INCH-POUND

MIL-M-38510/650C
26 July 2005

SUPERSEDING
MIL-M-38510/650B
05 June 2003

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, HIGH-SPEED CMOS, NAND GATES, MONOLITHIC SILICON, POSITIVE LOGIC

Reactivated after 26 July 2005 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, high speed 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 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).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	Quad 2 - input NAND gate
02	Triple 3 - input NAND gate
03	Dual 4 - input NAND gate
04	8 - input NAND gate
05	Quad 2 - input NAND Schmitt trigger

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
C	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	Flat pack
2	CQCC1-N20	20	Square leadless chip carrier

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

1.3 Absolute maximum ratings.

Supply voltage range (V_{CC})	-0.5 V dc to +7.0 V dc
DC input voltage range (V_{IN})	-0.5 V dc to V_{CC} + 0.5 V dc
DC output voltage range (V_{OUT})	-0.5 V dc to V_{CC} + 0.5 V dc
Clamp diode current (I_{IK}, I_{OK})	±20 mA
DC output current per pin (I_{OUT})	±25 mA
DC V_{CC} or GND current per pin (I_{CC}, I_{GND})	±50 mA
Storage temperature range (T_{STG})	-65°C to +150°C
Maximum power dissipation (P_D)	300 mW
Lead temperature (soldering, 10 seconds)	300°C
Thermal resistance, junction to case (θ_{JC}):	
Cases C, D, and 2	See MIL-STD-1835
Junction temperature (T_J)	175°C

1.4 Recommended operating conditions.

Device types 01, 02, 03, 04:

Maximum input low voltage (V_{IL})	0.3 V at V_{CC} = 2.0 V
	0.9 V at V_{CC} = 4.5 V
	1.2 V at V_{CC} = 6.0 V
Minimum input high voltage (V_{IH})	1.5 V at V_{CC} = 2.0 V
	3.15 V at V_{CC} = 4.5 V
	4.2 V at V_{CC} = 6.0 V

Device types 05:

Maximum input low threshold voltage (V_{T-})	1.0 V at V_{CC} = 2.0 V
	2.2 V at V_{CC} = 4.5 V
	3.0 V at V_{CC} = 6.0 V
Minimum input high threshold voltage (V_{T+})	0.7 V at V_{CC} = 2.0 V
	1.7 V at V_{CC} = 4.5 V
	2.1 V at V_{CC} = 6.0 V

All devices:

Supply voltage range (V_{CC})	2.0 V dc to 6.0 V dc
Output voltage range (V_{OUT})	0.0 V to V_{CC}
Operating temperature range (T_A)	-55°C to +125°C
Input rise and fall times (t_r, t_f) maximum:	
V_{CC} = 2.0 V	1000 ns
V_{CC} = 4.5 V	500 ns
V_{CC} = 6.0 V	400 ns

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 http://assist.daps.dla.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). This specification has been modified to allow the manufacturer to use the alternate die/fabrication requirements of paragraph A.3.2.2 of MIL-PRF-38535 or other alternative approved by the qualifying activity.

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.

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

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

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

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

3.3.5 Case outlines. The case outlines shall be as specified in 1.2.3 and MIL-STD-1835.

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. For product built in accordance with A.3.2.2 of MIL-PRF-38535, or as modified in the manufacturer's QM plan, the "QD" certification mark shall be used in place of the "Q" or "QML" certification mark.

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

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 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 method 1015 of MIL-STD-883.

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

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

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

i. For static burn-in I, all inputs shall be connected to GND. Outputs shall be open or connected to $V_{CC}/2$. Resistors are optional on outputs if open. Resistors are required on inputs and outputs connected to $V_{CC}/2$. R = 470Ω to 47 kΩ.

ii. For static burn-in II, all inputs shall be connected through a resistor to V_{CC}. Output shall be open or connected to $V_{CC}/2$. Resistors are optional on outputs if open. Resistors are required on inputs and on outputs connected to $V_{CC}/2$. R = 470Ω to 47 kΩ.

iii. V_{CC} = 6.0 V ±0.5 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. For dynamic burn-in, all inputs shall be connected through the resistors in parallel to a common CP. Outputs shall connected to $V_{CC}/2$ ±0.5 V through the resistors. R = 1 kΩ ±0.5% for outputs, 470Ω to 47 kΩ for inputs.

ii. CP = 25 kHz to 1 MHz square wave; duty cycle = 50 %±15%; V_{IH} = 4.5 V to V_{CC}; V_{IL} = 0.0 V ±0.5 V; transition time ≤ 0.5 μs.

iii. V_{CC} = 6.0 V ±0.5 V.

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

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

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, and D inspections (see 4.4.1 through 4.4.4).

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

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

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device types	V_{CC}	Limits		Unit
					Min	Max	
High level output voltage	V_{OH1} 2/	V_{IH} = 1.5 V V_{IL} = 0.3 V I_{OH} = -20 μA	All	2.0 V	1.95		V
	V_{OH2} 2/	V_{IH} = 3.15 V V_{IL} = 0.9 V I_{OH} = -20 μA	All	4.5 V	4.45		V
	V_{OH3}	V_{IH} = 4.2 V V_{IL} = 1.2 V I_{OH} = -20 μA	All	6.0 V	5.95		V
	V_{OH4} 2/	V_{IH} = 3.15 V V_{IL} = 0.9 V I_{OH} = -4.0 mA	All	4.5 V	3.7		V
	V_{OH5}	V_{IH} = 4.2 V V_{IL} = 1.2 V I_{OH} = -5.2 mA	All	6.0 V	5.2		V
Low level output voltage	V_{OL1} 2/	V_{IH} = 1.5 V V_{IL} = 0.3 V I_{OL} = 20 μA	All	2.0 V		0.05	V
	V_{OL2} 2/	V_{IH} = 3.15 V V_{IL} = 0.9 V I_{OL} = 20 μA	All	4.5 V		0.05	V
	V_{OL3}	V_{IH} = 4.2 V V_{IL} = 1.2 V I_{OL} = 20 μA	All	6.0 V		0.05	V
	V_{OL4} 2/	V_{IH} = 3.15 V V_{IL} = 0.9 V I_{OL} = 4.0 mA	All	4.5 V		0.4	V
	V_{OL5}	V_{IH} = 4.2 V V_{IL} = 1.2 V I_{OL} = 5.2 mA	All	6.0 V		0.4	V
Positive input clamp voltage	$V_{IC(pos)}$	I_{IN} = 1 mA T_C = 25°C	All	GND		1.5	V
Negative input clamp voltage	$V_{IC(neg)}$	I_{IN} = -1 mA T_C = 25°C	All	OPEN		-1.5	V

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device types	V_{CC}	Limits		Unit
					Min	Max	
Input current low	I_{IL}	V_{IN} = GND	All	6.0 V		-0.1	µA
Input current high	I_{IH}	$V_{IN} = V_{CC}$	All	6.0 V		0.1	µA
Short circuit output current	I_{OS1} 2/	V_{OUT} = GND V_{IN} = GND	All	2.0 V	-2	-50	mA
	I_{OS2} 2/			4.5 V	-15	-150	
	I_{OS3} 2/			6.0 V	-25	-180	
	I_{OS4}			4.0 V	-10	-120	
Supply current quiescent	I_{CC}	V_{IN} = 6.0 V or GND	All	6.0 V		10.0	µA
Positive going threshold voltage	V_{T+}		05 2/	2.0 V	0.7	1.5	V
			05 2/	4.5 V	1.7	3.15	V
			05	6.0 V	2.1	4.2	V
Negative going threshold voltage	V_{T-}		05 2/	2.0 V	0.3	1.0	V
			05 2/	4.5 V	0.9	2.2	V
			05	6.0 V	1.2	3.0	V
Hysteresis voltage	V_H		05 2/	2.0 V	0.2	1.0	V
			05 2/	4.5 V	0.4	1.4	V
			05	6.0 V	0.6	2.5	V
Input capacitance	C_{IN}	T_c = +25°C	All			10	pF
Power dissipation capacitance	C_{PD} 2/ 3/	T_c = +25°C	01			25	pF
			02			25	
			03			26	
			04			34	
			05			30	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device types	V_{CC}	Limits		Unit
					Min	Max	
Propagation delay times	t_{PHL}, t_{PLH} 4/ 5/	C_L = 50 pF +10 percent	01	4.5 V	3	21	ns
			02	4.5 V	3	23	
			03	4.5 V	3	26	
			04	4.5 V	6	41	
			05	4.5 V	4	29	
Transition delay times	t_{THL}, t_{TLH} 4/ 5/	C_L = 50 pF +10 percent	01	4.5 V	3	20	ns
			02	4.5 V	3	20	
			03	4.5 V	3	20	
			04	4.5 V	3	20	
			05	4.5 V	3	20	

1/ Complete terminal conditions shall be as specified in table III.
2/ Guaranteed but not tested.
3/ Power dissipation capacitance (C_{PD}) per gate.
4/ Tested at V_{CC} = 4.5 V at +125°C for sample testing and V_{CC} = 4.5 V at +25°C for screening. Guaranteed at other V_{CC} voltages and temperatures, see table IA and exception in 4.4.1d.
5/ For propagation and transition delay times at V_{CC} = 2.0 V, increase limit by a factor of 5.
For propagation and transition delay times at V_{CC} = 6.0 V, decrease limit by a factor of 0.85.

TABLE IA. Calculated dynamic figures at –55°C/+25°C case temperature.

