MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, CMOS, SCHMITT TRIGGERS,

MONOLITHIC SILICON, POSITIVE LOGIC

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

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, CMOS logic microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided and are reflected in the complete part number.

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

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

Device type	Circuit
01	Quad 2-input NAND Schmitt triggers
02	Hex Schmitt triggers

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

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

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

NOTES

1. As an exception to nickel plate or undercoating paragraph of MIL-M-38510, for case outlines X and Y only, the leads of bottom brazed ceramic packages (i.e. configuration 2 of case outlines F-1 or F-2) may have electroless nickel undercoating which shall be 50 to 200 microinches (1.27 to 5.08 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 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 S_1 dimension may go to .000 inch (.00 mm) minimum.

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

1.3 Absolute maximum ratings:

Supply voltage (V_{DD} - V_{SS})	-0.5 V to +18 V
Input current (each input)	±10 mA
Input voltage range	(V_{SS} -0.5) ≤ V_I ≤ (V_{DD} +0.5)
Storage temperature range	-65°C to 175°C
Maximum power dissipation (P_D)	200 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case	(See MIL-M-38510, appendix C)
Junction temperature (T_J)	+175°C

1.4 Recommended operating conditions:

Supply voltage (V_{DD} - V_{SS})	4.5 V dc to 15 V dc
Input low (V_{IL}) voltage range	0 - 1.5 V dc at V_{DD} = 5 V dc, V_{OL} = 10% V_{DD}, V_{OH} = 90% V_{DD}, 0-2.0 V dc at V_{DD} = 10 V dc, 0-4.0 V dc at V_{DD} = 15 V
Input high (V_{IH}) voltage range	3.5 - 5.0 V dc at V_{DD} = 5 V dc, V_{OL} = 10% V_{DD}, V_{OH} = 90% V_{DD}, 8.0-10.0 V dc at V_{DD} = 10 V dc, 11.0-15.0 V dc at V_{DD} = 15 V
Ambient operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specifications and standards. The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATION

MILITARY

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

STANDARD

MILITARY

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

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

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

3. REQUIREMENTS

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

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein. Although eutectic die bonding is preferred, epoxy die bonding may be performed. However, the resin used shall be DuPont 5504 conductive silver paste, or equivalent, which is cured at 200°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.

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

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

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

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

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

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

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

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

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

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

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

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

4. QUALITY ASSURANCE PROVISIONS

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

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

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

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

(1) Static tests (test condition A) using the circuit shown on figure 3, or equivalent. 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.

(2) Dynamic test (test condition D) using the circuit shown on figure 4, or equivalent. Ambient temperature (T_A) shall be 125°C minimum.

Test duration shall be in accordance with table I of method 1015.

c. Interim and final electrical parameters shall be as specified in table II herein.

d. For class S devices, post dynamic burn-in, or class B devices, post static burn-in, electrical parameter measurements may, at the manufacturer's option, be performed separately or included in the final electrical parameter 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 failures shall be cumulative for determining PDA.

c. The class B devices PDA shall be in accordance with MIL-M-38510 for static burn-in. Dynamic burn-in is not required.

d. Those devices whose measured characteristics after burn-in exceed the specified delta (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 lot initially submitted to burn-in shall be used to determine the percent defective for the lot and the lot shall be accepted or rejected based on the specified PDA.

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

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

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

a. Tests shall be as specified in table II herein.

b. Subgroups 5, 6, 7, and 8 of table I of method 5005 of MIL-STD-883 shall be omitted.

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

d. Subgroup 12 shall be added to the group A inspection requirements for class S devices, using an LTPD of 15, and consist of the procedures, test conditions, and limits specified in table III.

e. At the manufacturer's option, test tapes may be programmed simultaneously for each identical section provided that each output is measured and each specified input combination is tested.

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

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

b. A special subgroup shall be added using an LTPD of 15 for classes S and B, and shall be measured only for initial qualification and after process or design changes. This subgroup shall consist of a high voltage test of the input protection circuits, V_{ZAP} (see 4.5.3).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions V_{SS} = 0 V -55°C ≤ T_A ≤ +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, I_{IN} = 1 mA, V_{SS} = Open, Output = Open	All		1.5	V dc
Negative clamping input to V_{SS}	$V_{IC(neg)}$	T_A = 25°C, V_{DD} = Open, I_{IN} = -1 mA, V_{SS} = GND, Output = Open	All		-6	V dc
Quiescent supply current	I_{SS} or I_{DD}	V_{DD} = 18.0 V dc, V_{IN} = V_{SS} or V_{DD} All valid input combinations	All		-2.5	µA
High level output voltage	V_{OH1}	V_{DD} = 15.0 V dc, $\|I_O\| \leq 1$ µA Any one input = V_{DD} All other inputs = V_{SS}	01	14.95		V dc
		V_{IN} = V_{SS}	02	14.95		
Low level output voltage	V_{OL1}	V_{DD} = 15.0 V dc, $\|I_O\| \leq 1$ µA V_{IN} = V_{DD}	All		0.05	V dc
Positive trigger threshold voltage	V_{TP1}	V_{DD} = 5.0 V dc, $\|I_O\| \leq 1$ µA	01	2.2	3.6	V dc
		Any one input = V_{DD} All others = V_{SS} See table III and note 3	02	2.2	4.3	
	V_{TP2}	V_{DD} = 10.0 V dc, $\|I_O\| \leq 1$ µA	01	4.6	7.1	V dc
		Any one input = V_{DD} All others = V_{SS} See table III and note 3	02	4.6	8.6	
	V_{TP3}	V_{DD} = 15.0 V dc, $\|I_O\| \leq 1$ µA	01	6.8	10.8	V dc
		Any one input = V_{DD} All others = V_{SS} See table III and note 3	02	6.8	12.8	
Negative trigger threshold voltage	V_{TN1}	V_{DD} = 5.0 V dc, $\|I_O\| \leq 1$ µA	All	0.7	2.8	V dc
		Any one input = V_{DD} All others = V_{SS} See table III and note 3				

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions V_{SS} = 0 V -55°C ≤ T_A ≤ +125°C Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Negative trigger threshold voltage	V_{TN2}	V_{DD} = 10.0 V dc, $\|I_O\| \leq 1$ µA Any one input = V_{DD} All others = V_{SS} See table III and note 3	01	2.5	5.2	V dc
			02	1.4	5.2	
	V_{TN3}	V_{DD} = 15.0 V dc, $\|I_O\| \leq 1$ µA Any one input = V_{DD} All others = V_{SS} See table III and note 3	01	4.0	7.4	V dc
			02	2.1	7.4	
Hysteresis voltage	V_{H1}	V_{DD} = 5.0 V dc See table III and note 3 $V_{H1} = V_{TP1} - V_{TN1}$	01	0.3	2.0	V dc
			02	0.3	3.6	
	V_{H2}	V_{DD} = 10.0 V dc See table III and note 3 $V_{H2} = V_{TP2} - V_{TN2}$	01	1.0	4.0	V dc
			02	1.2	7.2	
	V_{H3}	V_{DD} = 15.0 V dc See table III and note 3 $V_{H3} = V_{TP3} - V_{TN3}$	01	1.5	6.0	V dc
			02	1.6	10.0	
Output high current source	I_{OH1}	V_{DD} = 5.0 V dc, V_{OH} = 4.6 V dc Any one input = V_{DD} All others = V_{SS}	01	-0.64		mA
		$V_{IN} = V_{SS}$	02	-0.64		
	I_{OH2}	V_{DD} = 15.0 V dc, V_{OH} = 13.5 V dc Any one input = V_{DD} All others = V_{SS}	01	-4.2		mA
		$V_{IN} = V_{SS}$	02	-4.2		
Output low current (sink)	I_{OL1}	V_{DD} = 5.0 V dc, V_{OH} = 0.4 V dc $V_{IN} = V_{DD}$	All	0.64		mA
	I_{OL2}	V_{DD} = 15.0 V dc, V_{OH} = 1.5 V dc $V_{IN} = V_{DD}$	All	4.2		mA

