

INCH-POUND

MIL-M-38510/370A
15 July 2004
SUPERSEDING
MIL-M-38510/370(USAF)
18 March 1983

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR, ADVANCED LOW POWER SCHOTTKY TTL,
NAND GATES, MONOLITHIC SILICON

Inactive for new design after 8 July 1997.

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, advanced low power Schottky TTL, positive NAND logic gating microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided for each type and are reflected in the complete part number. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).

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

1.2.1 Device types. The device types are as follows:

<u>Device type</u>	<u>Circuit</u>
01	Quadruple, 2-input positive NAND gate
02	Triple, 3-input positive NAND gate
03	Dual, 4-input positive NAND gate
04	Single, 8-input positive NAND gate
05	Single, 13-input positive NAND gate
06	Hex, 1-input inverter gate

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

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

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
A	GDFP5-F14 or CDFP6-F14	14	Flat pack
B	GDFP4-14		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
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 emailed to bipolar@dsccl.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	-0.5 V dc to +7.0 V dc
Input voltage range	-1.5 V dc at -18 mA to +7.0 V dc
Storage temperature range	-65° to +150°C
Maximum power dissipation (P_D), per device: <u>1/</u>	
Device 01	16.4 mW
Device 02	12.3 mW
Device 03	8.2 mW
Device 04 and 05	4.1 mW
Device 06	24.6 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction to case (θ_{JC}):	
Cases A, B, C, D, E, F, and 2	(See MIL-STD-1835)
Junction temperature (T_J) <u>2/</u>	175°C

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	4.5 V dc minimum to 5.5 V dc maximum
Minimum high level input voltage (V_{IH})	2.0 V dc
Maximum low level input voltage (V_{IL})	0.8 V dc
Case operating temperature range (T_C)	-55° 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 SPECIFICATIONS

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard for Microelectronics.
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 specification 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.

1/ Must withstand the added P_D due to short-circuit test (e.g., I_O).

2/ Maximum junction temperature should not be exceeded except in accordance with allowable short duration burn-in screening condition in accordance with MIL-PRF-38535.

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.

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

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

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

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

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

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.

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 8 (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 effect 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 test method 1015 of MIL-STD-883.
- b. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.
- c. Additional screening for space level product shall be as specified in MIL-PRF-38535.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified	Device type	Limits		Unit
				Min	Max	
High level output voltage	V _{OH}	V _{CC} = 4.5 V, V _{IL} = 0.8 V, I _{OH} = -400 μA	All	2.5		V
Low level output voltage	V _{OL}	V _{CC} = 4.5 V, I _{OL} = 4 mA, V _{IH} = 2.0 V	All		0.4	V
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V, I _{IN} = -18 mA, T _C = +25°C	All		-1.5	V
High level input current	I _{IH1}	V _{CC} = 5.5 V, V _{IH} = 2.7 V	All		20	μA
	I _{IH2}	V _{CC} = 5.5 V, V _{IH} = 7.0 V	All		100	μA
Low level input current	I _{IL}	V _{CC} = 5.5 V, V _{IN} = 0.4 V	All	0	-400	μA
Output current <u>1</u> /	I _O	V _{CC} = 5.5 V, V _O = 2.25 V	01, 03, 06	-15	-110	mA
			02, 04, 05	-20	-112	
High level supply current	I _{CCH}	V _{CC} = 5.5 V, V _{IN} = 0 V	01		0.85	mA
			02		0.6	
			03		0.4	
			04		0.36	
			05		0.34	
			06		1.1	
Low level supply current	I _{CCL}	V _{CC} = 5.5 V, V _{IN} = 4.5 V	01		3.0	mA
			02		2.2	
			03		1.5	
			04		0.9	
			05		0.8	
			06		4.2	

See footnote at end of table.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Propagation delay time, high-to-low level	t _{PHL}	V _{CC} = 5.0 V, C _L = 50 pF, R _L = 500 Ω	01	2	10	ns
			02	3	12	
			03	3	15	
			04	5	22	
			05	5	28	
			06	2	12	
Propagation delay time low-to-high level	t _{PLH}		01	3	14	ns
			02	3	15	
			03	3	13	
			04	3	12	
			05	3	14	
			06	3	17	

1/ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

TABLE II. Electrical test requirements.

MIL-PRF-38535 test requirements	Subgroups (see table III)	
	Class S devices	Class B devices
Interim electrical parameters	1	1
Final electrical test parameters	1*, 2, 3, 9, 10, 11	1*, 2, 3, 9
Group A test requirements	1, 2, 3, 9, 10, 11	1, 2, 3, 9, 10, 11
Group B electrical test parameters when using the method 5005 QCI option	1, 2, 3, 9, 10, 11	N/A
Group C end-point electrical parameters	1, 2, 3, 9, 10, 11	1, 2, 3
Group D end-point electrical parameters	1, 2, 3	1, 2, 3

*PDA applies to subgroup 1.

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 as specified in table II herein.
- b. Subgroups 4, 5, 6, 7, and 8 shall be omitted.

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

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

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

4.5.1 Voltage and current. All voltages given are referenced to the microcircuit ground terminal. Currents given are conventional and positive when flowing into the referenced terminal.