V_{CC}	T_C = (°C)	
	125	-55/25
2.0 V	5.0	5.0 X 0.75
4.5 V	1.0	0.75
6.0 V	0.85	0.85 X 0.75

Normalized numbers
(125°C equals 1)

NOTE: The 2.0 V and 6.0 V numbers are derived from their 4.5 V integer value.
Rounding off according 5/4.

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	Req'd			Not req'd	
3	Same as line 1		1*	Δ			
4	Static burn-in II (method 1015)	4.2c 4.5.2	Req'd		4.2c 4.5.2	4/ req'd	
5	Same as line 1	4.2e	1*	Δ	4.2e	1*	Δ
6	Dynamic burn-in (method 1015)	4.2c 4.5.2	Req'd			Not req'd	
7	Same as line 1	4.2e	1	Δ			
8	Final electrical parameters		1*, 2, 3, 9			1*, 2, 9 4/	
9	Group A test requirements	4.4.1	1, 2, 3, 4, 9, 10, 11		4.4.1	1, 2, 3, 4, 9, 10, 11	
10	Group B test when using method 5005 QCI option	4.4.2	1, 2, 3, 9, 10, 11	Δ			
11	Group C end-point electrical parameters	4.4.2	1, 2, 3, 9, 10, 11	Δ	4.4.3	1, 2	Δ
12	Group D end-point electrical parameters	4.4.4	1, 2, 3		4.4.4	1, 2	

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 complete subgroup 1 electrical parameter measurements, including delta measurements, within 96 hours after burn-in completion (removal of bias); or may complete subgroup 1 electrical measurements without delta measurements within 24 hours after burn-in completion (removal of bias).

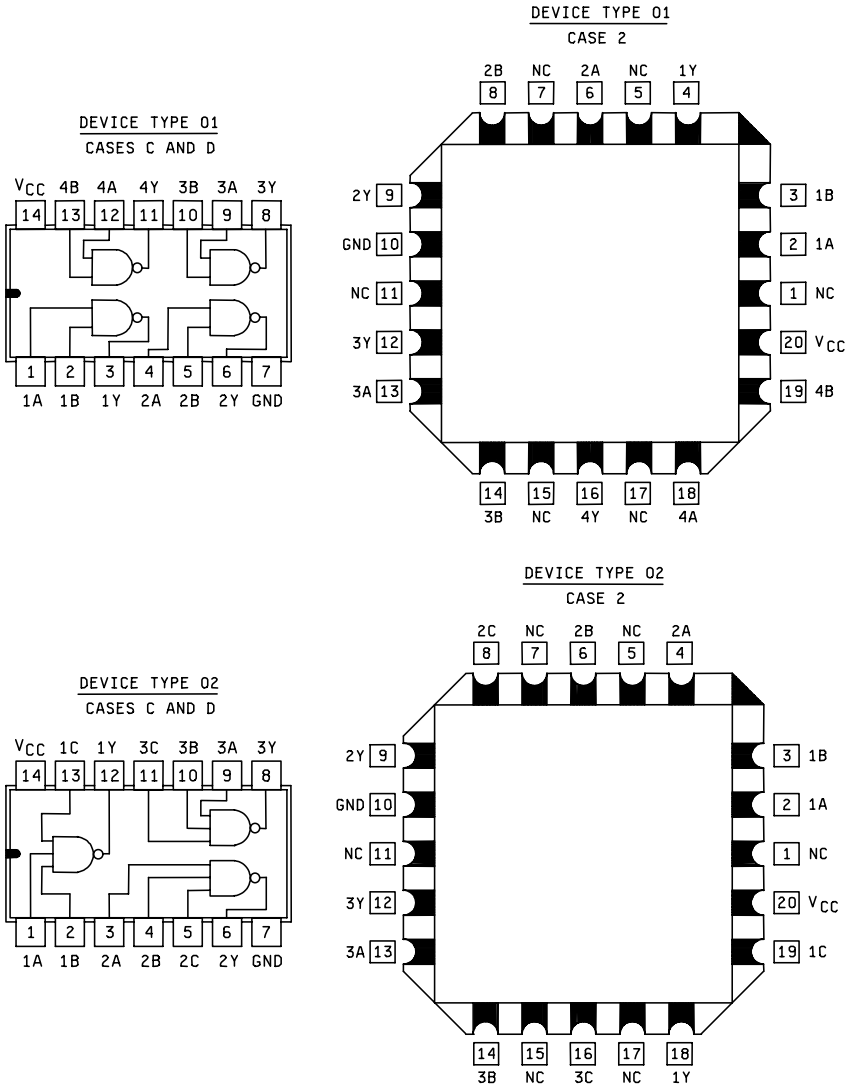


FIGURE 1. Logic diagram and terminal connections (top views).

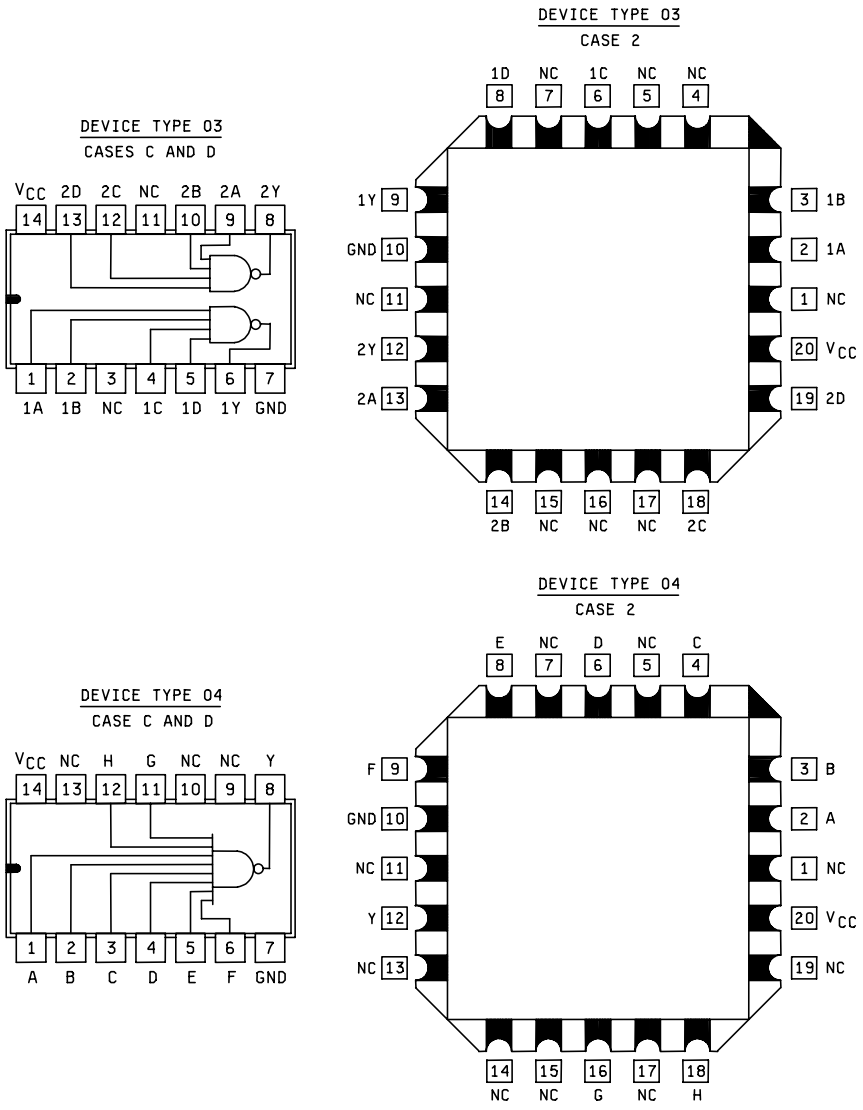


FIGURE 1. Logic diagram and terminal connections (top views) – Continued.

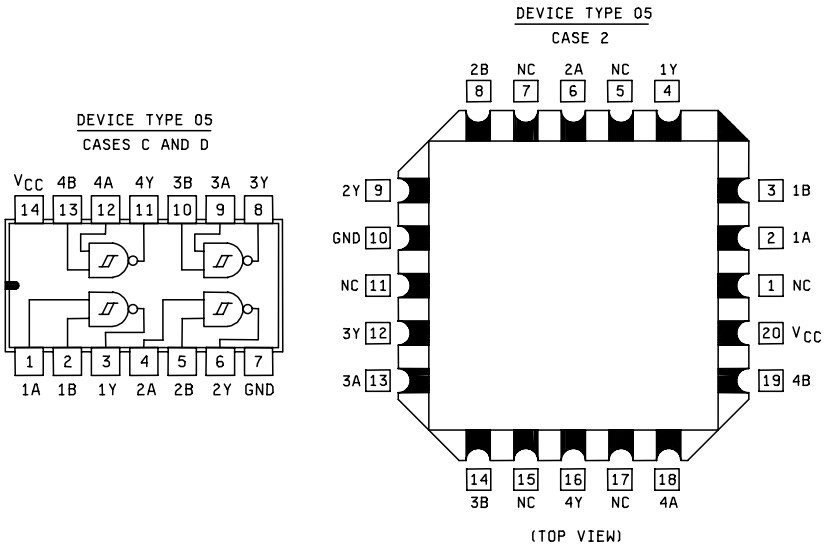


FIGURE 1. Logic diagram and terminal connections (top views) – Continued.

