

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, CMOS, DECODERS, ENCODER, AND DECODERS/DEMULTIPLEXERS 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:

<u>Device type</u>	<u>Circuit</u>
01	4-Bit latch/4-to-16 line decoder
02	4-Bit latch/4-to-16 line decoder
03	8-Bit priority encoder
04	Dual binary to 1 of 4 decoder/multiplexers
05	Dual binary to 1 of 4 decoder/demultiplexers

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

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

<u>Outline letter</u>	<u>Case outline (see MIL-M-38510, appendix C)</u>
E	D-2 (16-lead, 1/4" x 7/8", dual-in-line)
F	F-5 (16-lead, 1/4" x 3/8", flat-pack)
J	D-3 (24-lead, 1/2" x 1-1/4", dual-in-line)
K	F-6 (24-lead, 3/8" x 5/8" flat-pack)
X	See figure 1 (24-lead, 1/2" x 1-1/4", dual-in-line)
Y	See figure 1 (24-lead, 5/8" x 3/4", flat-pack)
Z	F-5 (16-lead, 1/4" x 3/8", flat-pack except A dimension = 0.1" (2.54 mm) maximum)
U	F-6 (24-lead, 3/8" x 5/8", flat-pack, except A dimension = 0.1" (2.54 mm) maximum)

NOTES:

1. As an exception to 3.5.6.2.3 of MIL-M-38510, for case outlines Z and U only, the leads of bottom brazed ceramic packages (i.e., configuration 2 of case outlines F-5 or F-6) 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 braded packages, case outlines Z and U only, the S₁ dimension may go to .000 inch (.00 mm) minimum.

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

1.3 Absolute maximum ratings.

Supply voltage range- - - - -	-0.5 V dc to +18 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 - - - - -	-65°C to +175°C
Maximum power dissipation (P_D) 1/ - - - -	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 minimum to 5.5 V dc maximum
Input low (V_{IL}) voltage range - - - - -	0-1.5 V dc @ $V_{DD} = 5$ V dc, $V_{OL} = 10\% V_{DD}$, $V_{OH} = 90\% V_{DD}$, 0-2.0 V dc @ $V_{DD} = 10$ V dc, 0-4.0 V dc, @ $V_{DD} = 15$ V dc, 3.5-5.0 V dc @ $V_{DD} = 5$ V dc, $V_{OL} = 10\% V_{DD}$, $V_{OH} = 90\% V_{DD}$, 8.0-10.0 V dc @ $V_{DD} = 10$ V dc, 11.0-15 V dc @ $V_{DD} = 15$ V dc
Input high (V_{IH}) voltage range- - - - -	
Ambient operating temperature range (T_C)-	-55°C to +125°C

2. APPLICABLE DOCUMENTS

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

SPECIFICATION**MILITARY**

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

STANDARD**MILITARY**

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

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

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

3. REQUIREMENTS

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

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein. Although eutectic die bonding is preferred, epoxy die bonding may be performed. However, the resin used shall be Dupont 5504 Conductive Silver Paste, or equivalent which is cured at 200°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 Terminal connections. The terminal connections shall be as specified on figure 2.

3.2.2 Logic diagrams. The logic diagrams shall be as specified on figure 3.

3.2.3 Truth tables. The truth tables shall be as specified on figure 4.

3.2.4 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.

3.2.5 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. The electrical performance characteristics are as specified in table I, and apply over the full recommended ambient operating temperature range, unless otherwise specified.

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

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

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

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

3.6.3 Correctness of indexing and 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 39 (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 tests (method 1015 of MIL-STD-883).

(1) Static tests (test condition A) using circuit shown on figure 5 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 circuit shown on figure 6 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.

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		Units
				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, $I_{IN} = 1 \text{ mA}$	A11	-	1.5	Vdc
Negative clamping input to V_{SS}	$V_{IC(neg)}$	$T_A = 25^{\circ}\text{C}$, $V_{DD} = \text{Open}$, $V_{SS} = \text{GND}$, Output = Open, $I_{IN} = -1 \text{ mA}$	A11	-	-6	Vdc
Quiescent supply current	I_{SS} or I_{DD}	$V_{DD} = 18 \text{ Vdc}$, $V_{IN} = V_{SS}$ or V_{DD} All input combinations	A11	-	-2.5	μA
High level output voltage	V_{OH1}	$V_{DD} = 15 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	14.95	-	Vdc
Low level output voltage	V_{OL1}	$V_{DD} = 15 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	-	0.05	Vdc
Input high voltage	V_{IH1}	$V_{DD} = 5 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	3.5	-	Vdc
	V_{IH2}	$V_{DD} = 10 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	7.0	-	Vdc
	V_{IH3}	$V_{DD} = 15 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	11.0	-	Vdc

See note at end of table.

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		Units
				Min	Max	
Input low voltage	V_{IL1}	$V_{DD} = 5 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	-	1.5	Vdc
	V_{IL2}	$V_{DD} = 10 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	-	3.0	Vdc
	V_{IL3}	$V_{DD} = 15 \text{ Vdc}$ See table III $ I_O \leq 1 \mu\text{A}$	A11	-	4.0	Vdc
Output high (source) current	I_{OH1}	$V_{DD} = 5 \text{ Vdc}$ $V_{OH} = 4.6 \text{ Vdc}$	A11	-0.36	-	mAdc
	I_{OH2}	$V_{DD} = 15 \text{ Vdc}$ $V_{OH} = 13.5 \text{ Vdc}$	A11	-2.4	-	mAdc
Output low (sink) current	I_{OL1}	$V_{DD} = 5 \text{ Vdc}$ $V_{OL} = 0.4 \text{ Vdc}$	A11	0.36	-	mAdc
	I_{OL2}	$V_{DD} = 15 \text{ Vdc}$ $V_{OL} = 1.5 \text{ Vdc}$	A11	2.4	-	mAdc
Input leakage $\frac{1}{\text{current}}$	I_{IH}	$V_{DD} = 18 \text{ Vdc}$ Measure inputs sequentially connect all unused inputs to V_{SS} .	A11	-	45	nA
Input leakage $\frac{1}{\text{current}}$	I_{IL}	$V_{DD} = 18 \text{ Vdc}$ Measure inputs sequentially connect all unused inputs to V_{DD} .	A11	-	-45	nA

See note at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions	Device type	Limits		Units
				Min	Max	
		$V_{SS} = 0 \text{ V}$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ Unless otherwise specified				
Input capacitance	C_i	$V_{DD} = 0 \text{ Vdc}$, $f = 1 \text{ MHz}$, $T_A = 25^{\circ}\text{C}$	A11	-	7.5	pF
Input test voltage	V_{ZAP}	$C_1 = 100 \text{ pF}$ $R_Z = 1.5 \text{ k}\Omega$ (see 4.5.3)	A11	400	-	V
Minimum setup time	t_s	$V_{DD} = 5 \text{ Vdc}$, $C_L = 50 \text{ pF}$ (See figure 7)	01 02		210	ns
Propagation delay times data to output High to low level Low to high level	t_{PHL1}	$V_{DD} = 5 \text{ Vdc}$ $C_L = 50 \text{ pF}$ $R_L = 200 \text{ k}\Omega$ (See figure 7)	01	49	1360	ns
	t_{PLH1}		02			
Propagation delay times inhibit to output High to low level Low to high level	t_{PHL2}		01	25	700	ns
	t_{PLH2}		02			
Propagation delay times E1 to E0 High to low level Low to high level	t_{PHL1}		03	11	310	ns
	t_{PLH1}					
Propagation delay times E1 to GS High to low level Low to high level	t_{PHL2}		03	11	310	ns
	t_{PLH2}					
Propagation delay times E1 to Qn outputs High to low level Low to high level	t_{PHL3}		03	17	480	ns
	t_{PLH3}					
Propagation delay times Dn to GS High to low level Low to high level	t_{PHL4}		03	17	480	ns
	t_{PLH4}					
Propagation delay times Dn to Qn outputs High to low level Low to high level	t_{PHL5}		03	22	620	ns
	t_{PLH5}					

See note at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions	Device type	Limits		Units
				Min	Max	
		$V_{SS} = 0 \text{ V}$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ Unless otherwise specified				
Propagation delay times input to output		$V_{DD} = 5 \text{ Vdc}$ $C_L = 50 \text{ pF}$ $R_L = 200 \text{ k}\Omega$ (See figure 7)				
High to low level	t_{PHL1}		04	22	620	ns
Low to high level	t_{PLH1}					
Propagation delay times E to output						
High to low level	t_{PHL2}		04	20	560	ns
Low to high level	t_{PLH2}					
Propagation delay times input to outputs						
High to low level	t_{PHL1}		05	22	620	ns
Low to high level	t_{PLH1}					
Propagation delay times E to outputs						
High to low level	t_{PHL2}		05	20	560	ns
Low to high level	t_{PLH2}					
Transition times		$V_{DD} = 5 \text{ Vdc}$, $C_L = 50 \text{ pF}$ $R_L = 200 \text{ k}\Omega$ (See figure 7)				
High to low level	t_{THL}		A11	10	280	ns
Low to high level	t_{TLH}		A11	10	280	ns
Propagation delay times data to output		$V_{DD} = 10 \text{ Vdc}$ $R_L = 200 \text{ k}\Omega$ $C_L = 50 \text{ pF}$ (See figure 7)				
High to low level	t_{PHL1}		01	19	370	ns
Low to high level	t_{PLH1}		02			
Propagation delay times inhibit to output						
High to low level	t_{PHL2}		01	11	220	ns
Low to high level	t_{PLH2}		02			
Propagation delay times E1 to E0						
High to low level	t_{PHL1}		03	6	110	ns
Low to high level	t_{PLH1}					

See note at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions	Device type	Limits		Units
				Min	Max	
		$V_{SS} = 0 \text{ V}$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ Unless otherwise specified				
Propagation delay times E1 to GS High to low level Low to high level	t_{PHL2} t_{PLH2}	$V_{DD} = 10 \text{ Vdc}$ $C_L = 50 \text{ pF}$ $R_L = 200 \text{ k}\Omega$ (See figure 7)	03	6	110	ns
Propagation delay times E1 to Qn outputs High to low level Low to high level	t_{PHL3} t_{PLH3}		03	9	170	ns
Propagation delay times Dn to GS High to low level Low to high level	t_{PHL4} t_{PLH4}		03	9	170	ns
Propagation delay times Dn to Qn outputs High to low level Low to high level	t_{PHL5} t_{PLH5}		03	11	220	ns
Propagation delay times input to output High to low level Low to high level	t_{PHL1} t_{PLH1}		04	10	190	ns
Propagation delay times E to output High to low level Low to high level	t_{PHL2} t_{PLH2}		04	9	170	ns
Propagation delay times input to outputs High to low level Low to high level	t_{PHL1} t_{PLH1}		05	10	190	ns
Propagation delay times E to outputs High to low level Low to high level	t_{PHL2} t_{PLH2}		05	9	170	ns
Transition times High to low level Low to high level	t_{THL} t_{TLH}	$V_{DD} = 10 \text{ Vdc}$, $C_L = 50 \text{ pF}$ $R_L = 200 \text{ k}\Omega$ (See figure 7)	A11 A11	5 5	100 100	ns ns

1/ Input current of one input node.

TABLE II. Burn-in and electrical test requirements.

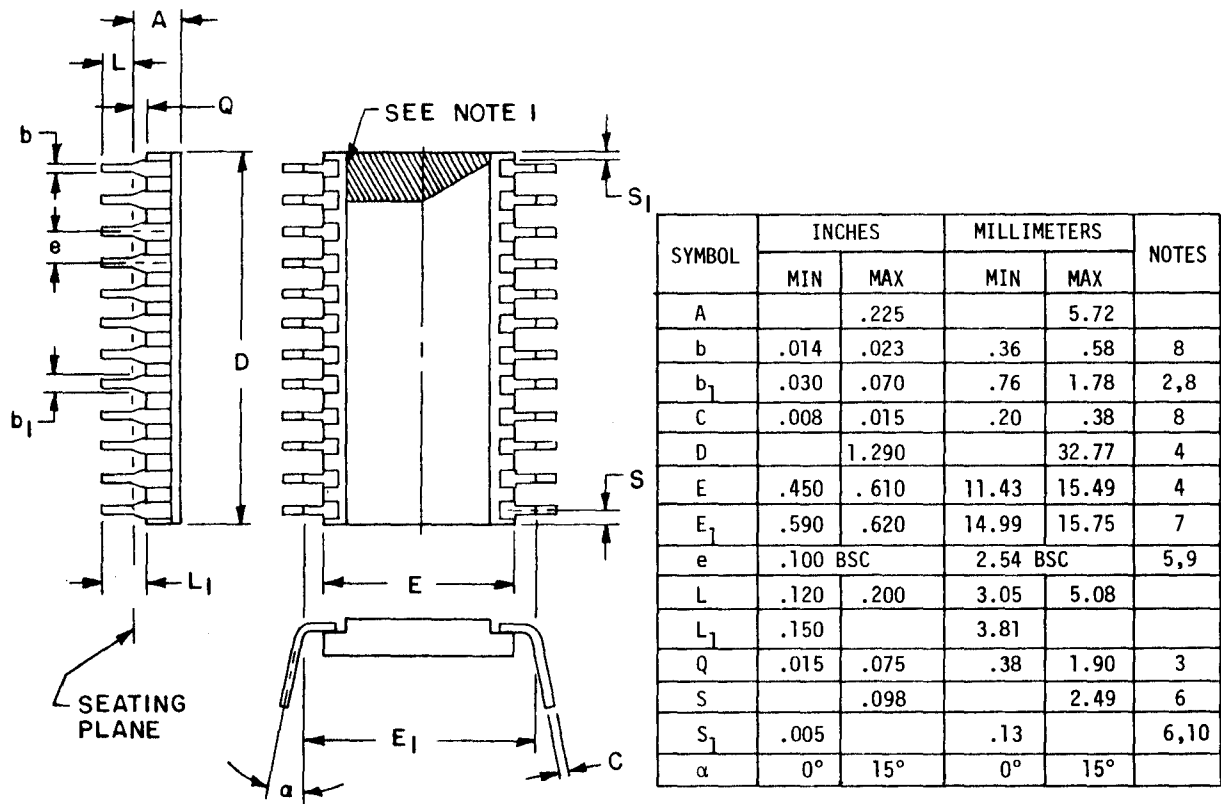
Line no.	Applicable tests and MIL-STD-883 test methods	Class S device <u>1/</u>				Class B device <u>1/</u>			
		Ref. par.	Table 2/ III sub-groups	Table 3/ IV delta limits	Test circuit figure	Ref. par.	Table 2/ III sub-groups	Table 3/ IV delta limits	Test circuit figure
1	Interim electrical parameters (method 5004)		1				1		
2	Static burn-in I (method 1015)	4.2b 4.5.2			5				
3	Same as line 1		1	Δ					
4	Static burn-in II (method 1015)	4.2b 4.5.2			5	4.2b 4.5.2	<u>4/</u>		5
5	Same as line 1		1*	Δ		4.2d	1*	Δ	
6	Dynamic burn-in (method 1015)	4.2b 4.5.2			6				
7	Same as line 1	4.2d	1*	Δ					
8	Final electrical parameters (method 5004)		1*,2,3 7,9				1*,2,3, 7,9		
9	Group A test requirements (method 5005)	4.4.1	1,2,3,4, 7,8,9, 10,11			4.4.1	1,2,3, 4,7,9, 10,11		
10	Group B V _{ZAP} requirement	4.4.2 4.5.3			8	4.4.2 4.5.3			8
11	Group C end-point electrical parameters (method 5005)					4.4.3	1,2,3	Δ	
13	Group D end-point electrical parameters (method 5005)	4.4.4	1,2,3			4.4.4	1,2,3		

1/ Blank spaces indicate tests are not applicable.

