INCH-POUND

MIL-M-38510/174B
8 July 2004

SUPERSEDING
MIL-M-38510/174A
30 April 1984

MILITARY SPECIFICATION
MICROCIRCUITS, DIGITAL, CMOS, INVERTER, NAND BUFFER DRIVER,
STROBED HEX INVERTER/BUFFER, VOLTAGE LEVEL SHIFTER,
MONOLITHIC SILICON, POSITIVE LOGIC

Reactivated after 24 June, 2004 and may be used for new and existing designs and acquisitions.

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

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

1. SCOPE

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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).

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

1.2.1 Device types. The device types are as follows:

Device type	Circuit
01	Hex inverter
02	Dual 2-input NAND buffer/driver
03	Strobed hex inverter/buffer
04	Quad low-to-high voltage level shifter

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

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

Outline letter	Descriptive designator	Terminals	Package style
A	GDFP5-F14 or CDFP6-F14	14	Flat pack
C	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	Flat pack
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
N	CDFP4-T16	16	Flat pack
T	CDFP3-F14	14	Flat pack
X 1/ 2/	GDFP5-F14 or CDFP6-F14	14	Flat pack, except A dimension equals 0.1” (2.54 mm) max
Y 1/ 2/	GDFP1-F14 or CDFP2-F14	14	Flat pack, except A dimension equals 0.1” (2.54 mm) max
Z 1/ 2/	GDFP2-F16 or CDFP3-F16	16	Flat pack, except A dimension equals 0.1” (2.54 mm) max

1/ As an exception to MIL-PRF-38535, appendix A, for case outlines X, Y and Z only, the leads of bottom brazed ceramic packages (i.e., configuration 2 of case outlines A, D, and F) may have electroless nickel undercoating which shall be 50 to 200 microinches (1.27 to 5.08 μm) thick provided the lead finish is hot solder dip (i.e., finish letter A) and provided that, after any lead forming, an additional hot solder dip coating is applied which shall extend from the outer tip of the lead to no more than 0.015 inch (0.38 mm) from the package edge.

2/ For bottom or side brazed packages, case outlines X, Y and Z only, the S_1 dimension may go to .000 inch (.00 mm) minimum.

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

1.3 Absolute maximum ratings.

Supply voltage range (V_{DD} - V_{SS})	-0.5 V dc to +18.0 V dc
Input current (each input)	±10 mA
Input voltage range	(V_{SS} - 0.5) ≤ V_I ≤ (V_{DD} + 0.5)
Storage temperature range (T_{STG})	-65° to +175°C
Maximum power dissipation (P_D)	200 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction to case (Θ_{JC})	See MIL-STD-1835
Junction temperature (T_J)	175°C

1.4 Recommended operating conditions.

Supply voltage range (V_{DD} - V_{SS})	4.5 V dc to 15.0 V dc
Input low voltage range (V_{IL})	V_{OL} = 10% V_{DD}, V_{OH} = 90% V_{DD}
	0.0 V to 1.5 V dc @ V_{DD} = 5.0 V dc
	0.0 V to 2.0 V dc @ V_{DD} = 10.0 V dc
	0.0 V to 4.0 V dc @ V_{DD} = 15.0 V dc
Input high voltage range (V_{IH})	V_{OL} = 10% V_{DD}, V_{OH} = 90% V_{DD}
	3.5 V to 5.0 V dc @ V_{DD} = 5.0 V dc
	8.0 V to 10.0 V dc @ V_{DD} = 10.0 V dc
	11 V to 15.0 V dc @ V_{DD} = 15.0 V dc
Operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

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

2.2 Government documents.

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

DEPARTMENT OF DEFENSE SPECIFICATION

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

DEPARTMENT OF DEFENSE STANDARDS

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

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

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

3. REQUIREMENTS

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

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

3.3 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein. Although eutectic die bonding is preferred, epoxy die bonding may be performed. However, the resin used shall be Dupont 5504 Conductive Silver Paste, or equivalent, which is cured at 200°C ±10°C for a minimum of 2 hours. The use of equivalent epoxies or cure cycles shall be approved by the qualifying activity. Equivalency shall be demonstrated in data submitted to the qualifying activity for verification.

3.3.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.3.2 Logic diagrams. The logic diagrams shall be as specified on figure 2.

3.3.3 Truth tables. The truth tables shall be as specified on figure 3.

3.3.4 Switching waveforms and test circuit. The switching waveforms and test circuit shall be as specified on figure 4.

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

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

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

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

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

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

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

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 37 (see MIL-PRF-38535, appendix A).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ V_{SS} = 0 V -55°C ≤ T_A ≤ +125°C Unless otherwise specified		Device type	Limits		Unit
					Min	Max	
Positive clamping input to V_{DD}	$V_{IC (POS)}$	T_A = +25°C, V_{DD} = GND V_{SS} = Open, Output = Open I_{IN} = 1 mA		01, 02, 03		1.5	V dc
Negative clamping input to V_{SS}	$V_{IC (NEG)}$	T_A = +25°C, V_{DD} = Open V_{SS} = GND, Output = Open I_{IN} = -1 mA		All		-6.0	V dc
Quiescent supply current	I_{SS} or I_{DD}	V_{DD} = 18 V dc V_{IN} = V_{SS} or V_{DD} All input combinations		All		-750	nA
High level output voltage	V_{OH1}	V_{DD} = 15 V dc I_O ≤ 1µA	Any one input = V_{SS} All other inputs = V_{DD}	01	14.95		V dc
			V_{IN} = V_{SS}	03			
			V_{IN} = V_{DD}	04			
Low level output voltage	V_{OL1}	V_{DD} = 15 V dc I_O ≤ 1µA	Any one input = V_{DD} All other inputs = V_{SS}	01		0.05	V dc
			V_{IN} = V_{DD}	02, 03			
			All enables = V_{DD} All other inputs = V_{SS}	04			
Input high voltage	V_{IH1}	V_{DD} = 5 V dc See table III I_O ≤ 1µA		All	3.5		V dc
	V_{IH2}	V_{DD} = 10 V dc See table III I_O ≤ 1µA		All	7.0		V dc
	V_{IH3}	V_{DD} = 15 V dc See table III I_O ≤ 1µA		All	11.0		V dc
Input low voltage	V_{IL1}	V_{DD} = 5 V See table III I_O ≤ 1 µA		All		1.5	V
	V_{IL2}	V_{DD} = 10 V See table III I_O ≤ 1 µA		All		3.0	V
	V_{IL3}	V_{DD} = 15 V See table III I_O ≤ 1 µA		All		4.0	V

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ V_{SS} = 0 V -55°C ≤ T_A ≤ +125°C Unless otherwise specified		Device type	Limits		Unit
					Min	Max	
Output high (source) current	I_{OH1}	V_{DD} = 5 V V_{IN} = V_{SS} V_{OH} = 4.6 V		01, 03	-0.36		mA
	I_{OH2}	V_{DD} = 15 V V_{OH} = 13.5 V	V_{IN} = V_{SS}	01,03	-2.4		
			V_{IN} = V_{DD}	04			
Output low (sink) current	I_{OL1}	V_{DD} = 5 V V_{OL} = 0.4 V	V_{IN} = V_{DD}	02	12.0		mA
				01	0.36		
			V_{IN} = V_{SS}	03			
	I_{OL2}	V_{DD} = 15V V_{OL} = 1.5 V	V_{IN} = V_{DD}	02	80.0		mA
				01	2.4		
				04			
			V_{IN} = V_{SS}	03			
Input leakage current, high 2/	I_{IH}	V_{DD} = 18 V Measure inputs sequentially Connect all unused inputs to V_{SS}		01, 03	100		nA
				02, 04	45		
Input leakage current, low 2/	I_{IL}	V_{DD} = 18 V Measure inputs sequentially Connect all unused inputs to V_{DD}		01, 03	-100		nA
				02, 04	-45		
Input capacitance	C_{IN}	V_{DD} = 0 V, f = 1 MHz, T_A = 25°C		01		12.0	pF
				02, 03, 04		7.5	pF
Three-state output leakage current	I_{OC1}	V_{DD} = 18 V Measure outputs sequentially V_O = V_{DD}		03		90	nA
				04		90	
	I_{OC2}	V_{DD} = 18 V Measure outputs sequentially V_O = V_{SS}		03		-90	nA
				04		-90	
Propagation delay time, high-to-low level	t_{PHL}	V_{DD} = 5.0 V C_L = 50 pF R_L = 200 kΩ (see figure 4)		01	5	155	ns
				02	10	280	
				03	14	380	
				04	30	840	
Propagation delay time, low-to-high level	t_{PLH}	V_{DD} = 5.0 V C_L = 50 pF R_L = 200 kΩ (see figure 4)		01	5	155	ns
				02	10	280	
				03	19	535	
				04	13	365	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ V_{SS} = 0 V -55°C ≤ T_A ≤ +125°C Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Propagation delay time, high-to-low level	t_{PHL}	V_{DD} = 10.0 V, C_L = 50 pF R_L = 200 kΩ. See figure 4 For group A requirements T_A = 25°C V_{CC} = 5.0 V for device type 04.	01	3	60	ns
			02	5	90	
			03	6	120	
			04	30	840	
Propagation delay time, low-to-high level	t_{PLH}		01	3	60	
			02	6	120	
			03	9	180	
			04	13	365	
Three-state disable delay time, output high to high impedance	t_{PHZ}	V_{DD} = 5.0 V, C_L = 50 pF R_L = 1.0 kΩ (see figure 4)	03,04	6	170	ns
Three-state disable delay time, high impedance to output high	t_{PZH}		03	11	310	
			04	32	895	
Three-state disable delay time, output low to high impedance	t_{PLZ}		03	13	350	
			04	37	1040	
Three-state disable delay time, high impedance to output low	t_{PZL}		03	13	350	
			04	10	280	
Three-state disable delay time, output high to high impedance	t_{PHZ}	V_{DD} = 10.0 V C_L = 50 pF R_L = 1.0 kΩ For group A requirements T_A = 25°C See figure 4 V_{CC} = 5.0 V for device type 04	03	4	80	ns
			04	6	170	
Three-state disable delay time, high impedance to output high	t_{PZH}		03	5	100	
			04	32	895	
Three-state disable delay time, output low to high impedance	t_{PLZ}		03	7	130	
			04	37	1040	
Three-state disable delay time, high impedance to output low	t_{PZL}		03	6	110	
			04	10	280	
Transition time, high-to-low, low-to-high level	t_{THL}, t_{TLH}	V_{DD} = 5.0 V, C_L = 50 pF R_L = 200 kΩ (see figure 4)	01	10	280	ns
	t_{THL}		03	6	170	
	t_{TLH}		03	10	280	
	t_{THL}, t_{TLH}		04	5	140	
Transition time, high-to-low level	t_{THL}	V_{DD} = 10.0 V, C_L = 50 pF R_L = 200 kΩ. See figure 4 For group A requirements T_A = 25°C V_{CC} = 5.0 V for device type 04	01	5	100	ns
			02	2	40	
			03	3	60	
			04	5	140	
Transition time, low-to-high level	t_{TLH}		01	5	100	
			02	4	70	
			03	5	100	
			04	5	140	

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

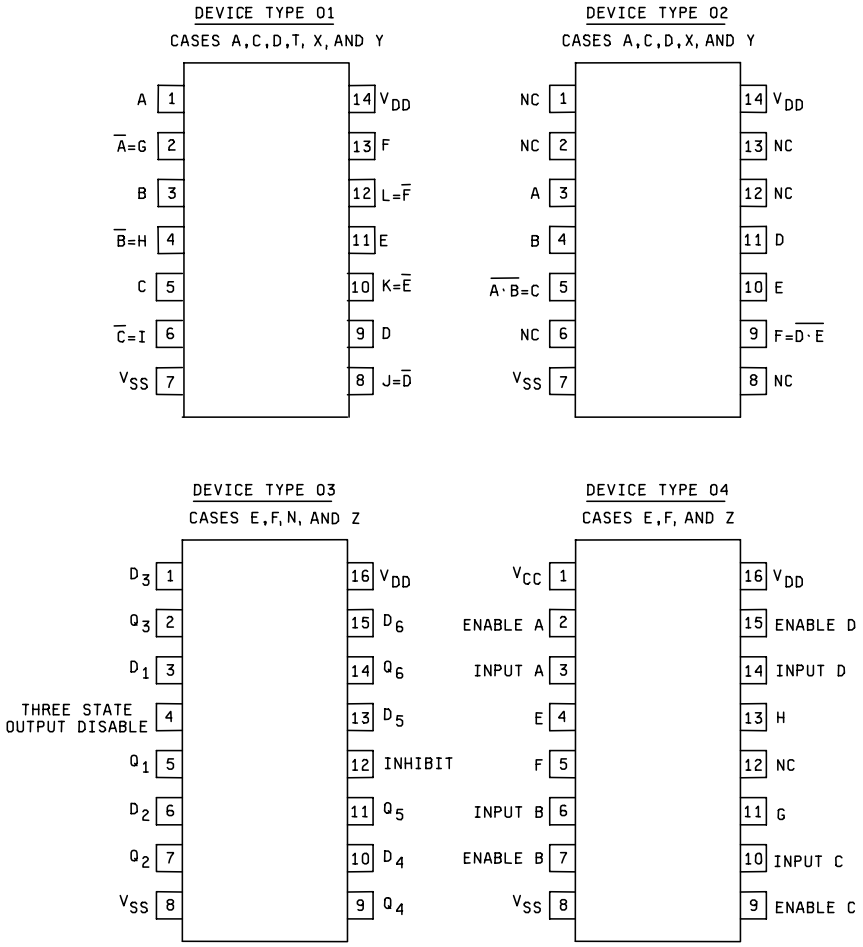


FIGURE 1. Terminal connections.

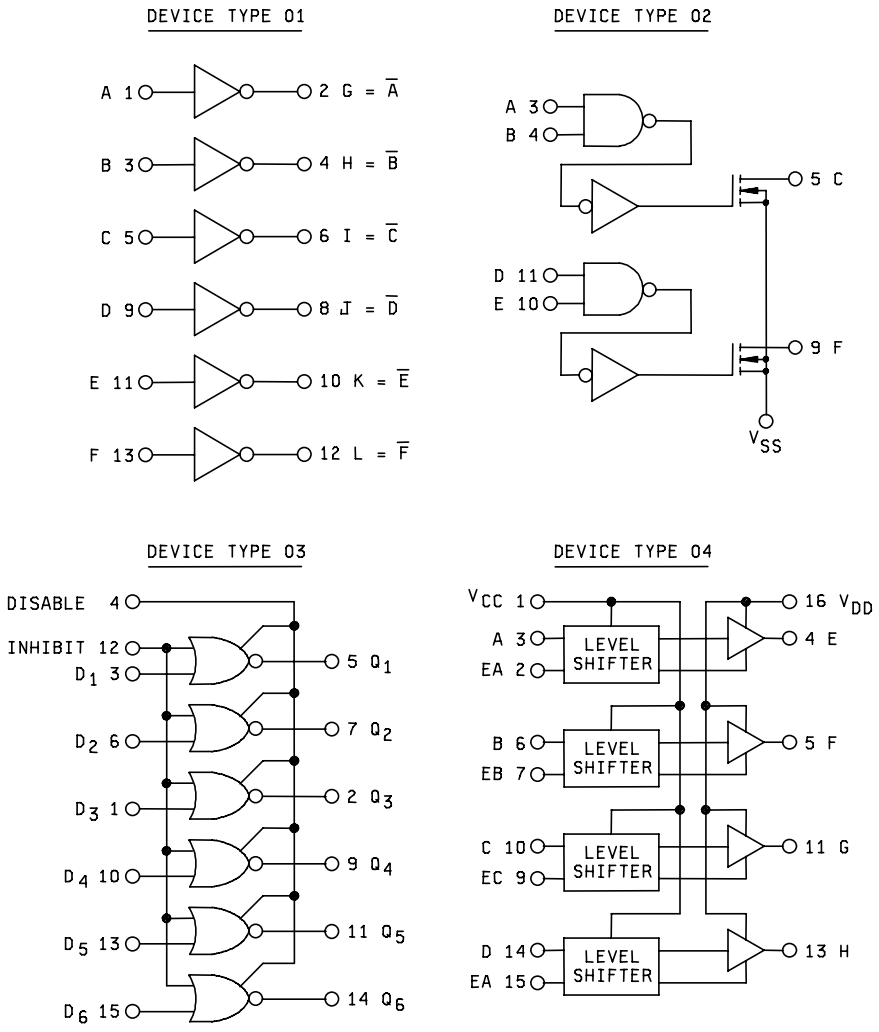


FIGURE 2 Logic diagrams.