Device type 05

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

Positive logic $Y = \overline{AB}$

Device type 01

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

Positive logic $Y = \overline{AB}$

FIGURE 2. Truth tables and logic equations.

Device type 02

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

Positive logic $Y = \overline{ABC}$

Device type 03

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

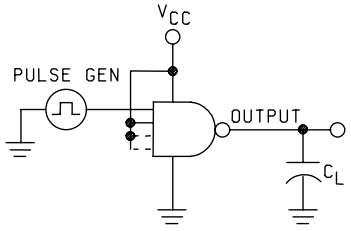
Positive logic $Y = \overline{ABCD}$

Device type 04

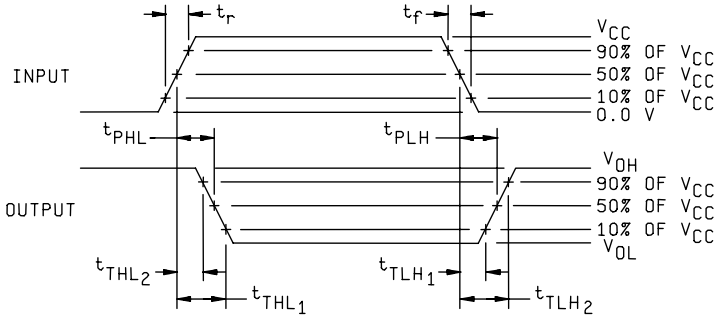
Truth table								
Inputs								Output
A	B	C	D	E	F	G	H	Y
H	H	H	H	H	H	H	H	L
All other combinations of H and L at the inputs give a H output								

Positive logic $Y = \overline{ABCDEFGH}$

FIGURE 2. Truth table and logic equations - Continued.



TEST CIRCUIT



WAVEFORMS

NOTES:

1. C_L = 50 pF ±10%, includes test jig and probe capacitance.
2. Input pulse shall have the following characteristics: $t_r = t_f \leq 6$ ns; PRR ≤ 1MHz; duty cycle = 50%.
3. All unused inputs are tied to V_{CC}.
4. $t_{THL1} - t_{THL2} = t_{THL}$; $t_{TLH2} - t_{TLH1} = t_{TLH}$.