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

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

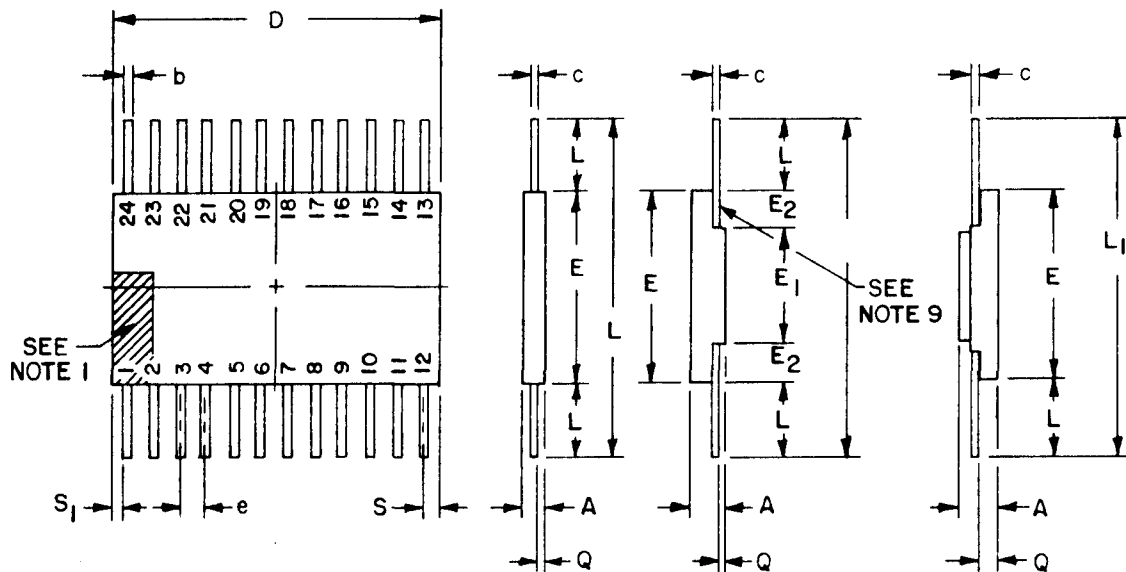
4/ The device manufacturer may at his option either perform delta measurements or within 24 hours after burn-in (or removal of bias) perform the final electrical parameter measurements.



NOTES:

1. Index area; a notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The minimum limit for dimension S₁ may be .020 (.51 mm) for leads number 1, 12, 13, and 24 only.
3. Dimension Q shall be measured from the seating plane to the base plane.
4. This dimension allows for off-center lid, meniscus and glass overrun.
5. The basic pin spacing is .100 (2.54 mm) between centerlines. Each pin centerline shall be located within ±.010 (.25 mm) of its exact longitudinal position relative to pins 1 and 24.
6. Applies to all four corners (leads number 1, 12, 13, and 24).
7. Lead center when α is 0°. E₁ shall be measured at the centerline of the leads.
8. All leads.
9. Twenty-two spaces.
10. Dimension S₁ may be .000 (.00 mm) if the leads are brazed to the ceramic body.

FIGURE 1. Case outline X (24-lead, 1/2" x 1-1/4").



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	.045	.115	1.14	2.92	
b	.015	.019	.38	.48	5
c	.003	.006	.08	.15	5
D		.725		18.42	3
E	.570	.650	14.48	16.51	3
e	.050 BSC		1.27 BSC		4,6
L	.250	.370	6.35	9.40	
L ₁	.860		21.84		
Q	.010	.060	.25	1.52	
S		.045		1.14	7
S ₁	.005		.13		7,8

NOTES:

1. Index area; a notch or a pin one identification mark shall be located adjacent to pin one and shall be within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. Dimension Q shall be measured at the point of exit of the lead from the body.
3. This dimension allows for off-center lid, meniscus and glass overrun.
4. The basic pin spacing is .050 (1.27 mm) between centerlines. Each pin centerline shall be located within $\pm .005$ (.13 mm) of its exact longitudinal position relative to pins 1 and 24.
5. All leads.
6. Twenty-two spaces.
7. Applies to all four corners (leads number 1, 12, 13, and 24).
8. Dimension S₁ may be .000 (.00 mm) if leads number 1, 12, 13, and 24 bend toward the cavity of the package within one lead width from the point of entry of the lead into the body or if the leads are brazed to the metallized ceramic body.
9. Optional configuration. If this configuration is used, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.

FIGURE 1. Case outline Y (24-lead 5/8" x 3/4") - Continued.

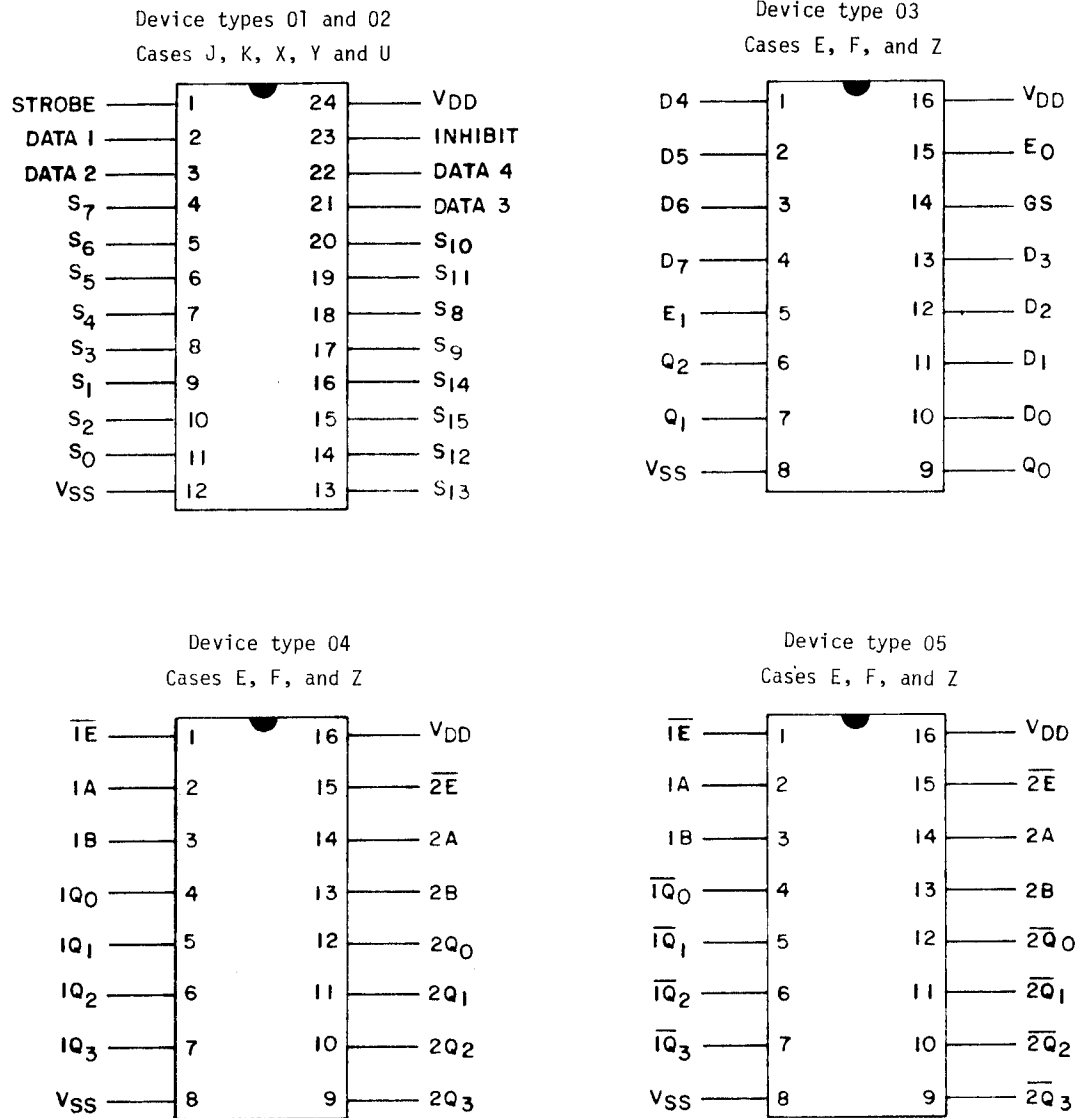
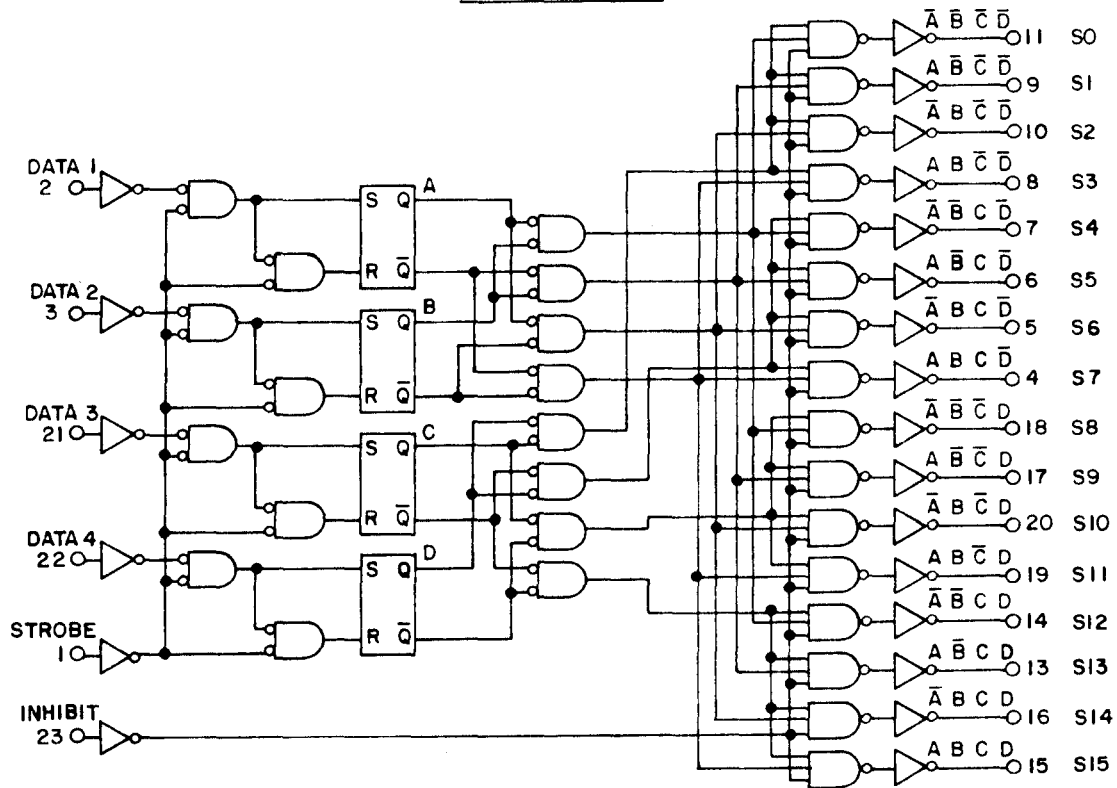
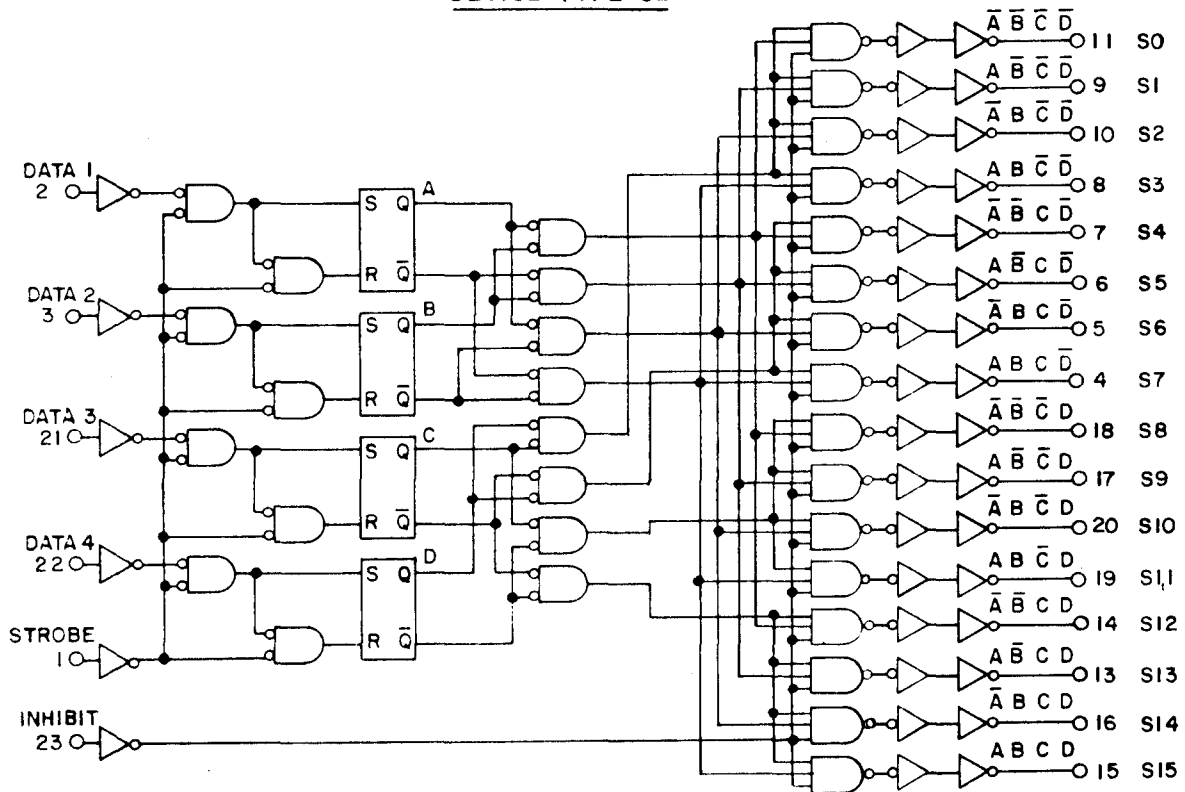
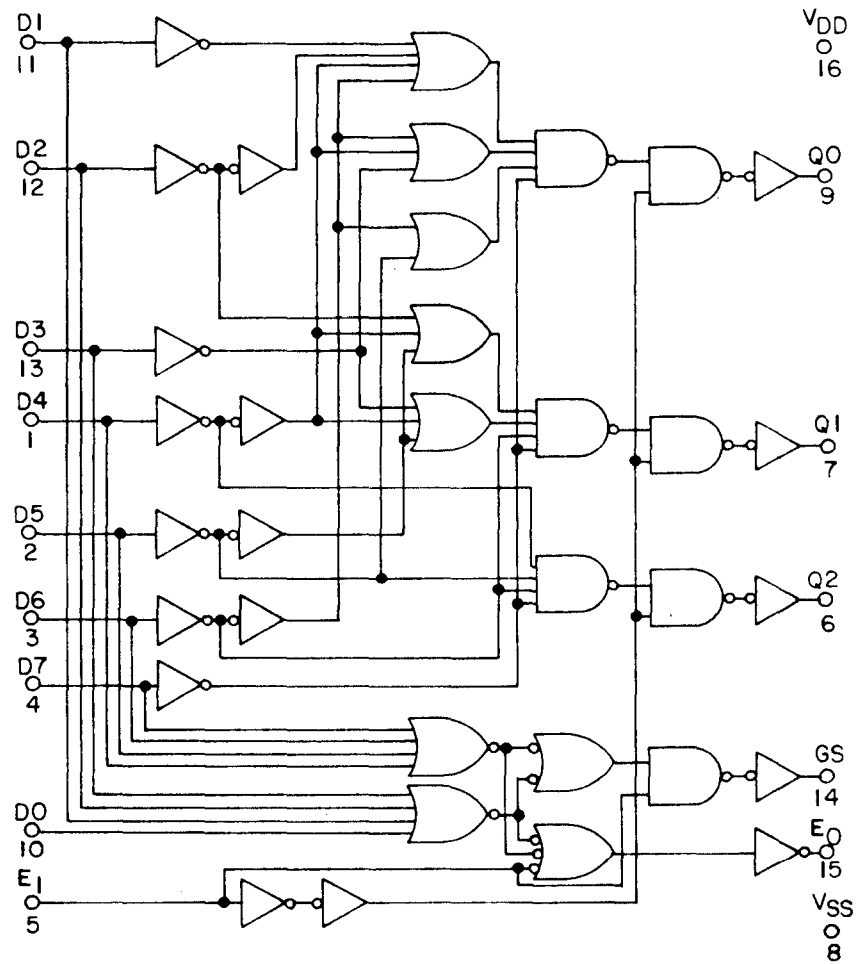


