V		3.5V													
	57					1.5V	1.5V		1.5V	1.5V		3.5V													
V _{IL2}		58	3.0V	3.0V			3.0V	3.0V		3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	10V	1E	9.0							
V _{IH2}	59		7.0V	3.0V										7.0V	3.0V			9.0		9.0		9.0			
		60	3.0V	7.0V											7.0V				9.0	1.0	9.0	1.0	9.0		
		61	7.0V	7.0V											3.0V	3.0V									
		62	3.0V	3.0V											7.0V	7.0V									
		63	7.0V	7.0V											7.0V	7.0V									
		64	7.0V	7.0V								7.0V		7.0V	7.0V										
		65	3.0V	3.0V								7.0V		3.0V	3.0V										
		66								3.0V		7.0V						2E	9.0		9.0		9.0		
		67					7.0V			7.0V									9.0		9.0		9.0		
		68					3.0V	7.0V		3.0V	7.0V								9.0		9.0		9.0		
		69					7.0V			3.0V	3.0V									1.0		1.0		1.0	
		70					3.0V			7.0V	7.0V														
	71					7.0V			7.0V	7.0V															
	72					7.0V			7.0V	7.0V		7.0V													
	73					3.0V	3.0V		3.0V	3.0V		7.0V													
V _{IL3}		74	4.0V	4.0V			4.0V	4.0V		4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	15V	1E	13.5		13.5		13.5			
V _{IH3}			11.0V	4.0V										11.0V	4.0V			13.5		13.5		13.5			
		76	4.0V	11.0V											4.0V	11.0V			13.5		13.5		13.5		
		77	11.0V	11.0V											4.0V	4.0V				1.5		1.5		1.5	
		78	4.0V	4.0V											11.0V	11.0V									
		79	11.0V	11.0V											11.0V	11.0V									
		80	11.0V	11.0V											11.0V	11.0V									
		81	4.0V	4.0V											4.0V	4.0V									
		82																2E	13.5		13.5		13.5		
		83					11.0V			11.0V									13.5		13.5		13.5		
		84					4.0V	11.0V		4.0V	11.0V								13.5		13.5		13.5		
		85					11.0V	11.0V		4.0V	4.0V														
		86					4.0V	4.0V		11.0V	11.0V								1.5		1.5		1.5		
	87					11.0V	11.0V		11.0V	11.0V															
	88					11.0V	11.0V		11.0V	11.0V		11.0V													
	89					4.0V	4.0V		4.0V	4.0V		11.0V		11.0V											

See footnotes at end of device type 01.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 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			
			1A	1B	1E	2E	2A	2B	V _{SS}	2C	2D	1I	2I	1C	1D	V _{DD}		Min	Max	Min	Max	Min	Max		
3/ I _{IH1}	3010	90	18.0V	18.0V				18.0V	18.0V	GND	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	All		10						nA
I _{IH2}	"	91	GND	GND				GND	GND	"	GND	GND	18.0V	GND	GND	"	1I		1						"
"	"	92	18.0V	GND				"	"	"	"	"	GND	GND	GND	"	1A		1						"
"	"	93	GND	18.0V				"	"	"	"	"	"	GND	GND	"	1B		"						"
"	"	94	"	GND				"	"	"	"	"	"	18.0V	GND	"	1C		"	45					"
"	"	95	"	"				"	"	"	"	"	"	GND	"	"	1D		"	"					"
"	"	96	"	"				"	"	"	"	"	"	"	18.0V	GND	2I		"	"					"
"	"	97	"	"				18.0V	GND	"	"	"	"	GND	"	"	2A		"	"					"
"	"	98	"	"				"	18.0V	"	"	"	"	"	"	"	2B		"	"					"
"	"	99	"	"				"	GND	"	18.0V	"	"	"	"	"	2C		"	"					"
"	"	100	"	"				"	GND	"	GND	18.0V	"	"	"	"	2D		"	"					"
3/ I _{IL2}	3009	101	"	"				"	GND	"	GND	GND	"	"	"	"	All		-10						"
I _{IL2}	"	102	18.0V	18.0V				18.0V	18.0V	"	18.0V	18.0V	"	18.0V	18.0V	18.0V	1I		-1						"
"	"	103	GND	18.0V				"	"	"	"	"	18.0V	"	18.0V	"	1A		-1						"
"	"	104	"	GND				"	"	"	"	"	"	"	18.0V	"	1B		"	-45					"
"	"	105	"	18.0V				"	"	"	"	"	"	"	GND	"	1C		"	"					"
"	"	106	"	"				"	"	"	"	"	"	"	18.0V	GND	1D		"	"					"
"	"	107	"	"				"	"	"	"	"	"	GND	18.0V	"	2I		"	"					"
"	"	108	"	"				GND	"	"	"	"	"	18.0V	"	"	2A		"	"					"
"	"	109	"	"				18.0V	GND	"	"	"	"	"	"	"	2B		"	"					"
"	"	110	"	"				18.0V	18.0V	"	GND	"	"	"	"	"	2C		"	"					"
"	"	111	"	"				18.0V	18.0V	"	18.0V	GND	"	"	"	"	2D		"	"					"
I _{OL1}		112	GND	GND	0.4V			GND	GND	"	GND	"	"	5.0V	GND	GND	1E	0.51		0.36		0.64			mA
I _{OL1}		113	"	"	"	0.4V		"	"	"	"	"	"	GND	5.0V	"	2E	0.51		0.36		0.64			"
I _{OL2}		114	"	"	1.5V			"	"	"	"	"	"	15.0V	GND	"	1E	3.4							"
I _{OL2}		115	"	"	"	1.5V		"	"	"	"	"	"	GND	15.0V	"	2E	3.4		2.4		4.2			"
I _{OH1}		116	"	"	4.6V			"	"	"	"	"	"	GND	"	"	1E	-0.51	2.4	-0.36	4.2	-0.64	"		"
I _{OH1}		117	"	"	"	4.6V		"	"	"	"	"	"	"	5.0V	"	2E	-0.51	"	-0.36	"	-0.64	"		"
I _{OH2}		118	"	"	13.5V			"	"	"	"	"	"	"	"	"	1E	-3.4		-2.4		-4.2			"
I _{OH2}		119	"	"	"	13.5V		"	"	"	"	"	"	"	"	"	2E	-3.4		-2.4		-4.2			"
																		Subgroup 4 T _A = 25°C							
																		Min	Max						
C ₁	3012	120							GND				4/			GND	1I		7.5						pF
"	"	121	4/						"				"			"	1A		"						"
"	"	122	"	4/					"				"			"	1B		"						"
"	"	123	"	"					"				"		4/	"	1C		"						"
"	"	124	"	"					"				"		"	"	1D		"						"
"	"	125	"	"					"				"	4/	"	"	2I		"						"
"	"	126	"	"				4/	"				"	"	"	"	2A		"						"
"	"	127	"	"				"	4/				"	"	"	"	2B		"						"
"	"	128	"	"				"	"				"	4/	"	"	1C		"						"
"	"	129A	"	"				"	"				"	"	4/	"	1D		"						"
"	"	129B	"	"				"	"	4/			"	"	"	"	2C		"						"
"	"	129C	"	"				"	"	"	4/		"	"	"	"	2D		"						"