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions V_{SS} = 0 V -55°C ≤ T_A ≤ +125°C Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Input leakage current	I_{IH}	V_{DD} = 18.0 V dc Measure inputs sequentially connect all unused inputs to V_{SS}.	All		45	nA
	I_{IL}	V_{DD} = 18.0 V dc Measure inputs sequentially connect all unused inputs to V_{DD}.	All		-45	nA
Input capacitance	C_i	V_{DD} = 0 V dc, f = 1 MHz T_A = 25°C	All		7.5	pF
Input test voltage	V_{ZAP}	C_1 = 100 pF, R_2 = 1.5 kΩ (see 4.5.3)	All	400		V
Propagation delay times High to low level	t_{PHL1}	V_{DD} = 5.0 V dc, C_L = 50 pF R_L = 200 kΩ (see figure 5)	01	30	840	ns
			02	19	520	
Low to high level	t_{PLH1}		01	30	840	
			02	19	520	
Transition times High to low level	t_{THL1}	V_{DD} = 5.0 V dc, C_L = 50 pF R_L = 200 kΩ (see figure 5)	01	10	280	ns
			02	9	280	
Low to high level	t_{TLH1}		01	10	280	
			02	9	280	
Propagation delay times High to low level	t_{PHL2}	V_{DD} = 10.0 V dc, C_L = 50 pF R_L = 200 kΩ (see figure 5)	01	15	300	ns
			02	7	140	
Low to high level	t_{PLH2}	T_A = 25°C	01	15	300	
			02	7	140	
Transition time High to low level	t_{THL2}	V_{DD} = 10.0 V dc, C_L = 50 pF R_L = 200 kΩ (see figure 5)	All	5	100	ns
Low to high level	t_{TLH2}	T_A = 25°C	All	5	100	

TABLE II. Electrical test requirements.

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

1/ (Δ) indicates delta limit shall be required only on table III, subgroup 1, where specified, and delta values shall be computed with reference value to the previous interim electrical measurements line.

2/ (*) indicates PDA applies to subgroup 1 (see 4.2.1).

3/ Blank spaces indicate tests are not applicable.

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

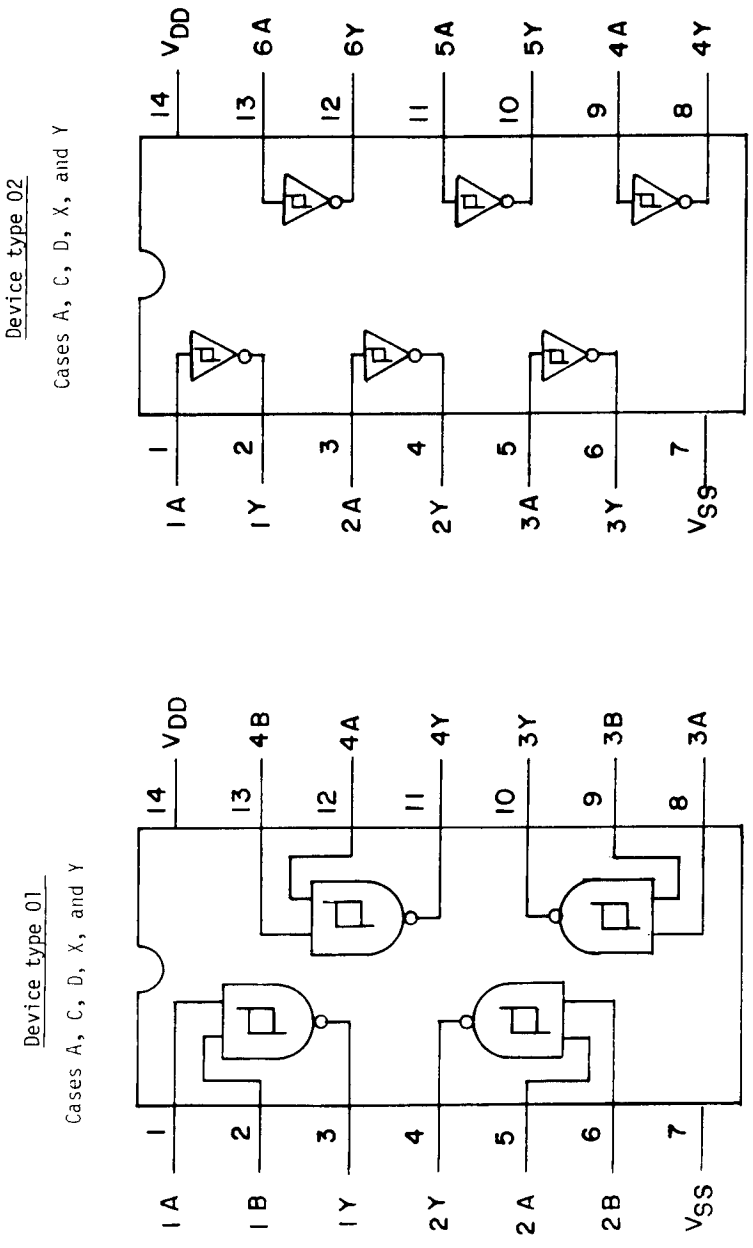


FIGURE 1. Logic diagrams and terminal connections.

Device type 01

EACH GATE		
INPUT		OUTPUT
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

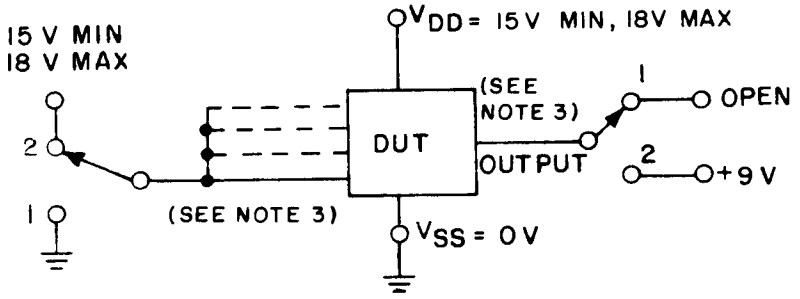
$Y = \overline{AB}$

Device type 02

EACH INVERTER	
INPUT	OUTPUT
A	Y
L	H
H	L

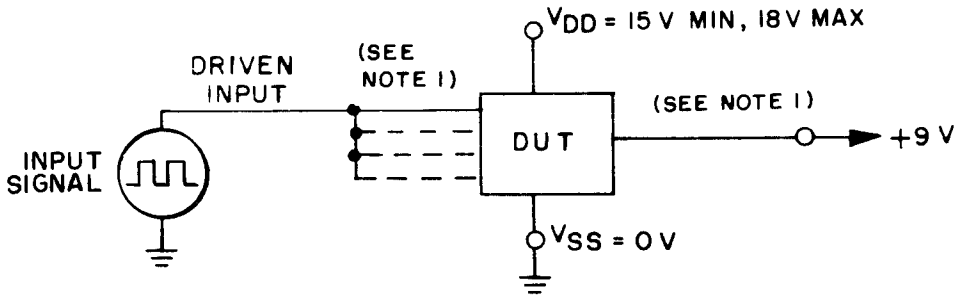
$Y = \overline{A}$

FIGURE 2. Truth tables and logic equations.



NOTES:
1. For static burn-in I, all inputs are connected to 0 volts, switch position 1.
2. For static burn-in II, all inputs are connected to V_{DD}, switch position 2.
3. Except for V_{DD} and V_{SS}, each terminal shall be connected through a resistor whose value is 2 kΩ to 47 kΩ. The actual measured value of the resistor selected shall not exeed ±20% of its branded value due to use, heat or age.
4. Output may be in switch position 1 or 2.
5. $V_{DD/2} = V_{DD/2} \pm 1.0$ V.