Device type 01

Truth table, each gate	
Input	Output
L	H
H	L

Device type 02

Truth table, each gate		
Inputs		Output
A	B	C
L	L	H
L	H	H
H	L	H
H	H	L

$\overline{D \bullet E} = F$ is the same but not shown

Device type 03

Truth table, each gate			
Inputs			Output
Disable	Inhibit	D_n	Q_n
L	L	L	H
L	L	H	L
L	H	X	L
H	X	X	Z

Device type 04

Truth table, each gate			
Inputs			Output
Mode	Enable		
L to H level shift	H	L	L
	H	H	H
	L	X	Z

NOTES:
1. Z = High impedance
2. X = Don't care
3. H = High
4. L = Low
5. Device type 04 only; L = V_{SS}, H = V_{CC} at inputs and V_{DD} at outputs.

FIGURE 3. Truth tables.

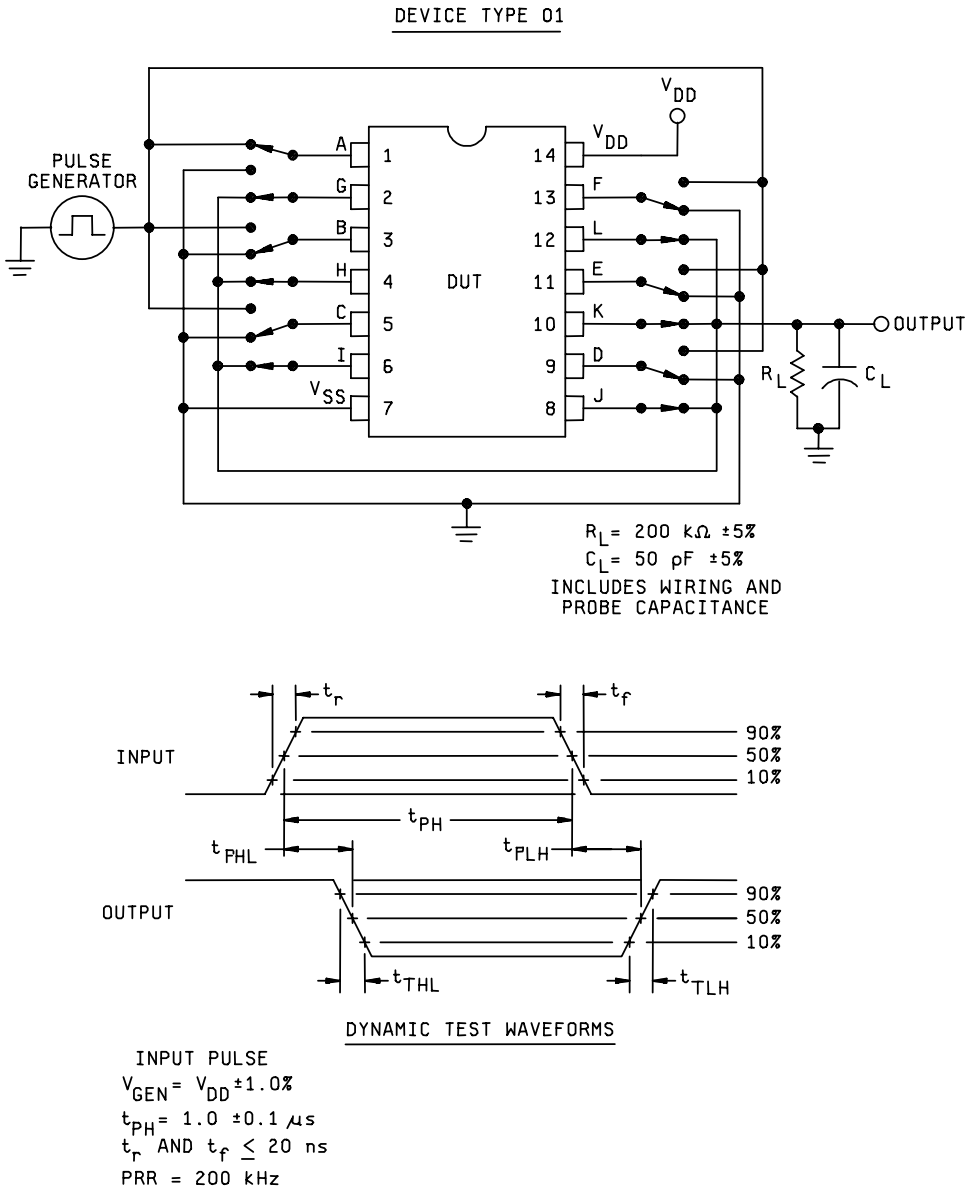
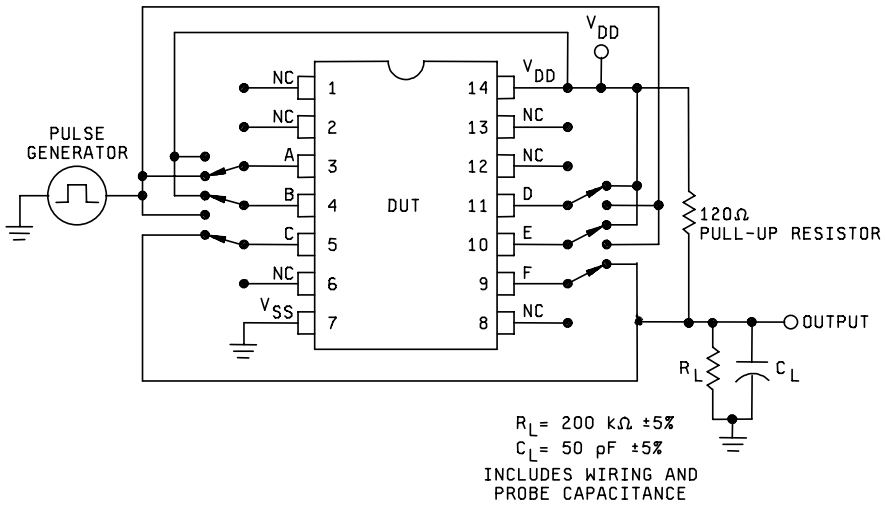
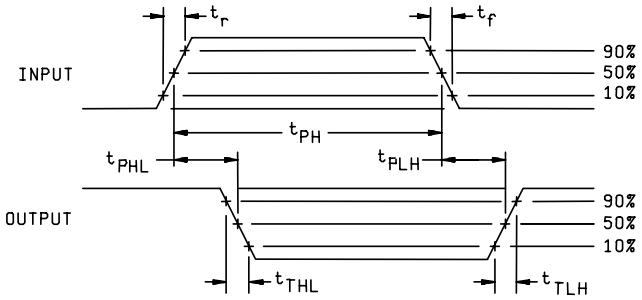


FIGURE 4. Switching waveforms and test circuit.

DEVICE TYPE 02



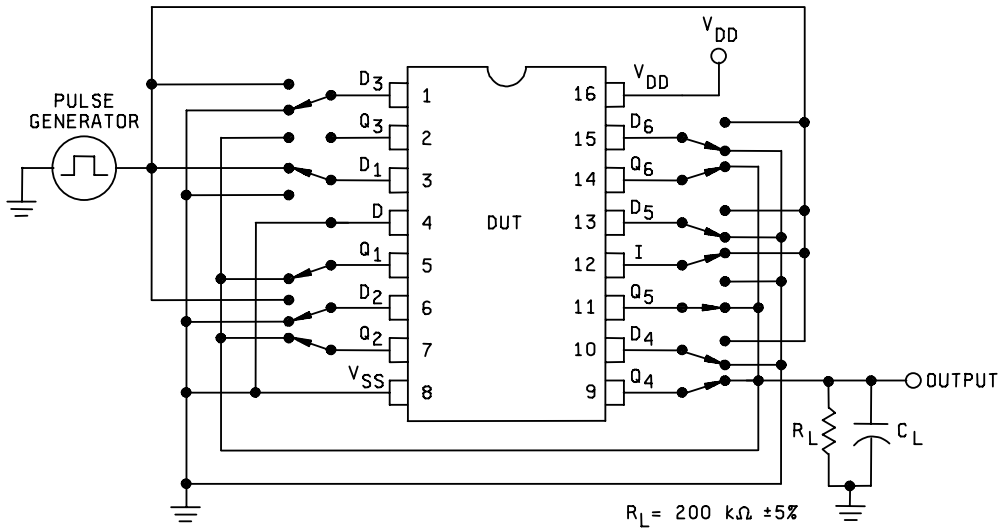


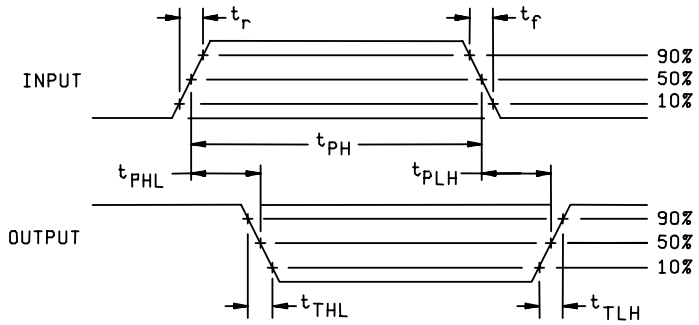
DYNAMIC TEST WAVEFORMS

INPUT PULSE
$V_{GEN} = V_{DD} \pm 1.0\%$
$t_{PH} = 1.0 \pm 0.1\ \mu s$
t_r AND $t_f \leq 20$ ns
PRR = 200 kHz

FIGURE 4. Switching waveforms and test circuit – Continued.

DEVICE TYPE 03





DYNAMIC TEST WAVEFORMS

INPUT PULSE
V_{GEN} = V_{DD} ±1.0%
t_{PH} = 1.0 ±0.1 µs
t_r AND $t_f \leq$ 20 ns
PRR = 200 kHz

FIGURE 4. Switching waveforms and test circuit – Continued.

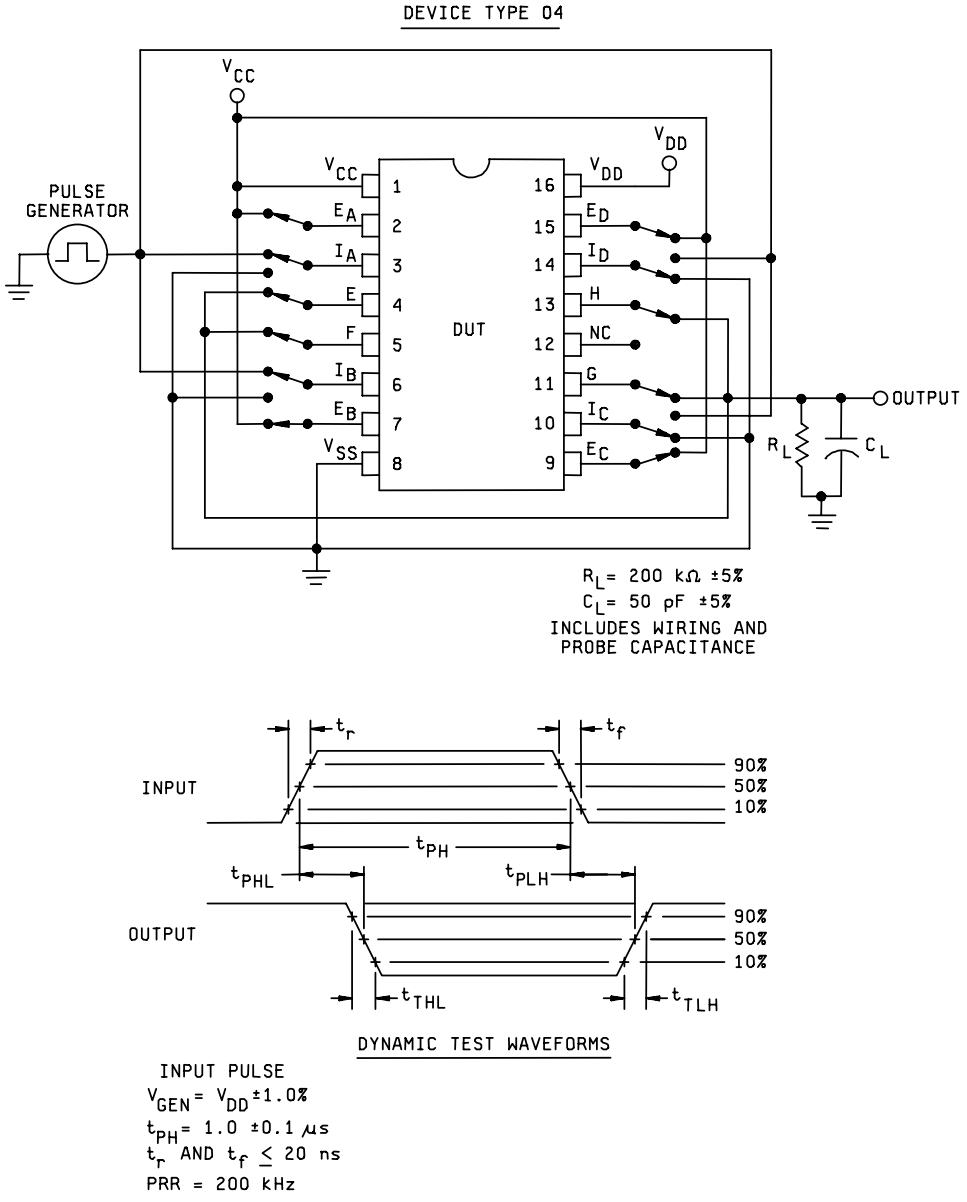


FIGURE 4. Switching waveforms and test circuit – Continued.