See footnotes at end of device type 01.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 1/														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			
			1A	1B	1E	2E	2A	2B	V _{SS}	2C	2D	1I	2I	1C	1D	V _{DD}		Min	Max	Min	Max	Min	Max		
t _{PHL}	3003 Fig. 3	130 131 132 133 134 135 136 137 138 139	GND IN 5.0V GND	GND 5.0V IN GND	OUT		GND	GND	GND	GND	GND	IN GND	GND	GND GND GND IN 5.0V IN GND	GND GND GND 5.0V IN GND	5.0V	1I to 1E 1A to 1E 1B to 1E 1C to 1E 1D to 1E 2I to 2E 2A to 2E 2B to 2E 2C to 2E 2D to 2E	15 23	300 450	21 32	420 630	15 23	300 450	ns	
t _{PLH}		140 141 142 143 144 145 146 147 148 149	IN 5.0V GND	5.0V IN GND	OUT				GND	GND	IN GND			IN 5.0V GND	5.0V IN GND		1I to 1E 1A to 1E 1B to 1E 1C to 1E 1D to 1E 2I to 2E 2A to 2E 2B to 2E 2C to 2E 2D to 2E	25 31	500 620	35 44	700 870	25 31	500 620		
t _{THL}	3004 Fig. 3	150 151 152 153 154 155 156 157 158 159	IN 5.0V GND	5.0V IN GND	OUT				GND	GND	IN GND			IN 5.0V GND	5.0V IN GND		1E 2E	10	200	14	200	10	200		
t _{TLH}		160 161 162 163 164 165 166 167 168 169	IN 5.0V GND	5.0V IN GND	OUT				GND	GND	IN GND			IN 5.0V GND	5.0V IN GND		1E 2E								
																		Subgroup 12 T _A = 25°C							
t _{PHL}	3003 Fig. 3	170 171 172 173 174 175 176 177 178 179	GND IN 10.0V GND	GND 10.0V IN GND	OUT		GND	GND	GND	GND	IN GND	GND	GND GND GND IN 10.0V GND	GND GND GND IN GND	10.0V	1I to 1E 1A to 1E 1B to 1E 1C to 1E 1D to 1E 2I to 2E 2A to 2E 2B to 2E 2C to 2E 2D to 2E	6 9	120 180							

See footnotes at end of device type 01.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 12 T _A = 25°C						
			1A	1B	1E	2E	2A	2B	V _{SS}	2C	2D	1I	2I	1C	1D	V _{DD}		Min	Max	Min	Max	Min	Max	
t _{PLH}	3003 Fig. 3	180 181 182 183 184 185 186 187 188 189	GND IN 10.0V GND	GND 10.0V IN GND	OUT		GND	GND	GND	GND	IN GND	GND	GND GND GND IN 10.0V GND	GND GND GND IN 10.0V GND	10.0V	1I to 1E 1A to 1E 1B to 1E 1C to 1E 1D to 1E 2I to 2E 2A to 2E 2B to 2E 2C to 2E 2D to 2E	10 13	200 250					ns	
t _{THL}	3004 Fig. 3	190 191 192 193 194 195 196 197 198 199		IN 10.0V GND 10.0V	OUT					GND	GND	IN GND				1E	5	100						
				IN 10.0V GND 10.0V		OUT								IN 10.0V GND	10.0V IN GND	2E								
t _{TLH}		200 201 202 203 204 205 206 207 208 209		IN 10.0V GND	OUT					GND	GND	IN GND				1E								
				IN 10.0V GND		OUT								IN 10.0V GND	10.0V IN GND	2E								
										IN 10.0V GND GND	10.0V IN GND GND			IN GND										
										IN 10.0V GND GND	10.0V IN GND GND													

1/ Pins not designated may be "HIGH" level logic, "LOW" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ 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.

4/ See 4.4.1c.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 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										
			A	B	J	NC	E	F	V _{SS}	G	H	I	EN	C	D	V _{DD}		Min	Max	Min	Max	Min	Max									
V _{IC} (pos)	1	2	1mA	1mA												GND	A B C D E F G H I EN	1.5	"	"	"	"	"	"	Vdc							
"		3														"										"	"	"	"	"	"	
"		4											1mA			"										"	"	"	"	"	"	
"		5					1mA									"										"	"	"	"	"	"	
"		6						1mA								"										"	"	"	"	"	"	
"		7								1mA						"										"	"	"	"	"	"	
"		8									1mA					"										"	"	"	"	"	"	
"		9										1mA				"										"	"	"	"	"	"	
"		10											1mA			"										"	"	"	"	"	"	
V _{IC} (neg)		11	12	-1mA	-1mA					GND																	B C D E F G H I EN	-6.0	"	"	"	"
"	13								"							"																
"	14								"							"																
"	15						-1mA		"							"																
"	16							-1mA	"							"																
"	17								"							"																
"	18								"							"																
"	19								"							"																
"	20								"							"																
I _{SS}	3005		21	GND	GND				GND	GND	"	GND	GND	GND	18.0V	GND	GND	V _{SS}	-25	"	"	"	"	"	"	nA						
2/	"	22	GND	GND				GND	GND	"	GND	GND	18.0V	18.0V	GND	GND	"															
"	"	23	GND	GND				GND	GND	"	GND	GND	GND	GND	GND	GND	"															
"	"	24	18.0V	18.0V				18.0V	18.0V	"	18.0V	18.0V	18.0V	18.0V	18.0V	"	"															
"	"	25	18.0V	18.0V				GND	GND	"	GND	GND	GND	GND	GND	"	"															
"	"	26	GND	GND				GND	GND	"	GND	GND	"	18.0V	18.0V	"	"															
"	"	27	GND	"				18.0V	18.0V	"	GND	GND	"	GND	GND	"	"															
"	"	28	GND	"				GND	GND	"	18.0V	18.0V	"	GND	GND	"	"															
"	"	29	18.0V	"				18.0V	"	"	18.0V	GND	"	18.0V	"	"	"															
V _{OL1}	3007	30	GND	"				GND	"	"	GND	GND	15.0V	15.0V	GND	15.0V	J	0.05									"	"	"	"	"	"
"	"	31	GND	"				GND	"	"	GND	GND	GND	GND	"	"	"															
"	"	32	15.0V	15.0V				15.0V	15.0V	"	15.0V	15.0V	"	15.0V	15.0V	"	"															
"	"	33	15.0V	15.0V				GND	GND	"	GND	GND	"	GND	GND	"	"															
"	"	34	GND	GND				GND	GND	"	GND	GND	"	15.0V	15.0V	"	"															
"	"	35	"	"				15.0V	15.0V	"	15.0V	15.0V	"	GND	GND	"	"															
"	"	36	"	"				GND	GND	"	15.0V	15.0V	"	GND	"	"	"															
V _{OH1}	3006	37	"	"				GND	GND	"	GND	15.0V	"	"	"	"	"		14.95		14.95		14.95		"							
V _{OH1}	3006	38	15.0V	"				15.0V	GND	"	15.0V	GND	"	15.0V	"	"	"		14.95		14.95		14.95		"							
V _{OH1}	3006	39	GND	15.0V				GND	15.0V	"	GND	15.0V	"	"	GND	15.0V	"		14.95		14.95		14.95		"							