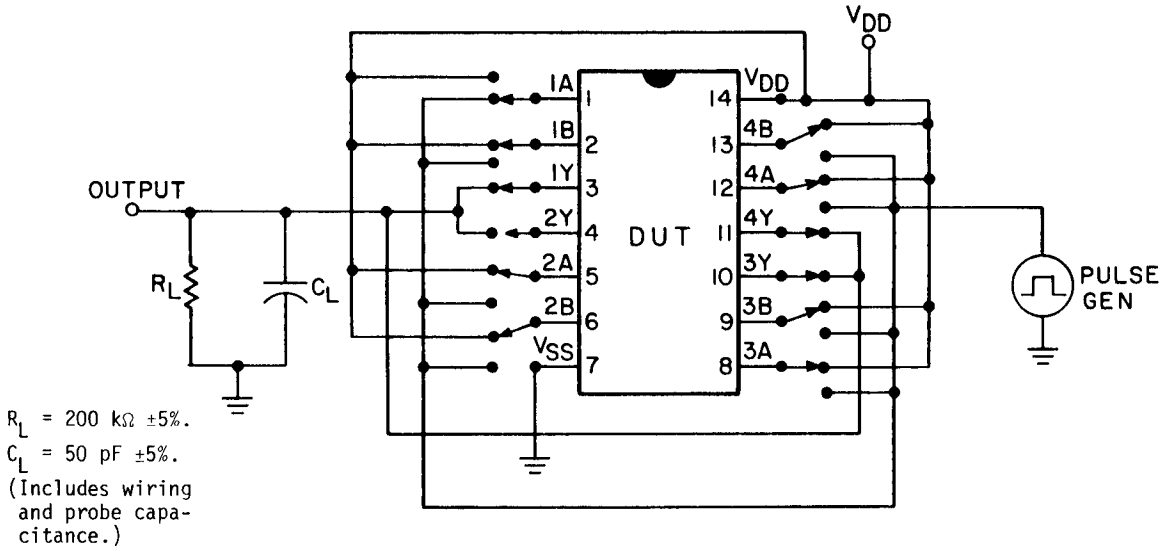
FIGURE 3. Static burn-in test circuits.



NOTES:
1. Except for V_{DD} and V_{SS}, each terminal shall be connected through a resistor 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.
2. Input signal requirements:
   a. Square wave, 50% duty cycle.
   b. 25 kHz < PRR < 1 MHz.
   c. t_{TLH} and t_{THL} < 1 µs.
   d. Voltage level:
      Minimum = V_{SS} -0.5 V, +10% V_{DD}.
      Maximum = V_{DD} +0.5 V, -10% V_{DD}.
3. $V_{DD} = V_{DD/2}$ ±1.0 V.

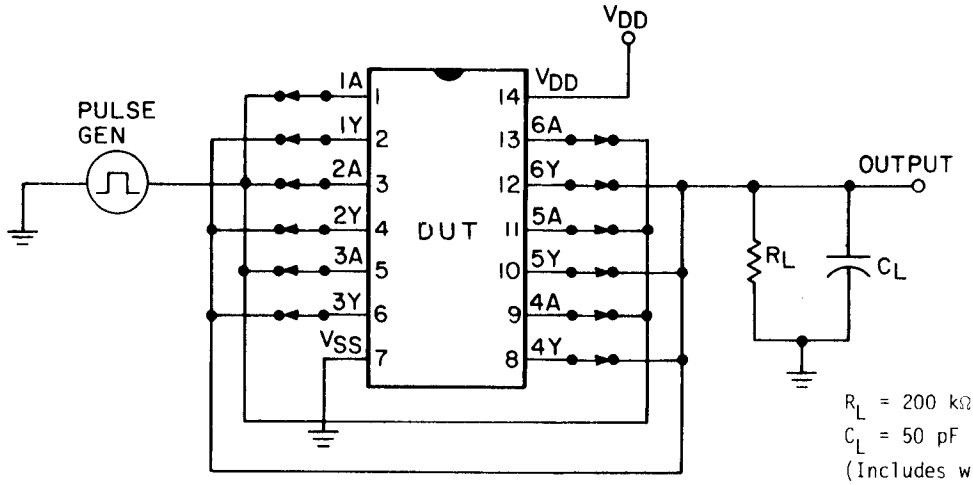
FIGURE 4. Dynamic burn-in and steady-state life test circuits.

Device type 01



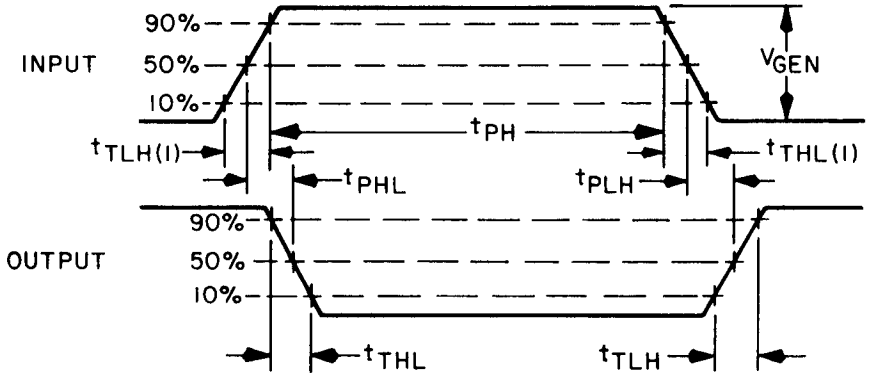
R_L = 200 kΩ ±5%.
C_L = 50 pF ±5%.
(Includes wiring and probe capacitance.)

Device type 02



R_L = 200 kΩ ±5%.
C_L = 50 pF ±5%.
(Includes wiring and probe capacitance.)

FIGURE 5. Switching time test circuits and waveforms.



DYNAMIC TEST WAVE FORMS

Input pulse
$V_{GEN} = V_{DD} \pm 1.0\%$.
$t_{PH} = 1.0 \pm 0.1$ µs.
$t_{THL(1)} = t_{TLH(1)} = 20 \pm 2$ ns.
PRR = 200 kHz.