FIGURE 3. Switching time test circuit and waveforms.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Min	Max	Min	Max	
V_{IC} (pos) 1/		1	1 mA						1/							GND	1A	1/	1.5					V
		2		1 mA					"							"	1B	"	"					"
		3				1 mA			"							"	2A	"	"					"
		4					1 mA		"							"	2B	"	"					"
		5							"		1 mA					"	3A	"	"					"
		6							"			1 mA				"	3B	"	"					"
		7							"					1 mA		"	4A	"	"					"
		8							"						1 mA	"	4B	"	"					"
V_{IC} (neg) 1/		9	-1 mA						GND							1/	1A		-1.5					"
		10		-1 mA					"							"	1B		"					"
		11				-1 mA			"							"	2A		"					"
		12					-1 mA		"							"	2B		"					"
		13							"		-1 mA					"	3A		"					"
		14							"			-1 mA				"	3B		"					"
		15							"					-1 mA		"	4A		"					"
		16							"						-1 mA	"	4B		"					"
I_{CCH}	3005	17	GND	GND		GND	GND		"		GND	GND		GND	GND	6.0 V	V_{CC}		0.1		10.0			µA
I_{CCL}	3005	18	6.0 V	6.0 V		6.0 V	6.0 V		"		6.0 V	6.0 V		6.0 V	6.0 V	"	V_{CC}		0.1		10.0			µA
V_{OH3}	3006	19	4.2 V	1.2 V	-20 µA				"							"	1Y	5.95		5.95		5.95		V
		20	1.2 V	4.2 V	-20 µA				"							"	1Y	"		"		"		"
		21				4.2 V	1.2 V	-20 µA	"							"	2Y	"		"		"		"
		22				1.2 V	4.2 V	-20 µA	"							"	2Y	"		"		"		"
		23							"	-20 µA	4.2 V	1.2 V				"	3Y	"		"		"		"
		24							"	-20 µA	1.2 V	4.2 V				"	3Y	"		"		"		"
		25							"				-20 µA	4.2 V	1.2 V	"	4Y	"		"		"		"
		26							"				-20 µA	1.2 V	4.2 V	"	4Y	"		"		"		"
V_{OH5}	3006	27	1.2 V	4.2 V	-5.2 mA				"							"	1Y	5.48		5.2		5.48		"
		28	4.2 V	1.2 V	-5.2 mA				"							"	1Y	"		"		"		"
		29				1.2 V	4.2 V	-5.2 mA	"							"	2Y	"		"		"		"
		30				4.2 V	1.2 V	-5.2 mA	"							"	2Y	"		"		"		"
		31							"	-5.2 mA	1.2 V	4.2 V				"	3Y	"		"		"		"
		32							"	-5.2 mA	4.2 V	1.2 V				"	3Y	"		"		"		"
		33							"				-5.2 mA	1.2 V	4.2 V	"	4Y	"		"		"		"
		34							"				-5.2 mA	4.2 V	1.2 V	"	4Y	"		"		"		"
V_{OL3}	3007	35	4.2 V	4.2 V	20 µA				"							"	1Y		0.05		0.05		0.05	"
		36				4.2 V	4.2 V	20 µA	"							"	2Y		"		"		"	"
		37							"	20 µA	4.2 V	4.2 V				"	3Y		"		"		"	"
		38							"				20 µA	4.2 V	4.2 V	"	4Y		"		"		"	"
V_{OL5}	3007	39	4.2 V	4.2 V	5.2 mA				"							"	1Y		0.26		0.4		0.26	"
		40				4.2 V	4.2 V	5.2 mA	"							"	2Y		"		"		"	"
		41							"	5.2 mA	4.2 V	4.2 V				"	3Y		"		"		"	"
		42							"				5.2 mA	4.2 V	4.2 V	"	4Y		"		"		"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Min	Max	Min	Max	
I_{OS4}	3011	43	GND	GND	GND				GND							4 V	1Y	-10	-120	-10	-120	-10	-120	mA
		44				GND	GND	GND	"							"	2Y	"	"	"	"	"	"	"
		45							"	GND	GND	GND				"	3Y	"	"	"	"	"	"	"
		46							"				GND	GND	GND	"	4Y	"	"	"	"	"	"	"
I_{IH}	3010	47	6 V	GND					"							6 V	1A		0.05		0.1			µA
		48	GND	6 V					"							"	1B		"		"			"
		49				6 V	GND		"							"	2A		"		"			"
		50				GND	6 V		"							"	2B		"		"			"
		51							"		6 V	GND				"	3A		"		"			"
		52							"		GND	6 V				"	3B		"		"			"
		53							"					6 V	GND	"	4A		"		"			"
		54							"					GND	6 V	"	4B		"		"			"
I_{IL}	3009	55	GND	6 V					"							"	1A		-0.05		-0.1			"
		56	6 V	GND					"							"	1B		"		"			"
		57				GND	6 V		"							"	2A		"		"			"
		58				6 V	GND		"							"	2B		"		"			"
		59							"		GND	6 V				"	3A		"		"			"
		60							"		6 V	GND				"	3B		"		"			"
		61							"					GND	6 V	"	4A		"		"			"
		62							"					6 V	GND	"	4B		"		"			"
																		Subgroup 4 T_C = +25°C						
																		Min	Max					
C_{IN}	3012	63	2/						"							GND	1A		10					pF
		64		2/					"							"	1B		"					"
		65				2/			"							"	2A		"					"
		66					2/		"							"	2B		"					"
		67							"		2/					"	3A		"					"
		68							"			2/				"	3B		"					"
		69							"					2/		"	4A		"					"
		70							"						2/	"	4B		"					"
																		Subgroup 9 3/ T_C = +25°C		Subgroup 10 T_C = +125°C		Subgroup 11 3/ T_C = -55°C		
																		Min	Max	Min	Max	Min	Max	
t_{PHL}	3003 (fig. 3)	71	IN	4.5 V	OUT				"							4.5 V	1A to 1Y	3	16	3	21	3	16	ns
		72	4.5 V	IN	OUT				"							"	1B to 1Y	"	"	"	"	"	"	"
		73				IN	4.5 V	OUT	"							"	2A to 2Y	"	"	"	"	"	"	"
		74				4.5 V	IN	OUT	"							"	2B to 2Y	"	"	"	"	"	"	"
		75							"	OUT	IN	4.5 V				"	3A to 3Y	"	"	"	"	"	"	"
		76							"	OUT	4.5 V	IN				"	3B to 3Y	"	"	"	"	"	"	"
		77							"				OUT	IN	4.5 V	"	4A to 4Y	"	"	"	"	"	"	"
		78							"				OUT	4.5 V	IN	"	4B to 4Y	"	"	"	"	"	"	"
t_{PLH}	3003 (fig. 3)	79	IN	4.5 V	OUT				"							4.5 V	1A to 1Y	3	16	3	21	3	16	"
		80	4.5 V	IN	OUT				"							"	1B to 1Y	"	"	"	"	"	"	"
		81				IN	4.5 V	OUT	"							"	2A to 2Y	"	"	"	"	"	"	"
		82				4.5 V	IN	OUT	"							"	2B to 2Y	"	"	"	"	"	"	"
		83							"	OUT	IN	4.5 V				"	3A to 3Y	"	"	"	"	"	"	"
		84							"	OUT	4.5 V	IN				"	3B to 3Y	"	"	"	"	"	"	"
		85							"				OUT	IN	4.5 V	"	4A to 4Y	"	"	"	"	"	"	"
		86							"				OUT	4.5 V	IN	"	4B to 4Y	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 9 3/ T_C = +25°C		Subgroup 10 T_C = +125°C		Subgroup 11 3/ T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Min	Max	Min	Max	
t_{THL}	3004 (fig. 3)	87	IN	4.5 V	OUT				"							4.5 V	1Y	3	15	3	20	3	15	ns
		88	4.5 V	IN	OUT				"							"	1Y	"	"	"	"	"	"	"
		89				IN	4.5 V	OUT	"							"	2Y	"	"	"	"	"	"	"
		90				4.5 V	IN	OUT	"							"	2Y	"	"	"	"	"	"	"
		91							"	OUT	IN	4.5 V				"	3Y	"	"	"	"	"	"	"
		92							"	OUT	4.5 V	IN				"	3Y	"	"	"	"	"	"	"
		93							"				OUT	IN	4.5 V	"	4Y	"	"	"	"	"	"	"
		94							"				OUT	4.5 V	IN	"	4Y	"	"	"	"	"	"	"
t_{TLH}	3004 (fig. 3)	95	IN	4.5 V	OUT				"							"	1Y	3	15	3	20	3	15	"
		96	4.5 V	IN	OUT				"							"	1Y	"	"	"	"	"	"	"
		97				IN	4.5 V	OUT	"							"	2Y	"	"	"	"	"	"	"
		98				4.5 V	IN	OUT	"							"	2Y	"	"	"	"	"	"	"
		99							"	OUT	IN	4.5 V				"	3Y	"	"	"	"	"	"	"
		100							"	OUT	4.5 V	IN				"	3Y	"	"	"	"	"	"	"
		101							"				OUT	IN	4.5 V	"	4Y	"	"	"	"	"	"	"
		102							"				OUT	4.5 V	IN	"	4Y	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	2A	2B	2C	2Y	GND	3Y	3A	3B	3C	1Y	1C	V_{CC}		Min	Max	Min	Max	Min	Max	
V_{IC} (pos) 1/		1	1 mA						1/							GND	1A	1/	1.5					V
		2		1 mA					"							"	1B	"	"					"
		3			1 mA				"							"	2A	"	"					"
		4				1 mA			"							"	2B	"	"					"
		5					1 mA		"							"	2C	"	"					"
		6							"		1 mA					"	3A	"	"					"
		7							"			1 mA				"	3B	"	"					"
		8							"				1 mA			"	3C	"	"					"
		9							"						1 mA	"	1C		"					"
V_{IC} (neg) 1/		10	-1 mA						GND							1/	1A		-1.5					"
		11		-1 mA					"							"	1B		"					"
		12			-1 mA				"							"	2A		"					"
		13				-1 mA			"							"	2B		"					"
		14					-1 mA		"							"	2C		"					"
		15							"		-1 mA					"	3A		"					"
		16							"			-1 mA				"	3B		"					"
		17							"				-1 mA			"	3C		"					"
		18							"						-1 mA	"	1C		"					"
I_{CCH}	3005	19	GND	GND	GND	GND	GND		"		GND	GND	GND		GND	6 V	V_{CC}		0.1		10			µA
I_{CCL}	3005	20	6 V	6 V	6 V	6 V	6 V		"		6 V	6 V	6 V		6 V	6 V	V_{CC}		0.1		10			µA
V_{OH3}	3006	21	1.2 V	4.2 V					"					-20µA	4.2 V	"	1Y	5.95		5.95		5.95		V
		22	4.2 V	1.2 V					"					"	4.2 V	"	"	"		"		"		"
		23	4.2 V	4.2 V					"					"	1.2 V	"	"	"		"		"		"
		24			1.2 V	4.2 V	4.2 V	-20µA	"							"	2Y	"		"		"		"
		25			4.2 V	1.2 V	4.2 V	"	"							"	"	"		"		"		"
		26			4.2 V	4.2 V	1.2 V	"	"							"	"	"		"		"		"
		27							"	-20µA	1.2 V	4.2 V	4.2 V			"	3Y	"		"		"		"
		28							"	"	4.2 V	1.2 V	4.2 V			"	"	"		"		"		"
		29							"	"	4.2 V	4.2 V	1.2 V			"	"	"		"		"		"
V_{OH5}	3006	30	1.2 V	4.2 V					"					-5.2mA	4.2 V	"	1Y	5.48		5.2		5.48		"
		31	4.2 V	1.2 V					"					"	4.2 V	"	"	"		"		"		"
		32	4.2 V	4.2 V					"					"	1.2 V	"	"	"		"		"		"
		33			1.2 V	4.2 V	4.2 V	-5.2mA	"							"	2Y	"		"		"		"
		34			4.2 V	1.2 V	4.2 V	"	"							"	"	"		"		"		"
		35			4.2 V	4.2 V	1.2 V	"	"							"	"	"		"		"		"
		36							"	-5.2mA	1.2 V	4.2 V	4.2 V			"	3Y	"		"		"		"
		37							"	"	4.2 V	1.2 V	4.2 V			"	"	"		"		"		"
		38							"	"	4.2 V	4.2 V	1.2 V			"	"	"		"		"		"
V_{OL3}	3007	39	4.2 V	4.2 V					"					20µA	4.2 V	"	1Y		0.05		0.05		0.05	"
		40			4.2 V	4.2 V	4.2 V	20µA	"							"	2Y		"		"		"	"
		41							"	20µA	4.2 V	4.2 V	4.2 V			"	3Y		"		"		"	"
V_{OL5}	3007	42	4.2 V	4.2 V					"					5.2mA	4.2 V	"	1Y		0.26		0.4		0.26	"