See footnotes at end of device type 02.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y	Terminal conditions 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			
			Symbol	A	B	J	NC	E	F	V _{SS}	G	H	I	EN	C	D		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																						
V _{IL1}		40	1.5V	1.5V			1.5V	1.5V	GND	1.5V	1.5V	1.5V	3.5V	1.5V	1.5V	5.0V	J	4.5		4.5		4.5		Vdc	
V _{IH1}	41		1.5V	1.5V			1.5V	1.5V	"	1.5V	1.5V	3.5V	3.5V	1.5V	1.5V	"	"			0.5		0.5		0.5	"
		42	1.5V	1.5V			1.5V	1.5V	"	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	"	"			"		"		"	"
		43	3.5V	3.5V			3.5V	3.5V	"	3.5V	3.5V	3.5V	3.5V	3.5V	3.5V	"	"			"		"		"	"
		44	3.5V	3.5V			1.5V	1.5V	"	1.5V	1.5V	1.5V	"	1.5V	1.5V	"	"			"		"		"	"
		45	1.5V	1.5V			3.5V	3.5V	"	1.5V	1.5V	"	"	1.5V	1.5V	"	"			"		"		"	"
		46	1.5V	"			1.5V	1.5V	"	3.5V	3.5V	"	"	1.5V	1.5V	"	"			"		"		"	"
		47	1.5V	"			1.5V	1.5V	"	1.5V	1.5V	"	"	3.5V	3.5V	"	"			"		"		"	"
		48	3.5V	"			3.5V	1.5V	"	3.5V	1.5V	"	"	3.5V	1.5V	"	"			"		"		"	"
		49	1.5V	3.5V			1.5V	3.5V	"	1.5V	3.5V	"	"	1.5V	3.5V	"	"	4.5		4.5		4.5		"	"
V _{IL2}		50	3.0V	3.0V			3.0V	3.0V	"	3.0V	3.0V	3.0V	7.0V	3.0V	3.0V	10.0V	"	9.0		9.0		9.0		"	
V _{IH2}	51		3.0V	3.0V			3.0V	3.0V	"	3.0V	3.0V	7.0V	7.0V	3.0V	3.0V	"	"			1.0		1.0		1.0	"
		52	3.0V	3.0V			3.0V	3.0V	"	3.0V	3.0V	3.0V	3.0V	3.0V	3.0V	"	"			"		"		"	"
		53	7.0V	7.0V			7.0V	7.0V	"	7.0V	7.0V	7.0V	7.0V	7.0V	7.0V	"	"			"		"		"	"
		54	7.0V	7.0V			3.0V	3.0V	"	3.0V	3.0V	3.0V	"	3.0V	3.0V	"	"			"		"		"	"
		55	3.0V	3.0V			7.0V	7.0V	"	3.0V	3.0V	"	"	3.0V	3.0V	"	"			"		"		"	"
		56	3.0V	"			3.0V	3.0V	"	7.0V	7.0V	"	"	3.0V	3.0V	"	"			"		"		"	"
		57	3.0V	"			3.0V	3.0V	"	3.0V	3.0V	"	"	7.0V	7.0V	"	"			"		"		"	"
		58	7.0V	"			7.0V	3.0V	"	7.0V	3.0V	"	"	7.0V	3.0V	"	"	9.0		9.0		9.0		"	"
		59	3.0V	7.0V			3.0V	7.0V	"	3.0V	7.0V	"	"	3.0V	7.0V	"	"	9.0		9.0		9.0		"	"
V _{IL3}		60	4.0V	4.0V			4.0V	4.0V	"	4.0V	4.0V	4.0V	11.0V	4.0V	4.0V	15.0V	"	13.5		13.5		13.5		"	
V _{IH3}	61		4.0V	4.0V			4.0V	4.0V	"	4.0V	4.0V	11.0V	11.0V	4.0V	4.0V	"	"			1.5		1.5		1.5	"
		62	4.0V	4.0V			4.0V	4.0V	"	4.0V	4.0V	4.0V	4.0V	4.0V	4.0V	"	"			"		"		"	"
		63	11.0V	11.0V			11.0V	11.0V	"	11.0V	11.0V	11.0V	11.0V	11.0V	11.0V	"	"			"		"		"	"
		64	11.0V	11.0V			4.0V	4.0V	"	4.0V	4.0V	4.0V	"	4.0V	4.0V	"	"			"		"		"	"
		65	4.0V	4.0V			11.0V	11.0V	"	4.0V	4.0V	"	"	4.0V	4.0V	"	"			"		"		"	"
		66	4.0V	"			4.0V	4.0V	"	11.0V	11.0V	"	"	4.0V	4.0V	"	"			"		"		"	"
		67	4.0V	"			4.0V	4.0V	"	4.0V	4.0V	"	"	11.0V	11.0V	"	"			"		"		"	"
		68	11.0V	"			11.0V	4.0V	"	11.0V	4.0V	"	"	11.0V	4.0V	"	"	13.5		13.5		13.5		"	"
		69	4.0V	11.0V			4.0V	11.0V	"	4.0V	11.0V	"	"	4.0V	11.0V	"	"	13.5		13.5		13.5		"	"
I _{IH1} 3/	3010	70	18.0V	18.0V			18.0V	18.0V	"	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	All inputs together							nA	
I _{IH2}	3010	71	18.0V	GND			GND	GND	"	GND	GND	GND	GND	GND	GND	"	A							"	
		72	GND	18.0V			"	"	"	"	"	"	"	GND	GND	"	B	10						"	
		73	"	GND			"	"	"	"	"	"	"	GND	GND	"	C							"	
		74	"	"			"	"	"	"	"	"	"	GND	GND	"	D							"	
		75	"	"			18.0V	"	"	"	"	"	"	GND	GND	"	E	1		45				"	
		76	"	"			GND	18.0V	"	"	"	"	"	"	GND	"	F							"	
		77	"	"			"	GND	"	18.0V	"	"	"	"	"	"	G							"	
		78	"	"			"	"	"	18.0V	"	"	"	"	"	"	H							"	
		79	"	"			"	"	"	GND	GND	18.0V	"	"	"	"	I							"	
		80	"	"			"	"	"	GND	GND	GND	18.0V	"	"	"	EN							"	