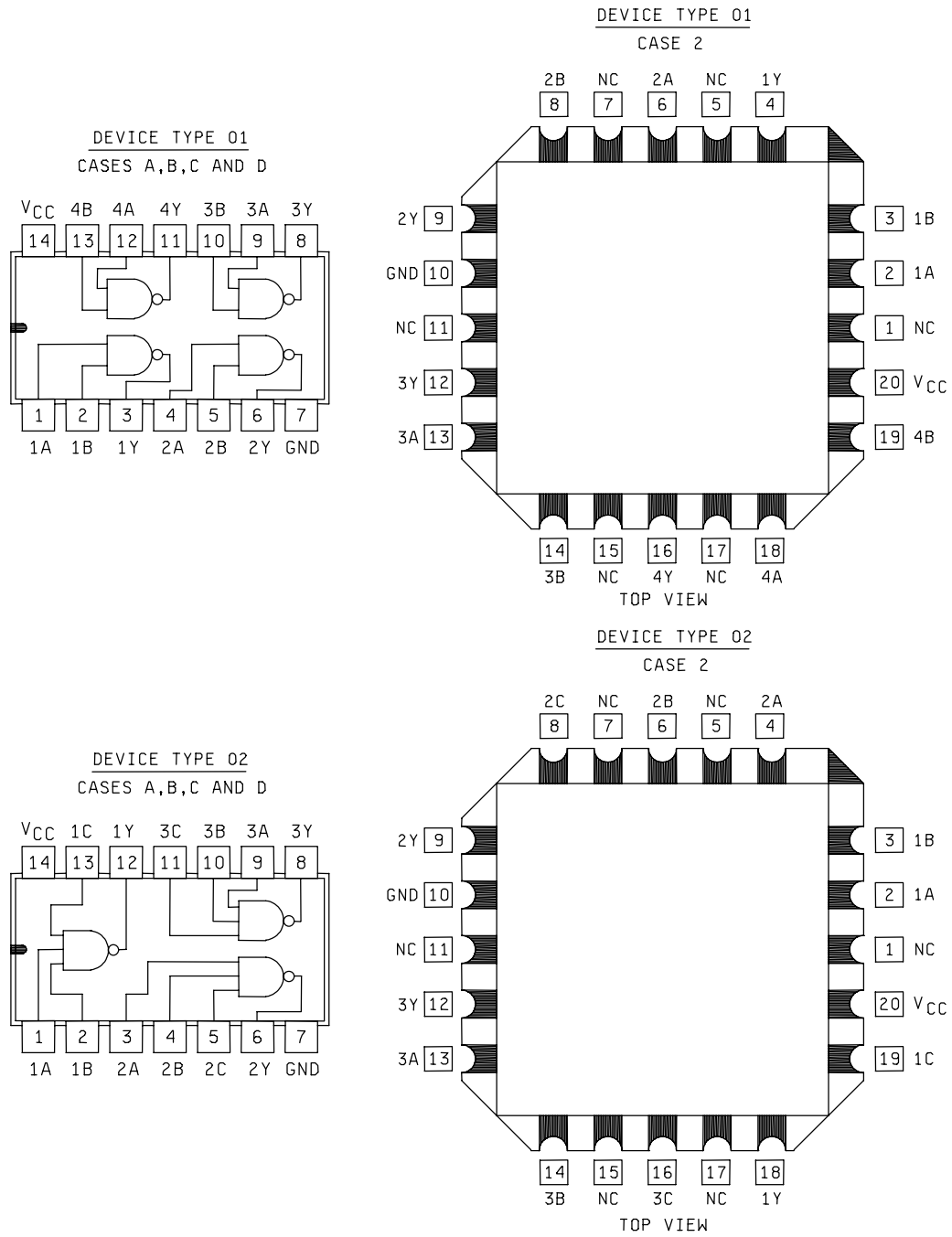


FIGURE 1. Logic diagram and terminal connections (top views).

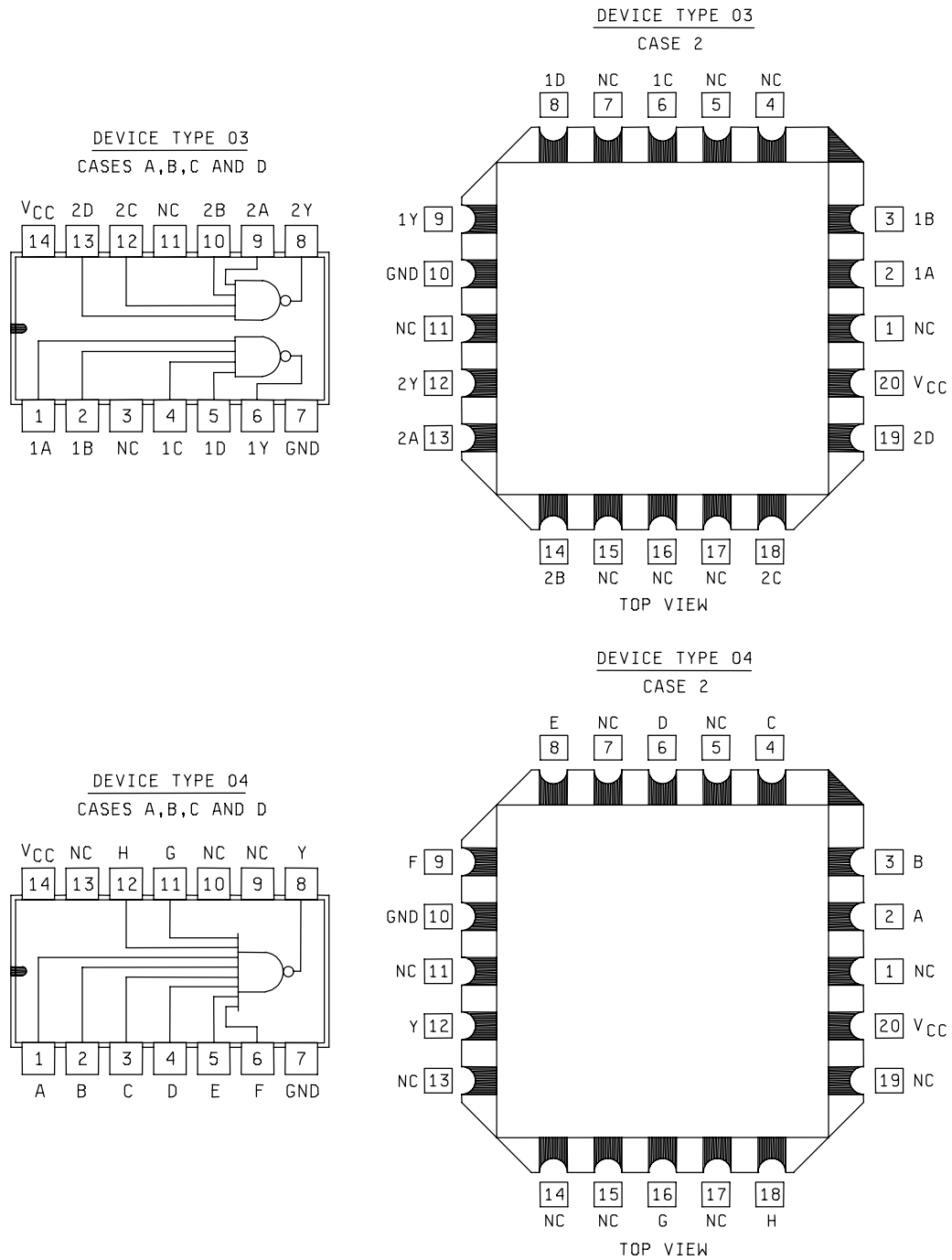


FIGURE 1. Logic diagram and terminal connections (top views) - Continued.