		43			4.2 V	4.2 V	4.2 V	5.2mA	"							"	2Y		"		"		"	"
		44							"	5.2mA	4.2 V	4.2 V	4.2 V			"	3Y		"		"		"	"
I_{OS4}	3011	45	GND	GND					"					GND	GND	4 V	1Y	-10	-120	-10	-120	-10	-120	mA
		46			GND	GND	GND	GND	"							"	2Y	"	"	"	"	"	"	"
		47							"	GND	GND	GND	GND			"	3Y	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	2A	2B	2C	2Y	GND	3Y	3A	3B	3C	1Y	1C	V_{CC}		Min	Max	Min	Max	Min	Max	
I_{IH}	3010	48	6 V	GND					"						GND	6 V	1A		0.05		0.1			µA
		49	GND	6 V					"						GND	"	1B		"		"			"
		50	GND	GND					"						6 V	"	1C		"		"			"
		51			6 V	GND	GND		"							"	2A		"		"			"
		52			GND	6 V	GND		"							"	2B		"		"			"
		53			GND	GND	6 V		"							"	2C		"		"			"
		54							"		6 V	GND	GND			"	3A		"		"			"
		55							"		GND	6 V	GND			"	3B		"		"			"
		56							"		GND	GND	6 V			"	3C		"		"			"
I_{IL}	3009	57	GND	6 V					"						6 V	6 V	1A		-0.05		-0.1			µA
		58	6 V	GND					"						6 V	"	1B		"		"			"
		59	6 V	6 V					"						GND	"	1C		"		"			"
		60			GND	6 V	6 V		"							"	2A		"		"			"
		61			6 V	GND	6 V		"							"	2B		"		"			"
		62			6 V	6 V	GND		"							"	2C		"		"			"
		63							"		GND	6 V	6 V			"	3A		"		"			"
		64							"		6 V	GND	6 V			"	3B		"		"			"
		65							"		6 V	6 V	GND			"	3C		"		"			"
																		Subgroup 4 T_C = +25ºC						
																		Min	Max					
C_{IN}	3012	66	2/						"							GND	1A		10					pF
		67		2/					"							"	1B		"					"
		68							"						2/	"	1C		"					"
		69			2/				"							"	2A		"					"
		70				2/			"							"	2B		"					"
		71					2/		"							"	2C		"					"
		72							"		2/					"	3A		"					"
		73							"			2/				"	3B		"					"
		74							"				2/			"	3C		"					"
																		3/ Subgroup 9 T_C = +25ºC		Subgroup 10 T_C = +125ºC		3/ Subgroup 11 T_C = -55ºC		
																		Min	Max	Min	Max	Min	Max	
t_{PHL}	3003 (fig. 3)	75	IN	4.5 V					"					OUT	4.5 V	4.5 V	1A to 1Y	3	17	3	23	3	17	ns
		76	4.5 V	IN					"					"	4.5 V	"	1B to 1Y	"	"	"	"	"	"	"
		77	4.5 V	4.5 V					"					"	IN	"	1C to 1Y	"	"	"	"	"	"	"
		78			IN	4.5 V	4.5 V	OUT	"							"	2A to 2Y	"	"	"	"	"	"	"
		79			4.5 V	IN	4.5 V	"	"							"	2B to 2Y	"	"	"	"	"	"	"
		80			4.5 V	4.5 V	IN	"	"							"	2C to 2Y	"	"	"	"	"	"	"
		81							"	OUT	IN	4.5 V	4.5 V			"	3A to 3Y	"	"	"	"	"	"	"
		82							"	"	4.5 V	IN	4.5 V			"	3B to 3Y	"	"	"	"	"	"	"
		83							"	"	4.5 V	4.5 V	IN			"	3C to 3Y	"	"	"	"	"	"	"
t_{PLH}	3003 (fig. 3)	84	IN	4.5 V					"					OUT	4.5 V	4.5 V	1A to 1Y	3	17	3	23	3	17	"
		85	4.5 V	IN					"					"	4.5 V	"	1B to 1Y	"	"	"	"	"	"	"
		86	4.5 V	4.5 V					"					"	IN	"	1C to 1Y	"	"	"	"	"	"	"
		87			IN	4.5 V	4.5 V	OUT	"							"	2A to 2Y	"	"	"	"	"	"	"
		88			4.5 V	IN	4.5 V	"	"							"	2B to 2Y	"	"	"	"	"	"	"
		89			4.5 V	4.5 V	IN	"	"							"	2C to 2Y	"	"	"	"	"	"	"
		90							"	OUT	IN	4.5 V	4.5 V			"	3A to 3Y	"	"	"	"	"	"	"
		91							"	"	4.5 V	IN	4.5 V			"	3B to 3Y	"	"	"	"	"	"	"
		92							"	"	4.5 V	4.5 V	IN			"	3C to 3Y	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 9 3/ T_C = +25°C		Subgroup 10 T_C = +125°C		Subgroup 11 3/ T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	2A	2B	2C	2Y	GND	3Y	3A	3B	3C	1Y	1C	V_{CC}		Min	Max	Min	Max	Min	Max	
t_{TLH}	3004 (fig. 3)	93	IN	4.5 V					GND					OUT	4.5 V	4.5 V	1Y	3	15	3	20	3	15	ns
		94	4.5 V	IN					"					"	4.5 V	"	1Y	"	"	"	"	"	"	"
		95	4.5 V	4.5 V					"					"	IN	"	1Y	"	"	"	"	"	"	"
		96			IN	4.5 V	4.5 V	OUT	"							"	2Y	"	"	"	"	"	"	"
		97			4.5 V	IN	4.5 V	"	"							"	2Y	"	"	"	"	"	"	"
		98			4.5 V	4.5 V	IN	"	"							"	2Y	"	"	"	"	"	"	"
		99							"	OUT	IN	4.5 V	4.5 V			"	3Y	"	"	"	"	"	"	"
		100							"	"	4.5 V	IN	4.5 V			"	3Y	"	"	"	"	"	"	"
		101							"	"	4.5 V	4.5 V	IN			"	3Y	"	"	"	"	"	"	"
t_{THL}	3004 (fig. 3)	102	IN	4.5 V					"					OUT	4.5 V	"	1Y	3	15	3	20	3	15	"
		103	4.5 V	IN					"					"	4.5 V	"	1Y	"	"	"	"	"	"	"
		104	4.5 V	4.5 V					"					"	IN	"	1Y	"	"	"	"	"	"	"
		105			IN	4.5 V	4.5 V	OUT	"							"	2Y	"	"	"	"	"	"	"
		106			4.5 V	IN	4.5 V	"	"							"	2Y	"	"	"	"	"	"	"
		107			4.5 V	4.5 V	IN	"	"							"	2Y	"	"	"	"	"	"	"
		108							"	OUT	IN	4.5 V	4.5 V			"	3Y	"	"	"	"	"	"	"
		109							"	"	4.5 V	IN	4.5 V			"	3Y	"	"	"	"	"	"	"
		110							"	"	4.5 V	4.5 V	IN			"	3Y	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	NC	1C	1D	1Y	GND	2Y	2A	2B	NC	2C	2D	V_{CC}		Min	Max	Min	Max	Min	Max	
V_{IC} (pos) 1/		1	1 mA						1/							GND	1A	1/	1.5					V
		2		1 mA					"							"	1B	"	"					"
		3				1 mA			"							"	1C	"	"					"
		4					1 mA		"							"	1D	"	"					"
		5							"		1 mA					"	2A	"	"					"
		6							"			1 mA				"	2B	"	"					"
		7							"					1 mA		"	2C	"	"					"
		8							"						1 mA	"	2D	"	"					"
V_{IC} (neg) 1/		9	-1 mA						GND							1/	1A		-1.5					"
		10		-1 mA					"							"	1B		"					"
		11				-1 mA			"							"	1C		"					"
		12					-1 mA		"							"	1D		"					"
		13							"		-1 mA					"	2A		"					"
		14							"			-1 mA				"	2B		"					"
		15							"					-1 mA		"	2C		"					"
		16							"						-1 mA	"	2D		"					"
I_{CCH}	3005	17	GND	GND		GND	GND		"		GND	GND		GND	GND	6 V	V_{CC}		0.1		10			µA
I_{CCL}	3005	18	6 V	6 V		6 V	6 V		"		6 V	6 V		6 V	6 V	"	V_{CC}		0.1		10			µA
V_{OH3}	3006	19	1.2 V	4.2 V		4.2 V	4.2 V	-20µA	"							"	1Y	5.95		5.95		5.95		V
		20	4.2 V	1.2 V		4.2 V	4.2 V	"	"							"	"	"		"		"		"
		21	4.2 V	4.2 V		1.2 V	4.2 V	"	"							"	"	"		"		"		"
		22	4.2 V	4.2 V		4.2 V	1.2 V	"	"							"	"	"		"		"		"
		23							"	-20µA	1.2 V	4.2 V		4.2 V	4.2 V	"	2Y	"		"		"		"
		24							"	"	4.2 V	1.2 V		4.2 V	4.2 V	"	"	"		"		"		"
		25							"	"	4.2 V	4.2 V		1.2 V	4.2 V	"	"	"		"		"		"
		26							"	"	4.2 V	4.2 V		4.2 V	1.2 V	"	"	"		"		"		"
V_{OH5}	3006	27	1.2 V	4.2 V		4.2 V	4.2 V	-5.2mA	"							"	1Y	5.48		5.2		5.48		"
		28	4.2 V	1.2 V		4.2 V	4.2 V	"	"							"	"	"		"		"		"
		29	4.2 V	4.2 V		1.2 V	4.2 V	"	"							"	"	"		"		"		"
		30	4.2 V	4.2 V		4.2 V	1.2 V	"	"							"	"	"		"		"		"
		31							"	-5.2mA	1.2 V	4.2 V		4.2 V	4.2 V	"	2Y	"		"		"		"
		32							"	"	4.2 V	1.2 V		4.2 V	4.2 V	"	"	"		"		"		"
		33							"	"	4.2 V	4.2 V		1.2 V	4.2 V	"	"	"		"		"		"
		34							"	"	4.2 V	4.2 V		4.2 V	1.2 V	"	"	"		"		"		"
V_{OL3}	3007	35	4.2 V	4.2 V		4.2 V	4.2 V	20µA	"							"	1Y		0.05		0.05		0.05	"
		36							"	20µA	4.2 V	4.2 V		4.2 V	4.2 V	"	2Y		"		"		"	"
V_{OL5}	3007	37	4.2 V	4.2 V		4.2 V	4.2 V	5.2mA	"							"	1Y		0.26		0.4		0.26	"
		38							"	5.2mA	4.2 V	4.2 V		4.2 V	4.2 V	"	2Y		"		"		"	"
I_{OS4}	3011	39	GND	GND		GND	GND	GND	"							4 V	1Y	-10	-120	-10	-120	-10	-120	mA
		40							"	GND	GND	GND		GND	GND	4 V	2Y	"	"	"	"	"	"	mA
I_{IH}	3010	41	6 V	GND		GND	GND		"							6 V	1A		0.05		0.1			µA
		42	GND	6 V		GND	GND		"							"	1B		"		"			"
		43	GND	GND		6 V	GND		"							"	1C		"		"			"
		44	GND	GND		GND	6 V		"							"	1D		"		"			"
		45							"		6 V	GND		GND	GND	"	2A		"		"			"
		46							"		GND	6 V		GND	GND	"	2B		"		"			"
		47							"		GND	GND		6 V	GND	"	2C		"		"			"
		48							"		GND	GND		GND	6 V	"	2D		"		"			"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	NC	1C	1D	1Y	GND	2Y	2A	2B	NC	2C	2D	V_{CC}		Min	Max	Min	Max	Min	Max	
I_{IL}	3009	49	GND	6 V		6 V	6 V		GND							6 V	1A		-0.05		-0.1			µA
		50	6 V	GND		6 V	"		"							"	1B		"		"			"
		51	6 V	6 V		GND	"		"							"	1C		"		"			"
		52	6 V	6 V		6 V	GND		"							"	1D		"		"			"
		53							"		GND	6 V		6 V	6 V	"	2A		"		"			"
		54							"		6 V	GND		6 V	6 V	"	2B		"		"			"
		55							"		6 V	6 V		GND	6 V	"	2C		"		"			"
		56							"		6 V	6 V		6 V	GND	"	2D		"		"			"
																		Subgroup 4 T_C = +25ºC						
																		Min	Max					
C_{IN}	3012	57	2/						GND							GND	1A		10					pF
		58		2/					"							"	1B		"					"
		59				2/			"							"	1C		"					"
		60					2/		"							"	1D		"					"
		61							"		2/					"	2A		"					"
		62							"			2/				"	2B		"					"
		63							"					2/		"	2C		"					"
		64							"						2/	"	2D		"					"
																		3/ Subgroup 9 T_C = +25ºC		Subgroup 10 T_C = +125ºC		3/ Subgroup 11 T_C = -55ºC		
																		Min	Max	Min	Max	Min	Max	
t_{PHL}	3003 (fig. 3)	65	IN	4.5 V		4.5 V	4.5 V	OUT	GND							4.5 V	1A to 1Y	3	20	3	26	3	20	ns
		66	4.5 V	IN		4.5 V	4.5 V	"	"							"	1B to 1Y	"	"	"	"	"	"	"