FIGURE 5. Switching time test circuits and waveforms - Continued.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			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		
		Test no.	1A	1B	1Y	2Y	2A	2B	V_{SS}	3A	3B	3Y	4Y	4A	4B	V_{DD}		Min	Max	Min	Max	Min	Max	
V_{OH}(pos)		1	1 mA													GND	1A		1.5					V
		2		1 mA												"	1B		"					"
		3					1 mA									"	2A		"					"
		4						1 mA								"	2B		"					"
		5								1 mA						"	3A		"					"
		6									1 mA					"	3B		"					"
		7												1 mA		"	4A		"					"
		8													1 mA	"	4B		"					"
V_{OH}(neg)		9	-1 mA						GND								1A		-6.0					"
		10		-1 mA					"								1B		"					"
		11					-1 mA		"								2A		"					"
		12						-1 mA	"								2B		"					"
		13							"	-1 mA							3A		"					"
		14							"		-1 mA						3B		"					"
		15							"					-1 mA			4A		"					"
		16							"						-1 mA		4B		"					"
I_{SS}	3005	17	GND	GND			GND	GND	"	GND	GND			GND	GND	18.0 V	V_{SS}		-.075		-2.5			µA
2/	"	18	GND	18.0 V			GND	18.0 V	"	GND	18.0 V			GND	18.0 V	"	"		"		"			"
	"	19	18.0 V	GND			18.0 V	GND	"	18.0 V	GND			18.0 V	GND	"	"		"		"			"
	"	20	18.0 V	18.0 V			18.0 V	18.0 V	"	18.0 V	18.0 V			18.0 V	18.0 V	"	"		"		"			"
V_{OL1}	3007	21	15.0 V	15.0 V			15.0 V	15.0 V	"	15.0 V	15.0 V			15.0 V	15.0 V	15.0 V	1Y		0.05		0.05		0.05	V
	"	22	"	"			"	"	"	"	"			"	"	"	2Y		"		"		"	"
	"	23	"	"			"	"	"	"	"			"	"	"	3Y		"		"		"	"
	"	24	"	"			"	"	"	"	"			"	"	"	4Y		"		"		"	"
V_{TP1}	3006	25	GND	GND			GND	GND	"	GND	GND			GND	GND	"	1Y	14.95		14.95		14.95		"
	"	26	GND	15.0 V			"	"	"	"	"			"	"	"	"	"		"		"		"
	"	27	15.0 V	GND			"	"	"	"	"			"	"	"	"	"		"		"		"
	"	28	GND	"			"	"	"	"	"			"	"	"	2Y	"		"		"		"
	"	29	"	"			"	15.0 V	"	"	"			"	"	"	"	"		"		"		"
	"	30	"	"			15.0 V	GND	"	"	"			"	"	"	"	"		"		"		"
	"	31	"	"			GND	"	"	"	"			"	"	"	3Y	"		"		"		"
	"	32	"	"			"	"	"	"	15.0 V			"	"	"	"	"		"		"		"
	"	33	"	"			"	"	"	15.0 V	GND			"	"	"	"	"		"		"		"
	"	34	"	"			"	"	"	GND	"			"	"	"	4Y	"		"		"		"
	"	35	"	"			"	"	"	"	"			"	15.0 V	"	"	"		"		"		"
	"	36	"	"			"	"	"	"	"			15.0 V	GND	"	"	"		"		"		"
V_{TP1}	3/	37	5.0 V	IN	OUT		"	"	"	"	"			GND	"	5.0 V	1Y	2.2	3.6	2.2	3.6	2.2	3.6	"
	"	38	IN	5.0 V	OUT		"	"	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
	"	39	GND	GND		OUT	5.0 V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	40	"	"		OUT	IN	5.0 V	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	41	"	"			GND	GND	"	5.0 V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	42	"	"			"	"	"	IN	5.0 V	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	43	"	"			"	"	"	GND	GND		OUT	5.0 V	IN	"	4Y	"	"	"	"	"	"	"
	"	44	"	"			"	"	"	GND	GND		OUT	IN	5.0 V	"	4Y	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			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		
		Test no.	1A	1B	1Y	2Y	2A	2B	V_{SS}	3A	3B	3Y	4Y	4A	4B	V_{DD}		Min	Max	Min	Max	Min	Max	
V_{TN1}	3/	45	5.0 V	IN	OUT		GND	GND	GND	GND	GND			GND	GND	5.0 V	1Y	0.9	2.8	0.9	2.8	0.9	2.8	V
	"	46	IN	5.0 V	OUT		GND	GND	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
	"	47	GND	GND		OUT	5.0 V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	48	"	"		OUT	IN	5.0 V	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	49	"	"			GND	GND	"	5.0 V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	50	"	"			"	"	"	IN	5.0 V	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	51	"	"			"	"	"	GND	GND		OUT	5.0 V	IN	"	4Y	"	"	"	"	"	"	"
	"	52	"	"			"	"	"	GND	GND		OUT	IN	5.0 V	"	4Y	"	"	"	"	"	"	"
V_{H1}	"	53	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	0.3	2.0	0.3	2.0	0.3	2.0	"
	"	54	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	55	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	56	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	57	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
V_{TP2}	"	61	10.0 V	IN	OUT		GND	GND	GND	GND	GND			GND	GND	10.0 V	1Y	4.6	7.1	4.6	7.1	4.6	7.1	"
	"	62	IN	10.0 V	OUT		GND	GND	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
	"	63	GND	GND		OUT	10.0 V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	64	"	"		OUT	IN	10.0 V	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	65	"	"			GND	GND	"	10.0 V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	66	"	"			"	"	"	IN	10.0 V	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	67	"	"			"	"	"	GND	GND		OUT	10.0 V	IN	"	4Y	"	"	"	"	"	"	"
	"	68	"	"			"	"	"	"	"		OUT	IN	10.0 V	"	4Y	"	"	"	"	"	"	"
V_{TN2}	"	69	10.0 V	IN	OUT		"	"	"	"	"			GND	GND	"	1Y	2.5	5.2	2.5	5.2	2.5	5.2	"
	"	70	IN	10.0 V	OUT		"	"	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
	"	71	GND	GND		OUT	10.0 V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	72	"	"		OUT	IN	10.0 V	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	73	"	"			GND	GND	"	10.0 V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	74	"	"			"	"	"	IN	10.0 V	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	75	"	"			"	"	"	GND	GND		OUT	10.0 V	IN	"	4Y	"	"	"	"	"	"	"
	"	76	"	"			"	"	"	GND	GND		OUT	IN	10.0 V	"	4Y	"	"	"	"	"	"	"
V_{H2}	"	77	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	0.8	4.0	0.8	4.0	0.8	4.0	"
	"	78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	79	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	81	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	83	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	84	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
V_{TP3}	"	85	15.0 V	IN	OUT		GND	GND	GND	GND	GND			GND	GND	15.0 V	1Y	6.8	10.8	6.8	10.8	6.8	10.8	"
	"	86	IN	15.0 V	OUT		GND	GND	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
	"	87	GND	GND		OUT	15.0 V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	88	"	"		OUT	IN	15.0 V	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	89	"	"			GND	GND	"	15.0 V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	90	"	"			"	"	"	IN	15.0 V	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	91	"	"			"	"	"	GND	GND		OUT	15.0 V	IN	"	4Y	"	"	"	"	"	"	"
	"	92	"	"			"	"	"	GND	GND		OUT	IN	15.0 V	"	4Y	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			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		
		Test no.	1A	1B	1Y	2Y	2A	2B	V_{SS}	3A	3B	3Y	4Y	4A	4B	V_{DD}		Min	Max	Min	Max	Min	Max	
V_{TH3}	3/	93	15.0 V	IN	OUT		GND	GND	GND	GND	GND			GND	GND	15.0 V	1Y	4.0	7.4	4.0	7.4	4.0	7.4	V
	"	94	IN	15.0 V	OUT		GND	GND	"	"	"			"	"	"	1Y	"	"	"	"	"	"	"
	"	95	GND	GND		OUT	15.0 V	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	96	"	"		OUT	IN	15.0 V	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	97	"	"			GND	GND	"	15.0 V	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	98	"	"			"	"	"	IN	15.0 V	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	99	"	"			"	"	"	GND	GND		OUT	15.0 V	IN	"	4Y	"	"	"	"	"	"	"
	"	100	"	"			"	"	"	GND	GND		OUT	IN	15.0 V	"	4Y	"	"	"	"	"	"	"
V_{43}	"	101	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	1.1	6.0	1.1	6.0	1.1	6.0	"
	"	102	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	104	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	107	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	"	108	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
I_{IH1} 3/	3010	109	18.0 V	18.0 V			18.0 V	18.0 V	GND	18.0 V	18.0 V			18.0 V	18.0 V	18.0 V	All		8					nA
I_{IH2}	"	110	18.0 V	GND			GND	GND	"	GND	GND			GND	GND	"	1A		1		45			"
	"	111	GND	18.0 V			GND	"	"	"	"			"	"	"	1B		"		"			"
	"	112	"	GND			18.0 V	"	"	"	"			"	"	"	2A		"		"			"
	"	113	"	"			GND	18.0 V	"	"	"			"	"	"	2B		"		"			"
	"	114	"	"			"	GND	"	18.0 V	"			"	"	"	3A		"		"			"
	"	115	"	"			"	"	"	GND	18.0 V			"	"	"	3B		"		"			"
	"	116	"	"			"	"	"	"	GND			18.0 V	"	"	4A		"		"			"
	"	117	"	"			"	"	"	"	"			GND	18.0 V	"	4B		"		"			"
I_{IL1} 3/	3009	118	"	"			"	"	"	"	"			GND	GND	"	All		-8					"
I_{IL2}	"	119	"	18.0 V			18.0 V	18.0 V	"	18.0 V	18.0 V			18.0 V	18.0 V	"	1A		-1		-45			"
	"	120	18.0 V	GND			18.0 V	"	"	"	"			"	"	"	1B		"		"			"
	"	121	"	18.0 V			GND	"	"	"	"			"	"	"	2A		"		"			"
	"	122	"	"			18.0 V	GND	"	"	"			"	"	"	2B		"		"			"
	"	123	"	"			"	18.0 V	"	GND	"			"	"	"	3A		"		"			"
	"	124	"	"			"	"	"	18.0 V	GND			"	"	"	3B		"		"			"
	"	125	"	"			"	"	"	"	18.0 V			GND	"	"	4A		"		"			"
	"	126	"	"			"	"	"	"	18.0 V			18.0 V	GND	"	4B		"		"			"
I_{OL1}		127	5.0 V	5.0 V	0.4 V		5.0 V	5.0 V	"	5.0 V	5.0 V			5.0 V	5.0 V	5.0 V	1Y	0.51		0.36		0.64		mA
		128	"	"		0.4 V	"	"	"	"	"			"	"	"	2Y	"		"		"		"
		129	"	"			"	"	"	"	"	0.4 V		"	"	"	3Y	"		"		"		"
		130	"	"			"	"	"	"	"		0.4 V	"	"	"	4Y	"		"		"		"
I_{OH1}		131	"	GND	4.6 V		"	GND	"	"	GND			"	GND	"	1Y	-0.51		-0.36		-0.64		"
		132	"	"		4.6 V	"	"	"	"	"			"	"	"	2Y	"		"		"		"
		133	"	"			"	"	"	"	"	4.6 V		"	"	"	3Y	"		"		"		"
		134	"	"			"	"	"	"	"		4.6 V	"	"	"	4Y	"		"		"		"

See footnotes at end of table.