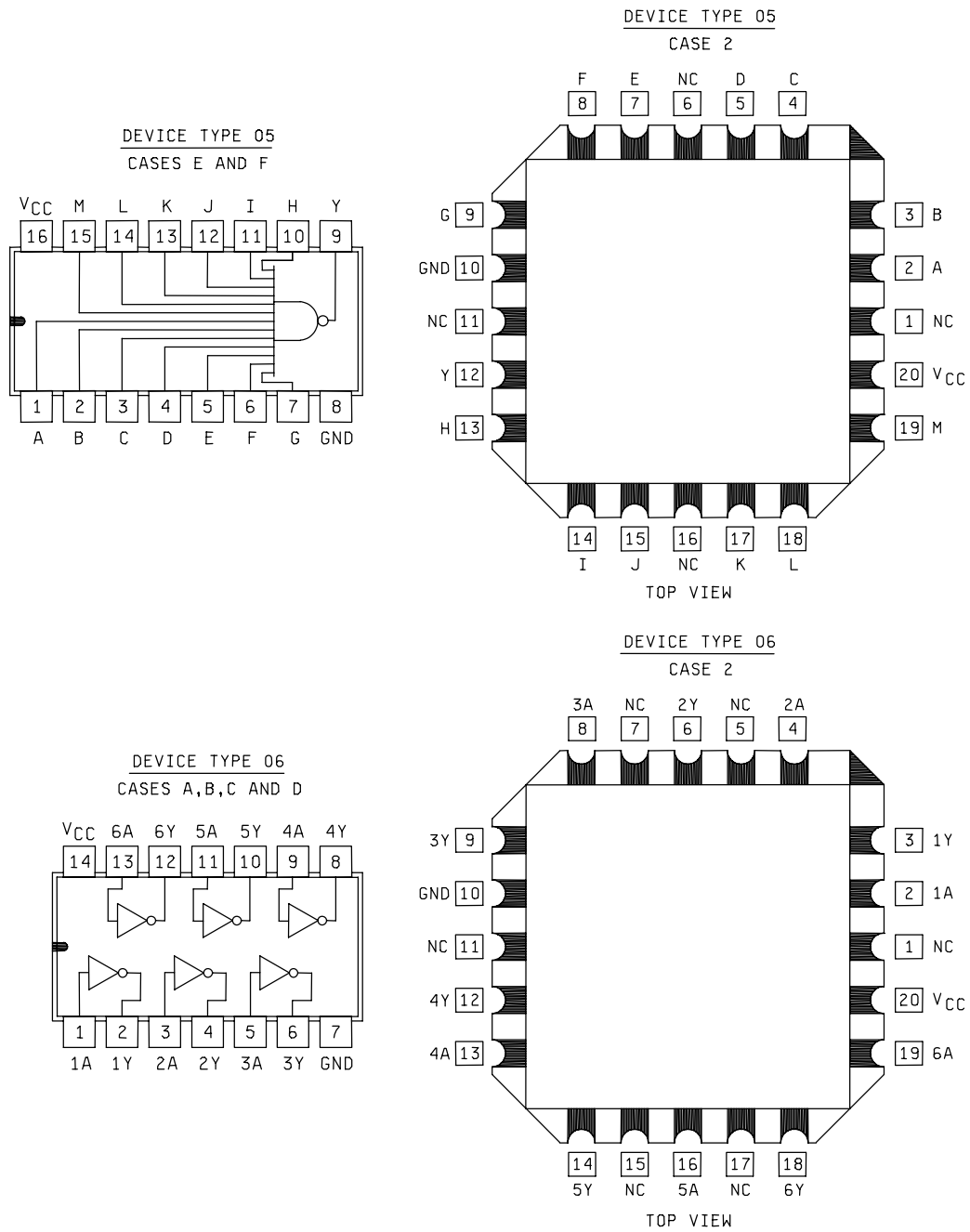


FIGURE 1. Logic diagram and terminal connections (top views) - Continued.

Device type 01

Truth table each gate		
Input		Output
A	B	Y
L	L	H
H	L	H
L	H	H
H	H	L

Positive logic $Y = \overline{AB}$

Device type 02

Truth table each gate			
Input			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

Input				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								Outputs
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 H output.

Positive logic $Y = \overline{ABCDEFGH}$

FIGURE 2. Truth tables and logic equations.

Device type 05

Truth table													
Inputs													Outputs
A	B	C	D	E	F	G	H	I	J	K	L	M	Y
H	H	H	H	H	H	H	H	H	H	H	H	H	L

All other combinations of H and L at the inputs give H output.

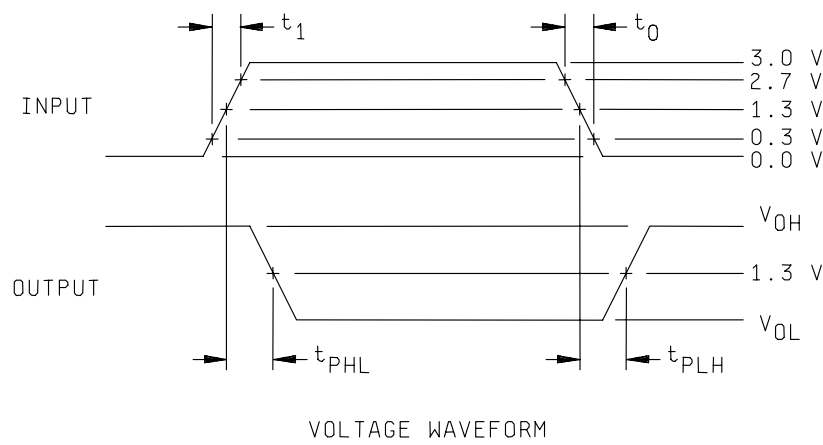
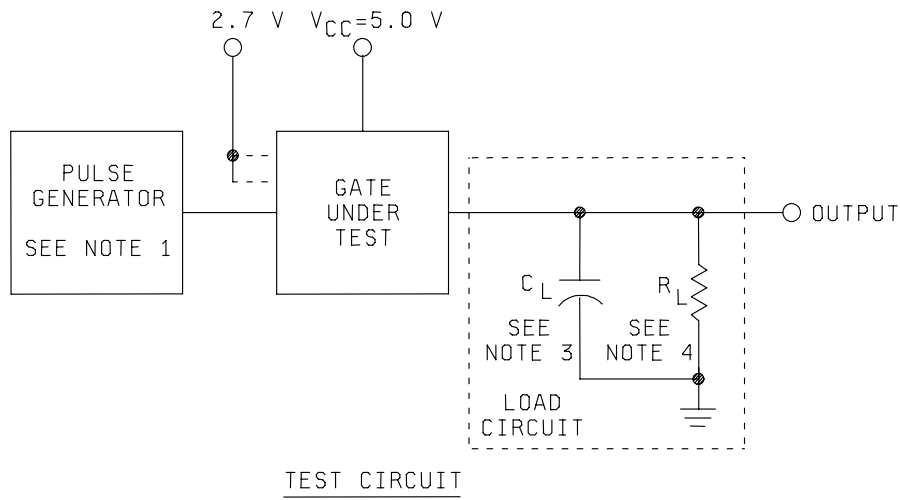
Positive logic $Y = \overline{ABCDEFGHIJKLM}$

Device type 06

Truth table each gate	
A	Y
L	H
H	L

Positive logic $Y = \overline{A}$

FIGURE 2. Truth tables and logic equations - Continued.



NOTES:

1. Input pulse has the following characteristics:
 $t_1 = t_0 = 6 \pm 1.5$ ns, $PRR \leq 1.0$ MHz, $Z_{OUT} \cong 50\Omega$.
2. Inputs not under test are at 2.7 V.
3. $C_L = 50$ pF $\pm 10\%$, including scope probe, wiring and stray capacitance without package in test fixture.
4. $R_L = 499\Omega \pm 1\%$.
5. Voltage measurements are to be made with respect to network ground terminal.

FIGURE 3. Switching time test circuit and waveforms for device types 01 through 06.