		67	4.5 V	4.5 V		IN	4.5 V	"	"							"	1C to 1Y	"	"	"	"	"	"	"
		68	4.5 V	4.5 V		4.5 V	IN	"	"							"	1D to 1Y	"	"	"	"	"	"	"
		69							"	OUT	IN	4.5 V		4.5 V	4.5 V	"	2A to 2Y	"	"	"	"	"	"	"
		70							"	"	4.5 V	IN		4.5 V	4.5 V	"	2B to 2Y	"	"	"	"	"	"	"
		71							"	"	4.5 V	4.5 V		IN	4.5 V	"	2C to 2Y	"	"	"	"	"	"	"
		72							"	"	4.5 V	4.5 V		4.5 V	IN	"	2D to 2Y	"	"	"	"	"	"	"
t_{PLH}	3003 (fig. 3)	73	IN	4.5 V		4.5 V	4.5 V	OUT	"							"	1A to 1Y	3	20	3	26	3	20	ns
		74	4.5 V	IN		4.5 V	4.5 V	"	"							"	1B to 1Y	"	"	"	"	"	"	"
		75	4.5 V	4.5 V		IN	4.5 V	"	"							"	1C to 1Y	"	"	"	"	"	"	"
		76	4.5 V	4.5 V		4.5 V	IN	"	"							"	1D to 1Y	"	"	"	"	"	"	"
		77							"	OUT	IN	4.5 V		4.5 V	4.5 V	"	2A to 2Y	"	"	"	"	"	"	"
		78							"	"	4.5 V	IN		4.5 V	4.5 V	"	2B to 2Y	"	"	"	"	"	"	"
		79							"	"	4.5 V	4.5 V		IN	4.5 V	"	2C to 2Y	"	"	"	"	"	"	"
		80							"	"	4.5 V	4.5 V		4.5 V	IN	"	2D to 2Y	"	"	"	"	"	"	"
t_{THL}	3004 (fig. 3)	81	IN	4.5 V		4.5 V	4.5 V	OUT	"							"	1Y	3	15	3	20	3	15	"
		82	4.5 V	IN		4.5 V	4.5 V	"	"							"	"	"	"	"	"	"	"	"
		83	4.5 V	4.5 V		IN	4.5 V	"	"							"	"	"	"	"	"	"	"	"
		84	4.5 V	4.5 V		4.5 V	IN	"	"							"	"	"	"	"	"	"	"	"
		85							"	OUT	IN	4.5 V		4.5 V	4.5 V	"	2Y	"	"	"	"	"	"	"
		86							"	"	4.5 V	IN		4.5 V	4.5 V	"	"	"	"	"	"	"	"	"
		87							"	"	4.5 V	4.5 V		IN	4.5 V	"	"	"	"	"	"	"	"	"
		88							"	"	4.5 V	4.5 V		4.5 V	IN	"	"	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 9 3/ T_C = +25°C		Subgroup 10 T_C = +125°C		Subgroup 11 3/ T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	NC	1C	1D	1Y	GND	2Y	2A	2B	NC	2C	2D	V_{CC}		Min	Max	Min	Max	Min	Max	
t_{TLH}	3004 (fig. 3)	89	IN	4.5 V		4.5 V	4.5 V	OUT	GND							4.5 V	1Y	3	15	3	20	3	15	ns
		90	4.5 V	IN		4.5 V	4.5 V	"	"							"	"	"	"	"	"	"	"	"
		91	4.5 V	4.5 V		IN	4.5 V	"	"							"	"	"	"	"	"	"	"	"
		92	4.5 V	4.5 V		4.5 V	IN	"	"							"	"	"	"	"	"	"	"	"
		93							"	OUT	IN	4.5 V		4.5 V	4.5 V	"	2Y	"	"	"	"	"	"	"
		94							"	"	4.5 V	IN		4.5 V	4.5 V	"	"	"	"	"	"	"	"	"
		95							"	"	4.5 V	4.5 V		IN	4.5 V	"	"	"	"	"	"	"	"	"
		96							"	"	4.5 V	4.5 V		4.5 V	IN	"	"	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	A	B	C	D	E	F	GND	Y	NC	NC	G	H	NC	V_{CC}		Min	Max	Min	Max	Min	Max	
V_{IC} (pos) 1/		1	1 mA						1/							GND	A	1/	1.5					V
		2		1 mA					"							"	B	"	"					"
		3			1 mA				"							"	C	"	"					"
		4				1 mA			"							"	D	"	"					"
		5					1 mA		"							"	E	"	"					"
		6						1 mA	"							"	F	"	"					"
		7							"				1 mA			"	G	"	"					"
		8							"					1 mA		"	H	"	"					"
V_{IC} (neg) 1/		9	-1 mA						GND							1/	A		-1.5					"
		10		-1 mA					"							"	B		"					"
		11			-1 mA				"							"	C		"					"
		12				-1 mA			"							"	D		"					"
		13					-1 mA		"							"	E		"					"
		14						-1 mA	"							"	F		"					"
		15							"				-1 mA			"	G		"					"
		16							"					-1 mA		"	H		"					"
I_{CCH}	3005	17	GND	GND	GND	GND	GND	GND	GND				GND	GND		6 V	V_{CC}		0.1		10			µA
I_{CCL}	3005	18	6 V	6 V	6 V	6 V	6 V	6 V	GND				6 V	6 V		6 V	V_{CC}		0.1		10			µA
V_{OH3}	3006	19	1.2 V	4.2 V	4.2 V	4.2 V	4.2 V	4.2 V	"	-20 µA			4.2 V	4.2 V		"	Y	5.95		5.95		5.95		V
		20	4.2 V	1.2 V	4.2 V	"	"	"	"	"			"	"		"	"	"		"		"		"
		21	"	4.2 V	1.2 V	"	"	"	"	"			"	"		"	"	"		"		"		"
		22	"	"	4.2 V	1.2 V	"	"	"	"			"	"		"	"	"		"		"		"
		23	"	"	"	4.2 V	1.2 V	"	"	"			"	"		"	"	"		"		"		"
		24	"	"	"	"	4.2 V	1.2 V	"	"			"	"		"	"	"		"		"		"
		25	"	"	"	"	"	4.2 V	"	"			1.2 V	"		"	"	"		"		"		"
		26	"	"	"	"	"	"	"	"			4.2 V	1.2 V		"	"	"		"		"		"
V_{OH5}	3006	27	1.2 V	"	"	"	"	"	"	-5.2 mA			"	4.2 V		"	"	5.48		5.2		5.48		"
		28	4.2 V	1.2 V	"	"	"	"	"	"			"	"		"	"	"		"		"		"
		29	"	4.2 V	1.2 V	"	"	"	"	"			"	"		"	"	"		"		"		"
		30	"	"	4.2 V	1.2 V	"	"	"	"			"	"		"	"	"		"		"		"
		31	"	"	"	4.2 V	1.2 V	"	"	"			"	"		"	"	"		"		"		"
		32	"	"	"	"	4.2 V	1.2 V	"	"			"	"		"	"	"		"		"		"
		33	"	"	"	"	"	4.2 V	"	"			1.2 V	"		"	"	"		"		"		"
		34	"	"	"	"	"	"	"	"			4.2 V	1.2 V		"	"	"		"		"		"
V_{OL3}	3007	35	"	"	"	"	"	"	"	20µA			"	4.2 V		"	"		0.05		0.05		0.05	"
V_{OL5}	3007	36	"	"	"	"	"	"	"	5.2mA			"	4.2 V		"	"		0.26		0.4		0.26	"
I_{OS4}	3011	37	GND	GND	GND	GND	GND	GND	"	GND			GND	GND		4 V	"	-10	-120	-10	-120	-10	-120	mA
I_{IH}	3010	38	6 V	GND	GND	GND	GND	GND	"				"	"		6 V	A		0.05		0.1			µA
		39	GND	6 V	"	"	"	"	"				"	"		"	B		"		"			"
		40	"	GND	6 V	"	"	"	"				"	"		"	C		"		"			"
		41	"	"	GND	6 V	"	"	"				"	"		"	D		"		"			"
		42	"	"	"	GND	6 V	"	"				"	"		"	E		"		"			"
		43	"	"	"	"	GND	6 V	"				"	"		"	F		"		"			"
		44	"	"	"	"	"	GND	"				6 V	"		"	G		"		"			"
		45	"	"	"	"	"	GND	"				GND	6 V		"	H		"		"			"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	A	B	C	D	E	F	GND	Y	NC	NC	G	H	NC	V_{CC}		Min	Max	Min	Max	Min	Max	
I_{IL}	3009	46	GND	6 V	6 V	6 V	6 V	6 V	GND				6 V	6 V		6 V	A		-0.05		-0.1			µA
		47	6 V	GND	6 V	"	"	"	"				"	"		"	B		"		"			"
		48	"	6 V	GND	"	"	"	"				"	"		"	C		"		"			"
		49	"	"	6 V	GND	"	"	"				"	"		"	D		"		"			"
		50	"	"	"	6 V	GND	"	"				"	"		"	E		"		"			"
		51	"	"	"	"	6 V	GND	"				"	"		"	F		"		"			"
		52	"	"	"	"	"	6 V	"				GND	"		"	G		"		"			"
		53	"	"	"	"	"	6 V	"				6 V	GND		"	H		"		"			"
																		Subgroup 4 T_C = +25ºC						
																		Min	Max	Min	Max	Min	Max	
C_{IN}	3012	54	2/						GND							GND	A		10					pF
		55		2/					"							"	B		"					"
		56			2/				"							"	C		"					"
		57				2/			"							"	D		"					"
		58					2/		"							"	E		"					"
		59						2/	"							"	F		"					"
		60							"				2/			"	G		"					"
		61							"					2/		"	H		"					"
																		3/ Subgroup 9 T_C = +25ºC		Subgroup 10 T_C = +125ºC		3/ Subgroup 11 T_C = -55ºC		
																		Min	Max	Min	Max	Min	Max	
t_{PHL}	3003 (fig. 3)	62	IN	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	GND	OUT			4.5 V	4.5 V		4.5 V	A to Y	6	31	6	41	6	31	ns
		63	4.5 V	IN	4.5 V	"	"	"	"	"			"	"		"	B to Y	"	"	"	"	"	"	"
		64	"	4.5 V	IN	"	"	"	"	"			"	"		"	C to Y	"	"	"	"	"	"	"
		65	"	"	4.5 V	IN	"	"	"	"			"	"		"	D to Y	"	"	"	"	"	"	"
		66	"	"	"	4.5 V	IN	"	"	"			"	"		"	E to Y	"	"	"	"	"	"	"
		67	"	"	"	"	4.5 V	IN	"	"			"	"		"	F to Y	"	"	"	"	"	"	"
		68	"	"	"	"	"	4.5 V	"	"			IN	"		"	G to Y	"	"	"	"	"	"	"
		69	"	"	"	"	"	"	"	"			4.5 V	IN		"	H to Y	"	"	"	"	"	"	"
t_{PLH}	3003 (fig. 3)	70	IN	"	"	"	"	"	"	"			"	4.5 V		"	A to Y	6	31	6	41	6	31	"
		71	4.5 V	IN	"	"	"	"	"	"			"	"		"	B to Y	"	"	"	"	"	"	"
		72	"	4.5 V	IN	"	"	"	"	"			"	"		"	C to Y	"	"	"	"	"	"	"
		73	"	"	4.5 V	IN	"	"	"	"			"	"		"	D to Y	"	"	"	"	"	"	"
		74	"	"	"	4.5 V	IN	"	"	"			"	"		"	E to Y	"	"	"	"	"	"	"
		75	"	"	"	"	4.5 V	IN	"	"			"	"		"	F to Y	"	"	"	"	"	"	"
		76	"	"	"	"	"	4.5 V	"	"			IN	"		"	G to Y	"	"	"	"	"	"	"
		77	"	"	"	"	"	"	"	"			4.5 V	IN		"	H to Y	"	"	"	"	"	"	"
t_{THL}	3004 (fig. 3)	78	IN	"	"	"	"	"	"	"			"	4.5 V		"	Y	3	15	3	20	3	15	"
		79	4.5 V	IN	"	"	"	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		80	"	4.5 V	IN	"	"	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		81	"	"	4.5 V	IN	"	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		82	"	"	"	4.5 V	IN	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		83	"	"	"	"	4.5 V	IN	"	"			"	"		"	"	"	"	"	"	"	"	"
		84	"	"	"	"	"	4.5 V	"	"			IN	"		"	"	"	"	"	"	"	"	"
		85	"	"	"	"	"	"	"	"			4.5 V	IN		"	"	"	"	"	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 9 3/ T_C = +25°C		Subgroup 10 T_C = +125°C		Subgroup 11 3/ T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	A	B	C	D	E	F	GND	Y	NC	NC	G	H	NC	V_{CC}		Min	Max	Min	Max	Min	Max	
t_{TLH}	3004 (fig. 3)	86	IN	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	GND	OUT			4.5 V	4.5 V		4.5 V	Y	3	15	3	20	3	15	ns
		87	4.5 V	IN	"	"	"	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		88	"	4.5 V	IN	"	"	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		89	"	"	4.5 V	IN	"	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		90	"	"	"	4.5 V	IN	"	"	"			"	"		"	"	"	"	"	"	"	"	"
		91	"	"	"	"	4.5 V	IN	"	"			"	"		"	"	"	"	"	"	"	"	"
		92	"	"	"	"	"	4.5 V	"	"			IN	"		"	"	"	"	"	"	"	"	"
		93	"	"	"	"	"	4.5 v	"	"			4.5 V	IN		"	"	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 05.