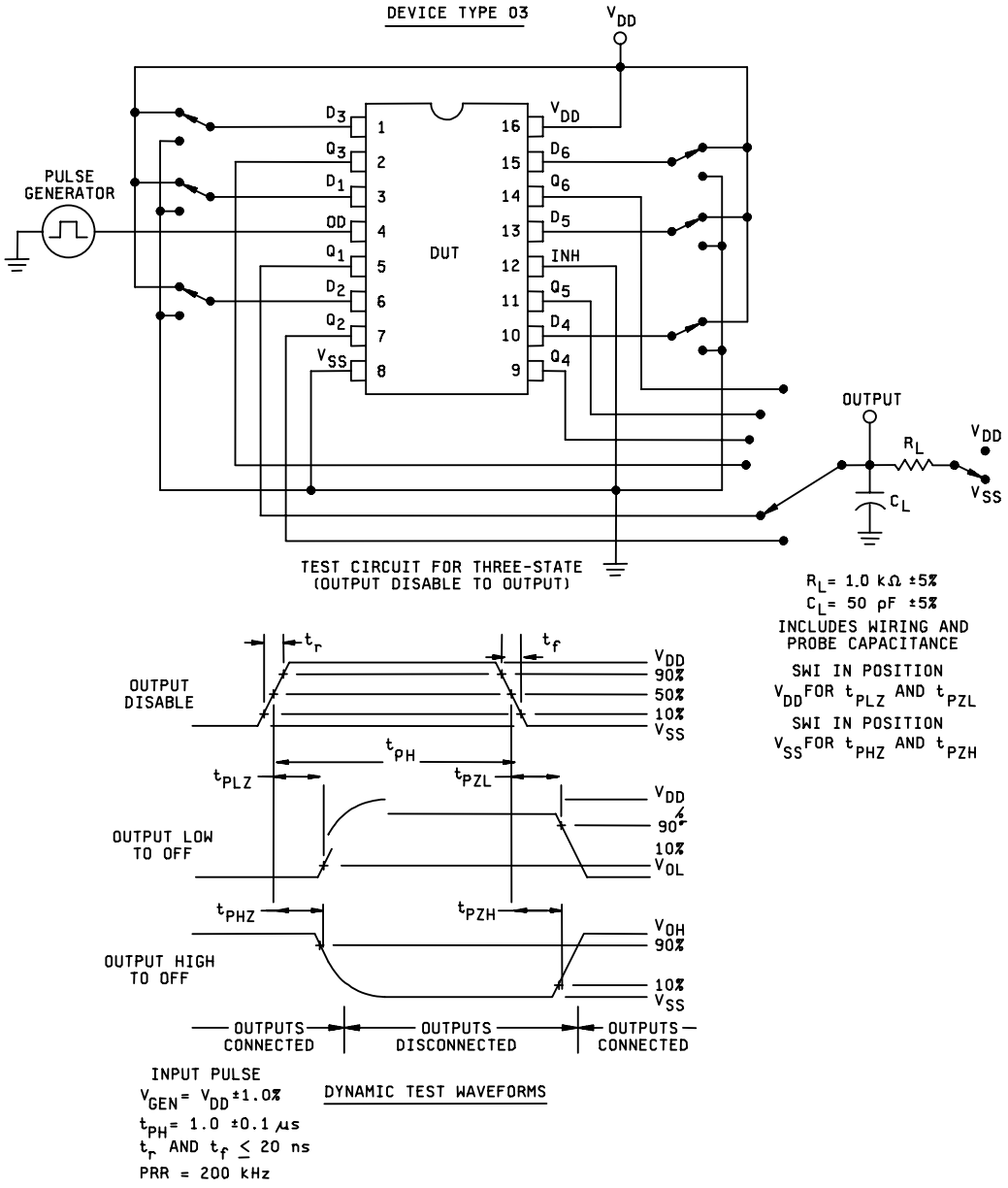
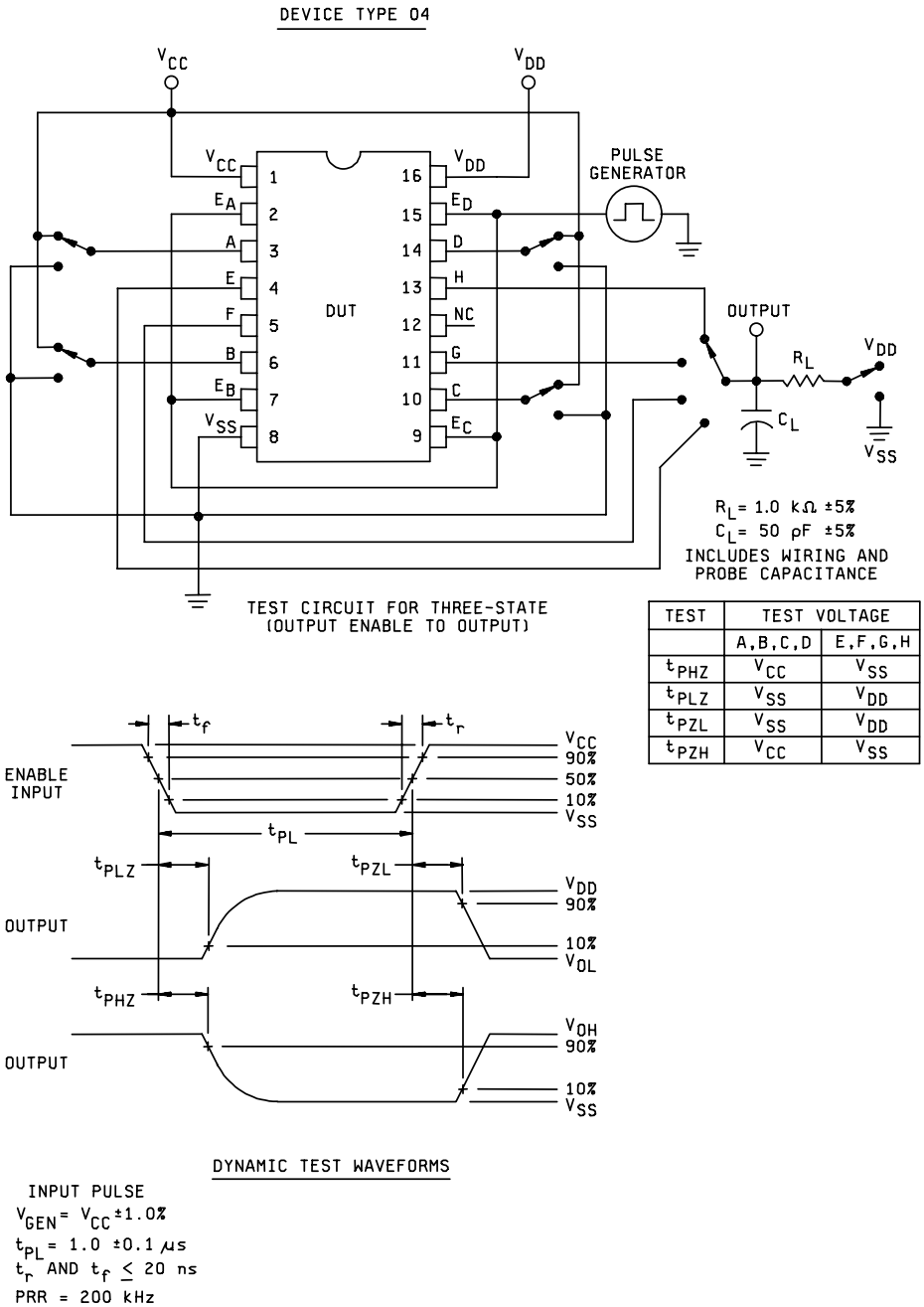


FIGURE 4. Switching waveforms and test circuit – Continued.



TEST	TEST VOLTAGE	
	A,B,C,D	E,F,G,H
t_{PHZ}	V_{CC}	V_{SS}
t_{PLZ}	V_{SS}	V_{DD}
t_{PZL}	V_{SS}	V_{DD}
t_{PZH}	V_{CC}	V_{SS}

FIGURE 4. Switching waveforms and test circuit – Continued.

4. VERIFICATION

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

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

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

b. Delete the sequence specified as initial (pre-burn-in) electrical parameters through interim (post-burn-in) electrical parameters of method 5004 and substitute lines 1 through 7 of table II herein.

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

(1) Unless otherwise specified in the manufacturers QM plan for static tests (test condition A), ambient temperature (T_A) shall be +125°C minimum. Test duration for each static test shall be 24 hours minimum for class S devices and in accordance with table I of method 1015 for class B devices.

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

ii. For static burn-in II, all inputs shall be connected to V_{DD}. V_{DD} = 15 V minimum and 18 V maximum.

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

iv. Output may be open or connected to +9.0 V.

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

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

ii. Input signal requirements: Square wave, 50% duty cycle; 25 kHz < PRR < 1 MHz; t_{TLH} and t_{THL} < 1 µs. Voltage level: Minimum = V_{SS} – 0.5 V, +10% V_{DD}; maximum = V_{DD} + 0.5 V, -10% V_{DD}. For device type 04, pin 4 (output disable) = PRR and all other inputs = PRR/2.

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

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

TABLE II. Electrical test requirements.

Line no.	MIL-PRF-38535 test requirements	Class S device 1/			Class B device 1/		
		Ref. par.	Table III Subgroups 2/	Table IV delta limits 3/	Ref. par.	Table III subgroups 2/	Table IV delta limits 3/
1	Interim electrical parameters		1			1	
2	Static burn-in I (method 1015)	4.2c 4.5.2					
3	Same as line 1		1	Δ			
4	Static burn-in II (method 1015)	4.2c 4.5.2			4.2c 4.5.2	4/	
5	Same as line 1	4.2e	1*	Δ	4.2e	1*	Δ
6	Dynamic burn-in (method 1015)	4.2c 4.5.2					
7	Same as line 1	4.2e	1*	Δ			
8	Final electrical parameters (method 5004)		1*, 2, 3, 9			1*, 2, 3, 9, 10, 11	
9	Group A test requirements (method 5005)	4.4.1	1, 2, 3, 4, 9, 10, 11, 12		4.4.1	1, 2, 3, 4, 9	
10	Group B test when using method 5005 QCI option	4.4.2	1, 2, 3, 9, 10, 11	Δ			
11	Group C end-point electrical parameters (method 5005)				4.4.3	1, 2,3	Δ
12	Group D end-point electrical parameters (method 5005)	4.4.4	1, 2, 3		4.4.4	1, 2, 3	

1/ Blank spaces indicate tests are not applicable.

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

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

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

4.2.1 Percent defective allowable (PDA).

a. The PDA for class S devices shall be 5 percent for static burn-in and 5 percent for dynamic burn-in, based on the exact number of devices submitted to each separate burn-in.

b. Static burn-in I and II failure shall be cumulative for determining the PDA.

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

d. Those devices whose measured characteristics, after burn-in, exceed the specified delta (Δ) limits or electrical parameter limits specified in table III, subgroup 1, are defective and shall be removed from the lot. The verified failures divided by the total number of devices in the lot initially submitted to burn-in shall be used to determine the percent defective for the lot and the lot shall be accepted or rejected based on the specified PDA.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.

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

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

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

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

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

d. Subgroup 12 shall be added to the group A inspection requirements for class S devices using sample size series of 15 (acceptance 0) and consist of procedures, test conditions, and limits specified in table III.

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

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

4.4.3 Group C inspection. Group C inspection shall be in accordance with table IV of MIL-PRF-38535 and as follows:

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

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

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-833 method	Cases A,C,D,T, X,Y	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	A	G	B	H	C	I	V_{SS}	J	D	K	E	L	F	V_{DD}								
		Test No.																Min	Max	Min	Max	Min	Max	
$V_{IC(pos)}$		1	1mA													GND	A		1.5					Vdc
"		2			1mA											"	B		"					"
"		3					1mA									"	C		"					"
"		4									1mA					"	D		"					"
"		5											1mA			"	E		"					"
"		6													1mA	"	F		"					"
$V_{IC(neg)}$		7	-1mA						GND								A		-6.0					"
"		8			-1mA				"								B		"					"
"		9					-1mA		"								C		"					"
"		10							"		-1mA						D		"					"
"		11							"				-1mA				E		"					"
"		12							"						-1mA		F		"					"
I_{SS} 2/	3005	13	18.0V		18.0V		18.0V		"		18.0V		18.0V		18.0V	18.0V	V_{SS}		-25		-750			nA
I_{SS} 2/	3005	14	GND		GND		GND		"		GND		GND		GND	18.0V	V_{SS}		-25		-750			nA
V_{OL1}	3007	15	15.0V		GND		GND		"		"		"		"	15.0V	G		0.05		0.05		0.05	Vdc
"	"	16	GND		15.0V		GND		"		"		"		"	"	H		"		"		"	"
"	"	17	"		GND		15.0V		"		"		"		"	"	I		"		"		"	"
"	"	18	"		"		GND		"		15.0V		"		"	"	J		"		"		"	"
"	"	19	"		"		GND		"		GND		15.0V		"	"	K		"		"		"	"
"	"	20	"		"		GND		"		GND		GND		15.0V	"	L		"		"		"	"
V_{OH1}	3006	21	GND		15.0V		15.0V		"		15.0V		15.0V		15.0V	"	G	14.95		14.95		14.95	"	Vdc
"	"	22	15.0V		GND		15.0V		"		15.0V		"		"	"	H	"		"		"	"	"
"	"	23	"		15.0V		GND		"		15.0V		"		"	"	I	"		"		"	"	"
"	"	24	"		"		15.0V		"		GND		"		"	"	J	"		"		"	"	"
"	"	25	"		"		15.0V		"		15.0V		GND		"	"	K	"		"		"	"	"
"	"	26	"		"		15.0V		"		15.0V		15.0V		GND	"	L	"		"		"	"	"
V_{IH2}		27	7.0V		GND		GND		GND		GND		GND		GND	10.0V	G		1.0		1.0		1.0	Vdc
"		28	GND		7.0V		GND		"		GND		"		"	"	H		"		"		"	"
"		29	"		GND		7.0V		"		GND		"		"	"	I		"		"		"	"
"		30	"		"		GND		"		7.0V		"		"	"	J		"		"		"	"
"		31	"		"		"		"		GND		7.0V		"	"	K		"		"		"	"
"		32	"		"		"		"		"		GND		7.0V	"	L		"		"		"	"
V_{IL2}		33	3.0V		"		"		"		"		"		GND	"	G	9.0		9.0		9.0		"
"		34	GND		3.0V		"		"		"		"		"	"	H	"		"		"		"
"		35	"		GND		3.0V		"		"		"		"	"	I	"		"		"		"
"		36	"		"		GND		"		3.0V		"		"	"	J	"		"		"		"
"		37	"		"		GND		"		GND		3.0V		"	"	K	"		"		"		"
"		38	"		"		GND		"		"		GND		3.0V	"	L	"		"		"		"
V_{IH1}		39	3.5V		GND		GND		"		"		"		GND	5.0V	G		0.5		0.5		0.5	"
"		40	GND		3.5V		GND		"		"		"		"	"	H		"		"		"	"
"		41	"		GND		3.5V		"		"		"		"	"	I		"		"		"	"
"		42	"		"		GND		"		3.5V		"		"	"	J		"		"		"	"
"		43	"		"		"		"		GND		3.5V		"	"	K		"		"		"	"
"		44	"		"		"		"		"		GND		3.5V	"	L		"		"		"	"
V_{IL1}		45	1.5V		"		"		"		"		"		GND	"	G	4.5		4.5		4.5		"
"		46	GND		1.5V		"		"		"		"		"	"	H	"		"		"		"
"		47	"		GND		1.5V		"		"		"		"	"	I	"		"		"		"
"		48	"		"		GND		"		1.5V		"		"	"	J	"		"		"		"
"		49	"		"		"		"		GND		1.5V		"	"	K	"		"		"		"
"		50	"		"		"		"		GND		GND		1.5V	"	L	"		"		"		"

See notes at end of table.