TABLE III. Group A inspection for device type 01.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				2	1A	1B	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	20		Min	Max	
1 T _C = 25°C	V _{OH}	3006	Test no.	1	5.5 V	0.8 V	400 μ A	5.5 V	5.5 V	GND	3Y	3A	3B	4Y	4A	4B	V _{CC}	1Y	2.5		V
				2	0.8 V	5.5 V	400 μ A	5.5 V		GND							4.5 V	1Y			"
				3	5.5 V			0.8 V	400 μ A									2Y			"
				4				0.8 V	5.5 V	400 μ A								2Y			"
				5				5.5 V			400 μ A		0.8 V					3Y			"
				6							400 μ A	0.8 V	5.5 V					3Y			"
				7								5.5 V				0.8 V		4Y			"
				8								5.5 V				5.5 V		4Y			"
				9	2.0 V	2.0 V	4 mA	GND				GND	GND			GND		1Y		0.4	"
				10	GND	GND		2.0 V	2.0 V	4 mA		GND	GND			GND		2Y			"
				11				GND			4 mA	2.0 V	2.0 V					3Y			"
				12				GND				GND	GND	4 mA	2.0 V	2.0 V		4Y			"
I	I _C	3007	Test no.	13	-18 mA													1A		-1.5	"
				14		-18 mA												1B			"
				15			-18 mA											2A			"
				16				-18 mA										2B			"
				17								-18 mA						3A			"
				18									-18 mA					3B			"
				19														4A			"
				20														4B			"
				21	2.7 V	GND		GND				GND	GND			-18 mA	5.5 V	1A		20	μ A
				22	GND	2.7 V		GND								GND		1B			"
				23		GND		2.7 V										2A			"
				24				GND	2.7 V									2B			"
I	I _{H1}	3010	Test no.	25				GND				2.7 V						3A			"
				26								GND	2.7 V					3B			"
				27									GND		2.7 V			4A			"
				28											GND	2.7 V		4B			"
				29	7.0 V											GND		1A		100	"
				30	GND	7.0 V												1B			"
				31		GND		7.0 V										2A			"
				32				GND										2B			"
				33								7.0 V						3A			"
				34								GND	7.0 V					3B			"
				35									GND		7.0 V			4A			"
				36											GND	7.0 V		4B			"
I	I _L	3009	Test no.	37	0.4 V	5.5 V		5.5 V				5.5 V	5.5 V			7.0 V		1A	2/		"
				38	5.5 V	0.4 V		5.5 V										1B			"
				39		5.5 V												2A			"
				40				0.4 V										2B			"
				41				5.5 V				0.4 V						3A			"
				42								5.5 V	0.4 V					3B			"
				43									5.5 V		0.4 V			4A			"
				44									5.5 V		5.5 V	0.4 V		4B			"

See footnotes at end of table.

TABLE III. Group A inspection for device type 01 – Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 Case 1/2 method	Cases A,B,C,D Case 1/2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits	Unit		
1 Tc = 25°C	Io3	3011	Test no.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	Vcc	1Y	Min -15 4/	mA		
		"	45	GND	GND	2.25 V												5.5 V	-70 4/			
		"	46				GND	GND	2.25 V	"								"	"			
		"	47							"	2.25 V	GND	GND	2.25 V	GND	GND	4Y	"	"			
		"	48								"							"	"			
		"	49	GND	GND		GND	GND					GND	GND	GND	GND	Vcc	"	0.85			
2	GCH	3005	50	4.5 V	4.5 V		4.5 V	4.5 V		"		4.5 V	4.5 V		4.5 V	4.5 V	"	Vcc	3.0	"		
	CCL	3005																				
3	Same tests, terminal conditions and limits as for subgroup 1, except Tc = +125°C and Vcc tests are omitted.																					
9 Tc = 25°C	IphL	3003 Fig. 3	51	IN	2.7 V	OUT	2.7 V	2.7 V		GND		2.7 V	2.7 V		2.7 V	2.7 V	5.0 V	1A to 1Y	2	8	ns	
				52	2.7 V	IN	OUT	2.7 V	"		"		"		"		"		1B to 1Y	"	"	
				53	"	2.7 V		IN	"	OUT		"		"		"		"		2A to 2Y	"	"
				54	"	"		2.7 V	IN	OUT		"		"		"		"		2B to 2Y	"	"
				55	"	"		"	2.7 V		OUT	IN	"		"		"		3A to 3Y	"	"	
				56	"	"		"	"		OUT	2.7 V	IN		"		"		3B to 3Y	"	"	
				57	"	"		"	"		"	"	2.7 V	OUT	"		"		4A to 4Y	"	"	
				58	"	"		"	"		"	"	"		"		"		4B to 4Y	"	"	
				59	IN	"	OUT	"	"		GND		"		"		"		1A to 1Y	3	11	"
				60	2.7 V	IN	OUT	"	"		"	"	"		"		"		1B to 1Y	"	"	
				61	"	2.7 V		IN	"	OUT		"	"		"		"		2A to 2Y	"	"	
10	PLH	Same tests and terminal conditions as subgroup 9, except Tc = +125°C.	62	"	"		2.7 V	IN	OUT		IN	"		"		"	"	2A to 2Y	"	"		
				63	"	"		"	2.7 V		OUT	IN	"		"		"	"	2B to 2Y	"	"	
				64	"	"		"	"		OUT	2.7 V	IN		"		"	"	3A to 3Y	"	"	
				65	"	"		"	"		"	"	2.7 V	OUT	IN	"	"	"	3B to 3Y	"	"	
				66	"	"		"	"		"	"	"	OUT	2.7 V	IN	"	"	4A to 4Y	"	"	
				66	"	"		"	"		"	"	"		"		"		4B to 4Y	"	"	
10	IphL	Same tests and terminal conditions as subgroup 9, except Tc = +125°C.																				
11	PLH	Same tests, terminal conditions and limits as for subgroup 10, except Tc = -55°C.																				

1/ For case 2, pins not referenced are N/C.

2/ I_{HL} limits shall be as follows:

Parameters	Min/Max limits in μA for circuit		
	A	B	C
I_{HL}	0/-100	0/-100	-0.2/-400

3/ Method 3011 of MIL-STD-883 shall be used, except the output shall be as specified herein, and the output current shall be operating rather than short circuit current.
The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS} .

4/ I_{O} limits for circuit A shall be -30 to -112 mA and for circuit C shall be -30 to -110 mA.

See footnotes at end of table.

[illegible]