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Min	Max	Min	Max	
V_{IC} (pos) 1/		1	1 mA						1/							GND	1A	1/	1.5					V
		2		1 mA					"							"	1B	"	"					"
		3				1 mA			"							"	2A	"	"					"
		4					1 mA		"							"	2B	"	"					"
		5							"		1 mA					"	3A	"	"					"
		6							"			1 mA				"	3B	"	"					"
		7							"					1 mA		"	4A	"	"					"
		8							"						1 mA	"	4B	"	"					"
V_{IC} (neg) 1/		9	-1 mA						GND							1/	1A		-1.5					"
		10		-1 mA					"							"	1B		"					"
		11				-1 mA			"							"	2A		"					"
		12					-1 mA		"							"	2B		"					"
		13							"		-1 mA					"	3A		"					"
		14							"			-1 mA				"	3B		"					"
		15							"					-1 mA		"	4A		"					"
		16							"						-1 mA	"	4B		"					"
I_{CCH}	3005	17	GND	GND		GND	GND		"		GND	GND		GND	GND	6 V	V_{CC}		0.1		10			µA
I_{CCL}	3005	18	6 V	6 V		6 V	6 V		"		6 V	6 V		6 V	6 V	"	V_{CC}		0.1		10			µA
V_{OH3}	3006	19	4.2 V	1.2 V	-20µA				"							"	1Y	5.95		5.95		5.95		V
		20	1.2 V	4.2 V	-20µA				"							"	1Y	"		"		"		"
		21				4.2 V	1.2 V	-20µA	"							"	2Y	"		"		"		"
		22				1.2 V	4.2 V	-20µA	"							"	2Y	"		"		"		"
		23							"	-20 µA	4.2 V	1.2 V				"	3Y	"		"		"		"
		24							"	-20µA	1.2 V	4.2 V				"	3Y	"		"		"		"
		25							"				-20µA	4.2 V	1.2 V	"	4Y	"		"		"		"
		26							"				-20µA	1.2 V	4.2 V	"	4Y	"		"		"		"
V_{OH5}	3006	27	1.2 V	4.2 V	-5.2mA				"							"	1Y	5.48		5.2		5.48		"
		28	4.2 V	1.2 V	-5.2mA				"							"	1Y	"		"		"		"
		29				1.2 V	4.2 V	-5.2mA	"							"	2Y	"		"		"		"
		30				4.2 V	1.2 V	-5.2mA	"							"	2Y	"		"		"		"
		31							"	-5.2mA	1.2 V	4.2 V				"	3Y	"		"		"		"
		32							"	-5.2mA	4.2 V	1.2 V				"	3Y	"		"		"		"
		33							"				-5.2mA	1.2 V	4.2 V	"	4Y	"		"		"		"
		34							"				-5.2mA	4.2 V	1.2 V	"	4Y	"		"		"		"
V_{T-}		35	4/	6 V					"							"	1Y	1.2	3.0	1.2	3.0	1.2	3.0	"
		36	6 V	4/					"							"	1Y	"	"	"	"	"	"	"
		37				4/	6 V		"							"	2Y	"	"	"	"	"	"	"
		38				6 V	4/		"							"	2Y	"	"	"	"	"	"	"
		39							"		4/	6 V				"	3Y	"	"	"	"	"	"	"
		40							"		6 V	4/				"	3Y	"	"	"	"	"	"	"
		41							"					4/	6 V	"	4Y	"	"	"	"	"	"	"
		42							"					6 V	4/	"	4Y	"	"	"	"	"	"	"
V_{OL3}	3007	43	4.2 V	4.2 V	20µA				"							"	1Y		0.05		0.05		0.05	"
		44				4.2 V	4.2 V	20µA	"							"	2Y		"		"		"	"
		45							"	20µA	4.2 V	4.2 V				"	3Y		"		"		"	"
		46							"				20µA	4.2 V	4.2 V	"	4Y		"		"		"	"