See footnotes at end of device type 02.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 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		
			A	B	J	NC	E	F	V _{SS}	G	H	I	EN	C	D	V _{DD}		Min	Max	Min	Max	Min	Max	
I _{IL1} 3/	3009	81	GND	GND			GND	GND	GND	GND	GND	GND	GND	GND	GND	18.0V	All inputs together							nA
I _{IL2}	"	82	GND	18.0V			18.0V	18.0V	"	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	"	A	-10	"					"
"	"	83	18.0V	GND			"	"	"	"	"	"	"	"	"	"	B	"	"					"
"	"	84	"	18.0V			"	"	"	"	"	"	"	"	GND	"	C	"	"					"
"	"	85	"	"			"	"	"	"	"	"	"	"	18.0V	"	D	-1	"	-45	"			"
"	"	86	"	"			GND	"	"	"	"	"	"	"	18.0V	"	E	"	"	"				"
"	"	87	"	"			18.0V	GND	"	"	"	"	"	"	"	"	F	"	"	"				"
"	"	88	"	"			"	18.0V	"	"	"	"	"	"	"	"	G	"	"	"				"
"	"	89	"	"			"	"	"	"	"	"	"	"	"	"	H	"	"	"				"
"	"	90	"	"			"	"	"	"	"	"	"	"	"	"	I	"	"	"				"
"	"	91	"	"			"	"	"	"	"	"	"	"	"	"	EN	"	"	"				"
I _{OL1}		92	GND	GND	0.4V		GND	GND	"	GND	GND	GND	GND	GND	GND	5.0V	J	0.51		0.36		0.64		mA
I _{OL2}		93	"	"	1.5V		"	"	"	"	"	"	"	"	"	15.0V	"	3.4				4.2		"
I _{OH1}		94	"	"	4.6V		"	"	"	"	"	"	"	"	5.0V	"	"	-0.51		-0.36		-0.64		"
I _{OH2}		95	"	"	13.5V		"	"	"	"	"	"	"	"	15.0V	"	"	-3.4		-2.4		-4.2		"
																		Subgroup 4 T _A = 25°C						
C _i	3012	96	4/	4/					GND							GND	A							pF
"	"	97	"	"					"							"	B							"
"	"	98	"	"					"							"	C							"
"	"	99	"	"					"					4/		"	D	7.5						"
"	"	100	"	"			4/		"							"	E							"
"	"	101	"	"				4/	"							"	F							"
"	"	102	"	"				"	"	4/						"	G							"
"	"	103	"	"				"	"	"	4/					"	H							"
"	"	104	"	"				"	"	"	"	4/				"	I							"
"	"	105	"	"				"	"	"	"	"	4/			"	EN							"
																		Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C		Unit
t _{PHL}	3003 Fig. 3	106	GND	GND	OUT			GND	GND	GND	GND	IN	5.0V	GND	GND	5.0V	I to J	15	300	21	420	15	300	ns
"	"	107	IN	5.0V	"			"	"	"	"	GND	"	GND	GND	"	A to J	23	450	32	630	23	450	"
"	"	108	5.0V	IN	"			"	"	"	"	"	"	GND	IN	"	B to J	"	"	"	"	"	"	"
"	"	109	GND	GND	"	GND		"	"	"	"	"	"	5.0V	IN	"	C to J	"	"	"	"	"	"	"
"	"	110	"	"	"	"		"	"	"	"	"	"	GND	GND	"	D to J	"	"	"	"	"	"	"
"	"	111	"	"	"	"	IN	5.0V	"	"	"	"	"	"	"	"	E to J	"	"	"	"	"	"	"
"	"	112	"	"	"	"	5.0V	IN	"	"	"	"	"	"	"	"	F to J	"	"	"	"	"	"	"
"	"	113	"	"	"	"	GND	GND	"	IN	5.0V	"	"	"	"	"	G to J	"	"	"	"	"	"	"
"	"	114	"	"	"	"	"	"	"	5.0V	IN	"	"	"	"	"	H to J	"	"	"	"	"	"	"
"	"	115	"	"	"	"	"	"	"	GND	GND	"	IN	"	"	"	EN to J	"	"	"	"	"	"	"
t _{PLH}	"	116	"	"	"			"	"	"	"	IN	5.0V	"	"	"	I to J	25	500	35	700	25	500	"
"	"	117	"	"	"			"	"	"	"	GND	"	"	"	"	A to J	35	700	49	980	35	700	"
"	"	118	IN	5.0V	"			"	"	"	"	"	"	"	"	"	B to J	"	"	"	"	"	"	"
"	"	119	5.0V	IN	"			"	"	"	"	"	"	IN	5.0V	"	C to J	"	"	"	"	"	"	"
"	"	120	GND	GND	"			"	"	"	"	"	"	GND	IN	"	D to J	"	"	"	"	"	"	"
"	"	121	"	"	"		IN	5.0V	"	"	"	"	"	"	GND	"	E to J	"	"	"	"	"	"	"
"	"	122	"	"	"		5.0V	IN	"	"	"	"	"	"	"	"	F to J	"	"	"	"	"	"	"
"	"	123	"	"	"		GND	GND	"	IN	5.0V	"	"	"	"	"	G to J	"	"	"	"	"	"	"
"	"	124	"	"	"		GND	GND	"	5.0V	IN	"	"	"	"	"	H to J	"	"	"	"	"	"	"
"	"	125	"	"	"		GND	GND	"	GND	GND	"	IN	"	"	"	EN to J	"	"	"	"	"	"	"

See footnotes at end of device type 02.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9		Subgroup 10		Subgroup 11		
			A	B	J	NC	E	F	V _{SS}	G	H	I	EN	C	D	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C		
																		Min	Max	Min	Max	Min	Max	
t _{THL}	3004 Fig. 3	126 127 128 129 130 131 132 133 134 135	GND IN 5.0V GND	GND 5.0V IN GND	OUT			GND	GND	GND	GND	IN GND	5.0V	GND GND GND IN 5.0V GND	GND GND GND IN 5.0V GND	5.0V	J	10	200	18	280	10	200	ns
t _{TLH}		136 137 138 139 140 141 142 143 144 145	IN 5.0V GND	5.0V IN GND							IN GND	5.0V		IN 5.0V GND	5.0V IN GND									
Subgroup 12 T _A = 25°C																								
t _{PHL}	3003 Fig. 3	146 147 148 149 150 151 152 153 154 155	GND IN 10.0V GND	GND 10.0V IN GND	OUT			GND	GND	GND	GND	IN GND	10.0V	GND GND GND IN 10.0V GND	GND GND GND 10.0V IN GND	10.0V	I to J A to J B to J C to J D to J E to J F to J G to J H to J EN to J	6 9	120 180					ns
t _{PLH}		156 157 158 159 160 161 162 163 164 165	IN 10.0V GND	10.0V IN GND							IN GND	10.0V		IN 10.0V GND	10.0V IN GND		I to J A to J B to J C to J D to J E to J F to J G to J H to J EN to J	10 14	200 280					
t _{THL}	3004 Fig. 3	166 167 168 169 170 171 172 173 174 175	IN 10.0V GND	10.0V IN GND							IN GND	10.0V		IN 10.0V GND	10.0V IN GND		J	5	100					

See footnotes at end of device type 02.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 12 T _A = 25°C						
			A	B	J	NC	E	F	V _{SS}	G	H	I	EN	C	D	V _{DD}		Min	Max	Min	Max	Min	Max	
t _{TLH}	3004 Fig. 3	176	GND	GND	OUT			GND	GND	GND	IN	10.0V	GND	GND	10.0V	J	5	100					ns	
"	"	177	IN	10.0V	"		"	"	"	"	"	"	GND	GND	"	"	"	"					"	
"	"	178	10.0V	IN	"		"	"	"	"	"	"	GND	GND	"	"	"	"					"	
"	"	179	GND	GND	"	GND	"	"	"	"	"	"	IN	10.0V	"	"	"	"					"	
"	"	180	"	"	"	"	"	"	"	"	"	"	10.0V	IN	"	"	"	"					"	
"	"	181	"	"	"	"	IN	10.0V	"	"	"	"	GND	GND	"	"	"	"					"	
"	"	182	"	"	"	"	10.0V	IN	"	"	"	"	"	"	"	"	"	"					"	
"	"	183	"	"	"	"	GND	GND	"	IN	10.0V	"	"	"	"	"	"	"					"	
"	"	184	"	"	"	"	GND	GND	"	10.0V	IN	"	GND	"	"	"	"	"					"	
"	"	185	"	"	"	"	GND	GND	"	GND	GND	"	IN	"	"	"	"	"					"	

1/ Pins not designated may be "HIGH" level logic, "LOW" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ 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.