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

Symbol	Mil-STD-883 method	Cases A, C, D, X, Y Test no.	Terminal conditions 1/ 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Test limits Subgroup 1 T_A = 25°C Min	Max	Subgroup 2 T_A = 125°C Min	Max	Subgroup 3 T_A = -55°C Min	Max	Units
			1A	1B	1Y	2Y	2A	2B	V_{SS}	3A	3B	3Y	4Y	4A	4B	V_{DD}								
V_{OL2}		135	15.0 V	15.0 V	1.5 V		15.0 V	15.0 V	GND	15.0 V	15.0 V			15.0 V	15.0 V	15.0 V	1Y	3.4		2.4		4.2		mA
		136	"	"		1.5 V	"	"	"	"	"	1.5 V		"	"	"	2Y	"		"		"		"
		137	"	"			"	"	"	"	"		1.5 V	"	"	"	3Y	"		"		"		"
		138	"	"			"	"	"	"	"			"	"	"	4Y	"		"		"		"
I_{OH2}		139	"	GND	13.5 V		"	GND	"	"	GND			"	GND	"	1Y	-3.4		-2.4		-4.2		"
		140	"	"		13.5 V	"	"	"	"	"	13.5 V		"	"	"	2Y	"		"		"		"
		141	"	"			"	"	"	"	"		13.5 V	"	"	"	3Y	"		"		"		"
		142	"	"			"	"	"	"	"			"	"	"	4Y	"		"		"		"
																		Subgroup 4 T_A = 25°C Min	Max					
C_I	3012	143	4/						GND							GND	1A		7.5					pF
	"	144		4/					"							"	1B		"					"
	"	145					4/		"							"	2A		"					"
	"	146						4/	"							"	2B		"					"
	"	147							"	4/						"	3A		"					"
	"	148							"		4/					"	3B		"					"
	"	149							"					4/		"	4A		"					"
	"	150							"						4/	"	4B		"					"
																		Subgroup 9 T_A = 25°C Min	Max	Subgroup 10 T_A = 125°C Min	Max	Subgroup 11 T_A = -55°C Min	Max	
t_{PHL}	3003 Fig. 5	151	IN	5.0 V	OUT		5.0 V	5.0 V	GND	5.0 V	5.0 V			5.0 V	5.0 V	5.0 V	1A to 1Y	30	600	42	840	30	600	ns
	"	152	5.0 V	IN	OUT		5.0 V	"	"	"	"			"	"	"	1B to 1Y	"	"	"	"	"	"	"
	"	153	"	5.0 V		OUT	IN	"	"	"	"			"	"	"	2A to 2Y	"	"	"	"	"	"	"
	"	154	"	"		OUT	5.0 V	IN	"	"	"			"	"	"	2B to 2Y	"	"	"	"	"	"	"
	"	155	"	"			"	5.0 V	"	IN	"	OUT		"	"	"	3A to 3Y	"	"	"	"	"	"	"
	"	156	"	"			"	"	"	5.0 V	IN	OUT		"	"	"	3B to 3Y	"	"	"	"	"	"	"
	"	157	"	"			"	"	"	"	5.0 V		OUT	IN	"	"	4A to 4Y	"	"	"	"	"	"	"
	"	158	"	"			"	"	"	"	"		OUT	5.0 V	IN	"	4B to 4Y	"	"	"	"	"	"	"
t_{PLH}	"	159	IN	"	OUT		"	"	"	"	"			"	5.0 V	"	1A to 1Y	"	"	"	"	"	"	"
	"	160	5.0 V	IN	OUT		"	"	"	"	"			"	"	"	1B to 1Y	"	"	"	"	"	"	"
	"	161	"	5.0 V		OUT	IN	"	"	"	"			"	"	"	2A to 2Y	"	"	"	"	"	"	"
	"	162	"	"		OUT	5.0 V	IN	"	"	"			"	"	"	2B to 2Y	"	"	"	"	"	"	"
	"	163	"	"			"	5.0 V	"	IN	"	OUT		"	"	"	3A to 3Y	"	"	"	"	"	"	"
	"	164	"	"			"	"	"	5.0 V	IN	OUT		"	"	"	3B to 3Y	"	"	"	"	"	"	"
	"	165	"	"			"	"	"	"	5.0 V		OUT	IN	"	"	4A to 4Y	"	"	"	"	"	"	"
	"	166	"	"			"	"	"	"	"		OUT	5.0 V	"	"	4B to 4Y	"	"	"	"	"	"	"
t_{THL}	3004 Fig. 5	167	"	IN	OUT		"	"	"	"	"			"	"	"	1Y	10	200	14	280	10	200	"
	"	168	"	5.0 V		OUT	"	IN	"	"	"			"	"	"	2Y	"	"	"	"	"	"	"
	"	169	"	"			"	5.0 V	"	"	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
	"	170	"	"			"	5.0 V	"	"	5.0 V		OUT	"	IN	"	4Y	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases A, C, D, K, Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			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		
		Test no.	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. 5	171	5.0 V	IN	OUT		5.0 V	5.0 V	GND	5.0 V	5.0 V			5.0 V	5.0 V	5.0 V	1Y	10	200	14	280	10	200	ns
		172	"	5.0 V		OUT	"	IN	"	"	5.0 V			"	"	"	2Y	"	"	"	"	"	"	"
		173	"	"			"	5.0 V	"	"	IN	OUT		"	"	"	3Y	"	"	"	"	"	"	"
		174	"	"	OUT	OUT	"	5.0 V	"	"	5.0 V		OUT	"	IN	"	4Y	"	"	"	"	"	"	"

																		Subgroup 12 T_A = 25°C						
																		Min	Max					
t_{PHL} & t_{PLH}	3003 Fig. 5	175	IN	10.0 V	OUT		10.0 V	10.0 V	GND	10.0 V	10.0 V			10.0 V	10.0 V	10.0 V	1A to 1Y	15	300					ns
		176	10.0 V	IN	OUT		10.0 V	"	"	"	"			"	"	"	1B to 1Y	"	"					"
		177	"	10.0 V		OUT	IN	"	"	"	"			"	"	"	2A to 2Y	"	"					"
		178	"	"		OUT	10.0 V	IN	"	"	"			"	"	"	2B to 2Y	"	"					"
		179	"	"			"	10.0 V	"	IN	"	OUT		"	"	"	3A to 3Y	"	"					"
		180	"	"			"	"	"	10.0 V	IN	OUT		"	"	"	3B to 3Y	"	"					"
		181	"	"			"	"	"	"	10.0 V		OUT	IN	"	"	4A to 4Y	"	"					"
		182	"	"			"	"	"	"	"		OUT	10.0 V	IN	"	4B to 4Y	"	"					"
t_{THL} & t_{TLH}	3004 Fig. 5	183	"	IN	OUT		"	"	"	"	"			"	10.0 V	"	1Y	5	100					"
		184	"	10.0 V		OUT	"	IN	"	"	"			"	"	"	2Y	"	"					"
		185	"	"			"	10.0 V	"	"	IN	OUT		"	"	"	3Y	"	"					"
		186	"	"			"	10.0 V	"	"	10.0 V		OUT	"	IN	"	4Y	"	"					"