See footnotes at end of table.

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

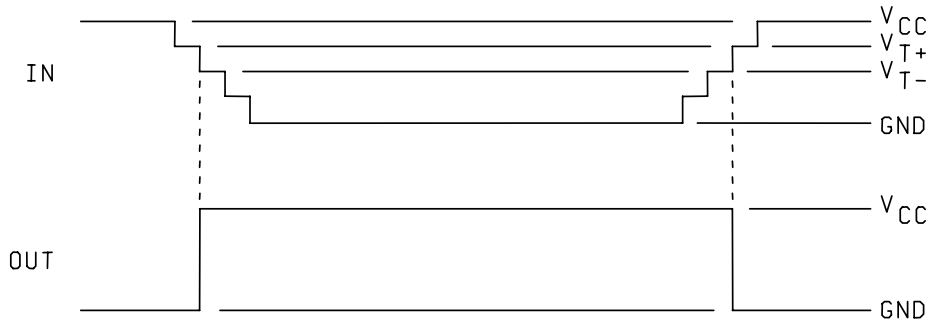
Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T_C = +25°C		Subgroup 2 T_C = +125°C		Subgroup 3 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Min	Max	Min	Max	
V_{OL5}	3007	47	4.2 V	4.2 V	5.2mA				GND							6 V	1Y		0.26		0.4		0.26	V
		48				4.2 V	4.2 V	5.2mA	"							"	2Y		"		"		"	"
		49							"	5.2mA	4.2 V	4.2 V				"	3Y		"		"		"	"
		50							"				5.2mA	4.2 V	4.2 V	"	4Y		"		"		"	"
V_{T+}		51	5/	6 V					GND							6 V	1Y	2.1	4.2	2.1	4.2	2.1	4.2	V
		52	6 V	5/					"							"	1Y		"	"	"	"	"	"
		53				5/	6 V		"							"	2Y		"	"	"	"	"	"
		54				6 V	5/		"							"	2Y		"	"	"	"	"	"
		55							"		5/	6 V				"	3Y		"	"	"	"	"	"
		56							"		6 V	5/				"	3Y		"	"	"	"	"	"
		57							"					5/	6 V	"	4Y		"	"	"	"	"	"
		58							"					6 V	5/	"	4Y		"	"	"	"	"	"
V_H		59	6/						GND							"	1Y	0.6	2.5	0.6	2.5	0.6	2.5	"
		60		6/					"							"	1Y	"	"	"	"	"	"	"
		61				6/			"							"	2Y	"	"	"	"	"	"	"
		62					6/		"							"	2Y	"	"	"	"	"	"	"
		63							"		6/					"	3Y	"	"	"	"	"	"	"
		64							"			6/				"	3Y	"	"	"	"	"	"	"
		65							"					6/		"	4Y	"	"	"	"	"	"	"
		66							"						6/	"	4Y	"	"	"	"	"	"	"
I_{OS4}	3011	67	GND	GND	GND				"							4 V	1Y	-10	-120	-10	-120	-10	-120	mA
		68				GND	GND	GND	"							"	2Y	"	"	"	"	"	"	"
		69							"	GND	GND	GND				"	3Y	"	"	"	"	"	"	"
		70							"				GND	GND	GND	"	4Y	"	"	"	"	"	"	"
I_{IH}	3010	71	6 V	GND					GND							6 V	1A		0.05		0.1			µA
		72	GND	6 V					"							"	1B		"		"			"
		73				6 V	GND		"							"	2A		"		"			"
		74				GND	6 V		"							"	2B		"		"			"
		75							"		6 V	GND				"	3A		"		"			"
		76							"		GND	6 V				"	3B		"		"			"
		77							"					6 V	GND	"	4A		"		"			"
		78							"					GND	6 V	"	4B		"		"			"
I_{IL}	3009	79	GND	6 V					GND							"	1A		-0.05		-0.1			"
		80	6 V	GND					"							"	1B		"		"			"
		81				GND	6 V		"							"	2A		"		"			"
		82				6 V	GND		"							"	2B		"		"			"
		83							"		GND	6 V				"	3A		"		"			"
		84							"		6 V	GND				"	3B		"		"			"
		85							"					GND	6 V	"	4A		"		"			"
		86							"					6 V	GND	"	4B		"		"			"
																		Subgroup 4 T_C = +25ºC						
																		Min	Max					
C_{IN}	3012	87	2/						1/							GND	1A		10					pF
		88		2/					"							"	1B		"					"
		89				2/			"							"	2A		"					"
		90					2/		"							"	2B		"					"
		91							"		2/					"	3A		"					"
		92							"			2/				"	3B		"					"
		93							"					2/		"	4A		"					"
		94							"						2/	"	4B		"					"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured Terminal	Test limits						Unit
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		3/ Subgroup 9 T_C = +25°C		Subgroup 10 T_C = +125°C		3/ Subgroup 11 T_C = -55°C		
		C and D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Min	Max	Min	Max	
t_{PHL}	3003 (fig. 3)	95	IN	4.5 V	OUT				GND							4.5 V	1A to 1Y	4	23	4	29	4	23	ns
		96	4.5 V	IN	OUT				"							"	1B to 1Y	"	"	"	"	"	"	"
		97				IN	4.5 V	OUT	"							"	2A to 2Y	"	"	"	"	"	"	"
		98				4.5 V	IN	OUT	"							"	2B to 2Y	"	"	"	"	"	"	"
		99							"	OUT	IN	4.5 V				"	3A to 3Y	"	"	"	"	"	"	"
		100							"	OUT	4.5	IN				"	3B to 3Y	"	"	"	"	"	"	"
		101							"				OUT	IN	4.5 V	"	4A to 4Y	"	"	"	"	"	"	"
		102							"				OUT	4.5 V	IN	"	4B to 4Y	"	"	"	"	"	"	"
t_{PLH}	3003 (fig. 3)	103	IN	4.5 V	OUT				"							"	1A to 1Y	4	23	4	29	4	23	"
		104	4.5 V	IN	OUT				"							"	1B to 1Y	"	"	"	"	"	"	"
		105				IN	4.5 V	OUT	"							"	2A to 2Y	"	"	"	"	"	"	"
		106				4.5 V	IN	OUT	"							"	2B to 2Y	"	"	"	"	"	"	"
		107							"	OUT	IN	4.5 V				"	3A to 3Y	"	"	"	"	"	"	"
		108							"	OUT	4.5 V	IN				"	3B to 3Y	"	"	"	"	"	"	"
		109							"				OUT	IN	4.5 V	"	4A to 4Y	"	"	"	"	"	"	"
		110							"				OUT	4.5 V	IN	"	4B to 4Y	"	"	"	"	"	"	"
t_{THL}	3004 (fig. 3)	111	IN	4.5 V	OUT				"							"	1Y	3	15	3	20	3	15	"
		112	4.5 V	IN	OUT				"							"	1Y	"	"	"	"	"	"	"
		113				IN	4.5 V	OUT	"							"	2Y	"	"	"	"	"	"	"
		114				4.5 V	IN	OUT	"							"	2Y	"	"	"	"	"	"	"
		115							"	OUT	IN	4.5 V				"	3Y	"	"	"	"	"	"	"
		116							"	OUT	4.5 V	IN				"	3Y	"	"	"	"	"	"	"
		117							"				OUT	IN	4.5 V	"	4Y	"	"	"	"	"	"	"
		118							"				OUT	4.5 V	IN	"	4Y	"	"	"	"	"	"	"
t_{TLH}	3004 (fig. 3)	119	IN	4.5 V	OUT				"							"	1Y	3	15	3	20	3	15	"
		120	4.5 V	IN	OUT				"							"	1Y	"	"	"	"	"	"	"
		121				IN	4.5 V	OUT	"							"	2Y	"	"	"	"	"	"	"
		122				4.5 V	IN	OUT	"							"	2Y	"	"	"	"	"	"	"
		123							"	OUT	IN	4.5 V				"	3Y	"	"	"	"	"	"	"
		124							"	OUT	4.5 V	IN				"	3Y	"	"	"	"	"	"	"
		125							"				OUT	IN	4.5 V	"	4Y	"	"	"	"	"	"	"
		126							"				OUT	4.5 V	IN	"	4Y	"	"	"	"	"	"	"

See footnotes on next page.



SEE NOTES 4 AND 5

NOTES:

1. Input pins not designated shall be “high” level logic, “low” level logic, or may be left open provided they do not influence the outcome of the measurement. Output pins not designated shall be tied to the loads or left open provided they do not influence the outcome of the measurement.
   Exceptions are as follows:
   a. V_{IC} (POS) tests: The “GND” terminal shall be open. A minimum limit of 0.4 V applies to tests being performed on equipment not capable of opening “GND” pin during test.
   b. V_{IC} (NEG) tests: The V_{CC} terminal shall be open.
   c. I_{CC} tests: The output terminals shall be open.
2. See 4.4.1c. All type input terminals (e.g. clock, clear, data, etc.), a minimum of three inputs of each shall be tested.
3. See 4.4.1d.
4. Decrement input in 50 mV steps beginning 100 mV above the maximum limit specified until the output changes from GND to V_{CC}. The input voltage where this transition occurs is V_{T-}.
5. Increment input in 50 mV steps beginning 100 mV below the minimum limit specified until the output changes from V_{CC} to GND. The input voltage where this transition occurs is V_{T+}.
6. $V_H = (V_{T+}) – (V_{T-})$. See table I for V_H limits.

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 method 1005 of MIL-STD-883.

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

4.5 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 GND 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 within 10°C of their power stable condition at room temperature; then, electrical parameter end-point measurements shall be performed.

TABLE IV. Delta limits at 25°C.

Parameter 1/	Device types	
	All	
I_{CC}		±30 nA

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

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

5. PACKAGING

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

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

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 options.

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

i. Requirements for "JAN" marking.

j. Packaging requirements (see 5.1).

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

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

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

C_{IN} ..... Input terminal-to-GND capacitance.
GND ..... Ground zero voltage potential
I_{CC} ..... Quiescent supply current.
T_C ..... Case temperature.
V_{CC} ..... Positive supply voltage.

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

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

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

b. A copy of each radiograph.

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

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

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

6.8 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-35810 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	54HC00
02	54HC10
03	54HC20
04	54HC30
05	54HC132

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

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

Preparing activity:
DLA - CC

(Project 5962-2005-017)

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 http://assist.daps.dla.mil.