FIGURE 2. Terminal connections.

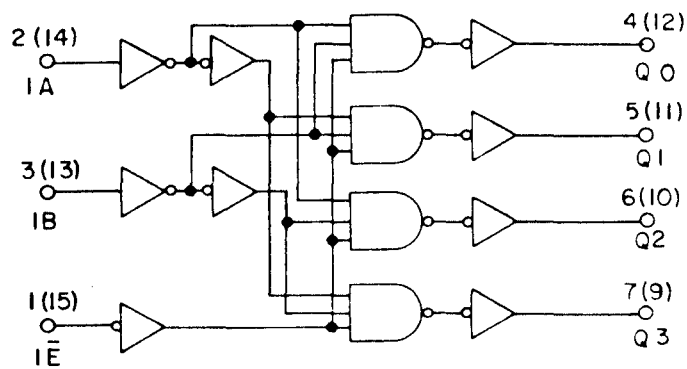
DEVICE TYPE OIFIGURE 3. Logic diagrams.

DEVICE TYPE 02FIGURE 3. Logic diagrams - Continued.



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DEVICE TYPE 04
(ONE OF TWO CIRCUITS SHOWN)



DEVICE TYPE 05
(ONE OF TWO CIRCUITS SHOWN)

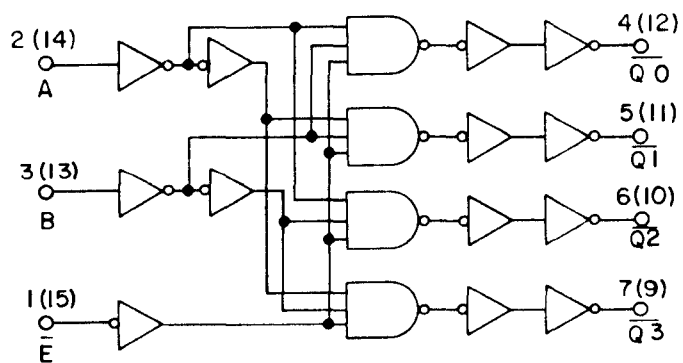


FIGURE 3. Logic diagrams - Continued.

Device types 01 and 02

DECODE TRUTH TABLE (Strobe = 1)

Inhibit	Decoder inputs				Selected output Type 01 = Logic 1 (High) Type 02 = Logic 0 (Low)
	D ₄	D ₃	D ₂	D ₁	
0	0	0	0	0	S0
0	0	0	0	1	S1
0	0	0	1	0	S2
0	0	0	1	1	S3
0	0	1	0	0	S4
0	0	1	0	1	S5
0	0	1	1	0	S6
0	0	1	1	1	S7
0	1	0	0	0	S8
0	1	0	0	1	S9
0	1	0	1	0	S10
0	1	0	1	1	S11
0	1	1	0	0	S12
0	1	1	0	1	S13
0	1	1	1	0	S14
0	1	1	1	1	S15
1	X	X	X	X	All outputs = 0, type 01 All outputs = 1, type 02

X = Don't care Logic 1 = High Logic 0 = Low

Device type 03

Input									Output				
E ₁	D7	D6	D5	D4	D3	D2	D1	D0	GS	Q2	Q1	Q0	E ₀
0	X	X	X	X	X	X	X	X	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	1
1	1	X	X	X	X	X	X	X	1	1	1	1	0
1	0	1	X	X	X	X	X	X	1	1	1	0	0
1	0	0	1	X	X	X	X	X	1	1	0	1	0
1	0	0	0	1	X	X	X	X	1	1	0	0	0
1	0	0	0	0	1	X	X	X	1	0	1	1	0
1	0	0	0	0	0	1	X	X	1	0	1	0	0
1	0	0	0	0	0	0	1	X	1	0	0	1	0
1	0	0	0	0	0	0	0	1	1	0	0	0	0

X = Don't Care

Logic 1 = High

Logic 0 = Low

FIGURE 4. Truth table.

Device type 04

TRUTH TABLE						
Inputs			Outputs			
E	B	A	Q3	Q2	Q1	Q0
0	0	0	0	0	0	1
0	0	1	0	0	1	0
0	1	0	0	1	0	0
0	1	1	1	0	0	0
1	X	X	0	0	0	0

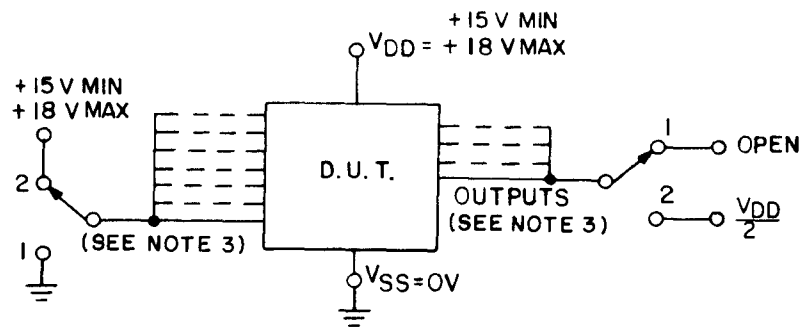
X = Don't Care
 Logic 1 = High; Logic 0 = Low

Device type 05

TRUTH TABLE						
Inputs			Outputs			
E	B	A	$\overline{Q3}$	$\overline{Q2}$	$\overline{Q1}$	$\overline{Q0}$
0	0	0	1	1	1	0
0	0	1	1	1	0	1
0	1	0	1	0	1	1
0	1	1	0	1	1	1
1	X	X	1	1	1	1

X = Don't Care
 Logic 1 = High; Logic 0 = Low

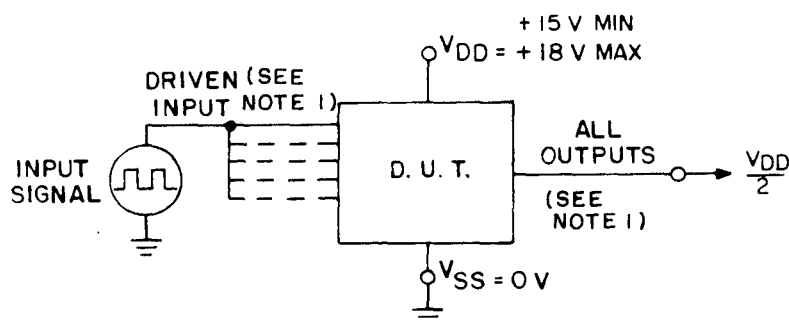
FIGURE 4. Truth table - Continued.



NOTES:

1. For static burn-in I, all inputs are connected to 0 volts, switch position 1.
2. For static burn-in II, all inputs are connected to V_{DD} , switch position 2.
3. Except for V_{DD} and V_{SS} , each terminal shall be connected through a resistor whose value is 2 k Ω 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.
4. Output may be in switch position 1 or 2.

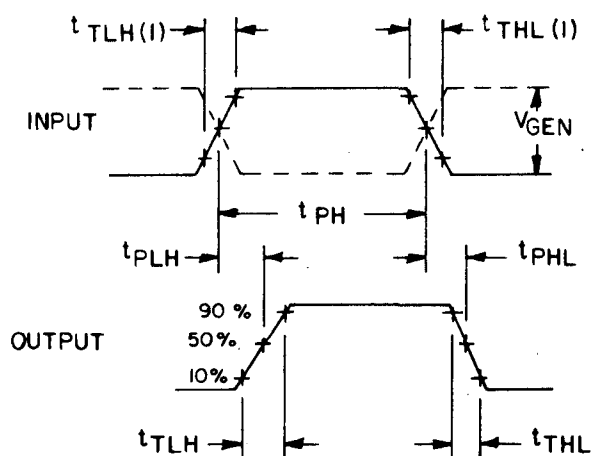
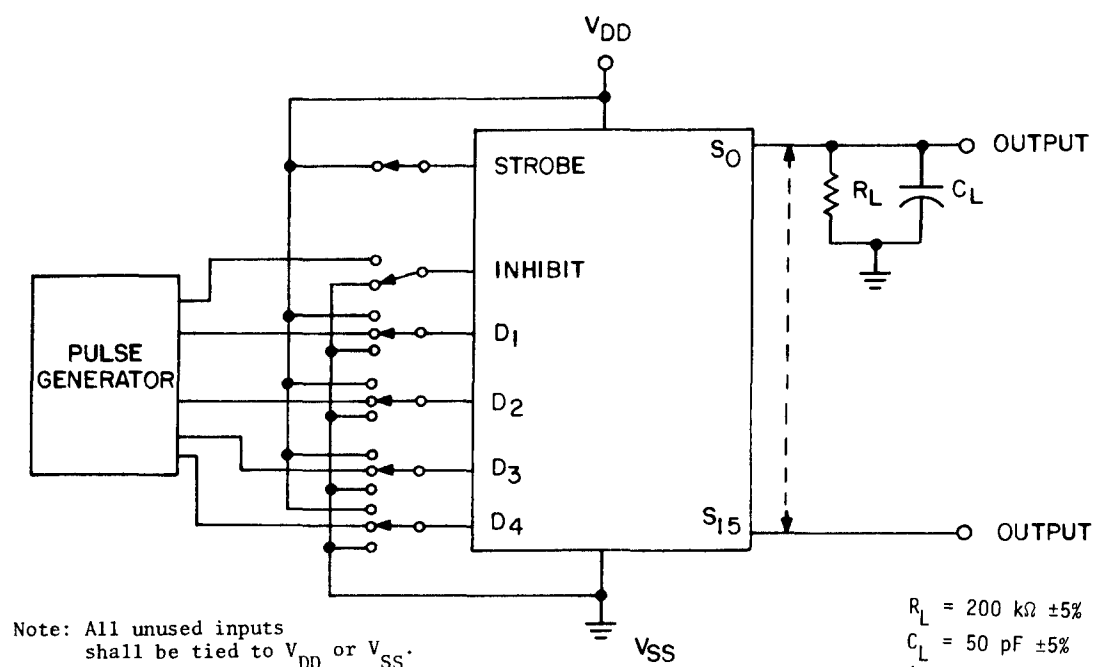
FIGURE 5. Static burn-in test circuits.



NOTES:

1. Except for V_{DD} and V_{SS} , each terminal shall be connected through a resistor whose value is $2 \text{ k}\Omega$ to $47 \text{ k}\Omega$. The actual measured value of the resistor selected shall not exceed $\pm 20\%$ of its branded value due to use, heat or age.
2. Input signal requirements:
 - a. Square wave, 50% duty cycle.
 - b. $25 \text{ kHz} < \text{PRR} < 1 \text{ MHz}$.
 - c. t_{TLH} and $t_{THL} < 1 \mu\text{s}$.
 - d. Voltage level:
 - Minimum = $V_{SS} - 0.5 \text{ V}$, $+10\% V_{DD}$.
 - Maximum = $V_{DD} + 0.5 \text{ V}$, $-10\% V_{DD}$.
3. Strobe input shall be connected to V_{DD} and inhibit shall be connected to V_{SS} (for device types 01 and 02 only).
4. Enable input shall be connected to V_{SS} for device types 04 and 05; enable input shall be connected to V_{DD} for device type 03.