TABLE III. Group A inspection for device type 02 – Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 Case 1/ Case 2/ Test no.	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	2A	2B	2C	2Y	2.25 V	2.25 V	3A	3B	3C	1Y	1C	20		Min	Max	
1 T _C = 25°C	I_{O3}	3011	49	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	2.25 V	GND	5.5 V	1Y	-30 $\frac{\Delta}{\Delta}$	-112 $\frac{\Delta}{\Delta}$	mA
		"	50						2.25 V	"	"						"	2Y	"	"	"
		"	51							"	2.25 V	GND	GND	GND			"	3Y	"	"	"
		3005	52	GND	GND	GND	GND	GND		"	"	GND	GND	GND		GND	"	V _{CC}		0.6	"
		3005	53	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V		"	"	4.5 V	4.5 V	4.5 V		4.5 V	"	V _{CC}		2.2	"
2				Same tests, terminal conditions and limits as for subgroup 1, except T _C = +125°C and V _{CC} tests are omitted.																	
3				Same tests, terminal conditions and limits as for subgroup 1, except T _C = -55°C and V _{CC} tests are omitted.																	
9 T _C = 25°C	I_{PHL}	3003 Fig. 3	54	IN	2.7 V	2.7 V	2.7 V	2.7 V		GND		2.7 V	2.7 V	2.7 V	OUT	2.7 V	5.0 V	1A to 1Y	3	11	ns
			55	2.7 V	IN	2.7 V	"	"		"		"	"	"	OUT	2.7 V	"	1B to 1Y	"	"	"
			56	"	2.7 V	2.7 V	"	"		"		"	"	"	OUT	IN	"	1C to 1Y	"	"	"
			57	"	"	IN	"	"	OUT	"		"	"	"		2.7 V	"	2A to 2Y	"	"	"
			58	"	"	2.7 V	IN	"	OUT	"		"	"	"		"	"	2B to 2Y	"	"	"
			59	"	"	"	2.7 V	IN	OUT	"		"	"	"		"	"	2C to 2Y	"	"	"
			60	"	"	"	"	2.7 V		"	OUT	IN	"	"		"	"	3A to 3Y	"	"	"
			61	"	"	"	"	"		"	OUT	2.7 V	IN	"		"	"	3B to 3Y	"	"	"
			62	"	"	"	"	"		"	OUT	"	2.7 V	IN		"	"	3C to 3Y	"	"	"
		PLH	63	IN	"	"	"	"		"		"	"	2.7 V	OUT	"	"	1A to 1Y	3	12	"
			64	2.7 V	IN	"	"	"		"		"	"	"	OUT	"	"	1B to 1Y	"	"	"
			65	"	2.7 V	"	"	"		"		"	"	"	OUT	IN	"	1C to 1Y	"	"	"
			66	"	"	IN	"	"	OUT	"		"	"	"		2.7 V	"	2A to 2Y	"	"	"
			67	"	"	2.7 V	IN	"	OUT	"		"	"	"		"	"	2B to 2Y	"	"	"
			68	"	"	"	2.7 V	IN	OUT	"		"	"	"		"	"	2C to 2Y	"	"	"
			69	"	"	"	"	2.7 V		"	OUT	IN	"	"		"	"	3A to 3Y	"	"	"
			70	"	"	"	"	"		"	OUT	2.7 V	IN	"		"	"	3B to 3Y	"	"	"
			71	"	"	"	"	"		"	OUT	"	2.7 V	IN		"	"	3C to 3Y	"	"	"
10	I_{PHL}	Same tests and terminal conditions as subgroup 9, except T _C = +125°C.																			
11	I_{PLH}	Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C.																			

1/ For case 2, pins not referenced are N/C.

2/ I_{IL} limits shall be as follows:

Parameters	Min/Max limits in μ A for circuit		
	A	B	C
I _{IL}	0/-100	0/-100	-0.2/-400

3/ Method 3011 of MIL-STD-883 shall be used, except the output shall be as specified herein, and the output current shall be operating rather than short circuit current. The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS}.

4/ I_O limits shall be -20/-112 mA for circuit A and -30 to -110 mA for circuit C.

TABLE III. Group A inspection for device type 03.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit	
																			2	3		4
1 Tc = 25°C	VOH	3006	Case 1/2	1A	1B	NC	1C	1D	1Y	GND	2Y	2A	2B	NC	2C	2D	VCC	1Y	2.5		V	
				0.8 V	5.5 V		5.5 V	5.5 V	-400 µA	GND		5.5 V	5.5 V		5.5 V	5.5 V	4.5 V	1Y				
				5.5 V	0.8 V														1Y			
					5.5 V		0.8 V												1Y			
							5.5 V	0.8 V											1Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
																			2Y			
				IC	OL	3007		2.0 V	2.0 V		2.0 V	2.0 V	4 mA				GND	GND	0.8 V	0.8 V		1Y
GND	GND		GND					GND			4 mA	2.0 V	2.0 V		GND	GND		2Y		0.4		
-18 mA																		1A		-1.5		
																			1B			
																			1C			
																			1D			
																			2A			
																			2B			
																			2C			
																			2C			
																			2C			
																			2C			
																			2C			
																			2C			
																			2C			
																			2C			
IH1		3010						2.7 V	GND		GND	GND				GND	GND		GND	-18 mA		1A
				GND	2.7 V		GND											1B				
					GND		2.7 V											1C				
							GND	2.7 V										1D				
								GND				2.7 V	2.7 V					2A				
												GND	GND					2B				
																		2C				
																		2C				
																		2D				
																			2D			
																			2D			
																			2D			
																			2D			
																			2D			
																			2D			
																			2D			
				IH2		3010		7.0 V														1A
GND	7.0 V																	1B				
	GND																	1C				
			7.0 V															1D				
			GND					7.0 V										2A				
								GND				7.0 V	7.0 V					2B				
																		2C				
																		2C				
																		2C				
																		2C				
																		2C				
																		2C				
																		2C				
																		2C				
																		2C				
																		2C				
IL	o 2/	3009						0.4 V	5.5 V		5.5 V	5.5 V				5.5 V	5.5 V		7.0 V	7.0 V		1A
				5.5 V	0.4 V		5.5 V										1B					
					5.5 V												1C					
							0.4										1D					
							5.5 V	0.4 V									2A					
								5.5 V									2B					
																	2C					
																	2C					
																	2C					
																	2C					
																	2C					
																	2C					
																	2C					
																	2C					
																	2C					
																	2C					
				o 3/		3011		GND	GND		GND	GND	2.25 V		2.25 V	GND	GND		GND	GND		1Y
																	2Y	-15 4/	-70 4/	mA		

See footnotes at end of table.

TABLE III. Group A inspection for device type 03 – Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Case 1/2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits	Unit
1	I_{OCH}	3005	Test no.	1A	1B	NC	4	1C	1D	1Y	GND	2Y	2A	2B	NC	18	20		Min	Max
$T_C = 25^\circ\text{C}$	I_{OCL}	3005	46	4.5 V	4.5 V		4.5 V	GND	GND	GND			GND	4.5 V	4.5 V	2C	V_{CC}	V_{CC}		0.4 mA
2																				1.5 mA
3																				
9	I_{BHL}	3003	47	IN	2.7 V		2.7 V	2.7 V	OUT	GND			2.7 V			2.7 V	5.0 V	1A to 1Y	3	10
$T_C = 25^\circ\text{C}$		Fig. 3	48	2.7 V	IN		2.7 V											1B to 1Y		
			49	"	2.7 V		IN											1C to 1Y		
			50	"	"		2.7 V	IN										1D to 1Y		
			51	"	"		"	2.7 V			OUT							2A to 2Y		
			52	"	"		"	"			"							2B to 2Y		
			53	"	"		"	"			"							2C to 2Y		
			54	"	"		"	"			"							2D to 2Y		
	I_{PLH}		55	IN	"		"	"	OUT				2.7 V			2.7 V		1A to 1Y	3	11
			56	2.7 V	IN		"	"										1B to 1Y		
			57	"	2.7 V		IN	"										1C to 1Y		
			58	"	"		2.7 V	IN										1D to 1Y		
			59	"	"		"	2.7 V			OUT							2A to 2Y		
			60	"	"		"	"			"							2B to 2Y		
			61	"	"		"	"			"							2C to 2Y		
			62	"	"		"	"			"							2D to 2Y		
10	I_{BHL}		Same tests and terminal conditions as subgroup 9, except $T_C = +125^\circ\text{C}$.																	
11	I_{PLH}		Same tests, terminal conditions and limits as for subgroup 10, except $T_C = -55^\circ\text{C}$.																	