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

Symbol	MIL-STD-833 method	Cases A,C,D,T, X,Y	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	A	G	B	H	C	I	V_{SS}	J	D	K	E	L	F	V_{DD}								
		Test No.																Min	Max	Min	Max	Min	Max	
V_{IH3}		51	11.0V		GND		GND		GND		GND		GND		GND	15.0V	G		1.5		1.5		1.5	Vdc
"		52	GND		11.0V		GND		"		GND		"		"	"	H		"		"		"	"
"		53	"		GND		11.0V		"		GND		"		"	"	I		"		"		"	"
"		54	"		"		GND		"		11.0V		"		"	"	J		"		"		"	"
"		55	"		"		GND		"		GND		11.0V		"	"	K		"		"		"	"
"		56	"		"		GND		"		GND		GND		11.0V	"	L		"		"		"	"
V_{IL3}		57	4.0V		"		GND		"		GND		"		GND	"	G	13.5		13.5		13.5		"
"		58	GND		4.0V		GND		"		GND		"		"	"	H	"		"		"		"
"		59	"		GND		4.0V		"		GND		"		"	"	I	"		"		"		"
"		60	"		"		GND		"		4.0V		"		"	"	J	"		"		"		"
"		61	"		"		GND		"		GND		4.0V		"	"	K	"		"		"		"
"		62	"		"		GND		"		GND		GND		4.0V	"	L	"		"		"		"
I_{IH1} 3/	3010	63	18.0V		18.0V		18.0V		"		18.0V		18.0V		18.0V	18V	All inputs together		600					nA
I_{IH2}	3010	64	18.0V		GND		GND		"		GND		GND		GND	"	A		100		100			"
"	"	65	GND		18.0V		GND		"		GND		"		"	"	B		"		"			"
"	"	66	"		GND		18.0V		"		GND		"		"	"	C		"		"			"
"	"	67	"		"		GND		"		18.0V		"		"	"	D		"		"			"
"	"	68	"		"		"		"		GND		18.0V		"	"	E		"		"			"
"	"	69	"		"		"		"		GND		GND		18.0V	"	F		"		"			"
I_{IL1} 3/	3009	70	"		"		"		"		GND		GND		GND	"	All inputs together		-600					"
I_{IL2}	3009	71	"		18.0V		18.0V		"		18.0V		18.0V		18.0V	18.0V	A		-100		-100			"
"	"	72	18.0V		GND		18.0V		"		18.0V		"		"	"	B		-100		-100			"
"	"	73	18.0V		18.0V		GND		"		18.0V		"		"	"	C		-100		-100			"
I_{IL2}	3009	74	18.0V		18.0V		18.0V		GND		GND		18.0V		18.0V	18.0V	D		-100		-100			nA
I_{IL2}	3009	75	18.0V		18.0V		18.0V		"		18.0V		GND		18.0V	"	E		-100		-100			nA
I_{IL2}	3009	76	18.0V		18.0V		18.0V		"		18.0V		18.0V		GND	"	F		-100		-100			nA
I_{OH1}		77	GND	4.6V	GND		GND		"		GND		GND		GND	5.0V	G	-0.51		-0.36		-0.64		mA
"		78	"		"	4.6V	"		"		"		"		"	"	H	"		"		"		"
"		79	"		"		"	4.6V	"		"		"		"	"	I	"		"		"		"
"		80	"		"		"		"	4.6V	"		"		"	"	J	"		"		"		"
"		81	"		"		"		"		"	4.6V	"		"	"	K	"		"		"		"
"		82	"		"		"		"		"		"	4.6V	"	"	L	"		"		"		"
I_{OH2}		83	"	13.5V	"		"		"		"		"		"	15.0V	G	-3.4		-2.4		-4.2		"
"		84	"		"	13.5V	"		"		"		"		"	"	H	"		"		"		"
"		85	"		"		"	13.5V	"		"		"		"	"	I	"		"		"		"
"		86	"		"		"		"	13.5V	"		"		"	"	J	"		"		"		"
"		87	"		"		"		"		"	13.5V	"		"	"	K	"		"		"		"
"		88	"		"		"		"		"		"	13.5V	"	"	L	"		"		"		"
I_{OL1}		89	5.0V	0.4V	5.0V		5.0V		"		5.0V		5.0V		5.0V	5.0V	G	0.51		0.36		0.64		"
"		90	"		"	0.4V			"		"		"		"	"	H	"		"		"		"
"		91	"		"			0.4V	"		"		"		"	"	I	"		"		"		"
"		92	"		"				"	0.4V	"		"		"	"	J	"		"		"		"
"		93	"		"				"		"	0.4V	"		"	"	K	"		"		"		"
"		94	"		"				"		"		"	0.4V	"	"	L	"		"		"		"

See notes at end of table.

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

Symbol	MIL-STD-833 method	Cases A,C,D,T, X,Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	A	G	B	H	C	I	V_{SS}	J	D	K	E	L	F	V_{DD}								
		Test No.																Min	Max	Min	Max	Min	Max	
I_{OL2}		95	15.0V	1.5V	15.0V	1.5V	15.0V		GND		15.0V		15.0V		15.0V	15.0V	G	3.4		2.4		4.2		mA
"		96	"		"				"		"		"		"	"	H	"		"		"		"
"		97	"		"			1.5V	"		"		"		"	"	I	"		"		"		"
"		98	"		"				"	1.5V	"		"		"	"	J	"		"		"		"
"		99	"		"				"		"	1.5V	"		"	"	K	"		"		"		"
"		100	"		"				"		"		"	1.5V	"	"	L	"		"		"		"
																		Subgroup 4 T_A = 25°C						
																		Min	Max					
C_I	3012	101	4/		4/				GND							GND	A		12.0					pF
"	"	102							"							"	B		"					"
"	"	103					4/		"							"	C		"					"
"	"	104							"	4/						"	D		"					"
"	"	105							"			4/				"	E		"					"
"	"	106							"					4/		"	F		"					"
																		Subgroup 9 T_A = 25°C		Subgroup 10 T_A = 125°C		Subgroup 11 T_A = -55°C		
																		Min	Max	Min	Max	Min	Max	
t_{PHL}	3003	107	IN	OUT	GND		GND		GND		GND		GND		GND	5.0V	A to G	5	110	8	155	5	110	ns
"	Fig. 4	108	GND		IN	OUT	GND		"		GND		"		"	"	B to H	"	"	"	"	"	"	"
"	"	109	"		GND		IN	OUT	"		GND		"		"	"	C to I	"	"	"	"	"	"	"
"	"	110	"		"		GND		"	OUT	IN		"		"	"	D to J	"	"	"	"	"	"	"
"	"	111	"		"		"		"		GND	OUT	IN		"	"	E to K	"	"	"	"	"	"	"
"	"	112	"		"		"		"		GND		GND	OUT	IN	"	F to L	"	"	"	"	"	"	"
t_{PLH}	3003	113	IN	OUT	GND		GND		GND		GND		GND		GND	5.0V	A to G	5	110	8	155	5	110	ns
"	Fig. 4	114	GND		IN	OUT	GND		"		GND		"		"	"	B to H	"	"	"	"	"	"	"
"	"	115	"		GND		IN	OUT	"		GND		"		"	"	C to I	"	"	"	"	"	"	"
"	"	116	"		"		GND		"	OUT	IN		"		"	"	D to J	"	"	"	"	"	"	"
"	"	117	"		"		"		"		GND	OUT	IN		"	"	E to K	"	"	"	"	"	"	"
"	"	118	"		"		"		"		"		GND	OUT	IN	"	F to L	"	"	"	"	"	"	"
t_{THL}	3004	119	IN	OUT	"		"		"		"		"		GND	"	G	10	200	14	280	10	200	"
"	Fig. 4	120	GND		IN	OUT	"		"		"		"		"	"	H	"	"	"	"	"	"	"
"	"	121	"		GND		IN	OUT	"		"		"		"	"	I	"	"	"	"	"	"	"
"	"	122	"		"		GND		"	OUT	IN		"		"	"	J	"	"	"	"	"	"	"
"	"	123	"		"		GND		"		GND	OUT	IN		"	"	K	"	"	"	"	"	"	"
"	"	124	"		"		GND		"		GND		GND	OUT	IN	"	L	"	"	"	"	"	"	"
t_{TLH}	"	125	IN	OUT	GND		GND		"		GND		"		GND	"	G	"	"	"	"	"	"	"
"	"	126	GND		IN	OUT	GND		"		GND		"		"	"	H	"	"	"	"	"	"	"
"	"	127	"		GND		IN	OUT	"		GND		"		"	"	I	"	"	"	"	"	"	"
"	"	128	"		"		GND		"	OUT	IN		"		"	"	J	"	"	"	"	"	"	"
"	"	129	"		"		GND		"		GND	OUT	IN		"	"	K	"	"	"	"	"	"	"
"	"	130	"		"		GND		"		GND		GND	OUT	IN	"	L	"	"	"	"	"	"	"

See notes at end of table.

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

Symbol	MIL-STD-833 method	Cases A,C,D,T, X,Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 12 T_A = 25°C						
		Symbol	A	G	B	H	C	I	V_{SS}	J	D	K	E	L	F	V_{DD}								
		Test No.																Min	Max					
t_{PHL}	3003	131	IN	OUT	GND		GND		GND		GND		GND		GND	10.0V	A to G	3	60					ns
"	Fig. 4	132	GND		IN	OUT	GND		"		"		"		"	"	B to H	"	"					"
"	"	133	"		GND		IN	OUT	"		"		"		"	"	C to I	"	"					"
"	"	134	"		"		GND		"	OUT	IN		"		"	"	D to J	"	"					"
"	"	135	"		"		GND		"		GND	OUT	IN		"	"	E to K	"	"					"
"	"	136	"		"		GND		"		GND		GND	OUT	IN	"	F to L	"	"					"
t_{PLH}	"	137	IN	OUT	GND		GND		"		GND		"		GND	"	A to G	"	"					"
"	"	138	GND		IN	OUT	GND		"		"		"		"	"	B to H	"	"					"
"	"	139	"		GND		IN	OUT	"		"		"		"	"	C to I	"	"					"
"	"	140	"		"		GND		"	OUT	IN		"		"	"	D to J	"	"					"
"	"	141	"		"		GND		"		GND	OUT	IN		"	"	E to K	"	"					"
"	"	142	"		"		GND		"		GND		GND	OUT	IN	"	F to L	"	"					"
t_{THL}	3004	143	IN	OUT	GND		GND		"		GND		"		GND	"	G	5	100					"
"	Fig. 4	144	GND		IN	OUT	GND		"		GND		"		"	"	H	"	"					"
"	"	145	"		GND		IN	OUT	"		GND		"		"	"	I	"	"					"
"	"	146	"		"		GND		"	OUT	IN		"		"	"	J	"	"					"
"	"	147	"		"		"		"		GND	OUT	IN		"	"	K	"	"					"
"	"	148	"		"		"		"		GND		GND	OUT	IN	"	L	"	"					"
t_{TLH}	"	149	IN	OUT	GND		"		"		"		"		GND	"	G	"	"					"
"	"	150	GND		IN	OUT	"		"		"		"		"	"	H	"	"					"
"	"	151	"		GND		IN	OUT	"		"		"		"	"	I	"	"					"
"	"	152	"		"		GND		"	OUT	IN		"		"	"	J	"	"					"
"	"	153	"		"		GND		"		GND	OUT	IN		"	"	K	"	"					"
"	"	154	"		"		GND		"		GND		GND	OUT	IN	"	L	"	"					"

See notes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-833 method	Cases A,C,D, X,Y	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
			Symbol	NC	NC	A	B	C	NC	V_{SS}	NC	F	E	D	NC	NC	V_{DD}								
			Test No.															Min	Max	Min	Max	Min	Max	
$V_{IC(pos)}$		1			1 mA											GND	A		1.5					Vdc
"		2				1 mA										"	B		"					"
"		3											1mA			"	D		"					"
"		4										1mA				"	E		"					"
$V_{IC(neg)}$		5			-1mA				GND								A		-6.0					"
"		6				-1mA			"								B		"					"
"		7							"				-1mA				D		"					"
"		8							"			-1mA					E		"					"
I_{SS} 2/	3005	9			GND	GND			"			GND	GND			18.0V	V_{SS}		-75		-750			nA
"	"	10			GND	18.0V			"			18.0V	GND			"	"		"		"			"
"	"	11			18.0V	GND			"			GND	18.0V			"	"		"		"			"
"	"	12			18.0V	18.0V			"			18.0V	18.0V			"	"		"		"			"
"	"	13			GND	GND			"			GND	GND			"	"		"		"			"
V_{OL1}	3007	14			15.0V	15.0V			"			GND	GND			15.0V	C		0.05		0.05		0.05	Vdc
V_{OL1}	3007	15			GND	GND			"			15.0V	15.0V			15.0V	F		0.05		0.05		0.05	"
V_{IH1}		16			3.5V	GND	5/		"		5/	GND	GND			5.0V	C	4.5		4.5		4.5		"
"		17			GND	3.5V	"		"		"	GND	GND			"	C	"		"		"		"
"		18			GND	GND	"		"		"	GND	3.5V			"	F	"		"		"		"
"		19			GND	GND	"		"		"	3.5V	GND			"	F	"		"		"		"
V_{IL1}		20			1.5V	3.5V	"		"		"	3.5V	3.5V			"	C	"		"		"		"
"		21			3.5V	1.5V	"		"		"	3.5V	3.5V			"	C	"		"		"		"
"		22			3.5V	3.5V	"		"		"	3.5V	1.5V			"	F	"		"		"		"
"		23			3.5V	3.5V	"		"		"	1.5V	3.5V			"	F	"		"		"		"
V_{IH2}		24			7.0V	GND	5/		GND		5/	GND	GND			10.0V	C	9.0		9.0		9.0		Vdc
"		25			GND	7.0V	"		"		"	GND	GND			"	C	"		"		"		"
"		26			GND	GND	"		"		"	GND	7.0V			"	F	"		"		"		"
"		27			GND	GND	"		"		"	7.0V	GND			"	F	"		"		"		"
V_{IL2}		28			3.0V	7.0V	"		"		"	7.0V	7.0V			"	C	"		"		"		"
"		29			7.0V	3.0V	"		"		"	"	7.0V			"	C	"		"		"		"
"		30			7.0V	7.0V	"		"		"	"	3.0V			"	F	"		"		"		"
"		31			7.0V	7.0V	"		"		"	3.0V	7.0V			"	F	"		"		"		"
V_{IH3}		32			11.0V	GND	"		"		"	GND	GND			15.0V	C	13.5		13.5		13.5		"
"		33			GND	11.0V	"		"		"	GND	GND			"	C	"		"		"		"
"		34			GND	GND	"		"		"	GND	11.0V			"	F	"		"		"		"
"		35			GND	GND	"		"		"	11.0V	GND			"	F	"		"		"		"
V_{IL3}		36			4.0V	11.0V	"		"		"	11.0V	11.0V			"	C	"		"		"		"
"		37			11.0V	4.0V	"		"		"	"	11.0V			"	C	"		"		"		"
"		38			11.0V	11.0V	"		"		"	"	4.0V			"	F	"		"		"		"
"		39			11.0V	11.0V	"		"		"	4.0V	11.0V			"	F	"		"		"		"
I_{IH1} 3/	3010	40			18.0V	18.0V			"			18.0V	18.0V			18.0V	All inputs together		4					nA
I_{IH2}	3010	41			18.0V	GND			"			GND	GND			"	A		1		45			"
"	"	42			GND	18.0V			"			GND	GND			"	B		"		"			"
"	"	43			GND	GND			"			GND	18.0V			"	D		"		"			"
"	"	44			GND	GND			"			18.0V	GND			"	E		"		"			"
I_{IL1} 3/	3009	45			GND	GND			"			GND	GND			"	All inputs together		-4		"			"

See notes at end of table.