4/ See 4.4.1c

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol	Terminal conditions 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		
			1A	1B	1Y	2Y	2A	2B	V _{SS}	3A	3B	3Y	4Y	4A	4B	V _{DD}		Min	Max	Min	Max	Min	Max	
V _{IC(pos)}	1	2	1mA	1mA											GND	1A	1.5	"					Vdc	
"		3				1mA									"	1B								
"		4					1mA								"	2A								
"		5							1mA						"	2B								
"		6								1mA					"	3A								
"		7									1mA				"	3B								
"		8										1mA			"	4A								
"													1mA		"	4B								
V _{IC(neg)}	9	10	-1mA	-1mA					GND						GND	1A	-6.0	"					"	
"		11				-1mA			"						"	1B								
"		12					-1mA		"						"	2A								
"		13							"	-1mA					"	2B								
"		14							"		-1mA				"	3A								
"		15							"			-1mA			"	3B								
"		16							"				-1mA		"	4A								
"									"					-1mA	"	4B								
I _{SS}	3005	17	GND	GND			GND	GND	"	GND	GND			GND	GND	18.0V	V _{SS}	-25	"		"		nA	
"	18	GND	18.0V			GND	18.0V	"	GND	18.0V			GND	18.0V	"	"								
"	19	18.0V	GND			18.0V	GND	"	18.0V	GND			18.0V	GND	"	"								
"	20	18.0V	18.0V			18.0V	18.0V	"	18.0V	18.0V			18.0V	18.0V	"	"								
V _{OL1}	3007	21	GND	GND			GND	GND	"	GND	GND			GND	GND	15.0V	1Y	0.05	"	0.05	"	0.05	"	Vdc
"	22	"	"			"	"	"	"	"			"	"	"	2Y								
"	23	"	"			"	"	"	"	"			"	"	"	3Y								
"	24	"	"			"	"	"	"	"			"	"	"	4Y								
"	25	15.0V	15.0V			15.0V	15.0V	"	15.0V	15.0V			15.0V	15.0V	"	1Y								
"	26	"	"			"	"	"	"	"			"	"	"	2Y								
"	27	"	"			"	"	"	"	"			"	"	"	3Y								
"	28	"	"			"	"	"	"	"			"	"	"	4Y								
V _{OH1}	3006	29	"	GND			GND	GND	"	GND	GND			GND	GND	"	1Y	14.95	14.95	"	14.95	"	"	"
"	30	GND	15.0V			GND	GND	"	"	"			"	"	"	1Y								
"	31	"	GND			15.0V	GND	"	"	"			"	"	"	2Y								
"	32	"	"			GND	15.0V	"	"	"			"	"	"	2Y								
"	33	"	"			"	GND	"	15.0V	"			"	"	"	3Y								
"	34	"	"			"	"	"	GND	15.0V			"	"	"	3Y								
"	35	"	"			"	"	"	"	GND			15.0V	"	"	4Y								
"	36	"	"			"	"	"	"	"			GND	15.0V	"	4Y								
V _{IH1}	37	38	3.5V	1.5V			"	"	"	"			"	"	"	1Y	4.5	4.5	"	4.5	"	"	"	
"		39	1.5V	3.5V			"	"	"	"	"			"	"	"	1Y							
"		40	GND	GND			3.5V	1.5V	"	"	"			"	"	"	2Y							
"		41	"	"			"	3.5V	"	"	"			"	"	"	2Y							
"		42	"	"			GND	GND	"	3.5V	1.5V			"	"	"	3Y							
"		43	"	"			"	"	"	GND	GND			3.5V	1.5V	"	3Y							
"		44	"	"			"	"	"	GND	GND			1.5V	3.5V	"	4Y							
"							"	"	"	"	"			"	"	"	4Y							

See footnotes at end of device type 03.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y	Terminal conditions 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			
			Symbol	1A	1B	1Y	2Y	2A	2B	V _{SS}	3A	3B	3Y	4Y	4A	4B		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																						
V _{IH2}			45 46 47 48 49 50 51 52	7.0V 3.0V GND 	3.0V 7.0V GND 			GND GND 7.0V 3.0V GND 	GND GND 7.0V GND 	GND 	GND 			GND 	GND 	10.0V 	1Y 1Y 2Y 2Y 3Y 3Y 4Y 4Y	9.0V 9.0V 		9.0V 9.0V 			V _{DC}		
V _{IH3}	53		54 55 56 57 58 59 60	11.0V 4.0V GND 	4.0V 11.0V GND 			 11.0V 4.0V GND 	 4.0V 11.0V GND 	 11.0V 4.0V GND 	 4.0V 11.0V GND 			GND 11.0V 4.0V 11.0V	GND 4.0V 11.0V	15.0V 	1Y 1Y 2Y 2Y 3Y 3Y 4Y 4Y	13.5 13.5 		13.5 13.5 					
V _{IL1}			62 63 64	1.5V GND GND GND	 			1.5V GND GND	 	 1.5V GND	 			GND GND GND 1.5V	GND 	5.0V 	1Y 2Y 3Y 4Y		0.5 		0.5 				
V _{IL2}	61		65 66 67 68	3.0V GND GND GND	 			GND 3.0V GND GND	 	GND GND 3.0V GND	 			GND GND GND 3.0V	 	10.0V 	1Y 2Y 3Y 4Y	1.0 		1.0 					
V _{IL3}			70 71 72	4.0V GND GND GND	 			GND 4.0V GND GND	 	GND GND 4.0V GND	 			GND GND GND 4.0V	 	15.0V 	1Y 2Y 3Y 4Y	1.5 		1.5 					
I _{IH1} 3/	3010 69		73	18.0V	18.0V			18.0V	18.0V		18.0V	18.0V			18.0V	18.0V	18.0V	All inputs together					nA		
I _{IH2}			74 75 76 77 78 79 80 81	18.0V GND 	GND 18.0V GND 			GND GND 18.0V GND	GND GND GND 18.0V GND	 18.0V 	GND 18.0V GND GND	 		GND 18.0V GND	GND 	18.0V 	1A 1B 2A 2B 3A 3B 4A 4B	800 100 		100 100 					
I _{IL1} 3/	3009 6		82	 	 			 	 	GND GND	GND GND			GND GND	GND GND	 	All inputs together								
I _{IL2}			83 84 85 86 87 88 89 90	 18.0V GND 18.0V 	18.0V GND 18.0V 			18.0V 18.0V 18.0V 18.0V GND 18.0V	18.0V 18.0V 18.0V GND 18.0V 18.0V	 GND 18.0V 18.0V 18.0V	 			18.0V GND 18.0V 18.0V	18.0V 	 	1A 1B 2A 2B 3A 3B 4A 4B	-800 -100 		-100 -100 					