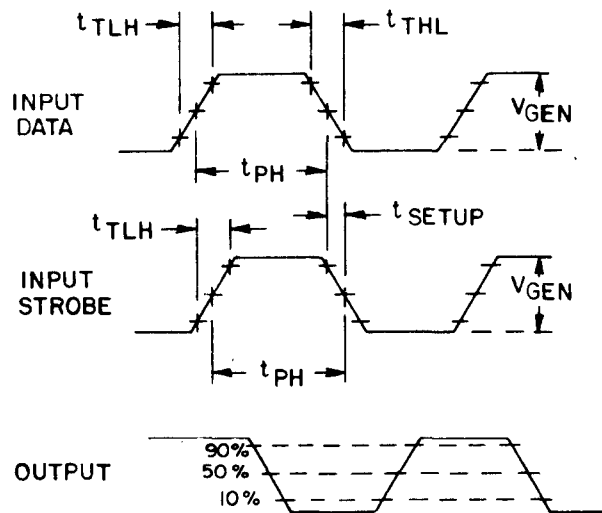
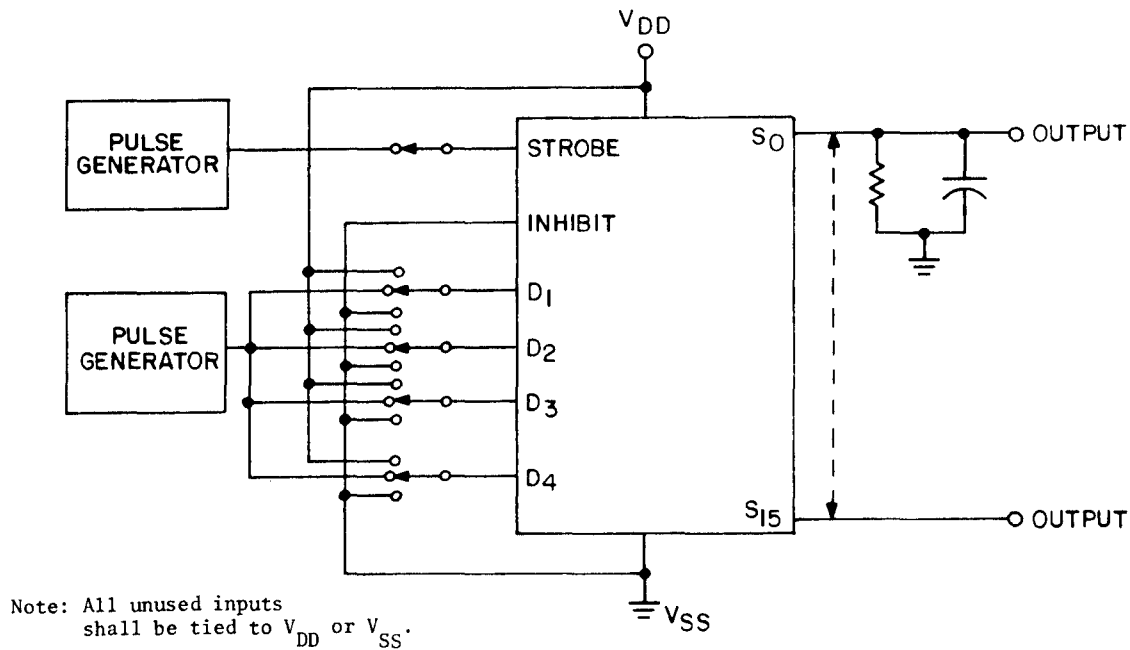
FIGURE 6. Dynamic burn-in and steady-state life test circuits.



NOTES:

1. The pulse generator has the following characteristics: $V_{GEN} = V_{DD} \pm 1.0\%$, $t_{PH} = 1.0 \pm 0.1\text{ }\mu\text{s}$, $t_{THL(1)}$ and $t_{TLH(1)} = 20 \pm 2\text{ ns}$ and $PRR = 500\text{ kHz}$.
2. All outputs shall have the same load circuit as shown for the S_0 output.
3. See table III for complete terminal conditions.

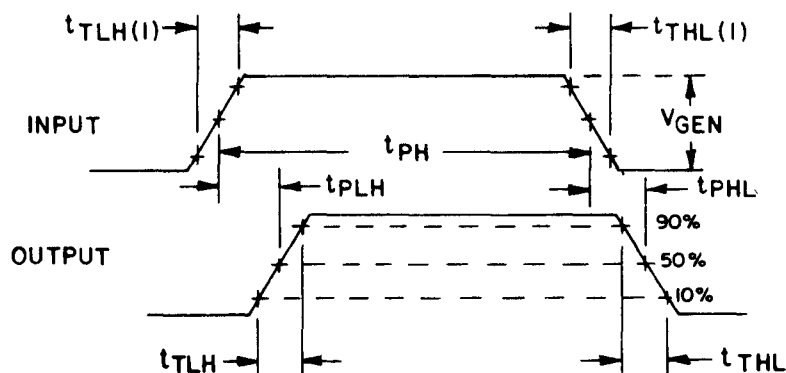
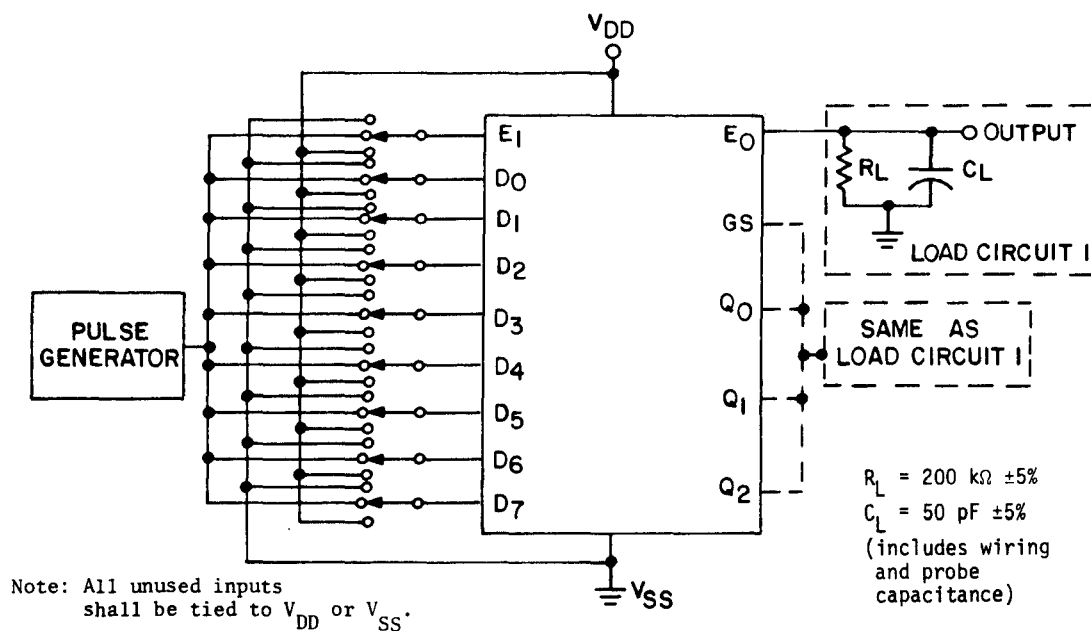
FIGURE 7. Switching time test circuit and waveforms for device types 01 and 02.



NOTES:

1. The pulse generators have the following characteristics: $V_{GEN} = V_{DD} \pm 1.0\%$, $t_{PH} = 1.0 \mu s \pm 0.1 \mu s$, t_{THL} and $t_{TLH} = 20 \pm 2 \text{ ns}$ and $PRR = 500 \text{ kHz}$.
2. Requirements for setup times are considered met if proper output state changes occur with t_{SETUP} set to that given in the limits column of table III.

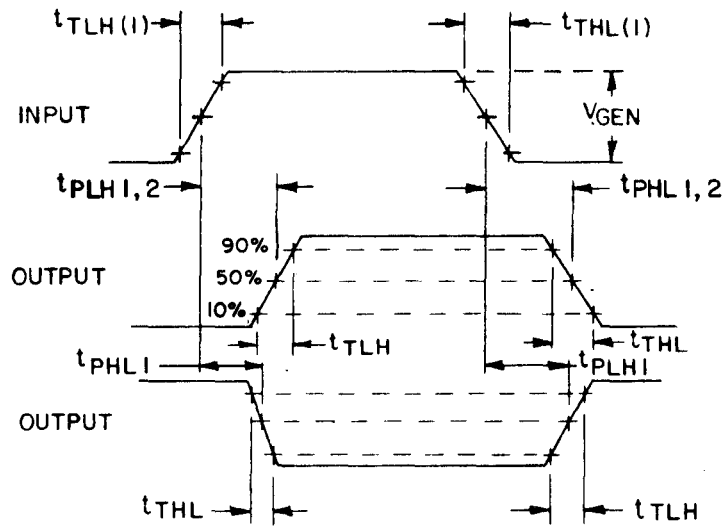
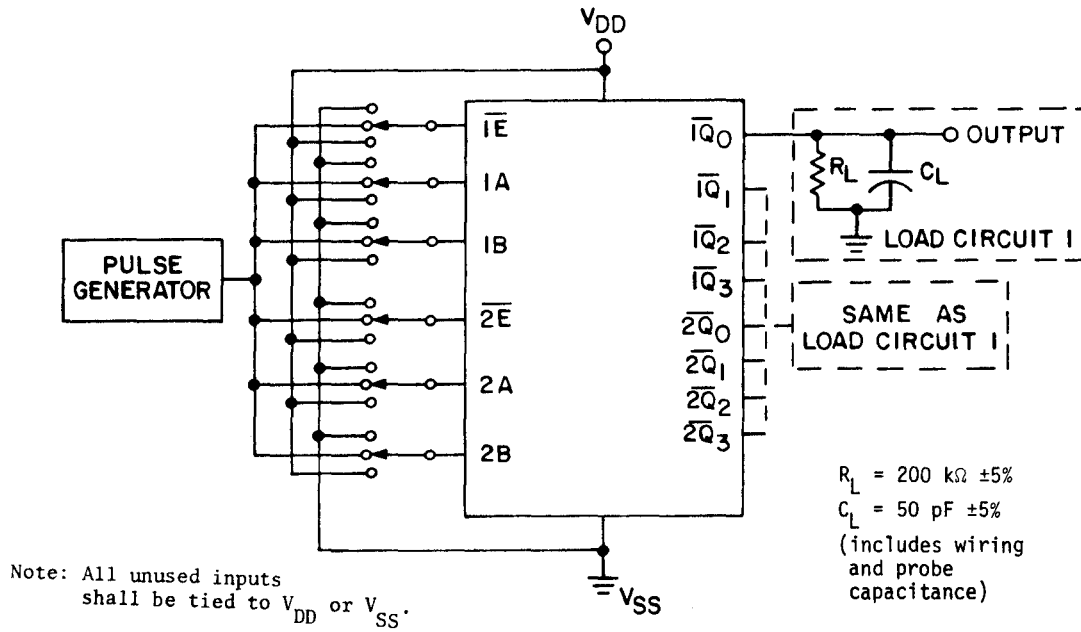
FIGURE 7. Switching time circuit and waveforms for device types 01 and 02 - Continued.



NOTES:

1. The pulse generator has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1\%$, $t_{PH} = 1.0 \pm 0.1\text{ }\mu\text{s}$, $t_{THL(1)}$ and $t_{TLH(1)} = 20 \pm 2\text{ ns}$ and $PRR = 1\text{ MHz}$.
2. See table III for complete terminal conditions.

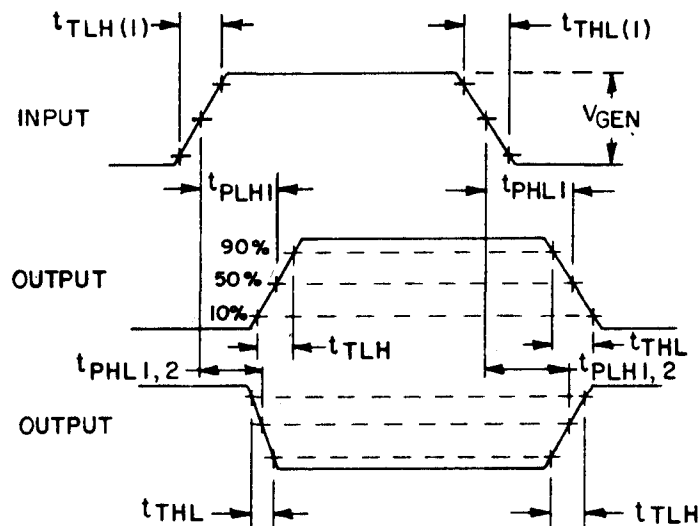
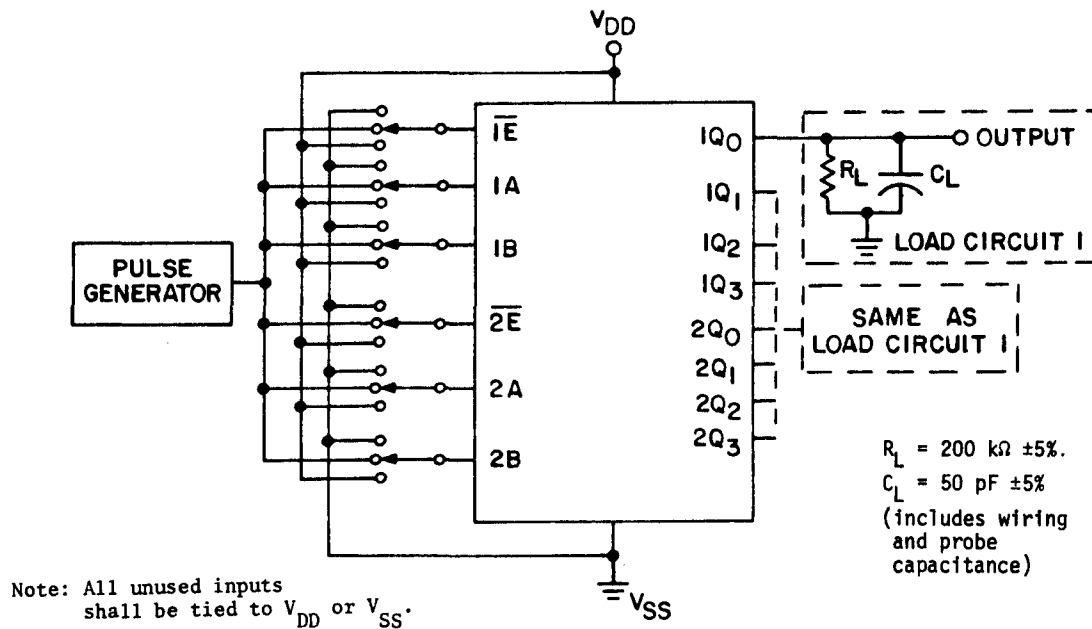
FIGURE 7. Switching time test circuit and waveforms for device type 03 - Continued.



NOTES:

- The pulse generator has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1\%$, $t_{PH} = 1.0 \pm 0.1 \mu\text{s}$, $t_{THL(1)}$ and $t_{TLH(1)} = 20 \pm 2 \text{ ns}$ and $\text{PRR} = 1 \text{ MHz}$.
- See table III for complete terminal conditions.

FIGURE 7. Switching time test circuit and waveforms for device type 05 - Continued.



NOTES:

1. The pulse generator has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1\%$, $t_{PH} = 1.0 \pm 0.1 \mu\text{s}$, $t_{THL(1)}$ and $t_{TLH(1)} = 20 \pm 2 \text{ ns}$ and $\text{PRR} = 1 \text{ MHz}$.
2. See table III for complete terminal conditions.