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

Symbol	MIL-STD-833 method	Cases A,C,D, X,Y	Terminal conditions 1/														Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	NC	NC	A	B	C	NC	V_{SS}	NC	F	E	D	NC	NC	V_{DD}								
		Test No.																Min	Max	Min	Max	Min	Max	
I_{IL2}	3009	46			GND	18.0V			GND			18.0V	18.0V			18.0V	A		-1		-45			nA
"	"	47			18.0V	GND			"			18.0V	18.0V			"	B		"		"			"
"	"	48			18.0V	18.0V			"			18.0V	GND			"	D		"		"			"
"	"	49			18.0V	18.0V			"			GND	18.0V			"	E		"		"			"
I_{OL1}		50			5.0V	5.0V	0.4V		"			5.0V	5.0V			5.0V	C	16		21		12		mA
I_{OL1}		51			5.0V	5.0V			"		0.4V	5.0V	5.0V			5.0V	F	16		21		12		"
I_{OL2}		52			15.0V	15.0V	1.5V		"			15.0V	15.0V			15.0V	C	110		140		80		"
I_{OL2}		53			15.0V	15.0V			"		1.5V	15.0V	15.0V			15.0V	F	110		140		80		"
																		Subgroup 4 T_A = 25°C						
																		Min	Max					
C_i	3012	54			4/				GND							GND	A		7.5					pF
"	"	55				4/			"							"	B		"					"
"	"	56							"				4/			"	D		"					"
"	"	57							"			4/				"	E		"					"
																		Subgroup 9 T_A = 25°C		Subgroup 10 T_A = 125°C		Subgroup 11 T_A = -55°C		
																		Min	Max	Min	Max	Min	Max	
t_{PHL}	3003	58			IN	5.0V	OUT		GND			5.0V	5.0V			5.0V	A to C	10	200	14	280	10	200	ns
"	Fig. 4	59			5.0V	IN	OUT		"			5.0V	5.0V			"	B to C	"	"	"	"	"	"	"
"	6/	60			5.0V	5.0V			"		OUT	5.0V	IN			"	D to F	"	"	"	"	"	"	"
"	"	61			5.0V	5.0V			"		OUT	IN	5.0V			"	E to F	"	"	"	"	"	"	"
t_{PLH}	"	62			IN	5.0V	OUT		GND			5.0V	5.0V			5.0V	A to C	"	"	"	"	"	"	"
"	"	63			5.0V	IN	OUT		"			5.0V	5.0V			"	B to C	"	"	"	"	"	"	"
"	"	64			5.0V	5.0V			"		OUT	5.0V	IN			"	D to F	"	"	"	"	"	"	"
"	"	65			5.0V	5.0V			"		OUT	IN	5.0V			"	E to F	"	"	"	"	"	"	"
t_{THL}	3004	66			IN	5.0V	OUT		GND			5.0V	5.0V			5.0V	C	5	100	7	140	5	100	ns
"	Fig. 4	67			5.0V	IN	OUT		"			5.0V	5.0V			"	C	"	"	"	"	"	"	"
"	6/	68			5.0V	5.0V			"		OUT	5.0V	IN			"	F	"	"	"	"	"	"	"
"	"	69			5.0V	5.0V			"		OUT	IN	5.0V			"	F	"	"	"	"	"	"	"
t_{TLH}	"	70			IN	5.0V	OUT		GND			5.0V	5.0V			5.0V	C	"	"	"	"	"	"	"
"	"	71			5.0V	IN	OUT		"			5.0V	5.0V			"	C	"	"	"	"	"	"	"
"	"	72			5.0V	5.0V			"		OUT	5.0V	IN			"	F	"	"	"	"	"	"	"
"	"	73			5.0V	5.0V			"		OUT	IN	5.0V			"	F	"	"	"	"	"	"	"
																		Subgroup 12 T_A = 25°C						
																		Min	Max					
t_{PHL}	3003	74			IN	10.0V	OUT		GND			10.0V	10.0V			10.0V	A to C	5	90					ns
"	Fig. 4	75			10.0V	IN	OUT		"			10.0V	10.0V			"	B to C	"	"					"
"	6/	76			10.0V	10.0V			"		OUT	10.0V	IN			"	D to F	"	"					"
"	"	77			10.0V	10.0V			"		OUT	IN	10.0V			"	E to F	"	"					"
t_{PLH}	"	78			IN	10.0V	OUT		GND			10.0V	10.0V			10.0V	A to C	6	120					"
"	"	79			10.0V	IN	OUT		"			10.0V	10.0V			"	B to C	"	"					"
"	"	80			10.0V	10.0V			"		OUT	10.0V	IN			"	D to F	"	"					"
"	"	81			10.0V	10.0V			"		OUT	IN	10.0V			"	E to F	"	"					"
t_{THL}	3004	82			IN	10.0V	OUT		"			10.0V	10.0V			"	C	2	40					"
"	Fig. 4	83			10.0V	IN	OUT		"			10.0V	10.0V			"	C	"	"					"
"	6/	84			10.0V	10.0V			"		OUT	10.0V	IN			"	F	"	"					"
"	"	85			10.0V	10.0V			"		OUT	IN	10.0V			"	F	"	"					"
t_{TLH}	3004	86			IN	10.0V	OUT		GND			10.0V	10.0V			10.0V	C	4	70					ns
"	Fig. 4	87			10.0V	IN	OUT		"			10.0V	10.0V			"	C	"	"					"
"	6/	88			"	10.0V			"		OUT	10.0V	IN			"	F	"	"					"
"	"	89			"	10.0V			"		OUT	IN	10.0V			"	F	"	"					"

See notes at end of table.

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/															Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	D3	Q3	D1	Dis.	Q1	D2	Q2	V_{SS}	Q4	D4	Q5	I	D5	Q6	D6	V_{DD}							
		Test No.																	Min	Max	Min	Max	Min	Max	
$V_{IC(pos)}$		1				1mA												GND	Dis.		1.5					Vdc
"		2												1mA				"	I		"					"
"		3			1mA													"	D_1		"					"
"		4						1mA										"	D_2		"					"
"		5	1mA															"	D_3		"					"
"		6										1mA						"	D_4		"					"
"		7													1mA			"	D_5		"					"
"		8															1mA	"	D_6		"					"
$V_{IC(neg)}$		9				-1mA				GND									Dis.		-6.0					"
"		10								"				-1mA					I		"					"
"		11			-1mA					"									D_1		"					"
"		12						-1mA		"									D_2		"					"
"		13	-1mA							"									D_3		"					"
"		14								"		-1mA							D_4		"					"
"		15								"					-1mA				D_5		"					"
"		16								"							-1mA		D_6		"					"
I_{SS} 2/	3005	17	GND		GND	GND		GND		"		GND		GND	GND		GND	18.0V	V_{SS}		-75		750			nA
"	"	18	18.0V		18.0V	GND		18.0V		"		18.0V		GND	18.0V		18.0V	"	"		"		"			"
"	"	19	18.0V		18.0V	GND		18.0V		"		18.0V		18.0V	18.0V		18.0V	"	"		"		"			"
"	"	20	18.0V		18.0V	18.0V		18.0V		"		18.0V		18.0V	18.0V		18.0V	"	"		"		"			"
I_{OC11} 3/		21	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	"	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	All output together		150					nA
I_{OC12}		22	"		"	"	18.0V	"		"		"		"	"		"	"	Q_1		25		90		25	"
"		23	"		"	"		"	18.0V	"		"		"	"		"	"	Q_2		"		"		"	"
"		24	"	18.0V	"	"		"		"		"		"	"		"	"	Q_3		"		"		"	"
"		25	"		"	"		"		"	18.0V	"		"	"		"	"	Q_4		"		"		"	"
"		26	"		"	"		"		"		"	18.0V	"	"		"	"	Q_5		"		"		"	"
"		27	"		"	"		"		"		"		"	"	18.0V	"	"	Q_6		"		"		"	"
I_{OC21} 3/		28	"	GND	"	"	GND	"	GND	"	GND	"	GND	"	"	GND	"	"	All output together		-150					"
I_{OC22}		29	"		"	"	GND	"		"		"		"	"		"	"	Q_1		-25		-90		-25	"
"		30	"		"	"		"	GND	"		"		"	"		"	"	Q_2		"		"		"	"
"		31	"	GND	"	"		"		"		"		"	"		"	"	Q_3		"		"		"	"
"		32	"		"	"		"		"	GND	"		"	"		"	"	Q_4		"		"		"	"
"		33	"		"	"		"		"		"	GND	"	"		"	"	Q_5		"		"		"	"
"		34	"		"	"		"		"		"		"	"	GND	"	"	Q_6		"		"		"	"
V_{OH1}	3006	35	GND		GND	GND		GND		"		GND		GND	GND		GND	15.0V	Q_1	14.95		14.95		14.95		Vdc
"	"	36	"		"	"		"		"		"		"	"		"	"	Q_2	"		"		"		"
"	"	37	"		"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"	"	38	"		"	"		"		"		"		"	"		"	"	Q_4	"		"		"		"
"	"	39	"		"	"		"		"		"		"	"		"	"	Q_5	"		"		"		"
"	"	40	"		"	"		"		"		"		"	"		"	"	Q_6	"		"		"		"