See footnotes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			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		
		Test no.	1A	1Y	2A	2Y	3A	3Y	V_{SS}	4Y	4A	5Y	5A	6Y	5A	V_{DD}		Min	Max	Min	Max	Min	Max	
$V_{IC(pos)}$		1	1 mA													GND	1A		1.5					V
		2			1 mA											"	2A		"					"
		3					1 mA									"	3A		"					"
		4									1 mA					"	4A		"					"
		5											1 mA			"	5A		"					"
		6													1 mA	"	6A		"					"
$V_{IC(neg)}$		7	-1 mA						GND								1A		-6.0					"
		8			-1 mA				"								2A		"					"
		9					-1 mA		"								3A		"					"
		10							"		-1 mA						4A		"					"
		11							"				-1 mA				5A		"					"
		12							"						-1 mA		6A		"					"
I_{SS} 2/	3005	13	18.0 V		18.0 V		18.0 V		"		18.0 V		18.0 V		18.0 V	18.0 V	V_{SS}		-.075		-2.5			µA
I_{SS} 2/	3005	14	GND		GND		GND		"		GND		GND		GND	18.0 V	V_{SS}		-.075		-2.5			µA
V_{OH1}	3006	15	"		"		"		"		"		"		"	15.0 V	1Y	14.95		14.95		14.95		V
	"	16	"		"		"		"		"		"		"	"	2Y	"		"		"		"
	"	17	"		"		"		"		"		"		"	"	3Y	"		"		"		"
	"	18	"		"		"		"		"		"		"	"	4Y	"		"		"		"
	"	19	"		"		"		"		"		"		"	"	5Y	"		"		"		"
	"	20	"		"		"		"		"		"		"	"	6Y	"		"		"		"
V_{OL1}	3007	21	15.0 V		15.0 V		15.0 V		"		15.0 V		15.0 V		15.0 V	"	1Y		0.05		0.05		0.05	"
	"	22	"		"		"		"		"		"		"	"	2Y		"		"		"	"
	"	23	"		"		"		"		"		"		"	"	3Y		"		"		"	"
	"	24	"		"		"		"		"		"		"	"	4Y		"		"		"	"
	"	25	"		"		"		"		"		"		"	"	5Y		"		"		"	"
	"	26	"		"		"		"		"		"		"	"	6Y		"		"		"	"
V_{TP1}	3/	27	IN	OUT	GND		GND		"		GND		GND		GND	5.0 V	1Y	2.2	4.3	2.2	4.3	2.2	4.3	"
	"	28	GND		IN	OUT	GND		"		"		"		"	"	2Y	"	"	"	"	"	"	"
	"	29	"		GND		IN	OUT	"		"		"		"	"	3Y	"	"	"	"	"	"	"
	"	30	"		"		GND		"	OUT	IN	OUT	"		"	"	4Y	"	"	"	"	"	"	"
	"	31	"		"		"		"		GND		IN	OUT	"	"	5Y	"	"	"	"	"	"	"
	"	32	"		"		"		"		"		GND		IN	"	6Y	"	"	"	"	"	"	"
V_{TN1}	"	33	IN	OUT	"		"		"		"		"		GND	"	1Y	0.7	2.8	0.7	2.8	0.7	2.8	"
	"	34	GND		IN	OUT	"		"		"		"		"	"	2Y	"	"	"	"	"	"	"
	"	35	"		GND		IN	OUT	"		"		"		"	"	3Y	"	"	"	"	"	"	"
	"	36	"		"		GND		"	OUT	IN	OUT	"		"	"	4Y	"	"	"	"	"	"	"
	"	37	"		"		"		"		GND		IN	OUT	"	"	5Y	"	"	"	"	"	"	"
	"	38	"		"		"		"		GND		GND		IN	"	6Y	"	"	"	"	"	"	"
V_{H1}	"	39	3/						"							"	1A	0.3	3.6	0.3	3.6	0.3	3.6	"
	"	40			3/				"							"	2A	"	"	"	"	"	"	"
	"	41					3/		"							"	3A	"	"	"	"	"	"	"
	"	42							"		3/					"	4A	"	"	"	"	"	"	"
	"	43							"				3/			"	5A	"	"	"	"	"	"	"
	"	44							"						3/	"	6A	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			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		
		Test no.	1A	1Y	2A	2Y	3A	3Y	V_{SS}	4Y	4A	5Y	5A	6Y	6A	V_{DD}		Min	Max	Min	Max	Min	Max	
V_{TP2}	3/	45	IN	OUT	GND		GND		GND		GND		GND		GND	10.0 V	1Y	4.6	8.6	4.6	8.6	4.6	8.6	V
	"	46	GND		IN	OUT	GND		"		"		"		"	"	2Y	"	"	"	"	"	"	"
	"	47	"		GND		IN	OUT	"		"		"		"	"	3Y	"	"	"	"	"	"	"
	"	48	"		"		GND		"	OUT	IN		"		"	"	4Y	"	"	"	"	"	"	"
	"	49	"		"		"		"		GND	OUT	IN		"	"	5Y	"	"	"	"	"	"	"
	"	50	"		"		"		"		"		GND	OUT	IN	"	6Y	"	"	"	"	"	"	"
V_{TP2}	"	51	IN	OUT	"		"		"		"		"		GND	"	1Y	1.4	5.2	1.4	5.2	1.4	5.2	"
	"	52	GND		IN	OUT	"		"		"		"		"	"	2Y	"	"	"	"	"	"	"
	"	53	"		GND		IN	OUT	"		"		"		"	"	3Y	"	"	"	"	"	"	"
	"	54	"		"		GND		"	OUT	IN		"		"	"	4Y	"	"	"	"	"	"	"
	"	55	"		"		"		"		GND	OUT	IN		"	"	5Y	"	"	"	"	"	"	"
	"	56	"		"		"		"		GND		GND	OUT	IN	"	6Y	"	"	"	"	"	"	"
V_{H2}	"	57	3/						"							"	1A	1.2	7.2	1.2	7.2	1.2	7.2	"
	"	58			3/				"							"	2A	"	"	"	"	"	"	"
	"	59					3/		"							"	3A	"	"	"	"	"	"	"
	"	60							"		3/					"	4A	"	"	"	"	"	"	"
	"	61							"				3/			"	5A	"	"	"	"	"	"	"
	"	62							"						3/	"	6A	"	"	"	"	"	"	"
V_{TP3}	"	63	IN	OUT	GND		GND		"		GND		GND		GND	15.0 V	1Y	6.8	12.8	6.8	12.8	6.8	12.8	"
	"	64	GND		IN	OUT	GND		"		"		"		"	"	2Y	"	"	"	"	"	"	"
	"	65	"		GND		IN	OUT	"		"		"		"	"	3Y	"	"	"	"	"	"	"
	"	66	"		"		GND		"	OUT	IN		"		"	"	4Y	"	"	"	"	"	"	"
	"	67	"		"		"		"		GND	OUT	IN		"	"	5Y	"	"	"	"	"	"	"
	"	68	"		"		"		"		"		GND	OUT	IN	"	6Y	"	"	"	"	"	"	"
V_{TN3}	"	69	IN	OUT	"		"		"		"		"		GND	"	1Y	2.1	7.4	2.1	7.4	2.1	7.4	"
	"	70	GND		IN	OUT	"		"		"		"		"	"	2Y	"	"	"	"	"	"	"
	"	71	"		GND		IN	OUT	"		"		"		"	"	3Y	"	"	"	"	"	"	"
	"	72	"		"		GND		"	OUT	IN		"		"	"	4Y	"	"	"	"	"	"	"
	"	73	"		"		"		"		GND	OUT	IN		"	"	5Y	"	"	"	"	"	"	"
	"	74	"		"		"		"		GND		GND	OUT	IN	"	6Y	"	"	"	"	"	"	"
V_{H3}	"	75	3/														1A	1.6	10.0	1.6	10.0	1.6	10.0	"
	"	76			3/												2A	"	"	"	"	"	"	"
	"	77					3/										3A	"	"	"	"	"	"	"
	"	78									3/						4A	"	"	"	"	"	"	"
	"	79											3/				5A	"	"	"	"	"	"	"
	"	80													3/		6A	"	"	"	"	"	"	"
I_{IH1} 5/	3010	81	18.0 V		18.0 V		18.0 V		GND		18.0 V		18.0 V		18.0 V	18.0 V	All		6					nA
I_{IH2}	"	82	18.0 V		GND		GND		"		GND		GND		GND	"	1A		1		45			"
	"	83	GND		18.0 V		GND		"		"		"		"	"	2A		"		"			"
	"	84	"		GND		18.0 V		"		"		"		"	"	3A		"		"			"