FIGURE 7. Switching time test circuit and waveforms for device type 04 - Continued.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Cases X, Y, U	Terminal conditions 1/																								Measured terminal	Test limits						Units	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C			
			Symbol	ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																																
V _{IC} (pos)		1 2 3 4 5 6	1mA	1mA	1mA																				GND	ST D1 D2 D3 D4 I	1.5					V _{dc}			
V _{IC} (neg)		7 8 9 10 11 12	-1mA	-1mA	-1mA								GND												ST D1 D2 D3 D4 I	-6.0									
V _{SS}	3005	13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	18V	GND 18V 																															

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases J, K, X, Y, U	Terminal conditions 1/																								Measured terminal	Test limits						Units	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C			
			Symbol	ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																																
V _{OH1} ↓ V _{OL1} ↓ V _{IL1} V _{IL2} V _{IL3} V _{IH1} V _{IH2} V _{IH3} I _{OL1} ↓	3006	56	15V	GND	15V									GND																					V _{dc}
		57		15V	GND																			15V	GND	GND	15V								
		58			GND																				GND	15V									
		59			15V	GND																													
		60			GND																														
		61			15V	GND																													
		62			GND																														
		63			15V	GND																													
		64			GND																														
		65			15V																														
V _{OL1} ↓ V _{IL1} V _{IL2} V _{IL3} V _{IH1} V _{IH2} V _{IH3} I _{OL1} ↓	3007	66																						15V											
		67																																	
		68																																	
		69																																	
		70																																	
		71																																	
		72																																	
		73																																	
		74																																	
		75																																	
V _{IL1} V _{IL2} V _{IL3} V _{IH1} V _{IH2} V _{IH3} I _{OL1} ↓	82	82	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	A11 Outputs	3/	3/	3/	3/	3/	3/			
		83																																	
		84																																	
		85																																	
		86																																	
		87																																	
		88	GND	GND	GND	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	0.4V	GND	GND	5.0V	5.0V	S7	0.51		0.36	0.64	mA		
		89																										S6							
		90																										S5							
		91																										S4							
V _{IL1} V _{IL2} V _{IL3} V _{IH1} V _{IH2} V _{IH3} I _{OL1} ↓	82	92																								S3									
		93																										S1							
		94																										S2							
		95																										S0							
		96																										S13							
		97																										S12							
		98																										S15							
		99																										S14							
		100																										S9							
		101																										S8							
102																										S11									
103																																			

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases J, K X, Y, U 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	15	16	17	18	19	20	21	22	23	24		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C		
			ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{DD}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I	V _{DD}		Min	Max	Min	Max	Min	Max	
I _{OL2}		104	GND	GND	GND	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	1.5V	GND										GND	GND	15V	15V	S7	3.4		2.4		4.2	μV	
		105																									S6							
		106																									S5							
		107																									S4							
		108																									S3							
		109																									S1							
		110																									S2							
		111																									S0							
		112																									S13							
		113																									S12							
		114																									S15							
		115																									S14							
		116																									S9							
		117																									S8							
		118																									S11							
		119																									S10							
I _{OH1}		120	5V	GND	GND								GND												GND	5V	S0	-0.51		-0.36		-0.64	μV	
		121		GND	GND								5V														S1							
		122		GND	5V								5V														S2							
		123		GND	5V								5V														S3							
		124		GND	GND								GND														S4							
		125		5V	GND								GND														S5							
		126		GND	5V								5V														S6							
		127		5V	5V								5V														S7							
		128		GND	GND								GND														S8							
		129		5V	GND								5V														S9							
		130		GND	5V								5V														S10							
		131		5V	5V								5V														S11							
		132		GND	GND								GND														S12							
		133		5V	GND								5V														S13							
		134		GND	5V								GND														S14							
		135		5V	5V								5V														S15							
I _{OH2}		136	15V	GND	GND								GND												GND	GND	S0	-3.4		-2.4		-4.2	μV	
		137		15V	GND								GND														S1							
		138		GND	15V								15V														S2							
		139		GND	15V								15V														S3							
		140		GND	GND								GND														S4							
		141		15V	GND								15V														S5							
		142		GND	15V								GND														S6							
		143		15V	15V								15V														S7							
		144		GND	GND								GND														S8							
		145		15V	GND								15V														S9							
		146		GND	15V								GND														S10							
		147		15V	15V								15V														S11							
		148		GND	GND								GND														S12							
		149		15V	GND								15V														S13							
		150		GND	15V								GND														S14							
		151		15V	15V								15V														S15							
I _{IH1}	3010	152	18V	18V	18V																						All inputs together		6				nA	
		4/																																

See notes at end of table.

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

6) L...M-38514/1/3E

See notes at end of table.

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

[illegible]

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases J, K X, Y, U Symbol Test No.	Terminal conditions 1/																								Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 9 T _A = 25°C		Subgp 10 T _A = 125°C		Subgp 11 T _A = -55°C		
			ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I	V _{DO}		Min	Max	Min	Max	Min	Max	
			Test No.																															
t _{PHL2} & t _{PLH2}	3003 Fig 7	241	5V	GND	GND								OUT	GND									GND	GND	IN	5V	I to S0	25	500	35	700	25	500	ns
		242	5V	GND	5V																					I to S1								
		243	GND	GND	5V																					I to S2								
		244	5V	GND	5V																					I to S3								
		245	GND	GND	GND																					I to S4								
		246	5V	GND	GND																					I to S5								
		247	GND	5V	5V		OUT																			I to S6								
		248	5V	GND	GND																					I to S7								
		249	GND	GND	GND															OUT	OUT					I to S8								
		250	5V	5V	GND																	OUT				I to S9								
		251	GND	5V	5V																		OUT			I to S10								
		252	5V	GND	GND																					I to S11								
		253	GND	GND	GND											OUT										I to S12								
		254	5V	GND	GND													OUT								I to S13								
		255	GND	5V	5V																					I to S14								
		256	5V	5V	5V																					I to S15								
t _{THL} & t _{TLH}	3004 Fig 7	257		IN	GND							OUT	OUT	OUT									GND	GND	GND		S0	10	200	14	280	10	200	
		258		IN	GND																					S1								
		259		GND	IN																					S2								
		260		IN	5V																					S3								
		261		GND	GND																					S4								
		262		5V	GND																					S5								
		263		GND	5V		OUT																			S6								
		264		5V	5V																					S7								
		265		GND	GND																					S8								
		266		5V	GND															OUT	OUT					S9								
		267		GND	5V																	OUT				S10								
		268		IN	5V																					S11								
		269		GND	GND																					S12								
		270		5V	GND																					S13								
		271		GND	IN											OUT										S14								
		272		5V	5V													OUT								S15	10	200	14	280	10	200		
t _{PLH1} & t _{PHL1}	3003 Fig 7	273	10.0	IN	GND							OUT	GND										GND	GND	GND	10.0V	D1 to S0	19	370					
		274		IN	GND																					D1 to S1								
		275		GND	IN																					D2 to S2								
		276		IN	10.0																					D3 to S3								
		277		GND	GND																					D4 to S4								
		278		10.0	GND																					D5 to S5								
		279		GND	10.0																					D6 to S6								
		280		10.0	10.0		OUT																			D7 to S7								
		281		GND	GND																					D8 to S8								
		282		10.0	GND																					D9 to S9								
		283		GND	10.0																OUT	OUT				D10 to S10								
		284		IN	10.0																					D1 to S11								
		285		GND	GND																					D2 to S12								
		286		10.0	GND																					D3 to S13								
		287		GND	IN											OUT										D4 to S14								
		288		10.0	10.0																					D5 to S15								

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases J,K, X,Y,U	Terminal conditions 1/																								Measured terminal	Test limits						Units	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 12 T _A = 25°C							
			Symbol	S1	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																																
t _{PHL2} & t _{PLH2}	3003 Fig 7	289	10.0	10.0	GND							OUT	GND										GND	GND	IN	10.0V	I to S0	11	220			ns			
		290		10.0	GND																					I to S1									
		291		GND	10.0																						I to S2								
		292		10.0	10.0						OUT		OUT														I to S3								
		293		GND	GND																						I to S4								
		294		10.0	GND																						I to S5								
		295		GND	10.0																						I to S6								
		296		10.0	10.0		OUT		OUT																		I to S7								
		297		GND	GND																						I to S8								
		298		10.0	GND															OUT		OUT					I to S9								
		299		GND	10.0																						I to S10								
		300		10.0	10.0																		OUT				I to S11								
		301		GND	GND											OUT	OUT		OUT								I to S12								
		302		10.0	GND																						I to S13								
		303		GND	10.0																						I to S14								
		304		10.0	10.0																						I to S15								
t _{THL} & t _{TLH}	3004 Fig 7	305		IN	GND							OUT											GND	GND	GND		S0	5	100						
		306		IN	GND																					S1									
		307		GND	IN																						S2								
		308		10.0	GND																						S3								
		309		GND	GND						OUT		OUT														S4								
		310		10.0	GND																						S5								
		311		GND	10.0																						S6								
		312		10.0	10.0		OUT		OUT																		S7								
		313		GND	GND																						S8								
		314		10.0	GND																						S9								
		315		GND	10.0																						S10								
		316		IN	10.0																						S11								
		317		GND	GND																						S12								
		318		10.0	GND											OUT	OUT		OUT								S13								
		319		GND	IN																						S14								
		320		10.0	10.0																						S15								

See notes 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} terminal 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 following timing sequence and input/output conditions shall apply.
 These tests require only a summary of attributes data.

[illegible]

* TIME SLOT 32 and Outputs S0: Inhibit shall go from 1 to 0 level before the strobe input goes from 1 to 0.

Input/output conditions

Test	V_{DD}	Input levels		Output levels	
		1	0	1	0
	<u>Volts</u>			<u>Min</u>	<u>Max</u>
V_{IH1} V_{IL1}	5.0	3.5V	1.5V	4.5V	0.5V
V_{IH2} V_{IL2}	10.0	7.0V	3.0V	9.0V	1.0V
V_{IH3} V_{IL3}	15.0	11.0V	4.0V	13.5V	1.5V

- 4/ 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.
- 5/ See 4.4.1c.
- 6/ The Truth Table Tests shall be performed in sequence.
- 7/ The Truth Table Tests shall be performed at V_{IH} and $V_{DD} \leq 5 \text{ Vdc}$ and $\geq 18 \text{ Vdc}$. $L = V_{SS} + 0.50 \text{ V}$ maximum and $H = V_{DD} - 0.50 \text{ V}$ minimum.
- 8/ t_{SETUP} may be performed concurrently with t_{PLH} and t_{PHL} , using the maximum allowed test t_{SETUP} .

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases J, K, X, Y, U Symbol	Terminal conditions 1/																								Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C		
			ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I	V _{DO}		Min	Max	Min	Max	Min	Max	
			Test No.																															
V _{IC} (pos)		1 2 3 4 5 6	1mA	1mA	1mA																						ST D1 D2 D3 D4		1.5					V _{IC}
V _{IC} (neg)		7 8 9 10 11 12	-1mA	-1mA	-1mA																						ST D1 D2 D3 D4		-6					
I _{SS} Z/	3005	13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	18V	GND 18V GND																														

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Cases J,K, X,Y,U Symbol	Terminal conditions 1/																								Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C		
			ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	SS	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I	V _{DD}		Min	Max	Min	Max	Min	Max	
			Test No.																															
V _{OL1}	3007	50	15V	GND									GND										GND	GND	GND	15V	S0						V _{dc}	
		51		15V	GND																					S1	0.05			0.05				
		52		GND	15V																					S2								
		53		15V	15V																					S3								
		54		GND	GND																					S4								
		55		15V	GND																					S5								
		56		GND	15V																					S6								
		57		15V	15V																					S7								
		58		GND	GND																					S8								
		59		15V	GND																					S9								
		60		GND	15V																					S10								
		61		15V	15V																					S11								
		62		GND	GND																					S12								
		63		15V	GND																					S13								
		64		GND	15V																					S14								
		65		15V	15V																					S15								
V _{OH1}	3006	66																								S0	14.95		14.95		14.95			
		67																								S1								
		68																								S2								
		69																								S3								
		70																								S4								
		71																								S5								
		72																								S6								
		73																								S7								
		74																								S8								
		75																								S9								
		76																								S10								
		77																								S11								
		78																								S12								
		79																								S13								
		80																								S14								
		81																								S15								
V _{IH1} V _{IL1} V _{IH2} V _{IL2} V _{IH3} V _{IL3}		82	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/		3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	All outputs	3/	3/	3/	3/	3/	3/			
		83																																
		84																																
		85																																