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/															Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	D3	Q3	D1	Dis.	Q1	D2	Q2	V_{SS}	Q4	D4	Q5	I	D5	Q6	D6	V_{DD}							
		Test No.																	Min	Max	Min	Max	Min	Max	
V_{OL1}	3007	41	15.0V		15.0V	GND		15.0V		GND		15.0V		GND	15.0V		15.0V	15.0V		0.05		0.05		0.05	Vdc
"	"	42	"		"	"		"		"		"		15.0V	"		"	"		"		"		"	"
"	"	43	"		"	"		"		"		"		GND	"		"	"		"		"		"	"
"	"	44	"		"	"		"		"		"		15.0V	"		"	"		"		"		"	"
"	"	45	"		"	"		"		"		"		GND	"		"	"		"		"		"	"
"	"	46	"		"	"		"		"		"		15.0V	"		"	"		"		"		"	"
"	"	47	"		"	"		"		"		"		GND	"		"	"		"		"		"	"
"	"	48	"		"	"		"		"		"		15.0V	"		"	"		"		"		"	"
"	"	49	"		"	"		"		"		"		GND	"		"	"		"		"		"	"
"	"	50	"		"	"		"		"		"		15.0V	"		"	"		"		"		"	"
"	"	51	"		"	"		"		"		"		GND	"		"	"		"		"		"	"
"	"	52	"		"	"		"		"		"		15.0V	"		"	"		"		"		"	"
V_{IH1}		53	GND		3.5V	"		GND		"		GND		GND	GND		GND	5.0V		0.5		0.5		0.5	Vdc
"		54	GND		GND	"		3.5V		"		"		"	"		"	"		"		"		"	"
"		55	3.5V		"	"		GND		"		"		"	"		"	"		"		"		"	"
"		56	GND		"	"		"		"		3.5V		"	"		"	"		"		"		"	"
"		57	"		"	"		"		"		GND		"	3.5V		"	"		"		"		"	"
"		58	"		"	"		"		"		"		"	GND		3.5V	"		"		"		"	"
"		59	"		"	"		"		"		"		3.5V	"		GND	"		"		"		"	"
"		60	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		61	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		62	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		63	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		64	"		"	"		"		"		"		"	"		"	"		"		"		"	"
V_{IH2}		65	GND		7.0V	GND		GND		GND		GND		GND	GND		GND	10.0V		1.0		1.0		1.0	Vdc
"		66	GND		GND	"		7.0V		"		GND		"	"		"	"		"		"		"	"
"		67	7.0V		"	"		GND		"		GND		"	"		"	"		"		"		"	"
"		68	GND		"	"		"		"		7.0V		"	"		"	"		"		"		"	"
"		69	"		"	"		"		"		GND		"	7.0V		"	"		"		"		"	"
"		70	"		"	"		"		"		"		"	GND		7.0V	"		"		"		"	"
"		71	"		"	"		"		"		"		7.0V	"		GND	"		"		"		"	"
"		72	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		73	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		74	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		75	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		76	"		"	"		"		"		"		"	"		"	"		"		"		"	"
V_{IH3}		77	"		11.0V	GND		"		"		"		GND	"		"	15.0V		1.5		1.5		1.5	Vdc
"		78	"		GND	"		11.0V		"		"		"	"		"	"		"		"		"	"
"		79	11.0V		"	"		GND		"		"		"	"		"	"		"		"		"	"
"		80	GND		"	"		"		"		11.0V		"	"		"	"		"		"		"	"
"		81	"		"	"		"		"		GND		"	11.0V		"	"		"		"		"	"
"		82	"		"	"		"		"		"		"	GND		11.0V	"		"		"		"	"
"		83	"		"	"		"		"		"		11.0V	"		GND	"		"		"		"	"
"		84	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		85	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		86	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		87	"		"	"		"		"		"		"	"		"	"		"		"		"	"
"		88	"		"	"		"		"		"		"	"		"	"		"		"		"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
			Symbol	D3	Q3	D1	Dis.	Q1	D2	Q2	V_{SS}	Q4	D4	Q5	I	D5	Q6	D6	V_{DD}							
			Test No.																	Min	Max	Min	Max	Min	Max	
V_{IL1}		89	GND		1.5V	GND		GND		GND		GND		GND	GND		GND	5.0V	Q_1	4.5		4.5		4.5		Vdc
"		90	GND		GND	"		1.5V		"		"		"	"		"	"	Q_2	"		"		"		"
"		91	1.5V		"	"		GND		"		"		"	"		"	"	Q_3	"		"		"		"
"		92	GND		"	"		"		"		1.5V		"	"		"	"	Q_4	"		"		"		"
"		93	"		"	"		"		"		GND		"	1.5V		"	"	Q_5	"		"		"		"
"		94	"		"	"		"		"		GND		"	GND		1.5V	"	Q_6	"		"		"		"
"		95	1.5V		1.5V	"		1.5V		"		1.5V		1.5V	1.5V		"	"	Q_1	"		"		"		"
"		96	"		"	"		"		"		"		"	"		"	"	Q_2	"		"		"		"
"		97	"		"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"		98	"		"	"		"		"		"		"	"		"	"	Q_4	"		"		"		"
"		99	"		"	"		"		"		"		"	"		"	"	Q_5	"		"		"		"
"		100	"		"	"		"		"		"		"	"		"	"	Q_6	"		"		"		"
V_{IL2}		101	GND		3.0V	"		GND		"		GND		GND	GND		GND	10.0V	Q_1	9.0		9.0		9.0		"
"		102	GND		GND	"		3.0V		"		GND		"	"		"	"	Q_2	"		"		"		"
"		103	3.0V		"	"		GND		"		GND		"	"		"	"	Q_3	"		"		"		"
"		104	GND		"	"		"		"		3.0V		"	"		"	"	Q_4	"		"		"		"
"		105	GND		"	"		"		"		GND		"	3.0V		"	"	Q_5	"		"		"		"
"		106	GND		"	"		"		"		GND		"	GND		3.0V	"	Q_6	"		"		"		"
"		107	3.0V		3.0V	"		3.0V		"		3.0V		3.0V	3.0V		"	"	Q_1	"		"		"		"
"		108	"		"	"		"		"		"		"	"		"	"	Q_2	"		"		"		"
"		109	"		"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"		110	"		"	"		"		"		"		"	"		"	"	Q_4	"		"		"		"
"		111	"		"	"		"		"		"		"	"		"	"	Q_5	"		"		"		"
"		112	"		"	"		"		"		"		"	"		"	"	Q_6	"		"		"		"
V_{IL3}		113	GND		4.0V	GND		GND		GND		GND		GND	GND		GND	15.0V	Q_1	13.5		13.5		13.5		Vdc
"		114	GND		GND	"		4.0V		"		GND		"	"		"	"	Q_2	"		"		"		"
"		115	4.0V		"	"		GND		"		GND		"	"		"	"	Q_3	"		"		"		"
"		116	GND		"	"		"		"		4.0V		"	"		"	"	Q_4	"		"		"		"
"		117	GND		"	"		"		"		GND		"	4.0V		"	"	Q_5	"		"		"		"
"		118	GND		"	"		"		"		GND		"	GND		4.0V	"	Q_6	"		"		"		"
"		119	4.0V		4.0V	"		4.0V		"		4.0V		4.0V	4.0V		"	"	Q_1	"		"		"		"
"		120	"		"	"		"		"		"		"	"		"	"	Q_2	"		"		"		"
"		121	"		"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"		122	"		"	"		"		"		"		"	"		"	"	Q_4	"		"		"		"
"		123	"		"	"		"		"		"		"	"		"	"	Q_5	"		"		"		"
"		124	"		"	"		"		"		"		"	"		"	"	Q_6	"		"		"		"
I_{IH1} 3/	3010	125	18.0V		18.0V	18.0V		18.0V		"		18.0V		18.0V	18.0V		18.0V	18.0V	All inputs together		800					nA
I_{IH2}	"	126	GND		GND	18.0V		GND		"		GND		GND	GND		GND	"	Dis.		100		100			"
"	"	127	"		GND	GND		GND		"		"		18.0V	"		"	"	I		"		"			"
"	"	128	"		18.0V	"		GND		"		"		GND	"		"	"	D_1		"		"			"
"	"	129	"		GND	"		18.0V		"		"		"	"		"	"	D_2		"		"			"
"	"	130	18.0V		"	"		GND		"		"		"	"		"	"	D_3		"		"			"
"	"	131	GND		"	"		"		"		18.0V		"	"		"	"	D_4		"		"			"
"	"	132	"		"	"		"		"		GND		"	18.0V		"	"	D_5		"		"			"
"	"	133	"		"	"		"		"		GND		"	GND		18.0V	"	D_6		"		"			"
I_{IL1} 3/	3009	134	"		"	"		"		"		GND		"	GND		GND	"	All inputs together		-800					"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	D3	Q3	D1	Dis.	Q1	D2	Q2	V_{SS}	Q4	D4	Q5	I	D5	Q6	D6	V_{DD}								
		Test No.																		Min	Max	Min	Max	Min	Max	
I_{IL2}	3009	135	18.0V		18.0V	GND		18.0V		GND		18.0V		18.0V	18.0V		18.0V	18.0V	Dis.		-100		-100			nA
"	"	136	"		18.0V	18.0V		18.0V		"		"		GND	"		"	"	I		"		"			"
"	"	137	"		GND	"		18.0V		"		"		18.0V	"		"	"	D_1		"		"			"
"	"	138	"		18.0V	"		GND		"		"		"	"		"	"	D_2		"		"			"
"	"	139	GND		"	"		18.0V		"		"		"	"		"	"	D_3		"		"			"
"	"	140	18.0V		"	"		"		"		GND		"	"		"	"	D_4		"		"			"
"	"	141	18.0V		"	"		"		"		18.0V		"	GND		"	"	D_5		"		"			"
"	"	142	18.0V		"	"		"		"		18.0V		"	18.0V		GND	"	D_6		"		"			"
I_{OH1}		143	GND		GND	GND	4.6V	GND		"		GND		GND	GND		"	5.0V	Q_1	-0.51		-0.36		-0.64		mA
"		144	"		"	"		"	4.6V	"		"		"	"		"	"	Q_2	"		"		"		"
"		145	"	4.6V	"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"		146	"		"	"		"		"	4.6V	"		"	"		"	"	Q_4	"		"		"		"
"		147	"		"	"		"		"		"	4.6V	"	"		"	"	Q_5	"		"		"		"
"		148	"		"	"		"		"		"		"	"	4.6V	"	"	Q_6	"		"		"		"
I_{OL1}		149	"		"	"	0.4V	"		"		"		5.0V	"		"	"	Q_1	0.51		0.36		0.64		"
"		150	"		"	"		"	0.4V	"		"		"	"		"	"	Q_2	"		"		"		"
"		151	"	0.4V	"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"		152	"		"	"		"		"	0.4V	"		"	"		"	"	Q_4	"		"		"		"
"		153	"		"	"		"		"		"	0.4V	"	"		"	"	Q_5	"		"		"		"
"		154	"		"	"		"		"		"		"	"	0.4V	"	"	Q_6	"		"		"		"
I_{OH2}		155	"		"	"	13.5V	"		"		"		GND	"		"	15.0V	Q_1	-3.4		-2.4		-4.2		"
"		156	"		"	"		"	13.5V	"		"		"	"		"	"	Q_2	"		"		"		"
"		157	"	13.5V	"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"		158	"		"	"		"		"	13.5V	"		"	"		"	"	Q_4	"		"		"		"
"		159	"		"	"		"		"		"	13.5V	"	"		"	"	Q_5	"		"		"		"
"		160	"		"	"		"		"		"		"	"	13.5V	"	"	Q_6	"		"		"		"
I_{OL2}		161	GND		GND	GND	1.5V	GND		GND		GND		15.0V	GND		GND	15.0V	Q_1	3.4		2.4		4.2		mA
"		162	"		"	"		"	1.5V	"		"		"	"		"	"	Q_2	"		"		"		"
"		163	"	1.5V	"	"		"		"		"		"	"		"	"	Q_3	"		"		"		"
"		164	"		"	"		"		"	1.5V	"		"	"		"	"	Q_4	"		"		"		"
"		165	"		"	"		"		"		"	1.5V	"	"		"	"	Q_5	"		"		"		"
"		166	"		"	"		"		"		"		"	"	1.5V	"	"	Q_6	"		"		"		"
																				Subgroup 4 T_A = 25°C						
																				Min	Max					
C_I	3012	167				4/				GND				4/				GND	Dis.		7.5					pF
"	"	168								"								"	I		"					"
"	"	169			4/					"								"	D_1		"					"
"	"	170						4/		"								"	D_2		"					"
"	"	171	4/							"								"	D_3		"					"
"	"	172								"		4/						"	D_4		"					"
"	"	173								"					4/			"	D_5		"					"
"	"	174								"							4/	"	D_6		"					"

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/															Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Subgroup 9 T_A = 25°C		Subgroup 10 T_A = 125°C		Subgroup 11 T_A = -55°C		
		Symbol	D3	Q3	D1	Dis.	Q1	D2	Q2	V_{SS}	Q4	D4	Q5	I	D5	Q6	D6	V_{DD}							
		Test No.																	Min	Max	Min	Max	Min	Max	
t_{PHL}	3003	175	GND		GND	GND	OUT	GND		GND		GND		IN	GND		GND	5.0V	I to Q_1	14	270	19	380	14	270	ns
"	Fig. 4	176	"		"	"		"	OUT	"		"		"	"		"	"	I to Q_2	"	"	"	"	"	"	"
"	"	177	"	OUT	"	"		"		"		"		"	"		"	"	I to Q_3	"	"	"	"	"	"	"
"	"	178	"		"	"		"		"	OUT	"		"	"		"	"	I to Q_4	"	"	"	"	"	"	"
"	"	179	"		"	"		"		"		"	OUT	"	"		"	"	I to Q_5	"	"	"	"	"	"	"
"	"	180	"		"	"		"		"		"		"	"	OUT	"	"	I to Q_6	"	"	"	"	"	"	"
"	"	181	"		IN	"	OUT	"		"		"		GND	"		"	"	D_1 to Q_1	"	"	"	"	"	"	"
"	"	182	"		GND	"		IN	OUT	"		"		"	"		"	"	D_2 to Q_2	"	"	"	"	"	"	"
"	"	183	IN	OUT	"	"		GND		"		"		"	"		"	"	D_3 to Q_3	"	"	"	"	"	"	"
"	"	184	GND		"	"		"		"	OUT	IN		"	"		"	"	D_4 to Q_4	"	"	"	"	"	"	"
"	"	185	"		"	"		"		"		GND	OUT	"	IN		"	"	D_5 to Q_5	"	"	"	"	"	"	"
"	"	186	"		"	"		"		"		"		"	GND	OUT	IN	"	D_6 to Q_6	"	"	"	"	"	"	"
t_{PLH}	3003	187	"		"	"	OUT	"		"		"		IN	GND		GND	"	I to Q_1	19	380	27	535	19	380	"
"	Fig. 4	188	"		"	"		"	OUT	"		"		"	"		"	"	I to Q_2	"	"	"	"	"	"	"
"	"	189	"	OUT	"	"		"		"		"		"	"		"	"	I to Q_3	"	"	"	"	"	"	"
"	"	190	"		"	"		"		"	OUT	"		"	"		"	"	I to Q_4	"	"	"	"	"	"	"
"	"	191	"		"	"		"		"		"	OUT	"	"		"	"	I to Q_5	"	"	"	"	"	"	"
"	"	192	"		"	"		"		"		"		"	"	OUT	"	"	I to Q_6	"	"	"	"	"	"	"
"	"	193	"		IN	"	OUT	"		"		"		GND	"		"	"	D_1 to Q_1	"	"	"	"	"	"	"
"	"	194	"		GND	"		IN	OUT	"		"		"	"		"	"	D_2 to Q_2	"	"	"	"	"	"	"
"	"	195	IN	OUT	"	"		GND		"		"		"	"		"	"	D_3 to Q_3	"	"	"	"	"	"	"
"	"	196	GND		"	"		"		"	OUT	IN		"	"		"	"	D_4 to Q_4	"	"	"	"	"	"	"
"	"	197	"		"	"		"		"		GND	OUT	"	IN		"	"	D_5 to Q_5	"	"	"	"	"	"	"
"	"	198	"		"	"		"		"		GND		"	GND	OUT	IN	"	D_6 to Q_6	"	"	"	"	"	"	"
t_{THL}	3004	199	GND		GND	GND	OUT	GND		GND		GND		IN	GND		GND	5.0V	Q_1	6	120	9	170	6	120	ns
"	Fig. 4	200	"		"	"		"	OUT	"		"		"	"		"	"	Q_2	"	"	"	"	"	"	"
"	"	201	"	OUT	"	"		"		"		"		"	"		"	"	Q_3	"	"	"	"	"	"	"
"	"	202	"		"	"		"		"	OUT	"		"	"		"	"	Q_4	"	"	"	"	"	"	"
"	"	203	"		"	"		"		"		"	OUT	"	"		"	"	Q_5	"	"	"	"	"	"	"
"	"	204	"		"	"		"		"		"		"	"	OUT	"	"	Q_6	"	"	"	"	"	"	"
"	"	205	"		IN	"	OUT	"		"		"		GND	"		"	"	Q_1	"	"	"	"	"	"	"
"	"	206	"		GND	"		IN	OUT	"		"		"	"		"	"	Q_2	"	"	"	"	"	"	"
"	"	207	IN	OUT	"	"		GND		"		"		"	"		"	"	Q_3	"	"	"	"	"	"	"
"	"	208	GND		"	"		"		"	OUT	IN		"	"		"	"	Q_4	"	"	"	"	"	"	"
"	"	209	"		"	"		"		"		GND	OUT	"	IN		"	"	Q_5	"	"	"	"	"	"	"
"	"	210	"		"	"		"		"		"		"	GND	OUT	IN	"	Q_6	"	"	"	"	"	"	"
t_{TLH}	3004	211	"		"	"	OUT	"		"		"		IN	"		GND	"	Q_1	10	200	14	280	10	200	ns
"	Fig. 4	212	"		"	"		"	OUT	"		"		"	"		"	"	Q_2	"	"	"	"	"	"	"
"	"	213	"	OUT	"	"		"		"		"		"	"		"	"	Q_3	"	"	"	"	"	"	"
"	"	214	"		"	"		"		"	OUT	"		"	"		"	"	Q_4	"	"	"	"	"	"	"
"	"	215	"		"	"		"		"		"	OUT	"	"		"	"	Q_5	"	"	"	"	"	"	"
"	"	216	"		"	"		"		"		"		"	"	OUT	"	"	Q_6	"	"	"	"	"	"	"
"	"	217	"		IN	"	OUT	"		"		"		GND	"		"	"	Q_1	"	"	"	"	"	"	"
"	"	218	"		GND	"		IN	OUT	"		"		"	"		"	"	Q_2	"	"	"	"	"	"	"
"	"	219	IN	OUT	"	"		GND		"		"		"	"		"	"	Q_3	"	"	"	"	"	"	"
"	"	220	GND		"	"		"		"	OUT	IN		"	"		"	"	Q_4	"	"	"	"	"	"	"
"	"	221	GND		"	"		"		"		GND	OUT	"	IN		"	"	Q_5	"	"	"	"	"	"	"
"	"	222	GND		"	"		"		"		GND		"	GND	OUT	IN	"	Q_6	"	"	"	"	"	"	"