1/ For case 2, pins not referenced are N/C.

2/ I_{IL} limits shall be as follows:

Parameters	Min/Max limits in μA for circuit		
	A	B	C
I_{IL}	0/-100	0/-100	-0.2/-400

3/ Method 3011 of MIL-STD-883 shall be used, except the output shall be as specified herein, and the output current shall be operating rather than short circuit current. The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS} .

4/ I_O limits shall be -20 to -112 mA for circuit A and -30 to -110 mA and for circuit C.

TABLE III. Group A inspection for device type 04.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Limits		Measured terminal	Unit
				2	3	4	6	8	9	10	12	13	14	16	18	19	20	Min	Max		
1 T _C = 25°C	V _{OH}	3006	Test no.	A	B	C	D	E	F	GND	Y	NC	NC	G	H	NC	V _{CC}	2.5		Y	V
				1	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	GND	-400 μ A			5.5 V	5.5 V		4.5 V			Y	
				2	0.8 V	0.8 V														Y	
				3	5.5 V	5.5 V														Y	
				4	5.5 V	0.8 V														Y	
				5		5.5 V	0.8 V													Y	
				6			5.5 V	0.8 V												Y	
				7				5.5 V	0.8 V											Y	
	OL IC	3007		8					5.5 V		4 mA			0.8 V	0.8 V					Y	
				9	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V					2.0 V	2.0 V					Y	0.4
				10	-18 mA															A	-1.5
				11		-18 mA														B	
				12			-18 mA													C	
				13																D	
				14				-18 mA												E	
				15					-18 mA											F	
	IH1	3010		16										-18 mA						G	
				17											-18 mA					H	
				18	2.7 V	GND	GND	GND	GND					GND	GND		5.5 V			A	20 μ A
				19	GND	2.7 V	GND													B	
				20		GND	2.7 V													C	
				21			GND	2.7 V												D	
				22			GND	2.7 V	GND											E	
				23				GND	2.7 V											F	
	IH2			24					GND					2.7 V						G	
				25																F	
				26	7.0 V									GND	2.7 V					G	
				27	GND	7.0 V									GND					H	
				28		GND														A	100
				29			7.0 V													B	
				30		GND	7.0 V													C	
				31			GND	7.0 V												D	
	IL	3009		32					GND											E	
				33										7.0 V						F	
				34	0.4 V	5.5 V	5.5 V	5.5 V	GND					GND	7.0 V					G	
				35	5.5 V	0.4 V	5.5 V		5.5 V					5.5 V	5.5 V			2/	2/	A	
				36		5.5 V	0.4 V													B	
				37			5.5 V	0.4 V												C	
				38			5.5 V	0.4 V												D	
				39				5.5 V	0.4 V											E	
	O ₃ / CCH CCL	3011 3005 3005		40					5.5 V											F	
				41					5.5 V					0.4 V						G	
				42	GND	GND	GND	GND	GND		2.25 V			5.5 V	0.4 V					H	
				43	GND	GND	GND	GND	GND					GND	GND			-30 4/	-112 4/	Y	mA
				44	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V					4.5 V	4.5 V					V _{CC}	μ A
																				V _{CC}	0.9 mA

See footnotes at end of table.

TABLE III. Group A inspection for device type 04 – Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal		Limits		Unit		
			Case 1/2	2	3	4	6	8	9	10	12	13	14	16	18	19	20			Min	Max			
			Test no.	A	B	C	D	E	F	GND	Y	NC	NC	G	H	NC	V _{CC}							
2	Same tests, terminal conditions and limits as for subgroup 1, except T _C = +125°C and V _{CC} tests are omitted.																							
3	Same tests, terminal conditions and limits as for subgroup 1, except T _C = -55°C and V _{CC} tests are omitted.																							
9 T _C = 25°C	t _{PHL}	3003 Fig. 3	45	IN	2.7 V	2.7 V	2.7 V	2.7 V	2.7 V	GND	OUT			2.7 V	2.7 V		5.0 V	A to Y	5	20	ns			
			46	2.7 V	IN	2.7 V													B to Y	"	"	"		
			47		2.7 V	IN														C to Y	"	"	"	
			48	"	"	2.7 V	IN													D to Y	"	"	"	
			49	"	"	"	2.7 V	IN												E to Y	"	"	"	
			50	"	"	"	"	2.7 V	IN											F to Y	"	"	"	
			51	"	"	"	"	"	2.7 V							IN				G to Y	"	"	"	
			52	"	"	"	"	"	"	"						2.7 V	IN			H to Y	"	"	"	
			53	IN	"	"	"	"	"	"	"									A to Y	3	10	"	
			54	2.7 V	IN	"	"	"	"	"	"									B to Y	"	"	"	
			55	"	2.7 V	IN	"	"	"	"	"							C to Y	"	"	"			
			56	"	"	2.7 V	IN												D to Y	"	"	"		
			57	"	"	"	2.7 V	IN											E to Y	"	"	"		
			58	"	"	"	"	2.7 V	IN										F to Y	"	"	"		
			59	"	"	"	"	"	2.7 V							IN			G to Y	"	"	"		
			60	"	"	"	"	"	"	"						2.7 V	IN			H to Y	"	"	"	
10	t _{PHL}	Same tests and terminal conditions as subgroup 9, except T _C = +125°C.																				5	22	"
11	PLH																					3	12	"
Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C.																								

1/ For case 2, pins not referenced are N/C.

2/ I_{IL} limits shall be as follows:

Parameters	Min/Max limits in μ A for circuit		
	A	B	C
I _{IL}	0/-100	0/-100	-0.2/-400

3/ Method 3011 of MIL-STD-883 shall be used, except the output shall be as specified herein, and the output current shall be operating rather than short circuit current. The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS}.

4/ I_O limits shall be -20 to -112 mA for circuit A and -30 to -110 mA and for circuit C.