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Cases J, K, X, Y, U	Terminal conditions 1/																								Measured terminal	Test limits						Units																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
			Symbol	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24	Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
				Test No.	ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4		I	V _{DD}	S0	S1	S2	S3		S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40	S41	S42	S43	S44	S45	S46	S47	S48	S49	S50	S51	S52	S53	S54	S55	S56	S57	S58	S59	S60	S61	S62	S63	S64	S65	S66	S67	S68	S69	S70	S71	S72	S73	S74	S75	S76	S77	S78	S79	S80	S81	S82	S83	S84	S85	S86	S87	S88	S89	S90	S91	S92	S93	S94	S95	S96	S97	S98	S99	S100	S101	S102	S103	S104	S105	S106	S107	S108	S109	S110	S111	S112	S113	S114	S115	S116	S117	S118	S119	S120	S121	S122	S123	S124	S125	S126	S127	S128	S129	S130	S131	S132	S133	S134	S135	S136	S137	S138	S139	S140	S141	S142	S143	S144	S145	S146	S147	S148	S149	S150	S151	S152	S153	S154	S155	S156	S157	S158	S159	S160	S161	S162	S163	S164	S165	S166	S167	S168	S169	S170	S171	S172	S173	S174	S175	S176	S177	S178	S179	S180	S181	S182	S183	S184	S185	S186	S187	S188	S189	S190	S191	S192	S193	S194	S195	S196	S197	S198	S199	S200	S201	S202	S203	S204	S205	S206	S207	S208	S209	S210	S211	S212	S213	S214	S215	S216	S217	S218	S219	S220	S221	S222	S223	S224	S225	S226	S227	S228	S229	S230	S231	S232	S233	S234	S235	S236	S237	S238	S239	S240	S241	S242	S243	S244	S245	S246	S247	S248	S249	S250	S251	S252	S253	S254	S255	S256	S257	S258	S259	S260	S261	S262	S263	S264	S265	S266	S267	S268	S269	S270	S271	S272	S273	S274	S275	S276	S277	S278	S279	S280	S281	S282	S283	S284	S285	S286	S287	S288	S289	S290	S291	S292	S293	S294	S295	S296	S297	S298	S299	S300	S301	S302	S303	S304	S305	S306	S307	S308	S309	S310	S311	S312	S313	S314	S315	S316	S317	S318	S319	S320	S321	S322	S323	S324	S325	S326	S327	S328	S329	S330	S331	S332	S333	S334	S335	S336	S337	S338	S339	S340	S341	S342	S343	S344	S345	S346	S347	S348	S349	S350	S351	S352	S353	S354	S355	S356	S357	S358	S359	S360	S361	S362	S363	S364	S365	S366	S367	S368	S369	S370	S371	S372	S373	S374	S375	S376	S377	S378	S379	S380	S381	S382	S383	S384	S385	S386	S387	S388	S389	S390	S391	S392	S393	S394	S395	S396	S397	S398	S399	S400	S401	S402	S403	S404	S405	S406	S407	S408	S409	S410	S411	S412	S413	S414	S415	S416	S417	S418	S419	S420	S421	S422	S423	S424	S425	S426	S427	S428	S429	S430	S431	S432	S433	S434	S435	S436	S437	S438	S439	S440	S441	S442	S443	S444	S445	S446	S447	S448	S449	S450	S451	S452	S453	S454	S455	S456	S457	S458	S459	S460	S461	S462	S463	S464	S465	S466	S467	S468	S469	S470	S471	S472	S473	S474	S475	S476	S477	S478	S479	S480	S481	S482	S483	S484	S485	S486	S487	S488	S489	S490	S491	S492	S493	S494	S495	S496	S497	S498	S499	S500	S501	S502	S503	S504	S505	S506	S507	S508	S509	S510	S511	S512	S513	S514	S515	S516	S517	S518	S519	S520	S521	S522	S523	S524	S525	S526	S527	S528	S529	S530	S531	S532	S533	S534	S535	S536	S537	S538	S539	S540	S541	S542	S543	S544	S545	S546	S547	S548	S549	S550	S551	S552	S553	S554	S555	S556	S557	S558	S559	S560	S561	S562	S563	S564	S565	S566	S567	S568	S569	S570	S571	S572	S573	S574	S575	S576	S577	S578	S579	S580	S581	S582	S583	S584	S585	S586	S587	S588	S589	S590	S591	S592	S593	S594	S595	S596	S597	S598	S599	S600	S601	S602	S603	S604	S605	S606	S607	S608	S609	S610	S611	S612	S613	S614	S615	S616	S617	S618	S619	S620	S621	S622	S623	S624	S625	S626	S627	S628	S629	S630	S631	S632	S633	S634	S635	S636	S637	S638	S639	S640	S641	S642	S643	S644	S645	S646	S647	S648	S649	S650	S651	S652	S653	S654	S655	S656	S657	S658	S659	S660	S661	S662	S663	S664	S665	S666	S667	S668	S669	S670	S671	S672	S673	S674	S675	S676	S677	S678	S679	S680	S681	S682	S683	S684	S685	S686	S687	S688	S689	S690	S691	S692	S693	S694	S695	S696	S697	S698	S699	S700	S701	S702	S703	S704	S705	S706	S707	S708	S709	S710	S711	S712	S713	S714	S715	S716	S717	S718	S719	S720	S721	S722	S723	S724	S725	S726	S727	S728	S729	S730	S731	S732	S733	S734	S735	S736	S737	S738	S739	S740	S741	S742	S743	S744	S745	S746	S747	S748	S749	S750	S751	S752	S753	S754	S755	S756	S757	S758	S759	S760	S761	S762	S763	S764	S765	S766	S767	S768	S769	S770	S771	S772	S773	S774	S775	S776	S777	S778	S779	S780	S781	S782	S783	S784	S785	S786	S787	S788	S789	S790	S791	S792	S793	S794	S795	S796	S797	S798	S799	S800	S801	S802	S803	S804	S805	S806	S807	S808	S809	S810	S811	S812	S813	S814	S815	S816	S817	S818	S819	S820	S821	S822	S823	S824	S825	S826	S827	S828	S829	S830	S831	S832	S833	S834	S835	S836	S837	S838	S839	S840	S841	S842	S843	S844	S845	S846	S847	S848	S849	S850	S851	S852	S853	S854	S855	S856	S857	S858	S859	S860	S861	S862	S863	S864	S865	S866	S867	S868	S869	S870	S871	S872	S873	S874	S875	S876	S877	S878	S879	S880	S881	S882	S883	S884	S885	S886	S887	S888	S889	S890	S891	S892	S893	S894	S895	S896	S897	S898	S899	S900	S901	S902	S903	S904	S905	S906	S907	S908	S909	S910	S911	S912	S913	S914	S915	S916	S917	S918	S919	S920	S921	S922	S923	S924	S925	S926	S927	S928	S929	S930	S931	S932	S933	S934	S935	S936	S937	S938	S939	S940	S941	S942	S943	S944	S945	S946	S947	S948	S949	S950	S951	S952	S953	S954	S955	S956	S957	S958	S959	S960	S961	S962	S963	S964	S965	S966	S967	S968	S969	S970	S971	S972	S973	S974	S975	S976	S977	S978	S979	S980	S981	S982	S983	S984	S985	S986	S987	S988	S989

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Cases J, K, L, X, Y, U Symbol Test No.	Terminal conditions 1/																								Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C		
			ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I	V _{DD}		Min	Max	Min	Max	Min	Max	
I _{IL1} I _{IL2}	3009	159	GND	GND	GND									GND									GND	GND	GND	18V	A11 inputs together ST D1 D2 D3 D4 I	-6					nA	
	3009	160	GND	18V	18V																		18V	18V	18V			-1		-45				
		161	18V	GND	18V																		GND	18V	GND	18V								
		162	18V	GND	18V																		GND	18V	GND	18V								
		163	18V	GND	18V																		GND	18V	GND	18V								
C _i	3012	166	5/	5/	5/									GND									5/	5/	5/	GND	ST D1 D2 D3 D4 I	7.5					pF	
		167																																
		168																																
		169																																
		170																																
TRUTH TABLE TEST	3014	172	5V	GND	GND	H	H	H	H	H	H	H	L	GND	H	H	H	H	H	H	H	H	GND	GND	GND	5V	A11 outputs	Subgp 7 T _A = 25°C		Subgp 8 T _A = 125°C		T _A = -55°C		See 6/ 7/
		173		5V	GND																		5V	GND	GND									
		174		GND	5V																		GND	5V	GND									
		175		5V	GND																		GND	5V	GND									
		176		GND	GND																		GND	5V	GND									
		177		5V	GND																		GND	5V	GND									
		178		GND	5V																		GND	5V	GND									
		179		5V	GND																		GND	5V	GND									
		180		GND	GND																		GND	5V	GND									
		181		5V	GND																		GND	5V	GND									
		182		GND	5V																		GND	5V	GND									
		183		5V	GND																		GND	5V	GND									
		184		GND	GND																		GND	5V	GND									
		185		5V	GND																		GND	5V	GND									
		186		GND	5V																		GND	5V	GND									
		187		5V	GND																		GND	5V	GND									
		188		GND	5V																		GND	5V	GND									
		189		5V	GND																		GND	5V	GND									
		190		GND	GND																		GND	5V	GND									
		191		5V	GND																		GND	5V	GND									
		192		GND	5V																		GND	5V	GND									
		193		5V	GND																		GND	5V	GND									
		194		GND	GND																		GND	5V	GND									
		195		5V	GND																		GND	5V	GND									
		196		GND	5V																		GND	5V	GND									
		197		5V	GND																		GND	5V	GND									
		198		GND	GND																		GND	5V	GND									
		199		5V	GND																		GND	5V	GND									
		200		GND	5V																		GND	5V	GND									
		201		5V	GND																		GND	5V	GND									
		202		GND	GND																		GND	5V	GND									
		203		5V	GND																		GND	5V	GND									

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Cases J, K, X, Y, U Symbol Test No.	Terminal conditions 1/																								Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 7 T _A = 25°C		Subgp 8 T _A = 125°C		Subgp 11 T _A = -55°C		
			ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I	V _{DD}		Min	Max	Min	Max	Min	Max	
TRUTH TABLE TEST	3014	204 205 206 207 208	GND GND 5V 5V GND	GND 5V 5V 5V GND	GND 5V 5V 5V GND	H H H H H	H H H H H	H H H H H	H H H H H	H H H H H	H H H H H	L L H H H	GND	H H H H H	H H H H H	H H H H H	H H H H H	H H H H H	H H H H H	H H H H H	H H H H H	GND 5V 5V 5V GND	GND 5V 5V 5V GND	GND		All outputs		See 6/ 7/						
																											Subgp 9 T _A = 25°C		Subgp 10 T _A = 125°C		Subgp 11 T _A = -55°C			
																											Min	Max	Min	Max	Min	Max		
SETUP B/	Fig 7	209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224	IN	IN GND IN GND 5V GND 5V GND 5V GND IN GND 5V GND 5V	GND IN 5V GND 5V 5V GND 5V GND IN GND 5V GND 5V	OUT	OUT	OUT	OUT	OUT	OUT	GND											GND IN GND IN IN 5V IN 5V IN 5V	GND IN IN 5V IN IN 5V IN IN 5V	GND IN IN 5V IN IN 5V IN IN 5V	5V	D1 to S0 D1 to S1 D2 to S2 D1 to S3 D3 to S4 D3 to S5 D3 to S6 D3 to S7 D4 to S8 D4 to S9 D4 to S10 D1 to S11 D3 to S12 D3 to S13 D2 to S14 D4 to S15	150	210	150	ns			
PHL1 & PLH1	3009 Fig 7	225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240	5V	IN GND IN GND 5V GND 5V GND 5V GND IN GND 5V GND 5V	GND IN 5V GND 5V GND 5V GND 5V GND IN GND 5V GND 5V	OUT	OUT	OUT	OUT	OUT	OUT	OUT											GND IN IN 5V IN IN 5V IN IN 5V	GND IN IN 5V IN IN 5V IN IN 5V	IN		D1 to S0 D1 to S1 D2 to S2 D1 to S3 D3 to S4 D3 to S5 D3 to S6 D3 to S7 D4 to S8 D4 to S9 D4 to S10 D1 to S11 D3 to S12 D3 to S13 D2 to S14 D4 to S15	49	970	68	1360	49	970	
PHL2 & PLH2	3003 Fig 7	241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256		IN GND 5V GND 5V GND 5V GND 5V GND 5V GND 5V GND 5V	GND 5V 5V GND 5V GND 5V GND 5V GND 5V GND 5V GND 5V	OUT	OUT	OUT	OUT	OUT	OUT	OUT											GND IN IN 5V IN IN 5V IN IN 5V	GND IN IN 5V IN IN 5V IN IN 5V	IN		I to S0 I to S1 I to S2 I to S3 I to S4 I to S5 I to S6 I to S7 I to S8 I to S9 I to S10 I to S11 I to S12 I to S13 I to S14 I to S15	25	500	35	700	25	500	

See notes at end of device type.

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

[illegible]

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Cases J, K, A, Y, U	Terminal conditions 1/																								Measured terminal	Test limits						Units	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		Subgp 12 T _A = 25°C							
			Symbol	ST	D1	D2	S7	S6	S5	S4	S3	S1	S2	S0	V _{SS}	S13	S12	S15	S14	S9	S8	S11	S10	D3	D4	I		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.																																
t _{THL} & t _{TLH}	3004 Fig 7	305	10.0	IN	GND							OUT	OUT	OUT	GND									GND	GND	GND	10.0	S0	5	100			ns		
		306		IN	IN																						S1								
		307		GND	IN																						S2								
		308		IN	GND																						S3								
		309		GND	GND																						S4								
		310		10.0	GND																						S5								
		311		GND	GND																						S6								
		312		10.0	10.0		OUT	OUT																			S7								
		313		GND	GND																						S8								
		314		10.0	GND																						S9								
		315		GND	10.0															OUT							S10								
		316		IN	GND																						S11								
		317		GND	GND																						S12								
		318		10.0	GND																						S13								
		319		GND	IN																						S14								
		320		10.0	10.0																						S15								

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} terminal shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminal shall be open.

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

3/ The following timing sequence and input/output conditions shall apply: These tests require only a summary of attributes data.

TIME SLOT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32*	33	34	35	36
I N P U T S	ST	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	INH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	D1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
	D2	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	D3	0	0	0	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
O U T P U T S	S0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S2	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S3	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S4	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S5	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S6	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S7	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S8	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S9	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S10	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	S15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	

* Time slot 32 and output 50: Inhibit input shall go from 1 to 0 before the strobe goes from 1 to 0.

Input/output conditions

Test	V _{DD}	Input levels		Output levels	
		1	0	1	0
V _{IH1}	5.0	Volts		Min	Max
V _{IL1}		3.5V	1.5V	4.5V	0.5V
V _{IH2}	10.0	Volts		Min	Max
V _{IL2}		7.0V	3.0V	9.0V	1.0V
V _{IH3}	15.0	Volts		Min	Max
V _{IL3}		11.0V	4.0V	13.5V	1.5V

4/ 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.

5/ See 4.4.1c.

6/ The Truth Table Tests shall be performed in sequence.

7/ The Truth Table Tests shall be performed at V_{IH} and V_{DD} ≤ 5 Vdc and ≥ 18 Vdc. L = V_{SS} +0.50V maximum and H = V_{DD} -0.50V minimum.

8/ t_{SETUP} may be performed concurrently with t_{PLH} or t_{PHL}, using the maximum allowed test t_{SETUP}.

TABLE III. Group A inspection for 03 - Continued.

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See notes at end of device type.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgp 7 T _A = 25°C		Subgp 8 T _A = 125°C																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		Symbol	D4	D5	D6	D7	E1	Q2	Q1	V _{SS}	Q0	D0'	D1	D2	D3	GS	E0	V _{DD}		T _A = -55°C																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		Test No.																		Min	Max	Min	Max	Min	Max																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
TRUTH TABLE TEST	3014	103 104 105 106 107 108 109 110 111 112	5V GND 5V ↓ GND ↓ ↓ ↓ ↓ ↓	5V GND 5V 5V 5V 5V GND ↓ ↓ ↓	5V GND 5V 5V 5V 5V GND ↓ ↓ ↓	5V GND 5V 5V 5V 5V GND ↓ ↓ ↓	GND 5V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND GND 5V ↓ GND ↓ ↓ ↓ ↓ ↓	GND GND 5V 5V 5V 5V GND 5V GND 5V GND GND	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND GND 5V 5V 5V 5V GND 5V GND 5V GND GND	5V GND 5V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	5V GND 5V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	5V GND 5V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND GND 5V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND GND 5V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	5V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	All outputs	See 6/ 7/																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units	
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgp 9 T _A = 25°C		Subgp 10 T _A = 125°C		Subgp 11 T _A = -55°C			
		Symbol	D4	D5	D6	D7	E1	Q2	Q1	V _{SS}	Q0	D0	D1	D2	D3	GS	E0	V _{DD}		Min	Max	Min	Max	Min	Max		
		Test No.																									
t _{THL} & t _{TLH}	3004 Fig 7	149 150 151	GND ↓ ↓	GND ↓ ↓	GND ↓ ↓	5.0V ↓ ↓	IN ↓ ↓	OUT	OUT	GND ↓ ↓	OUT	GND ↓ ↓	GND ↓ ↓	GND ↓ ↓	GND ↓ ↓			5V ↓	Q0 Q1 Q2	10 ↓ ↓	200 ↓ ↓	14 ↓ ↓	280 ↓ ↓	10 ↓ ↓	200 ↓ ↓	ns	
																				Subgp 12 T _A = 25°C							
																				Min	Max						
t _{PHL1} t _{PLH1} t _{PHL2} t _{PLH2} t _{PHL3}	3003 Fig 7	152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	10.0 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	10.0 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	10.0 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	10.0V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	E1 to E0 E1 to E0 E1 to GS E1 to GS E1 to Q0 E1 to Q1 E1 to Q0 E1 to Q1 E1 to Q2 E1 to Q2 E1 to Q0 E1 to Q1 E1 to Q2 E1 to Q0 E1 to Q1 E1 to Q2 E1 to Q0 E1 to Q1 E1 to Q2	6 ↓	110 ↓					ns	
t _{PLH3}		168 169 170 171 172 173 174 175 176 177 178 179	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	OUT	OUT	10.0 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓							E1 to Q0 E1 to Q1 E1 to Q0 E1 to Q1 E1 to Q2 E1 to Q2 E1 to Q0 E1 to Q1 E1 to Q2 E1 to Q0 E1 to Q1 E1 to Q2 E1 to Q0 E1 to Q1 E1 to Q2									
t _{PHL4}	3003 Fig 7	180 181 182 183 184 185 186 187	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	10.0 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT		D0 to GS D1 to GS D2 to GS D3 to GS D4 to GS D5 to GS D6 to GS D7 to GS									
t _{PLH4}		188 189 190 191 192 193 194 195	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT	OUT	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	IN ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT		D0 to GS D1 to GS D2 to GS D3 to GS D4 to GS D5 to GS D6 to GS D7 to GS								