See footnotes at end of device type 03.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1		Subgroup 2		Subgroup 3		
			1A	1B	1Y	2Y	2A	2B	V _{SS}	3A	3B	3Y	4Y	4A	4B	V _{DD}		T _A = 25°C	Max	T _A = 125°C	Max	T _A = -55°C	Max	
I _{OL1}		92 93 94	GND	GND	0.4V	0.4V	GND	GND	GND	GND	GND	0.4V	0.4V	GND	GND	5.0V	1Y 2Y 3Y 4Y	0.51	0.36	0.64	mA			
I _{OH1}	91	96 97 98	5.0V		4.6V	4.6V	5.0V			5.0V		4.6V	4.6V	5.0V			1Y 2Y 3Y 4Y	-0.51	-0.36	-0.64				
I _{OL2}	95	100 101 102	GND		1.5V	1.5V	GND			GND		1.5V	1.5V	GND		15.0V	1Y 2Y 3Y 4Y	3.4	2.4	4.2				
I _{OH2}	99	104 105 106	15.0V		13.5V	13.5V	15.0V			15.0V		13.5V	13.5V	15.0V			1Y 2Y 3Y 4Y	-3.4	-2.4	-4.2				
103																		Subgroup 4 T _A = 25°C						
																		Min	Max					
C _I	3012	107 108 109 110 111 112 113 114	4/	4/			4/	4/	GND						GND	1A 1B 2A 2B 3A 3B 4A 4B		7.5			pF			
																		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	115 116 117 118 119 120 121 122	IN GND IN GND IN GND IN GND	OUT IN GND IN GND IN GND	OUT OUT OUT OUT OUT OUT OUT OUT		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	OUT OUT OUT OUT OUT OUT OUT OUT		GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	5.0V	1A to 1Y 1B to 1Y 2A to 2Y 2B to 2Y 3A to 3Y 3B to 3Y 4A to 4Y 4B to 4Y	13	250	18	350	13	250	ns
t _{PLH}	3006 Fig. 3	123 124 125 126 127 128 129 130	IN GND IN GND IN GND IN GND	OUT IN GND OUT IN GND OUT IN	OUT OUT OUT OUT OUT OUT OUT OUT		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	OUT OUT OUT OUT OUT OUT OUT OUT		GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND		1A to 1Y 1B to 1Y 2A to 2Y 2B to 2Y 3A to 3Y 3B to 3Y 4A to 4Y 4B to 4Y							

See footnotes at end of device type 03.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9		Subgroup 10		Subgroup 11		
			1A	1B	1Y	2Y	2A	2B	V _{SS}	3A	3B	3Y	4Y	4A	4B	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C		
Test No.																		Min	Max	Min	Max	Min	Max	
t _{THL}	3004 Fig. 3	131	IN	GND	OUT		GND	GND	GND	GND	GND			GND	GND	5.0V	1Y	10	200	18	280	10	200	ns
		132	GND	IN			GND	GND									1Y							
		133		GND			IN	GND									2Y							
		134				OUT											2Y							
		135						IN									3Y							
		136							IN	IN	OUT						3Y							
		137								GND			OUT	IN			4Y							
		138												GND	IN		4Y							
t _{TLH}		139	IN		OUT									GND	GND		1Y							
		140	GND	IN			IN										1Y							
		141		GND		OUT		IN									2Y							
		142						IN	IN								2Y							
		143						GND		IN	OUT						3Y							
		144								GND			OUT				3Y							
		145								GND				IN			4Y							
		146								GND	GND		OUT		IN		4Y							
																	Subgroup 12 T _A = 25°C							
																	Min	Max						
t _{PHL}	3003 Fig. 3	147	IN	GND	OUT		GND	GND	GND	GND	GND			GND	GND	10.0V	1A to 1Y	6	120					ns
		148		IN			GND	GND									1B to 1Y							
		149		GND		OUT	IN	GND									2A to 2Y							
		150						IN									2B to 2Y							
		151								IN		OUT					3A to 3Y							
		152								GND	IN						3B to 3Y							
		153									GND		OUT	IN			4A to 4Y							
		154												IN	IN		4B to 4Y							
t _{PLH}		155	IN		OUT										GND	10.0V	1A to 1Y							
		156	GND	IN			IN										1B to 1Y							
		157		GND		OUT		GND									2A to 2Y							
		158						IN	IN								2B to 2Y							
		159								IN		OUT					3A to 3Y							
		160									IN						3B to 3Y							
		161											OUT	IN			4A to 4Y							
		162												GND	IN		4B to 4Y							
t _{THL}	3004 Fig. 3	163	IN		OUT									GND	GND		1Y	5	100					
		164	GND	IN													1Y							
		165		GND		OUT		IN									2Y							
		166						IN									2Y							
		167															3Y							
		168								IN		OUT					3Y							
		169								GND	IN		OUT				4Y							
		170								GND				GND	IN		4Y							

See footnotes at end of device type 03.

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

Symbol	MIL-STD-883 method	Case A,C,D,T,X,Y Symbol	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 12 T _A = 25°C						
			1A	1B	1Y	2Y	2A	2B	V _{SS}	3A	3B	3Y	4Y	4A	4B	V _{DD}		Min	Max	Min	Max	Min	Max	
t _{TLH}	3004 Fig. 3	171	IN	GND	OUT		GND	GND	GND	GND	GND			GND	GND	10.0V	1Y	5	100					ns
"	"	172	"	IN			GND	GND	"	"	"			"	"	"	1Y	"	"					"
"	"	173	"	GND		OUT	IN	GND	"	"	"			"	"	"	2Y	"	"					"
"	"	174	"	"		OUT	GND	IN	"	"	"			"	"	"	2Y	"	"					"
"	"	175	"	"			"	GND	"	IN	"	OUT		"	"	"	3Y	"	"					"
"	"	176	"	"			"	"	"	GND	IN	OUT		"	"	"	3Y	"	"					"
"	"	177	"	"			"	"	"	GND	GND	OUT	OUT	IN	"	"	4Y	"	"					"
"	"	178	"	"			"	"	"	GND	GND	OUT	OUT	GND	IN	"	4Y	"	"					"

1/ Pins not designated may be "HIGH" level logic, "LOW" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ 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.

4/ See 4.4.1c.

TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y	Terminal conditions 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			
			Symbol	1A	1B	1Y	2Y	2A	2B	V _{SS}	4A	4B	4Y	3Y	3A	3B		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																						
V _{IC} (pos)	1	2 3 4 5 6 7 8	1mA	1mA			1mA	1mA		1mA	1mA			1mA		GND	1A 1B 2A 2B 4A 4B 3A 3B	1.5	"					Vdc	
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
V _{IC} (neg)	9	10 11 12 13 14 15 16	-1mA	-1mA			-1mA	-1mA	GND							"	1B 2A 2B 4A 4B 3A 3B	-6.0	"						
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
I _{SS} 2/	3005	17 18 19 20	GND GND 18.0V 18.0V	GND 18.0V GND 18.0V			GND GND 18.0V 18.0V	GND GND GND 18.0V	"	GND GND 18.0V 18.0V	GND 18.0V GND 18.0V			GND GND 18.0V 18.0V	GND 18.0V GND 18.0V	18.0V	V _{SS}	-25	"		"	"		nA	
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
V _{OH1}	3006	21 22 23 24 25 26 27 28	GND " " 15.0V " " "	GND " " 15.0V " " "			GND " " 15.0V " " "	GND " " 15.0V " " "	"	GND " " 15.0V " " "	GND " " 15.0V " " "			GND " " 15.0V " " "	GND " " 15.0V " " "	15.0V	1Y 2Y 4Y 3Y 1Y 2Y 4Y 3Y	14.95	14.95	"		14.95	"	"	
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
V _{OL1}	3007	29 30 31 32 33 34 35 36	GND " " " " " "	GND 15.0V GND " " "			GND GND 15.0V GND " "	GND GND GND 15.0V GND " "	"	GND " " 15.0V GND " "	GND " " 15.0V GND "			GND " " 15.0V GND "	GND " " 15.0V GND "	"	1Y 2Y 4Y 3Y 1Y 2Y 4Y 3Y	0.05	"		0.05	"	0.05	"	
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
V _{IH1}	37	38 39 40 41 42 43 44	3.5V 1.5V GND " " "	1.5V 3.5V GND " " "			" 3.5V 1.5V GND " "	" 1.5V 3.5V GND " "	"	" 3.5V 1.5V GND GND	" " 3.5V GND GND			" " 3.5V 1.5V	GND " 1.5V 3.5V	5.0V	1Y 1Y 2Y 2Y 4Y 4Y 3Y 3Y	0.05	"		0.05	"	0.05	"	
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"
"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"