	"	85	"		"		GND		"		18.0 V		"		"	"	4A		"		"			"
	"	86	"		"		"		"		GND		18.0 V		"	"	5A		"		"			"
	"	87	"		"		"		"		GND		GND		18.0 V	"	6A		"		"			"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y Test no.	Terminal conditions 1/ 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Test limits Subgroup 1 T_A = 25°C Min	Max	Subgroup 2 T_A = 125°C Min	Max	Subgroup 3 T_A = -55°C Min	Max	Units
			1A	1Y	2A	2Y	3A	3Y	V_{SS}	4Y	4A	5Y	5A	6Y	6A	V_{DD}								
I_{IL1} 2/	3009	88	GND		GND		GND		GND		GND		GND		GND	18.0 V	All		-6					nA
I_{IL2}	"	89	"		18.0 V		18.0 V		"		18.0 V		18.0 V		18.0 V	"	1A		-1		-45			"
	"	90	18.0 V		GND		18.0 V		"		"		"		"	"	2A		"		"			"
	"	91	"		18.0 V		GND		"		"		"		"	"	3A		"		"			"
	"	92	"		"		18.0 V		"		GND		"		"	"	4A		"		"			"
	"	93	"		"		"		"		18.0 V		GND		"	"	5A		"		"			"
	"	94	"		"		"		"		18.0 V		18.0 V		GND	"	6A		"		"			"
I_{OL1}		95	5.0 V	0.4 V	5.0 V	0.4 V	5.0 V	0.4 V	"	0.4 V	5.0 V	0.4 V	5.0 V	0.4 V	5.0 V	5.0 V	1Y	0.51		0.36		0.64		mA
		96	"		"		"		"		"		"		"	"	2Y	"		"		"		"
		97	"		"		"		"		"		"		"	"	3Y	"		"		"		"
		98	"		"		"		"		"		"		"	"	4Y	"		"		"		"
		99	"		"		"		"		"		"		"	"	5Y	"		"		"		"
		100	"		"		"		"		"		"		"	"	6Y	"		"		"		"
I_{OH1}		101	GND	4.6 V	GND	4.6 V	GND	4.6 V	"	4.6 V	GND	4.6 V	GND	4.6 V	GND	"	1Y	-0.51		-0.36		-0.64		"
		102	"		"		"		"		"		"		"	"	2Y	"		"		"		"
		103	"		"		"		"		"		"		"	"	3Y	"		"		"		"
		104	"		"		"		"		"		"		"	"	4Y	"		"		"		"
		105	"		"		"		"		"		"		"	"	5Y	"		"		"		"
		106	"		"		"		"		"		"		"	"	6Y	"		"		"		"
I_{OH2}		107	"	13.5 V	"	13.5 V	"	13.5 V	"	13.5 V	"	13.5 V	"	13.5 V	"	15.0 V	1Y	-3.4		-2.4		-4.2		"
		108	"		"		"		"		"		"		"	"	2Y	"		"		"		"
		109	"		"		"		"		"		"		"	"	3Y	"		"		"		"
		110	"		"		"		"		"		"		"	"	4Y	"		"		"		"
		111	"		"		"		"		"		"		"	"	5Y	"		"		"		"
		112	"		"		"		"		"		"		"	"	6Y	"		"		"		"
I_{OL2}		113	15.0 V	1.5 V	15.0 V	1.5 V	15.0 V	1.5 V	"	1.5 V	15.0 V	1.5 V	15.0 V	1.5 V	15.0 V	"	1Y	3.4		2.4		4.2		"
		114	"		"		"		"		"		"		"	"	2Y	"		"		"		"
		115	"		"		"		"		"		"		"	"	3Y	"		"		"		"
		116	"		"		"		"		"		"		"	"	4Y	"		"		"		"
		117	"		"		"		"		"		"		"	"	5Y	"		"		"		"
		118	"		"		"		"		"		"		"	"	6Y	"		"		"		"
																		Subgroup 4 T_A = 25°C Min	Max					
C_i	3012	119	4/		4/		4/		GND		4/		4/		4/	GND	1A		7.5					pF
	"	120							"							"	2A		"					"
	"	121							"							"	3A		"					"
	"	122							"							"	4A		"					"
	"	123							"							"	5A		"					"
	"	124							"							"	6A		"					"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	Terminal conditions 1/														Measured terminal	Test Limits						Units
			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		
		Test no.	1A	1Y	2A	2Y	3A	3Y	V_{SS}	4Y	4A	5Y	5A	6Y	6A	V_{DD}		Min	Max	Min	Max	Min	Max	
t_{PLH}	3003 Fig. 5	125	IN	OUT	IN	OUT	IN	OUT	GND	OUT	IN	OUT	IN	OUT	IN	5.0 V	1A to 1Y	19	370	25	520	19	370	ns
	"	126							"							"	2A to 2Y	"	"	"	"	"	"	"
	"	127							"							"	3A to 3Y	"	"	"	"	"	"	"
	"	128							"							"	4A to 4Y	"	"	"	"	"	"	"
	"	129							"							"	5A to 5Y	"	"	"	"	"	"	"
	"	130							"							"	6A to 6Y	"	"	"	"	"	"	"
t_{PHL}	3004 Fig. 5	131	IN	OUT	IN	OUT	IN	OUT	"	OUT	IN	OUT	IN	OUT	IN	"	1A to 1Y	"	"	"	"	"	"	"
	"	132							"							"	2A to 2Y	"	"	"	"	"	"	"
	"	133							"							"	3A to 3Y	"	"	"	"	"	"	"
	"	134							"							"	4A to 4Y	"	"	"	"	"	"	"
	"	135							"							"	5A to 5Y	"	"	"	"	"	"	"
	"	136							"							"	6A to 6Y	"	"	"	"	"	"	"
t_{TLH}	"	137	IN	OUT	IN	OUT	IN	OUT	"	OUT	IN	OUT	IN	OUT	IN	"	1Y	9	180	14	280	10	200	"
	"	138							"							"	2Y	"	"	"	"	"	"	"
	"	139							"							"	3Y	"	"	"	"	"	"	"
	"	140							"							"	4Y	"	"	"	"	"	"	"
	"	141							"							"	5Y	"	"	"	"	"	"	"
	"	142							"							"	6Y	"	"	"	"	"	"	"
t_{THL}	"	143	IN	OUT	IN	OUT	IN	OUT	"	OUT	IN	OUT	IN	OUT	IN	"	1Y	"	"	"	"	"	"	"
	"	144							"							"	2Y	"	"	"	"	"	"	"
	"	145							"							"	3Y	"	"	"	"	"	"	"
	"	146							"							"	4Y	"	"	"	"	"	"	"
	"	147							"							"	5Y	"	"	"	"	"	"	"
	"	148							"							"	6Y	"	"	"	"	"	"	"
																		Subgroup 12 T_A = 25°C						
																		Min	Max					
t_{PHL} & t_{PLH}	3003 Fig. 5	149	IN	OUT	IN	OUT	IN	OUT	GND	OUT	IN	OUT	IN	OUT	IN	10.0 V	1A to 1Y	7	140					ns
	"	150							"							"	2A to 2Y	"	"					"
	"	151							"							"	3A to 3Y	"	"					"
	"	152							"							"	4A to 4Y	"	"					"
	"	153							"							"	5A to 5Y	"	"					"
	"	154							"							"	6A to 6Y	"	"					"
t_{THL} & t_{TLH}	3004 Fig. 5	155	IN	OUT	IN	OUT	IN	OUT	"	OUT	IN	OUT	IN	OUT	IN	"	1A to 1Y	5	100					"
	"	156							"							"	2A to 2Y	"	"					"
	"	157							"							"	3A to 3Y	"	"					"
	"	158							"							"	4A to 4Y	"	"					"
	"	159							"							"	5A to 5Y	"	"					"
	"	160							"							"	6A to 6Y	"	"					"