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgrp 12 T _A = 25°C						
		Symbol	D4	D5	D6	D7	E1	Q2	Q1	V _{SS}	Q0	D0	D1	D2	D3	GS	E0	V _{DD}		Min	Max	Min	Max	Min	Max	
		Test No.																								
t _{PHL5}	3003 Fig 7	196	GND	GND	GND	GND	10.0		OUT	GND	OUT	GND	IN GND	GND	GND			10.0V	D1 to Q0	11	220				n _s	
		197							OUT		OUT			IN GND	IN GND	GND			D2 to Q1							
198								OUT		OUT					IN			D3 to Q0								
199								OUT		OUT					IN			D3 to Q1								
200		IN GND					OUT							IN				D4 to Q2								
201			IN GND				OUT											D5 to Q0								
202				IN IN GND			OUT											D5 to Q2								
203					IN IN GND		OUT											D6 to Q2								
204						IN		OUT										D6 to Q1								
205								OUT										D7 to Q0								
t _{PLH5}		206																	D7 to Q1							
		207						OUT											D7 to Q2							
		208					GND		OUT		OUT		IN GND	IN GND	IN				D1 to Q0							
		209							OUT		OUT								D2 to Q1							
		210							OUT		OUT								D3 to Q0							
		211	IN GND					OUT											D3 to Q1							
		212		IN IN GND				OUT											D4 to Q2							
		213						OUT											D5 to Q0							
		214						OUT											D5 to Q2							
		215							OUT										D6 to Q2							
t _{THL} t _{TLH}	3004 Fig 7	216							OUT		OUT								D6 to Q1							
		217							OUT		OUT								D7 to Q0							
		218							OUT		OUT								D7 to Q1							
		219						OUT											D7 to Q2							
		220					10.0	IN			OUT								Q0	5	100					
		221							OUT		OUT								Q1							
		222							OUT		OUT								Q2							
		223							OUT		OUT								Q0							
		224							OUT		OUT								Q1							
		225							OUT										Q2							

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} terminal 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 following timing sequence and input/output conditions shall apply. These tests require only a summary of attributes data.

TIME SLOT	Inputs										Outputs					
	E1	D7	D6	D5	D4	D3	D2	D1	D0	GS	Q2	Q1	Q0	E0		
1	0	X	X	X	X	X	X	X	X	0	0	0	0	0		
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1		
3	1	1	X	X	X	X	X	X	X	1	1	1	1	0		
4	1	0	1	X	X	X	X	X	X	1	1	1	0	0		
5	1	0	0	1	X	X	X	X	X	1	1	0	1	0		
6	1	0	0	0	1	X	X	X	X	1	1	0	0	0		
7	1	0	0	0	0	1	X	X	X	1	0	1	1	0		
8	1	0	0	0	0	0	1	X	X	1	0	1	0	0		
9	1	0	0	0	0	0	0	1	X	1	0	0	1	0		
10	1	0	0	0	0	0	0	0	1	1	0	0	0	0		

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

5/ See 4.4.1c.

6/ The Truth Table Tests shall be performed in sequence.

7/ The Truth Table Tests shall be performed at V_{IH} and V_{DD} ≤ 5 Vdc and ≥ 18 Vdc. L = 0.50V maximum and H = V_{DD} - 0.50V minimum.

Test	V _{DD}	Input/output conditions			
		Input levels		Output levels	
		1	0	1	0
				Min	Max
V _{OH1}	15.0	15.0V	GND	14.95V	0.05V
V _{OL1}					
V _{IH1}	5.0	3.5V	1.5V	4.5V	0.5V
V _{IL1}					
V _{IH2}	10.0	7.0V	3.0V	9.0V	1.0V
V _{IL2}					
V _{IH3}	15.0	11.0V	4.0V	13.5V	1.5V
V _{IL3}					

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See notes at end of device type.

Group A inspection for device type 04 - Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units
		E, F, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp3 T _A = -55°C		
		Symbol	TE	1A	1B	1Q0	1Q1	1Q2	1Q3	V _{SS}	2Q3	2Q2	2Q1	2Q0	2B	2A	2E	V _{DD}		Min	Max	Min	Max	Min	Max	
		Test No.																								
I _{OL2} ↓ I _{OH1} ↓ I _{OH2} ↓ I _{IH1} 4/ ↓ I _{IH2} ↓ I _{IL1} 4/ ↓ I _{IL2} ↓		50 51 52 53 54 55 56 57	15V ↓	GND ↓	GND ↓	1.5V ↓	1.5V ↓	1.5V ↓	1.5V ↓	GND ↓	1.5V ↓	1.5V ↓	1.5V ↓	1.5V ↓	GND ↓	GND ↓	15V ↓	15V ↓	1Q0 1Q1 1Q2 1Q3 2Q3 2Q2 2Q1 2Q0	3.4 ↓		2.4 ↓		4.2 ↓		mA
		58 59 60 61 62 63 64 65	GND ↓	GND 5V GND 5V ↓	GND 5V ↓	4.6V ↓	4.6V ↓	4.6V ↓	4.6V ↓		4.6V ↓	4.6V ↓	4.6V ↓	4.6V ↓	5V ↓	5V ↓	GND ↓	5V ↓	1Q0 1Q1 1Q2 1Q3 2Q3 2Q2 2Q1 2Q0	-0.51 ↓		-0.36 ↓		-0.64 ↓		
		66 67 68 69 70 71 72 73		GND 15V GND 15V ↓	GND 15V ↓	13.5V ↓	13.5V ↓	13.5V ↓	13.5V ↓		13.5V ↓	13.5V ↓	13.5V ↓	13.5V ↓	GND 15V ↓	GND 15V ↓		15V ↓	1Q0 1Q1 1Q2 1Q3 2Q3 2Q2 2Q1 2Q0	-3.4 ↓		-2.4 ↓		-4.2 ↓		
		74	3010	18V	18V	18V								13.5V	18V	18V	18V	18V	All inputs together	6						nA
		75 76 77 78 79 80		18V GND ↓	GND 18V GND 18V GND ↓										GND 18V ↓	GND 18V ↓	GND ↓		TE 1A 1B 2B 2A 2E	1		45				
		81	3009	GND	GND	GND									GND	GND	GND		All inputs together	-6						
		82 83 84 85 86 87		GND 18V ↓	18V GND 18V 18V ↓	18V GND 18V ↓									18V ↓	18V ↓	18V ↓		TE 1A 1B 2B 2A 2E	-1		-45				
																				Subgp 4 T _A = 25°C						
																				Min	Max					
	C _i ↓	3012	88 89 90 91 92 93	5/ ↓	5/ ↓	5/ ↓					GND ↓				5/ ↓	5/ ↓	5/ ↓	GND ↓	TE 1A 1B 2B 2A 2E		7.5					pF

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See notes at end of device type.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units	
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgp 7 T _A = 25°C		Subgp 8 T _A = 125°C		T _A = -55°C			
		Symbol	1E	1A	1B	1Q0	1Q1	1Q2	1Q3	V _{SS}	2Q3	2Q2	2Q1	2Q0	2B	2A	2E	V _{DD}		Min	Max	Min	Max	Min	Max		
		Test No.																									
TRUTH TABLE TEST	3014	94 95 96 97 98 99 100 101 102 103	GND ↓ 5V	GND 5V GND 5V 5V	GND GND 5V 5V 5V	H L ↓	L H L ↓	L L H L L	L ↓ H L	GND ↓							5V ↓	A11 outputs ↓	See 6 7/								
																			Subgp 9 T _A = 25°C		Subgp 10 T _A = 125°C		Subgp 11 T _A = -55°C				
																			Min	Max	Min	Max	Min	Max			
t _{PHL1} & t _{PLH1}	3003 Fig 7	104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119	GND ↓	GND GND IN IN 5V 5V IN IN GND	IN IN GND GND IN IN 5V 5V GND	OUT ↓	OUT ↓	OUT ↓	OUT ↓										1B to 1Q0 1B to 1Q1 1A to 1Q2 1A to 1Q0 1B to 1Q1 1B to 1Q3 1A to 1Q2 1A to 1Q3 2B to 2Q0 2B to 2Q1 2A to 2Q2 2A to 2Q0 2B to 2Q1 2B to 2Q3 2A to 2Q2 2A to 2Q3		22	440	31	620	22	440	ns
t _{PHL2} & t _{PLH2}		120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135	IN ↓ GND ↓ IN ↓ GND ↓	GND 5V GND 5V GND ↓ 5V GND 5V GND ↓	GND 5V 5V GND ↓ 5V 5V GND ↓	OUT ↓	OUT ↓	OUT ↓	OUT ↓										1E to 1Q0 1E to 1Q1 1E to 1Q2 1E to 1Q3 2E to 2Q0 2E to 2Q1 2E to 2Q2 2E to 2Q3 1E to 1Q0 1E to 1Q1 1E to 1Q2 1E to 1Q3 2E to 2Q0 2E to 2Q1 2E to 2Q2 2E to 2Q3		20	400	28	560	20	400	
t _{THL} & t _{TLH}	3004 Fig 7	136 137 138 139 140 141 142 143	IN ↓ GND ↓	GND 5V GND 5V GND ↓	GND 5V 5V GND ↓	OUT ↓	OUT ↓	OUT ↓	OUT ↓										1Q0 1Q1 1Q2 1Q3 2Q0 2Q1 2Q2 2Q3		10	200	14	280	10	200	

See notes at end of device type.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units																																																																																																																
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgrp 12 T _A = 25°C																																																																																																																						
		Symbol	TE	1A	1B	1Q0	1Q1	1Q2	1Q3	V _{SS}	2Q3	2Q2	2Q1	2Q0	2B	2A	2E	V _{DD}		Min	Max	Min	Max	Min	Max																																																																																																																	
		Test No.																																																																																																																																								
t _{PHL1} & t _{PLH1} t _{PHL2} & t _{PLH2} t _{THL} & t _{TLH}	3003 Fig 7	144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND GND IN IN 10.0 10.0 IN IN 10.0 10.0 GND ↓ ↓ ↓ ↓ ↓	IN IN GND IN IN 10.0 10.0 GND ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT OUT	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	GND ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	10.0V ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	1B to 1Q0 1B to 1Q1 1A to 1Q2 1A to 1Q0 1B to 1Q1 1B to 1Q3 1A to 1Q2 1A to 1Q3 2B to 2Q0 2B to 2Q1 2A to 2Q2 2A to 2Q0 2B to 2Q1 2B to 2Q3 2A to 2Q2 2A to 2Q3 TE to 1Q0 TE to 1Q1 TE to 1Q2 TE to 1Q3 2E to 2Q0 2E to 2Q1 2E to 2Q2 2E to 2Q3	10 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	190 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓							ns																																																																																																																
		160 161 162 163 164 165 166 167	IN ↓ GND ↓ ↓ ↓ ↓	GND 10.0 GND 10.0 GND ↓ ↓ ↓	GND 10.0 10.0 GND ↓ ↓ ↓ ↓	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT

- 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} terminal 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 following timing sequence and input/output conditions shall apply: These tests require only a summary of attributes data.

Inputs			Outputs			
Enable	select		Device type 04			
E	B	A	Q3	Q2	Q1	Q0
0	0	0	0	0	0	1
0	0	1	0	0	1	0
0	1	0	0	1	0	0
0	1	1	1	0	0	0
1	X	X	0	0	0	0

- 4/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for individual input or measure all inputs together.
- 5/ See 4.4.1c.
- 6/ The Truth Table Tests shall be performed in sequence.
- 7/ The Truth Table Tests shall be performed at V_{IH} and V_{DD} ≤ 5 Vdc and ≥ 18 Vdc. L = V_{SS} +0.50 V maximum and H = V_{DD} -0.50 V minimum.

Input/output conditions

Test	V _{DD}	Input levels		Output levels	
		1	0	1	0
V _{IH1}	Volts 5.0	3.5V	1.5V	Min	Max
V _{IL1}				4.5V	0.5V
V _{IH2}	10.0	7.0V	3.0V	9.0V	1.0V
V _{IL2}					
V _{IH3}	15.0	11.0V	4.0V	13.5V	1.5V
V _{IL3}					

TABLE III. Group A inspection for device type 05.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgrp 1 T _A = 25°C		Subgrp 2 T _A = 125°C		Subgrp 3 T _A = -55°C		
		Symbol	1E	1A	1B	1Q0	1Q1	1Q2	1Q3	V _{SS}	2Q3	2Q2	2Q1	2Q0	2B	2A	2E	V _{DD}		Min	Max	Min	Max	Min	Max	
		Test No.																								
V _{IC} (pos) ↓ V _{IC} (neg) ↓ I _{SS} 2/ ↓ V _{OL1} ↓ V _{OH1} ↓ V _{IL1} V _{IL2} V _{IL3} V _{IH1} V _{IH2} V _{IH3} ↓ I _{OL1} ↓ I _{OL2} ↓		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57	1mA -1mA GND 18V ↓ 18V 																							

See notes at end of device type.

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TABLE III. Group A inspection for device type 05 - Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units	
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgp 1 T _A = 25°C		Subgp 2 T _A = 125°C		Subgp 3 T _A = -55°C			
		Symbol	1E	1A	1B	1Q0	1Q1	1Q2	1Q3	V _{SS}	2Q3	2Q2	2Q1	2Q0	2B	2A	2E	V _{DD}		Min	Max	Min	Max	Min	Max		
		Test No.																									
I _{OH1} ↓ I _{OH2} ↓ I _{IH1} 4/ I _{IH2} ↓ I _{IL1} 4/ I _{IL2} ↓		58 59 60 61 62 63 64 65	5V ↓	GND ↓	GND ↓	4.6V	4.6V	4.6V	4.6V	GND ↓	4.6V	4.6V	4.6V	4.6V	GND ↓	GND ↓	5V ↓	5V ↓	100 101 102 103 203 202 201 200	-0.51 ↓		-0.36 ↓		-0.64 ↓		mA	
		66 67 68 69 70 71 72 73	15V ↓	↓	↓	13.5V	13.5V	13.5V	13.5V	↓	13.5V	13.5V	13.5V	13.5V	↓	↓	15V ↓	15V ↓	100 101 102 103 203 202 201 200	-3.4 ↓		-2.4 ↓		-4.2 ↓			
	3010	74	18V	18V	18V					GND				13.5V	18V	18V	18V	18V	All inputs together		6					nA	
	3010	75 76 77 78 79 80	18V GND ↓	GND 18V GND ↓	GND GND 18V GND ↓					↓					GND GND 18V GND GND 18V	GND ↓ 18V GND ↓	GND ↓ 18V ↓	18V ↓	1E 1A 1B 2B 2A 2E		1		45 ↓				
	3009	81	GND	GND	GND					GND					GND	GND	GND		All inputs together	-6							
	3009	82 83 84 85 86 87	GND 18V ↓	18V GND 18V ↓	18V 18V GND 18V ↓					GND ↓					18V 18V 18V GND 18V 18V	18V ↓ 18V ↓ GND ↓	18V ↓ 18V ↓	18V ↓	1E 1A 1B 2B 2A 2E		-1		-45 ↓				
																				Subgp 4 T _A = 25°C							
																				Min	Max						
	C _i ↓	3012	88 89 90 91 92 93	5/ ↓	5/ ↓	5/ ↓					GND ↓					5/ ↓	5/ ↓	5/ ↓	GND ↓	1E 1A 1B 2B 2A 2E		7.5 ↓					pF

See notes at end of device type.