See footnotes at end of device type 04.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1		Subgroup 2		Subgroup 3				
			Symbol	1A	1B	1Y	2Y	2A	2B	V _{SS}	4A	4B	4Y	3Y	3A	3B	V _{DD}	T _A = 25°C		T _A = 125°C		T _A = -55°C				
			Test No.															Min	Max	Min	Max	Min	Max			
V _{IH2}			45 46 47 48 49 50 51 52	7.0V 3.0V GND 3.0V 7.0V GND	3.0V 7.0V GND			GND GND 7.0V 3.0V GND	GND GND 3.0V 7.0V GND	GND 3.0V 7.0V GND				GND GND 3.0V 7.0V	GND 3.0V 7.0V	10.0V	1Y 1Y 2Y 2Y 4Y 4Y 3Y 3Y		1.0			1.0			Vdc	
V _{IH3}		53	54 55 56 57 58 59 60	11.0V 4.0V GND 3.0V 7.0V GND	4.0V 11.0V GND			11.0V 4.0V GND	4.0V 11.0V GND	11.0V 4.0V 11.0V GND				GND GND 11.0V 4.0V	GND 3.0V 11.0V	15.0V	1Y 1Y 2Y 4Y 4Y 3Y 3Y		1.5			1.5				
V _{IL1}			62 63 64	1.5V GND GND				1.5V GND						GND GND GND 1.5V	GND 3.0V GND	5.0V	1Y 2Y 4Y 3Y	4.5				4.5				
V _{IL2}		61	65 66 67 68	3.0V GND GND GND				GND 3.0V GND GND						GND GND GND 3.0V	GND 3.0V GND	10.0V	1Y 2Y 4Y 3Y	9.0				9.0				
V _{IL3}			70 71 72	4.0V GND GND GND				GND 4.0V GND GND						GND GND GND 4.0V	GND 3.0V GND	15.0V	1Y 2Y 4Y 3Y	13.5				13.5				
I _{IH1} 3/	3010 69		73	18.0V	18.0V			18.0V	18.0V		18.0V	18.0V			18.0V	18.0V	18.0V	All inputs together								nA
I _{IH2}			74 75 76 77 78 79 80 81	18.0V GND 18.0V GND				GND GND 18.0V GND	GND GND 18.0V GND					GND GND 18.0V GND	GND 3.0V 18.0V GND		1A 1B 2A 2B 4A 4B 3A 3B	8	1							
I _{IL1} 3/	3009		82											GND	GND	GND	All inputs together									

See footnotes at end of device type 04.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 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		
			1A	1B	1Y	2Y	2A	2B	V _{SS}	4A	4B	4Y	3Y	3A	3B	V _{DD}		Min	Max	Min	Max	Min	Max	
I _{IL2}	3009	83 84 85 86 87 88 89 90	GND 18.0V GND 18.0V			18.0V 18.0V 18.0V GND 18.0V	18.0V 18.0V 18.0V GND 18.0V	GND	18.0V	18.0V			18.0V	18.0V	18.0V	1A 1B 2A 2B 4A 4B 3A 3B		-1					nA	
I _{OH1}		92 93 94	GND GND	4.6V	4.6V	GND			GND	GND	4.6V	4.6V	GND		5.0V	1Y 2Y 4Y 3Y	-0.51							
I _{OL1}	91	96 97 98	5.0V		0.4V	0.4V	5.0V		5.0V		0.4V	0.4V	5.0V			1Y 2Y 4Y 3Y	0.51							
I _{OH2}	95	100 101 102	GND		13.5V	13.5V	GND		GND		13.5V	13.5V	GND		15.0V	1Y 2Y 4Y 3Y	-3.4							
I _{OL2}	99	104 105 106	15.0V		1.5V	1.5V	15.0V		15.0V		1.5V	1.5V	15.0V			1Y 2Y 4Y 3Y	3.4							
103																	Subgroup 4 T _A = 25°C							
																	Min	Max						
C _i	3012	107 108 109 110 111 112 113 114	4/	4/			4/	4/	GND						GND	1A 1B 2A 2B 4A 4B 3A 3B		7.5					pF	
																	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	115 116 117 118 119 120 121 122	IN GND	GND IN GND	OUT OUT	OUT OUT	GND GND IN GND	GND GND IN GND	GND	GND	GND	OUT OUT	OUT OUT	GND	GND	5.0V	1A to 1Y 1B to 1Y 2A to 2Y 2B to 2Y 4A to 4Y 4B to 4Y 3A to 3Y 3B to 3Y	13 250	18 350	13 250			ns	

See footnotes at end of device type 04.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y Symbol Test No.	Terminal conditions 1/														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		
			1A	1B	1Y	2Y	2A	2B	V _{SS}	4A	4B	4Y	3Y	3A	3B	V _{DD}		Min	Max	Min	Max	Min	Max	
t _{PLH}	3003 Fig. 3	123 124 125 126 127 128 129 130	IN GND " " " " " "	GND IN GND " " " "	OUT OUT " " " " " "	" " OUT " " " "	GND GND IN GND " " "	GND GND IN GND " " "	GND " " " " " "	GND " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	GND " " " " " "	GND " " " " " "	5.0V " " " " " "	1A to 1Y 1B to 1Y 2A to 2Y 2B to 2Y 4A to 4Y 4B to 4Y 3A to 3Y 3B to 3Y	13 250 " " " " " "	250 " " " " " "	18 350 " " " " " "	13 250 " " " " " "	250 " " " " " "	ns " " " " " "	
t _{THL}	3004 Fig. 3	131 132 133 134 135 136 137 138	IN GND " " " " " "	" IN GND " " " "	OUT OUT " " " " " "	" " OUT " " " "	" " IN GND " " "	" " IN GND " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	GND " " " " " "	" " " " " " "	" " " " " " "	1Y 1Y 2Y 2Y 4Y 4Y 3Y 3Y	10 " " " " " "	200 " " " " " "	14 280 " " " " " "	10 200 " " " " " "	200 " " " " " "	" " " " " " "	
t _{TLH}	"	139 140 141 142 143 144 145 146	IN GND " " " " " "	" IN GND " " " "	OUT OUT " " " " " "	" " OUT " " " "	" " IN GND " " "	" " IN GND " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	GND " " " " " "	" " " " " " "	" " " " " " "	1Y 1Y 2Y 2Y 4Y 4Y 3Y 3Y	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	
																	Subgroup 12 T _A = 25°C							
																	Min	Max						
t _{PHL}	3003 Fig. 3	147 148 149 150 151 152 153 154	IN GND " " " " " "	GND IN GND " " " "	OUT OUT " " " " " "	" " OUT " " " "	GND GND IN GND " " "	GND GND IN GND " " "	GND " " " " " "	GND " " " " " "	GND " " " " " "	" " " " " " "	" " " " " " "	GND " " " " " "	GND " " " " " "	10.0V " " " " " "	1A to 1Y 1B to 1Y 2A to 2Y 2B to 2Y 4A to 4Y 4B to 4Y 3A to 3Y 3B to 3Y	6 120 " " " " " "	120 " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	ns " " " " " "	
t _{PLH}	"	155 156 157 158 159 160 161 162	IN GND " " " " " "	" IN GND " " " "	OUT OUT " " " " " "	" " OUT " " " "	" " IN GND " " "	" " IN GND " " "	" " " " " " "	GND " " " " " "	GND " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	GND " " " " " "	GND " " " " " "	1A to 1Y 1B to 1Y 2A to 2Y 2B to 2Y 4A to 4Y 4B to 4Y 3A to 3Y 3B to 3Y	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	" " " " " " "	