See footnotes at end of table.

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.

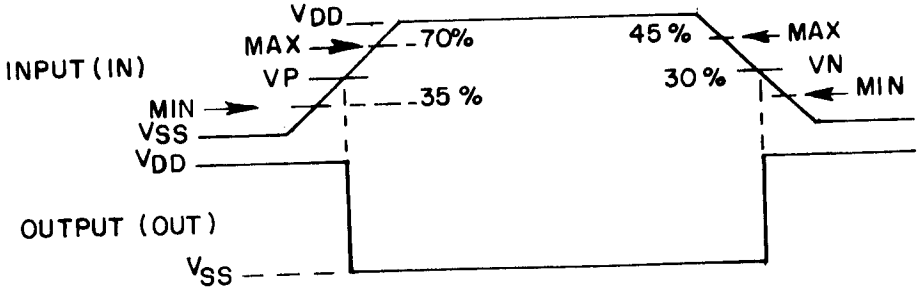
3/ Step (IN) input from V_{SS} to V_{DD} in 1V increments to VTP', where the output (OUT), changes from V_{DD} to V_{SS}. Return (IN) to V_{SS}.

Step (IN) input from V_{SS} to VTP' -1V and increment (IN) in 50 mV steps to VTP, which is the voltage on the (IN) input when the (OUT) output changes from V_{DD} to V_{SS}.

Step (IN) input from V_{DD} to V_{SS} in 1V decrements to VTN', where the (OUT) output, changes from V_{SS} to V_{DD}. Return (IN) to V_{DD}.

Step (IN) input from V_{DD} to VTN' +1V and decrement (IN) in 50 mV steps to VTN, which is the voltage on the (IN) input when the (OUT) output changes from V_{SS} to V_{DD}.

VH is defined as VTP-VTN; compare VH against the specified limits.



4/ See 4.4.1c.

5/ 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.

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

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

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

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

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

(2) T_A = 125°C minimum.

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

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

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

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

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

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

4.5.2 Burn-in and life test cooldown procedures. When these tests are completed and prior to removal of bias voltages, the devices under test shall be cooled to an ambient temperature of 25°C ±3°C, then electrical parameter end-point measurements shall be performed.

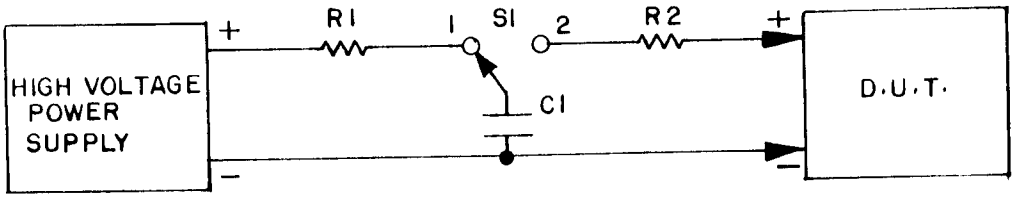
TABLE IV. Delta limits at 25°C.

Parameter 1/	Device types	
	01	02
I_{SS}	±10 nA	±10 nA
I_{OL1}	±15%	±15%
I_{OH1}	±15%	±15%

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

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

a. Measure I_{IL} and I_{IH} at the inputs selected, as stated above, at 25°C. The test limit for each input tested shall be ±10 nA at V_{DD} = 18 V dc. Measure I_{SS} on device under test (DUT) at 25°C. The test limit for this measurement shall be increased a maximum of 20 percent of the specified I_{SS} table III limit at V_{DD} = 18 V dc.



V_{ZAP} = 400 V minimum charge on C1.
1 MΩ ≤ R1 ≤ 50 MΩ.
R2 = 1.5 kΩ.
C1 = 100 pF.
S1 = Hg-wetted "bounceless" relay.

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

b. V_{ZAP} is applied to the DUT in the following modes (see table V) by charging C1 to V_{ZAP} with S1 in position 1 and then switching to position 2.

TABLE V. Modes for high voltage test.

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

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

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

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

a. Before irradiation, selected samples shall be assembled in qualified packages and pass the governing electrical parameters (Group A subgroup 1 at 25°C) and also be subjected to the threshold-voltage test in table VIII in order to calculate the delta threshold (ΔV_T) after irradiation.

b. The devices shall be subjected to a total radiation dose as specified in MIL-M-38510 for the radiation hardness assurance (RHA) level being tested, and meet the end-point electrical parameters as defined in table VI at 25°C, after exposure. The start and completion of the end-point electrical parameter measurements shall not exceed 2 hours following irradiation.

c. Threshold-voltage test circuit conditions shall be as specified in table VIII and figure 7. In situ and remote testing, the test shall be performed with the devices biased in accordance with table VII and bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.

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

TABLE VI. Radiation hardness 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	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 VII. Bias during exposure to radiation.

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

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

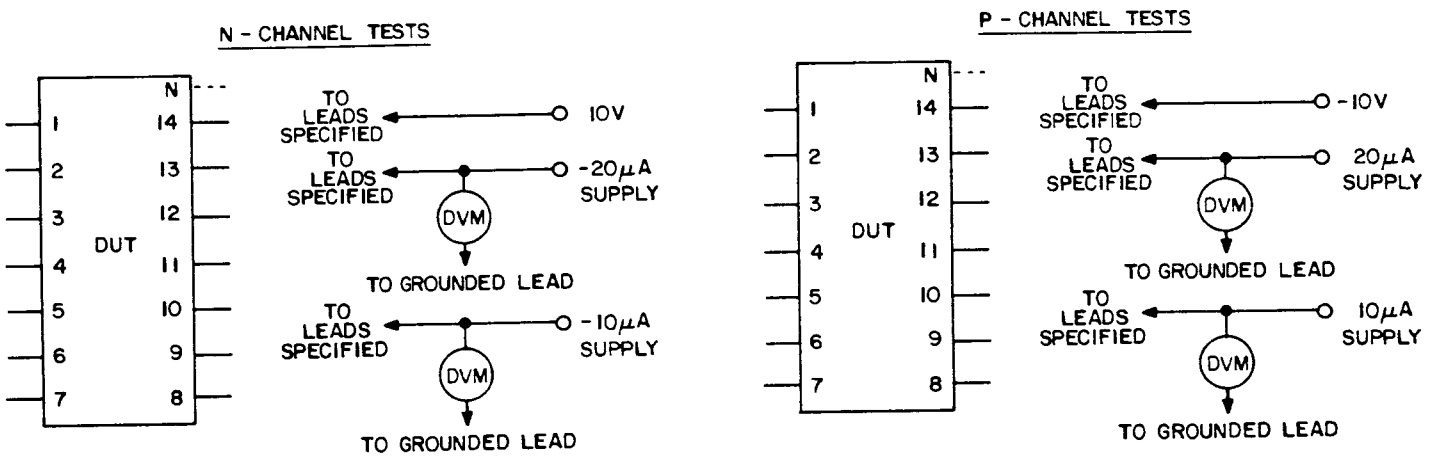


FIGURE 7. Threshold-voltage test circuit.

TABLE VIII. 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	1	2,5,6,8,9,12-14		7	1	2,5-9,12,13		14
02	1	3,5,9,11,13,14		7	1	7		3,5,9,11,13,14

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

a. Attributes data for all screening tests (see 4.2) and variables data for all static burn-in, dynamic burn-in-, and steady-state life tests.

b. A copy of each radiograph.

c. The quality conformance inspection data (see 4.4).

d. Parameter distribution data on parameters evaluated during burn-in (see 3.5).

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

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

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

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

a. Complete part number (see 1.2).

b. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.

c. Requirement for certificate of compliance, if applicable.

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

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

f. Requirements for product assurance options.

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

h. Requirements for JAN marking.

i. Requirements for total dose radiation testing (see 3.6.1 and 4.5.5).

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

V_{ZAP}	Input test voltage.
C_i	Input terminal-to-V_{SS} 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.
V_{TP}	Positive trigger threshold voltage.
V_{TN}	Negative trigger threshold voltage.
V_H	Hysteresis voltage.

6.4 Logistic support. Lead materials and finishes (see 3.3) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support shall be acquired to device class S for National Aeronautics and Space Administration or class B for Department of Defense (see 1.2.2), lead finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

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

Military device type	Generic-industry type
01	4093B
02	40106B

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

a. Devices should be handled on benches with conductive and grounded surface.

b. Ground test equipment and tools.

c. Do not handle devices by the leads.

d. Store devices in conductive foam or carriers.

e. Avoid use of plastic, rubber, or silk in MOS area.

f. Maintain relative humidity above 50 percent, if practical.

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

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

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

User activities:
Army - AR, SM
Navy - AS, CG, MC, OS, SH

Agent:
DLA - ES

Preparing activity:
NASA - NA

(Project 5962-0639-8)