TABLE III. Group A inspection for device type 05 - Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units
		E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgp 7 T _A = 25°C		Subgp 8 T _A = 125°C		T _A = -55°C		
		Symbol	TE	1A	1B	1Q0	1Q1	1Q2	1Q3	V _{SS}	2Q3	2Q2	2Q1	2Q0	2B	2A	2E	V _{DD}		Min	Max	Min	Max	Min	Max	
		Test No.																								
TRUTH TABLE TEST ↓	3014 ↓	94 95 96 97 98	GND ↓ 5V	GND 5V GND 5V 5V	GND GND 5V 5V 5V	L H H H H	H L H H H	H H L H H	H H H L H	GND ↓	H H H L H	H H L H H	L H H H H	GND GND 5V 5V 5V	GND 5V GND 5V 5V	GND ↓ 5V	5V ↓	A11 outputs ↓			See 6/ 7/					
																				Subgp 9 T _A = 25°C		Subgp 10 T _A = 125°C		Subgp 11 T _A = -55°C		
																				Min	Max	Min	Max	Min	Max	
t _{PHL1} & t _{PLH1} ↓	3003 Fig 7 ↓	99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114	GND ↓ IN	GND 5V IN IN 5V IN IN GND	IN IN GND IN IN 5V 5V GND	OUT OUT	OUT OUT	OUT OUT	OUT OUT	GND ↓	OUT OUT	OUT OUT	OUT OUT	GND ↓ IN IN GND IN IN 5V 5V	GND ↓ IN IN 5V 5V IN	GND ↓ IN	5V ↓	1B to 100 1B to 102 1A to 101 1A to 100 1B to 101 1B to 103 1A to 102 1A to 103 2B to 200 2B to 202 2A to 201 2A to 200 2B to 201 2B to 203 2A to 202 2A to 203	22	440	31	620	22	440	ns	
t _{PHL2} & t _{PLH2} ↓		115 116 117 118 119 120 121 122	IN ↓ GND	GND 5V GND 5V GND	GND GND 5V 5V GND	OUT	OUT	OUT	OUT	GND ↓	OUT	OUT	OUT	GND ↓ 5V 5V	GND ↓ 5V GND 5V	IN ↓		1E to 100 1E to 101 1E to 102 1E to 103 2E to 200 2E to 201 2E to 202 2E to 203	20	400	28	560	20	400		
t _{THL} & t _{TLH} ↓	3004 Fig 7 ↓	123 124 125 126 127 128 129 130	IN ↓ GND ↓	5V GND 5V GND	5V 5V GND	OUT	OUT	OUT	OUT	OUT ↓	OUT	OUT	OUT	GND ↓ 5V 5V	GND ↓ 5V GND 5V	GND ↓ IN ↓	↓	100 101 102 103 200 201 202 2Q3	10	200	14	280	10	200		

See notes at end of device type.

TABLE III. Group A inspection for device type 05

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Units	
			E,F,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	Subgp 12 T _A = 25°C						
Symbol	1E	1A	1B	1Q0	1Q1	1Q2	1Q3	V _{SS}	2Q3	2Q2	2Q1	2Q0	2B	2A	2E	V _{DD}	Min	Max	Min	Max	Min	Max					
Test No.																											
t _{PHL1} & t _{PLH1} ↓ t _{PHL2} & t _{PLH2} ↓ t _{THL} & t _{TLH} ↓	3003 Fig 7 ↓	131	GND	GND	IN	OUT	OUT	OUT	GND					GND	GND	GND	10.0	1B to 1Q0	10	190					ns		
		132	↓	GND	GND	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1B to 1Q1	↓	↓							
		133	↓	GND	IN	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1A to 1Q2	↓	↓							
		134	↓	10.0	IN	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1A to 1Q0	↓	↓							
		135	↓	10.0	IN	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1B to 1Q1	↓	↓							
		136	↓	10.0	IN	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1B to 1Q3	↓	↓							
		137	↓	10.0	IN	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1A to 1Q2	↓	↓							
		138	↓	10.0	IN	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1A to 1Q3	↓	↓							
		139	↓	GND	IN	IN	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	2B to 2Q0	↓	↓							
		140	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2B to 2Q1	↓	↓							
		141	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2A to 2Q2	↓	↓							
		142	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2A to 2Q0	↓	↓							
		143	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2B to 2Q1	↓	↓							
		144	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2B to 2Q3	↓	↓							
		145	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2A to 2Q2	↓	↓							
		146	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2A to 2Q3	↓	↓							
t _{PHL2} & t _{PLH2} ↓ t _{THL} & t _{TLH} ↓	↓	147	IN	GND	GND	OUT	OUT	OUT						GND	GND			1E to 1Q0	9	170							
		148	↓	10.0	GND	10.0	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1E to 1Q1	↓	↓							
		149	↓	10.0	GND	10.0	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1E to 1Q2	↓	↓							
		150	↓	10.0	GND	10.0	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	1E to 1Q3	↓	↓							
		151	GND	GND	GND	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	2E to 2Q0	↓	↓							
		152	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2E to 2Q1	↓	↓							
		153	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2E to 2Q2	↓	↓							
		154	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2E to 2Q3	↓	↓							
3004 Fig 7 ↓	155	IN	10.0	↓	OUT	OUT	OUT						GND	GND	GND		1Q0	5	100								
	156	↓	10.0	↓	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	1Q1	↓	↓								
	157	↓	GND	10.0	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	1Q2	↓	↓								
	158	↓	10.0	↓	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	1Q3	↓	↓								
	159	GND	GND	↓	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	2Q0	↓	↓								
	160	↓	↓	↓	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	2Q1	↓	↓								
	161	↓	↓	↓	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	2Q2	↓	↓								
	162	↓	↓	↓	OUT	OUT	OUT	↓	↓	↓	↓	↓	↓	↓	↓	↓	2Q3	↓	↓								

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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} terminal 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 following timing sequence and input/output conditions shall apply: These tests require only a summary of attributes data.

Inputs Enable select			Outputs Device type 05			
E	B	A	Q3	Q2	Q1	Q0
0	0	0	1	1	1	0
0	0	1	1	1	0	1
0	1	0	1	0	1	1
0	1	1	0	1	1	1
1	X	X	1	1	1	1

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

5/ See 4.4.1c.

6/ The Truth Table Tests shall be performed in sequence.

7/ The Truth Table Tests shall be performed at V_{IH} and V_{DD} ≤ 5 Vdc and ≥ 18 Vdc. L = V_{SS} +0.50 V maximum and H = V_{DD} -0.50 V minimum.

Input/output conditions

Test	V _{DD} Volts	Input levels		Output levels	
		1	0	1	0
V _{IH1}	5.0	3.5V	1.5V	Min 4.5V	Max 0.5V
V _{IL1}					
V _{IH2}	10.0	7.0V	3.0V	9.0V	1.0V
V _{IL2}					
V _{IH3}	15.0	11.0V	4.0V	13.5V	1.5V
V _{IL3}					

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

4.2.1 Percent defective allowable (PDA).

- a. The class S devices PDA 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 performed in accordance with table II herein.
- b. Subgroups 5 and 6 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 of method 5005 of MIL-STD-883 and as follows:

- a. Class S steady state life (accelerated) test circuits shall be submitted to the qualifying activity for approval. When the alternate steady state life test is used, the circuit on figure 6, or equivalent, shall be used.
- b. A special subgroup shall be added using an LTPD of 15 for classes S and B, and 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).

- 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 6, or equivalent.
 - (2) $T_A = +125^\circ\text{C}$ 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 cool down procedures. When these tests are completed and prior to removal of bias voltages, the devices under test (DUT) shall be cooled to a temperature of $25^\circ \pm 3^\circ\text{C}$; then, electrical parameter end-point measurements shall be performed.

TABLE IV. Delta limits 025°C .

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

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

4.5.3 High voltage (V_{ZAP}) test or input protection circuits. All input terminals (up to a maximum of 4) of the DUT shall be subjected to a voltage pulse from a 100 pF source charged to 400 V. This destructive test shall be conducted as follows using the test circuit on figure 8.

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

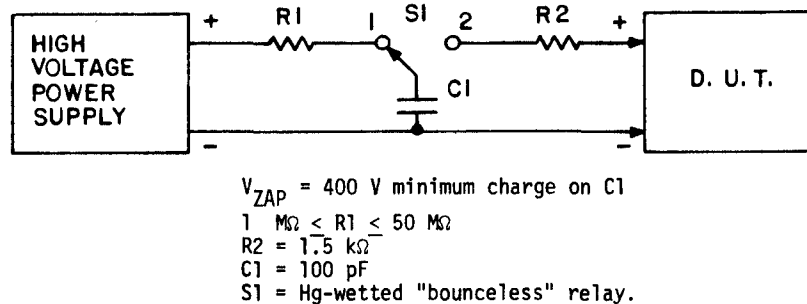


FIGURE 8. High voltage (V_{ZAP}) test circuit.

- b. V_{ZAP} is applied to DUT in the following modes (see table V) by changing 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_{IL} , and I_{IH} measurements on the same terminals as performed above. If a DUT exhibits leakage currents in excess of the specified limits after the V_{ZAP} test, it shall be classified as a failure.

4.5.4 Quiescent supply current (I_{SS} test). When performing quiescent supply current measurements (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:

- 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.
- 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 9. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VII and bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.
- d. After irradiation, the devices shall pass the truth table test as specified in subgroup 7 in table III or if subgroup 7 is not required, then an equivalent truth table test shall be performed.

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

Parameter	All device types	V _{DD}
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 a 30 k to 60 k resistor)	V _{SS} = GND	V _{DD} = 10 V dc
01	1,2,3,21,22,23	12	14, 24
02	1,2,3,21,22,23	12	14, 24
03	1,2,3,4,5,10,11,12,13	8	16
04	1,2,3,13,14,15	8	16
05	1,2,3,13,14,15	8	16

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

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

- 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 quality conformance inspection data (see 4.4).
- Parameter distribution data on parameters evaluated during burn-in (see 3.6).
- 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 applications and logistic support of existing equipment.

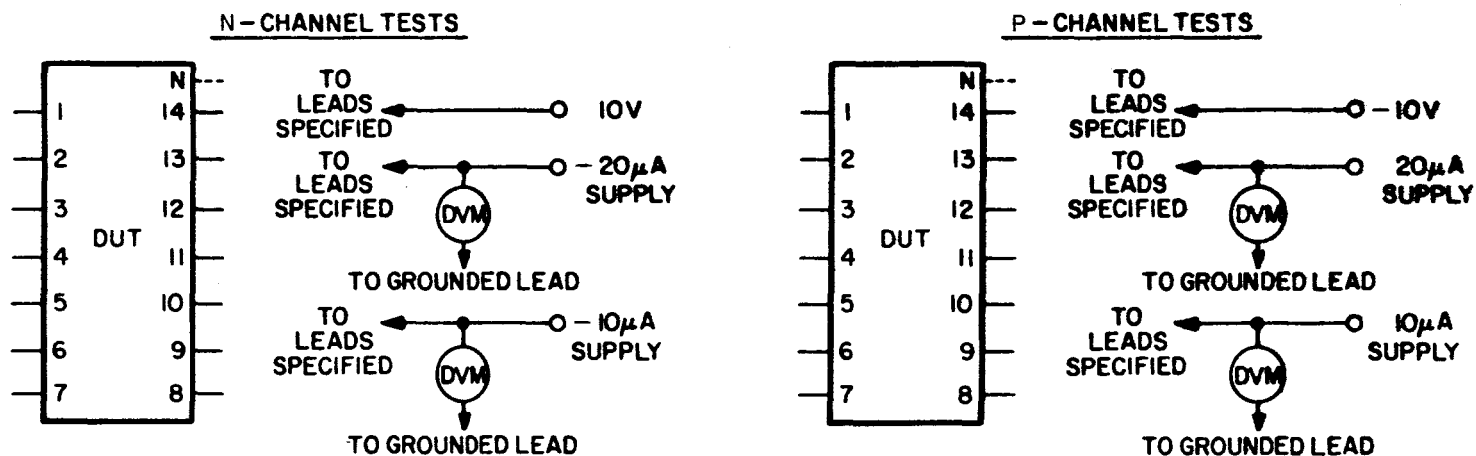


FIGURE 7. Threshold-voltage circuit.

TABLE VIII. Threshold - voltage test circuit conditions.

Device type	GND	10V	V_{TN} measured at		GND	-10V	V_{TP} measured at	
			-20 μ A supply	-10 μ A supply			20 μ A supply	10 μ A supply
01	2	24	3,12,21-23		1	2,3,12,21-23	24	
02	1	24	2,3,12,21-23		1	2,3,12,21-23	24	
03	1	2-5,10-13, 16		8	1	2-5,8,10,11, 12,13		16
04	1	16		2,3,8, 13-15	1	2,3,8, 13-15		16
05	1	16		2,3,8, 13-15	1	2,3,8, 13-15		16

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

- a. Complete part number (see 1.2).
- b. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- c. Requirements for certificate of compliance, if applicable.
- d. Requirements for notification of change of product or process to the contracting activity in addition to notification to the qualifying activity, if applicable.
- e. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action and reporting of results, if applicable.
- f. Requirements for product assurance options.
- g. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements shall not apply to direct purchase by or direct shipment to the Government.
- h. Requirements for "JAN" marking.
- i. Requirements for total dose radiation testing (see 3.6.1 and 4.5.5), if applicable.

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

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

6.4 Logistic support. Lead materials and finishes (see 3.3) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class S for National Aeronautics and Space Administration or class 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 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information shall not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-M-38510.

<u>Military device</u> <u>type</u>	<u>Generic-industry</u> <u>type</u>	<u>DESC drawing</u>
01	4514B	7703501
02	4515B	7703201
03	4532B	
04	4555B	7704701
05	4556B	7704801

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 build up. However, the following handling practices are recommended:

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

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

Custodians:

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

Preparing activity:
NASA - NA

(Project 5962-0639-4)

Review activities:

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

User activities:

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

Agent:

DLA - ES