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9 T_A = 25°C		Subgroup 10 T_A = 125°C		Subgroup 11 T_A = -55°C		
		Symbol	D3	Q3	D1	Dis.	Q1	D2	Q2	V_{SS}	Q4	D4	Q5	I	D5	Q6	D6	V_{DD}								
		Test No.																		Min	Max	Min	Max	Min	Max	
t_{PHZ} 5/	Fig. 4	223	GND		GND	IN	OUT	GND		GND		GND		GND	GND		GND	5.0V	Dis to Q_1	6	120	9	170	6	120	ns
"	"	224	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"	"	"	"	"	"
"	"	225	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"	"	"	"	"	"
"	"	226	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"	"	"	"	"	"
"	"	227	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"	"	"	"	"	"
"	"	228	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"	"	"	"	"	"
t_{PZH} 5/	"	229	"		"	"	OUT	"		"		"		"	"		"	"	Dis to Q_1	11	220	16	310	11	220	"
"	"	230	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"	"	"	"	"	"
"	"	231	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"	"	"	"	"	"
"	"	232	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"	"	"	"	"	"
"	"	233	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"	"	"	"	"	"
"	"	234	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"	"	"	"	"	"
t_{PLZ} 5/	"	235	5.0V		5.0V	"	OUT	5.0V		"		5.0V		"	5.0V		5.0V	"	Dis to Q_1	13	250	18	350	13	250	"
"	"	236	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"	"	"	"	"	"
"	"	237	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"	"	"	"	"	"
"	"	238	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"	"	"	"	"	"
"	"	239	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"	"	"	"	"	"
"	"	240	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"	"	"	"	"	"
t_{PZL} 5/	"	241	"		"	"	OUT	"		"		"		"	"		"	"	Dis to Q_1	"	"	"	"	"	"	"
"	"	242	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"	"	"	"	"	"
"	"	243	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"	"	"	"	"	"
"	"	244	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"	"	"	"	"	"
"	"	245	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"	"	"	"	"	"
"	"	246	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"	"	"	"	"	"
																				Subgroup 12 T_A = 25°C						
																				Min	Max					
t_{PHL}	3003	247	GND		GND	GND	OUT	GND		GND		GND		IN	GND		GND	10.0V	I to Q_1	6	120					ns
"	Fig. 4	248	"		"	"		"	OUT	"		"		"	"		"	"	I to Q_2	"	"					"
"	"	249	"	OUT	"	"		"		"		"		"	"		"	"	I to Q_3	"	"					"
"	"	250	"		"	"		"		"	OUT	"		"	"		"	"	I to Q_4	"	"					"
"	"	251	"		"	"		"		"		"	OUT	"	"		"	"	I to Q_5	"	"					"
"	"	252	"		"	"		"		"		"		"	"	OUT	"	"	I to Q_6	"	"					"
"	"	253	"		IN	"	OUT	"		"		"		GND	"		"	"	D_1 to Q_1	"	"					"
"	"	254	"		GND	"		IN	OUT	"		"		"	"		"	"	D_2 to Q_2	"	"					"
"	"	255	IN	OUT	"	"		GND		"		"		"	"		"	"	D_3 to Q_3	"	"					"
"	"	256	GND		"	"		"		"	OUT	IN		"	"		"	"	D_4 to Q_4	"	"					"
"	"	257	"		"	"		"		"		GND	OUT	"	IN		"	"	D_5 to Q_5	"	"					"
"	"	258	"		"	"		"		"		"		"	GND	OUT	IN	"	D_6 to Q_6	"	"					"
t_{PLH}	3003	259	"		"	"	OUT	"		"		"		IN	"		GND	"	I to Q_1	9	180					"
"	Fig. 4	260	"		"	"		"	OUT	"		"		"	"		"	"	I to Q_2	"	"					"
"	"	261	"	OUT	"	"		"		"		"		"	"		"	"	I to Q_3	"	"					"
"	"	262	"		"	"		"		"	OUT	"		"	"		"	"	I to Q_4	"	"					"
"	"	263	"		"	"		"		"		"	OUT	"	"		"	"	I to Q_5	"	"					"
"	"	264	"		"	"		"		"		"		"	"	OUT	"	"	I to Q_6	"	"					"
"	"	265	"		IN	"	OUT	"		"		"		GND	"		"	"	D_1 to Q_1	"	"					"
"	"	266	"		GND	"		IN	OUT	"		"		"	"		"	"	D_2 to Q_2	"	"					"
"	"	267	IN	OUT	"	"		GND		"		"		"	"		"	"	D_3 to Q_3	"	"					"
"	"	268	GND		"	"		"		"	OUT	IN		"	"		"	"	D_4 to Q_4	"	"					"
"	"	269	GND		"	"		"		"		GND	OUT	"	IN		"	"	D_5 to Q_5	"	"					"
"	"	270	GND		"	"		"		"		GND		"	GND	OUT	IN	"	D_6 to Q_6	"	"					"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 12 T_A = 25°C						
		Symbol	D3	Q3	D1	Dis.	Q1	D2	Q2	V_{SS}	Q4	D4	Q5	I	D5	Q6	D6	V_{DD}								
		Test No.																		Min	Max					
t_{THL}	3004	271	GND		GND	GND	OUT	GND		GND		GND		IN	GND		GND	10.0V	Q_1	3	60					ns
"	Fig. 4	272	"		"	"		"	OUT	"		"		"	"		"	"	Q_2	"	"					"
"	"	273	"	OUT	"	"		"		"		"		"	"		"	"	Q_3	"	"					"
"	"	274	"		"	"		"		"	OUT	"		"	"		"	"	Q_4	"	"					"
"	"	275	"		"	"		"		"		"	OUT	"	"		"	"	Q_5	"	"					"
"	"	276	"		"	"		"		"		"		"	"	OUT	"	"	Q_6	"	"					"
"	"	277	"		IN	"	OUT	"		"		"		GND	"		"	"	Q_1	"	"					"
"	"	278	"		GND	"		IN	OUT	"		"		"	"		"	"	Q_2	"	"					"
"	"	279	IN	OUT	"	"		GND		"		"		"	"		"	"	Q_3	"	"					"
"	"	280	GND		"	"		"		"	OUT	IN		"	"		"	"	Q_4	"	"					"
"	"	281	"		"	"		"		"		GND	OUT	"	IN		"	"	Q_5	"	"					"
"	"	282	"		"	"		"		"		"		"	GND	OUT	IN	"	Q_6	"	"					"
t_{TLH}	3004	283	"		"	"	OUT	"		"		"		IN	"		GND	"	Q_1	5	100					"
"	Fig. 4	284	"		"	"		"	OUT	"		"		"	"		"	"	Q_2	"	"					"
"	"	285	"	OUT	"	"		"		"		"		"	"		"	"	Q_3	"	"					"
"	"	286	"		"	"		"		"	OUT	"		"	"		"	"	Q_4	"	"					"
"	"	287	"		"	"		"		"		"	OUT	"	"		"	"	Q_5	"	"					"
"	"	288	"		"	"		"		"		"		"	"	OUT	"	"	Q_6	"	"					"
"	"	289	"		IN	"	OUT	"		"		"		GND	"		"	"	Q_1	"	"					"
"	"	290	"		GND	"		IN	OUT	"		"		"	"		"	"	Q_2	"	"					"
"	"	291	IN	OUT	"	"		GND		"		"		"	"		"	"	Q_3	"	"					"
"	"	292	GND		"	"		"		"	OUT	IN		"	"		"	"	Q_4	"	"					"
"	"	293	GND		"	"		"		"		GND	OUT	"	IN		"	"	Q_5	"	"					"
"	"	294	GND		"	"		"		"		GND		"	GND	OUT	IN	"	Q_6	"	"					"
t_{PHZ} 5/	Fig. 4	295	GND		GND	IN	OUT	GND		GND		GND		GND	GND		GND	10.0V	Dis to Q_1	4	80					ns
"	"	296	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"					"
"	"	297	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"					"
"	"	298	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"					"
"	"	299	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"					"
"	"	300	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"					"
t_{PZH} 5/	"	301	"		"	"	OUT	"		"		"		"	"		"	"	Dis to Q_1	5	100					"
"	"	302	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"					"
"	"	303	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"					"
"	"	304	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"					"
"	"	305	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"					"
"	"	306	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"					"
t_{PLZ} 5/	"	307	10.0V		10.0V	"	OUT	10.0V		"		10.0V		"	10.0V		10.0V	"	Dis to Q_1	7	130					"
"	"	308	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"					"
"	"	309	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"					"
"	"	310	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"					"
"	"	311	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"					"
"	"	312	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"					"
t_{PZL} 5/	"	313	"		"	"	OUT	"		"		"		"	"		"	"	Dis to Q_1	6	110					"
"	"	314	"		"	"		"	OUT	"		"		"	"		"	"	Dis to Q_2	"	"					"
"	"	315	"	OUT	"	"		"		"		"		"	"		"	"	Dis to Q_3	"	"					"
"	"	316	"		"	"		"		"	OUT	"		"	"		"	"	Dis to Q_4	"	"					"
"	"	317	"		"	"		"		"		"	OUT	"	"		"	"	Dis to Q_5	"	"					"
"	"	318	"		"	"		"		"		"		"	"	OUT	"	"	Dis to Q_6	"	"					"

See notes at end of table.

TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/															Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	V_{CC}	EA	IA	E	F	IB	EB	V_{SS}	EC	IC	G	NC	H	ID	ED	V_{DD}							
		Test No.																		Min	Max	Min	Max	Min	Max	
$V_{IC(neg)}$		1	GND		-1mA					GND									IA		-6.0					Vdc
"		2	"	-1mA						"									EA		"					"
"		3	"					-1mA		"									IB		"					"
"		4	"						-1mA	"									EB		"					"
"		5	"							"	-1mA								EC		"					"
"		6	"							"		-1mA							IC		"					"
"		7	"							"						-1mA			ID		"					"
"		8	"							"							-1mA		ED		"					"
I_{SS}	3005	9	18.0V	18.0V	GND			GND	18.0V	"	18.0V	GND				GND	18.0V	18.0V	V_{SS}		-75		-750			nA
"	"	10	18.0V	18.0V	18.0V			18.0V	18.0V	"	18.0V	18.0V				18.0V	18.0V	"	"		"		"				"
"	"	11	18.0V	GND	18.0V			18.0V	GND	"	GND	18.0V				18.0V	GND	"	"		"		"				"
V_{OH1}	3006	12	5.0V	15.0V	15.0V			15.0V	15.0V	"	15.0V	15.0V				15.0V	15.0V	15.0V	E	14.95		14.95		14.95		Vdc
"	"	13	"	"	"			"	"	"	"	"				"	"	"	F	"		"		"		"
"	"	14	"	"	"			"	"	"	"	"				"	"	"	G	"		"		"		"
"	"	15	"	"	"			"	"	"	"	"				"	"	"	H	"		"		"		"
V_{OL1}	3007	16	"	"	GND			GND	"	"	"	GND				GND	"	"	E		0.05		0.05		0.05	"
"	"	17	"	"	"			"	"	"	"	"				"	"	"	F		"		"		"	"
"	"	18	"	"	"			"	"	"	"	"				"	"	"	G		"		"		"	"
"	"	19	"	"	"			"	"	"	"	"				"	"	"	H		"		"		"	"
I_{OC11} 3/		20	"	GND	"	18.0V	18.0V	"	GND	"	GND	"	18.0V		18.0V	"	GND	18.0V	All outputs together		100					nA
I_{OC12}		21	"	"	"	18.0V		"	"	"	"	"				"	"	"	E		25		90		25	"
"		22	"	"	"		18.0V	"	"	"	"	"				"	"	"	F		"		"		"	"
"		23	"	"	"			"	"	"	"	"	18.0V			"	"	"	G		"		"		"	"
"		24	"	"	"			"	"	"	"	"			18.0V	"	"	"	H		"		"		"	"
I_{OC21} 3/		25	5.0V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND		GND	GND	GND	18.0V	All outputs together		-100					nA
I_{OC22}		26	"	"	"	GND		"	"	"	"	"				"	"	"	E		-25		-90		-25	"
"		27	"	"	"		GND	"	"	"	"	"				"	"	"	F		"		"		"	"
"		28	"	"	"			"	"	"	"	"	GND			"	"	"	G		"		"		"	"
"		29	"	"	"			"	"	"	"	"			GND	"	"	"	H		"		"		"	"
V_{IH}		30	"	3.5V	5.0V			5.0V	5.0V	"	5.0V	5.0V				5.0V	5.0V	10.0V	E	9.0		9.0		9.0		Vdc
"		31	"	5.0V	"			"	3.5V	"	"	"				"	"	"	F	"		"		"		"
"		32	"	"	"			"	5.0V	"	3.5V	"				"	"	"	G	"		"		"		"
"		33	"	"	"			"	"	"	5.0V	"				"	3.5V	"	H	"		"		"		"
"		34	"	"	3.5V			"	"	"	"	"				"	5.0V	"	E	"		"		"		"
"		35	"	"	5.0V			3.5V	"	"	"	"				"	"	"	F	"		"		"		"
"		36	"	"	5.0V			5.0V	"	"	"	3.5V				"	"	"	G	"		"		"		"
"		37	"	"	5.0V			5.0V	"	"	"	5.0V				3.5V	"	"	H	"		"		"		"
"		38	"	3.5V	GND			GND	"	"	"	GND				GND	"	15.0V	E		1.5		1.5		1.5	"
"		39	"	5.0V	"			"	3.5V	"	"	"				"	"	"	F		"		"		"	"
"		40	"	"	"			"	5.0V	"	3.5V	"				"	"	"	G		"		"		"	"
"		41	"	"	"			"	"	"	5.0V	"				"	3.5V	"	H		"		"		"	"
"		42	"	"	3.5V			"	"	"	"	"				"	5.0V	"	E	13.5		13.5		13.5		"
"		43	"	"	GND			3.5V	"	"	"	"				"	"	"	F	"		"		"		"
"		44	"	"	GND			GND	"	"	"	3.5V				"	"	"	G	"		"		"		"
"		45	"	"	GND			GND	"	"	"	GND				3.5V	"	"	H	"		"		"		"
"		46	10.0V	7.0V	10.0V			10.0V	10.0V	"	10.0V	10.0V				10.0V	10.0V	"	E	"		"		"		"
"		47	10.0V	10.0V	10.0V			10.0V	7.0V	"	10.0V	"				10.0V	10.0V	"	F	"		"		"		"
"		48	10.0V	10.0V	10.0V			10.0V	10.0V	"	7.0V	"				10.0V	10.0V	"	G	"		"		"		"