TABLE III. Group A inspection for device type 05.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.8 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E, F	Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.8 V; or open).																Measured terminal	Limits		Unit	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max		
1 $T_c = 25^\circ\text{C}$	V_{OH}	3006	Test no.	A	B	C	D	E	F	G	GND	Y	H	I	J	K	L	M	V_{cc}					
			1	0.8 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	GND	-400 μA	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	4.5 V	2.5		V	
			2	5.5 V	0.8 V	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			3	"	5.5 V	0.8 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			4	"	"	5.5 V	0.8 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			5	"	"	"	5.5 V	0.8 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			6	"	"	"	"	5.5 V	0.8 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			7	"	"	"	"	"	0.8 V	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			8	"	"	"	"	"	"	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			9	"	"	"	"	"	"	"	"	"	"	"	0.8 V	5.5 V	"	"	"	"	"	"	"	"
			10	"	"	"	"	"	"	"	"	"	"	"	5.5 V	0.8 V	5.5 V	"	"	"	"	"	"	"
			11	"	"	"	"	"	"	"	"	"	"	"	"	5.5 V	0.8 V	"	"	"	"	"	"	"
			12	"	"	"	"	"	"	"	"	"	"	"	"	"	5.5 V	0.8 V	"	"	"	"	"	"
			13	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5.5 V	0.8 V	"	"	"	"	"
			14	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V	"	4 mA	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V	2.0 V	"	0.4	-1.5	"
	I_C	3007	15	-18 mA	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			16	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			17	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			18	"	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			19	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			20	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			21	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			22	"	"	"	"	"	-18 mA	"	"	"	"	"	-18 mA	"	"	"	"	"	"	"	"	
			23	"	"	"	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	"	"	"	
			24	"	"	"	"	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	"	"	
			25	"	"	"	"	"	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	"	
			26	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	
			27	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	
			28	2.7 V	GND	GND	GND	GND	GND	GND	GND	GND	"	"	"	"	GND	GND	GND	GND	5.5 V	20	"	μA
			29	"	GND	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
30	"	GND	GND	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
31	"	"	"	GND	2.7 V	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
32	"	"	"	"	GND	GND	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
33	"	"	"	"	"	"	GND	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"			
34	"	"	"	"	"	"	"	GND	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"			
35	"	"	"	"	"	"	"	"	GND	"	"	2.7 V	"	"	"	"	"	"	"	"	"			
36	"	"	"	"	"	"	"	"	"	"	"	GND	2.7 V	"	"	"	"	"	"	"	"			
37	"	"	"	"	"	"	"	"	"	"	"	"	GND	2.7 V	"	"	"	"	"	"	"			
38	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	2.7 V	"	"	"	"	"	"			
39	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	2.7 V	"	"	"	"	"			
40	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	2.7 V	"	"	"	"			
41	7.0 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
42	GND	7.0 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
43	"	GND	7.0 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
44	"	"	GND	7.0 V	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
45	"	"	"	"	GND	7.0 V	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
46	"	"	"	"	"	"	GND	7.0 V	"	"	"	"	"	"	"	"	"	"	"	"	"			
47	"	"	"	"	"	"	"	GND	7.0 V	"	"	"	"	"	"	"	"	"	"	"	"			
48	"	"	"	"	"	"	"	"	"	"	"	7.0 V	"	"	"	"	"	"	"	"	"			
49	"	"	"	"	"	"	"	"	"	"	"	GND	7.0 V	"	"	"	"	"	"	"	"			
50	"	"	"	"	"	"	"	"	"	"	"	"	GND	7.0 V	"	"	"	"	"	"	"			
51	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	7.0 V	"	"	"	"	"	"			
52	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	7.0 V	"	"	"	"	"			
53	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	7.0 V	"	"	"	"			

See footnotes at end of table III.

TABLE III. Group A inspection for device type 05 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.8 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits	Unit
				Case 2 1/																	Min	Max
1	I_{IL}	3009	Test no.	A	B	C	D	E	F	G	GND	Y	H	I	J	K	L	M	V _{CC}	A	2/	2/
$T_C = 25^\circ\text{C}$			54	0.4 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V			5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	B	"	"
			55	5.5 V	0.4 V	5.5 V	"	"	"	"			"	"	"	"	"	"	"	C	"	"
			56	"	5.5 V	0.4 V	0.4 V	"	"	"			"	"	"	"	"	"	"	D	"	"
			57	"	"	5.5 V	5.5 V	0.4 V	"	"			"	"	"	"	"	"	"	E	"	"
			58	"	"	"	5.5 V	0.4 V	5.5 V	"			"	"	"	"	"	"	"	F	"	"
			59	"	"	"	"	5.5 V	0.4 V	0.4 V			"	"	"	"	"	"	"	G	"	"
			60	"	"	"	"	5.5 V	5.5 V	5.5 V			0.4 V	"	"	"	"	"	"	H	"	"
			61	"	"	"	"	"	"	5.5 V			5.5 V	0.4 V	"	"	"	"	"	I	"	"
			62	"	"	"	"	"	"	"			"	0.4 V	"	"	"	"	"	J	"	"
			63	"	"	"	"	"	"	"			"	5.5 V	0.4 V	"	"	"	"	K	"	"
			64	"	"	"	"	"	"	"			"	"	5.5 V	0.4 V	0.4 V	0.4 V	"	L	"	"
			65	"	"	"	"	"	"	"			"	"	"	5.5 V	5.5 V	5.5 V	"	M	"	"
			66	"	"	"	"	"	"	"			"	"	"	"	5.5 V	0.4 V	"	"	"	"
	$\phi_{3/}$	3011	67	GND	GND	GND	GND	GND	GND	GND	"	2.25 V	GND	GND	GND	GND	GND	GND	"	Y	-30.4/	-112.4/
	ϕ_{CH}	3005	68	GND	GND	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	V _{CC}	340	340
	ϕ_{CL}	3005	69	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	"	"	"	"	"	"	"	"	"	V _{CC}	800	800
2			Same tests, terminal conditions, and limits as subgroup 1, except $T_C = +125^\circ\text{C}$ and V_{IC} tests are omitted.																			
3			Same tests, terminal conditions, and limits as subgroup 1, except $T_C = -55^\circ\text{C}$ and V_{IC} tests are omitted.																			
9	t_{PHL}	3003 Fig. 3	70	IN	2.7 V	2.7 V	2.7 V	2.7 V	2.7 V	2.7 V	GND	OUT	2.7 V	2.7 V	2.7 V	2.7 V	2.7 V	2.7 V	5.0 V	A to Y	5	25
$T_C = 25^\circ\text{C}$			71	2.7 V	IN	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	B to Y	"	"
			72	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	C to Y	"	"
			73	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	D to Y	"	"
			74	"	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	"	E to Y	"	"
			75	"	"	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	F to Y	"	"
			76	"	"	"	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	G to Y	"	"
			77	"	"	"	"	"	"	2.7 V	"	"	IN	"	"	"	"	"	"	H to Y	"	"
			78	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	"	"	"	I to Y	"	"
			79	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	"	"	J to Y	"	"
			80	"	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	"	K to Y	"	"
			81	"	"	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	L to Y	"	"
			82	"	"	"	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	M to Y	"	"
			83	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	3	11
			84	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	"
			85	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	B to Y	"	"
			86	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	C to Y	"	"
			87	"	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	"	D to Y	"	"
			88	"	"	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	"	E to Y	"	"
			89	"	"	"	"	"	2.7 V	IN	"	"	"	"	"	"	"	"	"	F to Y	"	"
			90	"	"	"	"	"	"	2.7 V	"	"	IN	"	"	"	"	"	"	G to Y	"	"
			91	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	"	"	"	H to Y	"	"
			92	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	"	"	I to Y	"	"
			93	"	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	"	J to Y	"	"
			94	"	"	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	"	K to Y	"	"
			95	"	"	"	"	"	"	"	"	"	"	"	"	"	2.7 V	IN	"	L to Y	"	"
10	t_{PHL}		Same tests and terminal conditions as for subgroup 9, except $T_C = +125^\circ\text{C}$.																			
11			Same tests, terminal conditions and limits as for subgroup 10, except $T_C = -55^\circ\text{C}$.																			

1/ For case 2, pins not referenced are N/C.