See footnotes at end of device type 04.

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

Symbol	MIL-STD-833 method	Case A,C,D,T,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 12 T _A = 25°C						
		Symbol	1A	1B	1Y	2Y	2A	2B	V _{SS}	4A	4B	4Y	3Y	3A	3B	V _{DD}	Min	Max	Min	Max	Min	Max		
		Test No.																						
t _{THL}	3004 Fig. 3	163	IN	GND	OUT		GND	GND	GND	GND	GND		GND	GND	10.0V	1Y	5	100					ns	
"	"	164	GND	IN			GND	GND	"	"	"		"	"	"	1Y	"	"					"	
"	"	165	"	GND		OUT	IN	GND	"	"	"		"	"	"	2Y	"	"					"	
"	"	166	"	"			IN	GND	"	"	"		"	"	"	2Y	"	"					"	
"	"	167	"	"			"	IN	"	"	OUT		"	"	"	4Y	"	"					"	
"	"	168	"	"			"	"	GND	IN	OUT		"	"	"	4Y	"	"					"	
"	"	169	"	"			"	"	"	GND		OUT	IN	"	3Y	"	"					"		
"	"	170	"	"			"	"	"	"		OUT	IN	"	3Y	"	"					"		
t _{TLH}	"	171	IN	"	OUT		"	"	"	"	"		"	GND	"	1Y	"	"					"	
"	"	172	GND	IN			IN	"	"	"	"		"	"	"	1Y	"	"					"	
"	"	173	"	GND		OUT		"	"	"	"		"	"	"	2Y	"	"					"	
"	"	174	"	"			GND	IN	"	"	"		"	"	"	2Y	"	"					"	
"	"	175	"	"			"	GND	"	"	OUT		"	"	"	4Y	"	"					"	
"	"	176	"	"			"	"	GND	IN	OUT		"	"	"	4Y	"	"					"	
"	"	177	"	"			"	"	GND	GND		OUT	IN	"	3Y	"	"					"		
"	"	178	"	"			"	"	GND	GND		OUT	IN	"	3Y	"	"					"		

1/ Pins not designated may be "HIGH" level logic, "LOW" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ 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.

4/ See 4.4.1c.

TABLE IV. Delta limits at 25°C.

Parameter <u>1/</u>	Device types			
	01	02	03	04
I_{SS}	± 10 nA	± 10 nA	± 10 nA	± 10 nA
I_{OL1}	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$
I_{OH1}	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$

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 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}
V _{TN}	0.3 V min	10 V
V _{TP}	2.8 V max	10 V
ΔV _T	1.4 V max	10 V
I _{SS}	100 x max limit	18 V
t _{PLH}	1.35 x max limit	5 V
t _{PHL}	1.35 x max limit	5 V

TABLE VI. Bias during exposure to radiation.

Device type	Pin connections <u>1/</u>		
	V _{DD} = 10 V dc (through a 30 kΩ to 60 kΩ resistor)	V _{SS} = GND	V _{DD} = 10 V dc
01	1, 2, 5, 6, 8, 9, 10, 11, 12, 13	7	14
02	1, 2, 5, 6, 8, 9, 10, 11, 12, 13	7	14
03	1, 2, 5, 6, 8, 9, 12, 13	7	14
04	1, 2, 5, 6, 8, 9, 12, 13	7	14

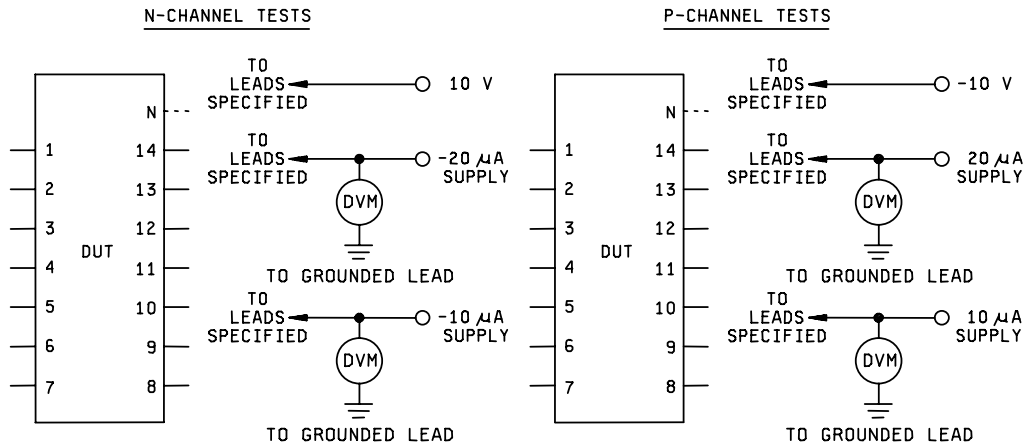
1/ Pins not designated are open, or tied to 10 V dc through a 30 kΩ to 60 kΩ resistor.

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

- 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).
- A copy of each radiograph.
- The technology conformance inspection (TCI) data (see 4.4).
- Parameter distribution data on parameters evaluated during burn-in (see 3.6).
- Final electrical parameters data (see 4.2d).
- RHA delta limits.

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.

FIGURE 4. Threshold-voltage test circuit.TABLE VII. Threshold-voltage test circuit conditions.

Device	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	1	2, 14		5-13	1	5-13		2, 14
02	1	2, 14		5-13	1	5-13		2, 14
03	1	14		2, 5-9, 12, 13	1	2, 5-9, 12, 13		14
04	1	14		2, 5-9, 12, 13	1	2, 5-9, 12, 13		14

6. NOTES

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

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.
T_A	Free air temperature.
V_{IC}	Input clamp voltage.
V_{DD}	Positive supply voltage.
V_{SS}	Negative supply voltage.
I_{SS}	Quiescent supply current.

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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 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	4085B
02	4086B
03	4070B
04	4077B

6.8 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:
Army - CR
Navy - EC
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5962-2029)

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.