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	V_{CC}	EA	IA	E	F	IB	EB	V_{SS}	EC	IC	G	NC	H	ID	ED	V_{DD}								
		Test No.																		Min	Max	Min	Max	Min	Max	
V_{IH}		49	10.0V	10.0V	10.0V			10.0V	10.0V	GND	10.0V	10.0V				10.0V	7.0V	15.0V	H	13.5		13.5		13.5		Vdc
"		50	"	"	7.0V			10.0V	"	"	"	10.0V				"	10.0V	"	E	"		"		"		"
"		51	"	"	10.0V			7.0V	"	"	"	10.0V				"	"	"	F	"		"		"		"
"		52	"	"	10.0V			10.0V	"	"	"	7.0V				"	"	"	G	"		"		"		"
"		53	"	"	10.0V			10.0V	"	"	"	10.0V				7.0V	"	"	H	"		"		"		"
"		54	"	"	3.0V			10.0V	"	"	"	10.0V				10.0V	"	"	E		1.5		1.5		1.5	"
"		55	"	"	10.0V			3.0V	"	"	"	10.0V				10.0V	"	"	F		"		"		"	"
"		56	"	"	10.0V			10.0V	"	"	"	3.0V				10.0V	"	"	G		"		"		"	"
"		57	"	"	10.0V			10.0V	"	"	"	10.0V				3.0V	"	"	H		"		"		"	"
V_{IL}		58	5.0V	5.0V	1.5V			GND	5.0V	"	5.0V	GND				GND	5.0V	10.0V	E		1.0		1.0		1.0	"
"		59	"	"	GND			1.5V	"	"	"	GND				GND	"	"	F		"		"		"	"
"		60	"	"	GND			GND	"	"	"	1.5V				GND	"	"	G		"		"		"	"
"		61	"	"	GND			GND	"	"	"	GND				1.5V	"	"	H		"		"		"	"
"		62	"	"	1.5V			GND	"	"	"	GND				GND	"	15.0V	E		1.5		1.5		1.5	"
"		63	"	"	GND			1.5V	"	"	"	GND				GND	"	"	F		"		"		"	"
"		64	"	"	GND			GND	"	"	"	1.5V				GND	"	"	G		"		"		"	"
"		65	"	"	GND			GND	"	"	"	GND				1.5V	"	"	H		3.5		3.5		3.5	"
I_{IH1} 3/	3010	66	18.0V	18.0V	18.0V			18.0V	18.0V	"	18.0V	18.0V				18.0V	18.0V	18.0V	All inputs together		8					nA
I_{IH2}	3010	67	"	18.0V	GND			GND	GND	"	GND	GND				GND	GND	"	EA		1		45			"
"	"	68	"	GND	18.0V			GND	GND	"	"	"				"	"	"	IA		"		"			"
"	"	69	"	"	GND			18.0V	GND	"	"	"				"	"	"	IB		"		"			"
"	"	70	"	"	"			GND	18.0V	"	"	"				"	"	"	EB		"		"			"
"	"	71	"	"	"			"	GND	"	18.0V	"				"	"	"	EC		"		"			"
I_{IH2}	3010	72	18.0V	GND	GND			GND	GND	GND	GND	18.0V				GND	GND	18.0V	IC		1		45			nA
"	"	73	"	"	"			"	"	"	"	GND				18.0V	"	"	ID		"		"			"
"	"	74	"	"	"			"	"	"	"	GND				GND	18.0V	"	ED		"		"			"
I_{IL1} 3/	3009	75	"	"	"			"	"	"	"	GND				GND	GND	"	All inputs together		-8					"
I_{IL2}	"	76	"	"	18.0V			18.0V	18.0V	"	18.0V	18.0V				18.0V	18.0V	"	EA		-1		-45			"
"	"	77	"	18.0V	GND			18.0V	18.0V	"	"	"				"	"	"	IA		"		"			"
"	"	78	"	"	18.0V			GND	18.0V	"	"	"				"	"	"	IB		"		"			"
"	"	79	"	"	"			18.0V	GND	"	"	"				"	"	"	EB		"		"			"
"	"	80	"	"	"			"	18.0V	"	GND	"				"	"	"	EC		"		"			"
"	"	81	"	"	"			"	"	"	18.0V	GND				"	"	"	IC		"		"			"
"	"	82	"	"	"			"	"	"	18.0V	18.0V				GND	"	"	ID		"		"			"
"	"	83	"	"	"			"	"	"	18.0V	18.0V				18.0V	GND	"	ED		"		"			"
I_{OH2}		84	5.0V	15.0V	15.0V	13.5V		15.0V	15.0V	"	15.0V	15.0V				15.0V	15.0V	15.0V	E	-3.4		-2.4		-4.2		mA
"		85	"	"	"	13.5V		"	"	"	"	"				"	"	"	E	"		"		"		"
"		86	"	"	"		13.5V	"	"	"	"	"				"	"	"	F	"		"		"		"
"		87	"	"	"		13.5V	"	"	"	"	"				"	"	"	F	"		"		"		"
"		88	"	"	"			"	"	"	"	"	13.5V			"	"	"	G	"		"		"		"
"		89	"	"	"			"	"	"	"	"	13.5V			"	"	"	G	"		"		"		"
"		90	"	"	"			"	"	"	"	"			13.5V	"	"	"	H	"		"		"		"
"		91	"	"	"			"	"	"	"	"			13.5V	"	"	"	H	"		"		"		"
I_{OL2}		92	"	"	GND	1.5V		GND	"	"	"	GND				GND	"	"	E	3.4		2.4		4.2		"
"		93	"	"	"	1.5V		"	"	"	"	"				"	"	"	E	"		"		"		"
"		94	"	"	"		1.5V	"	"	"	"	"				"	"	"	F	"		"		"		"

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T_A = 25°C		Subgroup 2 T_A = 125°C		Subgroup 3 T_A = -55°C		
		Symbol	V_{CC}	EA	IA	E	F	IB	EB	V_{SS}	EC	IC	G	NC	H	ID	ED	V_{DD}								
		Test No.																		Min	Max	Min	Max	Min	Max	
I_{OL2}		95	5.0V	15.0V	GND		1.5V	GND	15.0V	GND	15.0V	GND				GND	15.0V	15.0V	F	3.4		2.4		4.2		mA
"		96	"	"	"			"	"	"	"	"	1.5V			"	"	"	G	"		"		"		"
"		97	"	"	"			"	"	"	"	"	1.5V			"	"	"	G	"		"		"		"
"		98	"	"	"			"	"	"	"	"			1.5V	"	"	"	H	"		"		"		"
"		99	"	"	"			"	"	"	"	"			1.5V	"	"	"	H	"		"		"		"
																				Subgroup 4 T_A = 25°C						
																				Min	Max					
C_I	3012	100	GND	4/						GND								GND	EA		7.5					pF
"	"	101	"		4/					"								"	IA		"					"
"	"	102	"					4/		"								"	IB		"					"
"	"	103	"						4/	"								"	EB		"					"
"	"	104	"							"	4/							"	EC		"					"
"	"	105	"							"		4/						"	IC		"					"
"	"	106	"							"						4/		"	ID		"					"
"	"	107	"							"							4/	"	ED		"					"
																				Subgroup 9 T_A = 25°C		Subgroup 10 T_A = 125°C		Subgroup 11 T_A = -55°C		
																				Min	Max	Min	Max	Min	Max	
t_{PHL}	3003	108	5.0V	5.0V	IN	OUT		GND	5.0V	GND	5.0V	GND				GND	5.0V	10.0V	IA to E	30	600	42	840	30	600	ns
"	Fig. 4	109	"	"	GND		OUT	IN	"	"	"	GND				GND	"	"	IB to F	"	"	"	"	"	"	"
"	"	110	"	"	GND			GND	"	"	"	IN	OUT			GND	"	"	IC to G	"	"	"	"	"	"	"
"	"	111	"	"	GND			GND	"	"	"	GND			OUT	IN	"	"	ID to H	"	"	"	"	"	"	"
t_{PLH}	3003	112	5.0V	5.0V	IN	OUT		GND	5.0V	GND	5.0V	GND				GND	5.0V	10V	IA to E	13	260	19	365	13	260	ns
"	Fig. 4	113	"	"	GND		OUT	IN	"	"	"	GND				GND	"	"	IB to F	"	"	"	"	"	"	"
"	"	114	"	"	GND			GND	"	"	"	IN	OUT			GND	"	"	IC to G	"	"	"	"	"	"	"
"	"	115	"	"	GND			GND	"	"	"	GND			OUT	IN	"	"	ID to H	"	"	"	"	"	"	"
t_{TLH}	3004	116	"	"	IN	OUT		GND	"	"	"	GND				GND	"	"	E	5	100	7	140	5	100	"
"	Fig. 4	117	"	"	GND		OUT	IN	"	"	"	GND				GND	"	"	F	"	"	"	"	"	"	"
"	"	118	"	"	GND			GND	"	"	"	IN	OUT			GND	"	"	G	"	"	"	"	"	"	"
"	"	119	"	"	GND			GND	"	"	"	GND			OUT	IN	"	"	H	"	"	"	"	"	"	"
t_{THL}	"	120	"	"	IN	OUT		GND	"	"	"	GND				GND	"	"	E	"	"	"	"	"	"	"
"	"	121	"	"	GND		OUT	IN	"	"	"	GND				GND	"	"	F	"	"	"	"	"	"	"
"	"	122	"	"	"			GND	"	"	"	IN	OUT			GND	"	"	G	"	"	"	"	"	"	"
"	"	123	"	"	"			"	"	"	"	GND			OUT	IN	"	"	H	"	"	"	"	"	"	"
t_{PLZ}	Fig. 4	124	"	IN	"	OUT		"	"	"	"	"				GND	"	"	EA to E	37	740	52	1040	37	740	"
5/	"	125	"	GND	"		OUT	"	IN	"	"	"				"	"	"	EB to F	"	"	"	"	"	"	"
"	"	126	"	GND	"			"	GND	"	IN	"	OUT			"	"	"	EC to G	"	"	"	"	"	"	"
"	"	127	"	GND	"			"	GND	"	GND	"			OUT	"	IN	"	ED to H	"	"	"	"	"	"	"
t_{PZL}	"	128	"	IN	"	OUT		"	GND	"	GND	"				"	GND	"	EA to E	10	200	14	280	10	200	"
5/	"	129	"	GND	"		OUT	"	IN	"	GND	"				"	GND	"	EB to F	"	"	"	"	"	"	"
"	"	130	"	GND	"			"	GND	"	IN	"	OUT			"	GND	"	EC to G	"	"	"	"	"	"	"
"	"	131	"	GND	"			"	GND	"	GND	"			OUT	"	IN	"	ED to H	"	"	"	"	"	"	"
t_{PZH}	"	132	"	IN	5.0V	OUT		5.0V	GND	"	GND	5.0V				5.0V	GND	"	EA to E	32	640	45	895	32	640	"
5/	"	133	"	GND	"		OUT	"	IN	"	GND	"				"	GND	"	EB to F	"	"	"	"	"	"	"
"	"	134	"	GND	"			"	GND	"	IN	"	OUT			"	GND	"	EC to G	"	"	"	"	"	"	"
"	"	135	"	GND	"			"	GND	"	GND	"			OUT	"	IN	"	ED to H	"	"	"	"	"	"	"

See notes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9 T_A = 25°C		Subgroup 10 T_A = 125°C		Subgroup 11 T_A = -55°C		
		Symbol	V_{CC}	EA	IA	E	F	IB	EB	V_{SS}	EC	IC	G	NC	H	ID	ED	V_{DD}								
		Test No.																		Min	Max	Min	Max	Min	Max	
t_{PHZ}	Fig. 4	136	5.0V	IN	5.0V	OUT		5.0V	GND	GND	GND	5.0V				5.0V	GND	10V	EA to E	6	120	9	170	6	120	ns
5/	"	137	"	GND	"		OUT	"	IN	"	GND	"				"	GND	"	EB to F	"	"	"	"	"	"	"
"	"	138	"	GND	"			"	GND	"	IN	"	OUT			"	GND	"	EC to G	"	"	"	"	"	"	"
"	"	139	"	GND	"			"	GND	"	GND	"			OUT	"	IN	"	ED to H	"	"	"	"	"	"	"

1/ Pins not designated may be "HIGH" level logic, "LOW" level logic or open. Exceptions are as follows: $V_{IC(pos)}$ tests, the V_{SS} terminals shall be open; $V_{IC(neg)}$ tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminals shall be open.
2/ The I_{SS} measurements shall be performed in sequence.
3/ The device manufacturer may, at his option, measure I_{IL}, I_{IH}, I_{OC11}, and I_{OC21} at 25°C for each individual input or measure all inputs together.
4/ See 4.4.1c.
5/ Measured with external pull-up resistor of 1.0 kΩ ±5% connected between the output and V_{DD} for t_{PLZ} and t_{PZL}; and V_{SS} for t_{PHZ} and t_{PZH}.
6/ For device type 02, during the transition and propagation measurements, the output shall use an external pull-up resistor of 120Ω connected between the output and V_{DD}.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table V of MIL-PRF-38535. End-point electrical parameters shall be as specified in table II herein.

4.4.5 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.7 herein). RHA levels for device classes B and S shall be as specified in MIL-PRF-38535 and 4.5.4 herein.

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

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

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

TABLE IV. Delta limits at 25°C.

Parameter 1/	Device types			
	01	02	03	04
I_{SS}	±10 nA	±10 nA	±10 nA	±10 nA
I_{OL1}	±15%	±15%	±15%	±15%
I_{OH1}	±15%	±15%	±15%	±15%

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

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

4.5.4 Radiation hardness assurance (RHA) testing. The RHA testing shall be performed in accordance with test procedures and sampling specified in MIL-PRF-38535 and herein.

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

b. The devices shall be subjected to a total radiation dose as specified in MIL-PRF-38535 for the radiation hardness assurance level being tested, and meet the end-point electrical parameters as defined in table V at 25°C, after exposure. The start and completion of the end-point electrical parameter measurements shall not exceed 2 hours following irradiation.

c. Threshold-voltage test circuit conditions shall be as specified in table VII and figure 5. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VI and the bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.

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

TABLE V. Radiation hardened end-point electrical parameters at 25°C.

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

TABLE VI. Bias during exposure to radiation.

Device type	Pin connections 1/		
	V_{DD} = 10 V dc through a 30 kΩ to 60 kΩ resistor	V_{SS} = GND	V_{DD} = 10 V dc
01	1, 3, 5, 8, 9, 11, 13	7	14
02	3, 4, 5, 9, 10, 11	7	14
03	1, 3, 4, 6, 10, 12, 13, 15	8	16
04	2, 3, 6, 7, 9, 10, 14, 15	8	1, 16

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

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

a. Attributes data for all screening tests (see 4.2) and variables data for all static burn-in, dynamic burn-in, and steady-state life tests (see 3.6).

b. A copy of each radiograph.

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

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

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

f. RHA delta limits.

5. PACKAGING

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

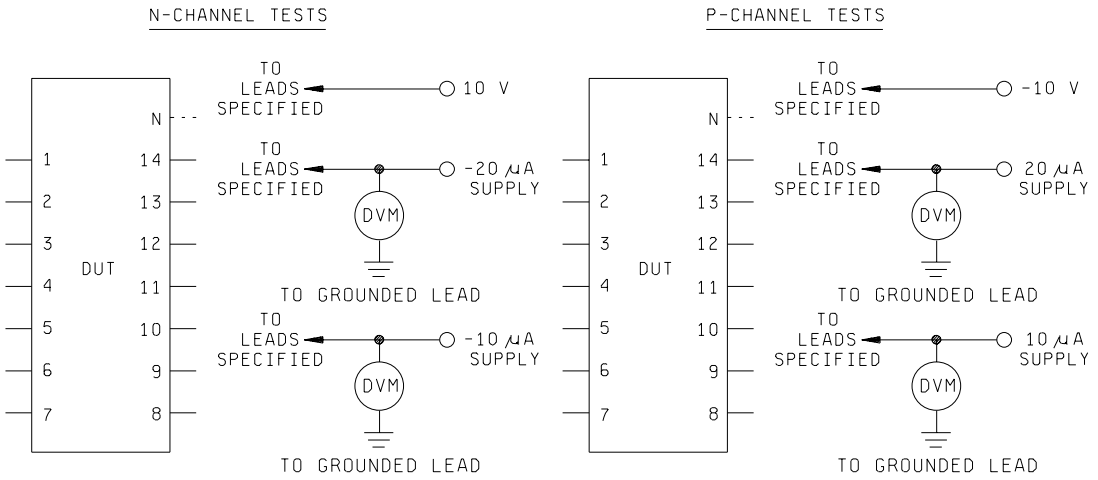


FIGURE 5. Threshold - voltage test circuit.

TABLE VII. Threshold - voltage test circuit conditions.

Device type	GND	10 V	V_{TN} measured at		GND	-10 V	V_{TP} measured at	
			-20 µA supply	-10 µA supply			20 µA supply	10 µA supply
01	1	14		3, 5, 7, 9, 11, 13	1	3, 5, 7, 9, 11, 13		14
02	3	4, 10, 11, 14		7	3	7		4, 10, 11, 14
03	1	3, 4, 6, 10, 12, 13, 15, 16		8	1	8		3, 4, 6, 10, 12, 13, 15, 16
04	2	1, 3, 6, 7, 9, 10, 14, 15, 16		8	2	8		1, 3, 6, 7, 9, 10, 14, 15, 16

6. NOTES

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

6.2 Acquisition requirements. Acquisition documents should specify the following:

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

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

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

d. Requirements for certificate of compliance, if applicable.

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

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

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

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

i. Requirements for "JAN" marking.

j. Packaging requirements. (see 5.1).

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

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, P.O. Box 3990, Columbus, Ohio 43128-3990.

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

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

6.6 Logistic support. Lead materials and finishes (see 3.4) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class S for National Aeronautics and Space Administration or class B for Department of Defense (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.

6.7 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges, post irradiation performance or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

Military device type	Generic-industry type
01	4069UB
02	40107B
03	4502B
04	40109B

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

CONCLUDING MATERIAL

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

Preparing activity:
DLA - CC

(Project 5962-2031)

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

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