2/ I_{IL} limits shall be as follows:

Parameters	Min/Max limits in μA for circuit		
I_{IL}	A	B	C
	0/-100	0/-100	-0.2/-400

3/ Method 3011 of MIL-STD-883 shall be used, except the output shall be as specified herein, and the output current shall be operating rather than short circuit current.

The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS} .

4/ I_O limits shall be -20 to -112 mA for circuit A and -30 to -110 mA and for circuit C.

TABLE III. Group A inspection for device type 06.
Terminal conditions (pins not designated may be high ≥ 2.0 V or low ≤ 0.8 V or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Case 1/2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit			
				2	3	4	6	8	9	10	12	13	14	16	18	19	20		Min	Max				
1 Tc = 25°C	V _{OH}	3006 " " " " "	Test no.	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	V _{CC}	1Y	2.5		V			
				0.8 V	-400 μA	5.5 V	5.5 V													2Y	"		"	
				5.5 V		5.5 V	-400 μA	5.5 V												3Y	"		"	
				"		5.5 V		0.8 V	-400 μA	"	-400 μA	0.8 V								4Y	"		"	
				"		"		5.5 V		"		5.5 V	-400 μA	0.8 V						5Y	"		"	
				"		"		"		"		5.5 V		5.5 V	-400 μA	0.8 V				6Y	"		"	
				3007 " " " " "	2.0 V	4 mA	GND		GND		"		"								1Y	0.4		"
					GND		2.0 V	4 mA	GND		"		"								2Y	"		"
					"		GND		2.0 V	4 mA	"		"								3Y	"		"
					"		"		GND		"	4 mA	2.0 V								4Y	"		"
					"		"		"		"		GND	4 mA	2.0 V						5Y	"		"
					"		"		"		"		GND		GND	4 mA	2.0 V				6Y	"		"
IC			13	-18 mA						"							"	1A	-1.5		"			
			14		-18 mA				"									"	2A	"		"		
			15				-18 mA		"		-18 mA							"	3A	"		"		
			16						"									"	4A	"		"		
			17						"		"							"	5A	"		"		
			18						"		"							"	6A	"		"		
			3010 " " " "	19	2.7 V	GND		GND		"		GND								1A	20		μA	
				20	GND	2.7 V		GND		"		"								2A	"		"	
				21	"	GND		2.7 V		"		"								3A	"		"	
				22	"	"		GND		"		2.7 V		"						4A	"		"	
				23	"	"		"		"		GND		2.7 V						5A	"		"	
				24	"	"		"		"		"		GND		2.7 V				6A	"		"	
IH2			25	7.0 V			"		"								"	1A	100		"			
			26	GND	7.0 V		"		"		"							"	2A	"		"		
			27	"	GND		7.0 V		"		"								3A	"		"		
			28	"	"		GND		"		7.0 V		"						4A	"		"		
			29	"	"		"		"		GND		7.0 V						5A	"		"		
			30	"	"		"		"		GND		GND		7.0 V				6A	"		"		
			3009 " " " "	31	0.4 V	5.5 V		5.5 V		"		5.5 V								1A	2/		"	
				32	5.5 V	0.4 V		5.5 V		"		"								2A	"		"	
				33	"	5.5 V		0.4 V		"		"								3A	"		"	
				34	"	"		5.5 V		"		0.4 V		"						4A	"		"	
				35	"	"		"		"		5.5 V		0.4 V						5A	"		"	
				36	"	"		"		"		5.5 V		5.5 V		0.4 V				6A	"		"	
o 3/			37	GND	2.25 V												"	1Y	-15.4/	-70.4/	mA			
			38						"									2Y	"		"			
			39				GND	2.25 V	"									3Y	"		"			
			40						"	2.25 V	GND							4Y	"		"			
			41						"									5Y	"		"			
			42						"									6Y	"		"			
			3005 CCH CCL	43	GND			GND		"		GND		GND		GND		GND	"	V _{CC}	1.1		"	
				44	4.5 V			4.5 V		"		4.5 V		4.5 V		4.5 V		4.5 V		V _{CC}	4.2		"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 06 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.8 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits	Unit
			Case 1/2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Min	Max
2			Test no.	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	V _{CC}			
3			Same tests, terminal conditions and limits as for subgroup 1, except T _C = +125°C and V _{CE} tests are omitted.																	
9	T _C = 25°C	3003 Fig. 3	45	IN	OUT	2.7 V	OUT	2.7 V		GND		2.7 V		2.7 V		2.7 V	5.0 V	1A to 1Y	2	9
			46	"		2.7 V	IN	IN	OUT	"		"		"		"	"	2A to 2Y	"	"
			47	"		"	"	2.7 V	"	"	OUT	"		"		"	"	3A to 3Y	"	"
			48	"		"	"	"	"	"	"	IN		"		"	"	4A to 4Y	"	"
			49	"		"	"	"	"	"	"	2.7 V	OUT	IN		"	"	5A to 5Y	"	"
			50	"		"	"	"	"	"	"	"		2.7 V	OUT	IN	"	6A to 6Y	"	"
			51	IN	OUT	"	"	"	"	"	"	"		"		2.7 V	"	1A to 1Y	3	11
			52	"		2.7 V	OUT	"	"	"	"	"		"		"	"	2A to 2Y	"	"
			53	"		"	"	IN	OUT	"	"	"		"		"	"	3A to 3Y	"	"
			54	"		"	"	2.7 V	"	"	OUT	IN		"		"	"	4A to 4Y	"	"
			55	"		"	"	"	"	"	"	2.7 V	OUT	IN		"	"	5A to 5Y	"	"
			56	"		"	"	"	"	"	"	"		2.7 V	OUT	IN	"	6A to 6Y	"	"
10			Same tests and terminal conditions as subgroup 9, except T _C = +125°C.																	
	I _{PH}																			
11			Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C.																	

1/ For case 2, pins not referenced are N/C.

2/ I_L limits shall be as follows:

Parameters	Min/Max limits in μ A for circuit		
	A	B	C
I _L	0/-100	0/-100	-0.2/-400

3/ Method 3011 of MIL-STD-883 shall be used, except the output shall be as specified herein, and the output current shall be operating rather than short circuit current. The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS}.

4/ I_O limits shall be -30 to -112 mA for circuit A and -30 to -110 mA and for circuit C.

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 actual 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 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.

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 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 contractor's 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, 3990 E. Broad Street, Columbus, Ohio 43123-1199.

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:

GND	Ground zero voltage potential
V _{IN}	Voltage level at an input terminal
V _{IC}	Input clamp voltage
I _{IN}	Current flowing into an input terminal

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 B (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 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	54ALS00A
02	54ALS10
03	54ALS20A
04	54ALS30
05	54ALS133
06	54ALS04A

6.8 Manufacturers' designation. Manufacturers' circuits which form a part of this specification are designated with an "X" as shown in table IV herein.

TABLE IV. Manufacturers' designations.

Device type	Circuits		
	A	B	C
	Texas Instruments	Motorola Inc.	National Semiconductor/ Fairchild Semiconductor
01	X	X	X
02	X	X	X
03	X	X	X
04	X	X	X
05	X		X
06	X	X	X

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 extensiveness of the changes.

Custodians:

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

Preparing activity:
DLA - CC

(Project 5962-2053)

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 the ASSIST Online database at www.dodssp.daps.mil.