MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL,
NOR GATES, MONOLITHIC SILICON

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

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, low-power Schottky TTL, positive NOR logic gating microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided and are reflected in the complete part number.

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

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

Device type	Circuit
01	Quadruple, 2-input positive NOR gate
02	Triple, 3-input positive NOR gate
03	Quadruple, 2-input exclusive NOR gate (open collector output)

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

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

Outline letter	Case outline (see MIL-M-38510), appendix C)
A	F-1 (14-lead, 1/4" x 1/4"), flat package
B	F-3 (14-lead, 3/16" x 1/4"), flat package
C	D-1 (14-lead, 1/4" x 3/4"), dual-in-line package
D	F-2 (14-lead, 1/4" x 3/8"), flat package
X	C-2A (20-terminal, .350" x .350"), square chip carrier package
2	C-2 (20-terminal, .350" x .350"), square chip carrier package

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 +5.5 V dc
Storage temperature range	-65°C to +150°C
Maximum power dissipation (P_D) 1/:	
Device type 01	30 mW
Device type 02	38 mW
Device type 03	72 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Cases A, B, C, D, X, and 2	(See MIL-M-38510, appendix C)
Junction temperature (T_J) 2/	+175°C

1/ Must withstand the added P_D due to short-circuit test (e.g., I_{OS}).
2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening condition per method 5004 of MIL-STD-883.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Rome Air Development Center, (RBE-2), Griffiss AFB, NY 13441-5700, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A
FSC 5962

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}) - - - - -	+0.7 V dc
Case operating temperature range (T_C) - - - - -	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specification and standard. The following specification and standard form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

MILITARY

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

STANDARD

MILITARY

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

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

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

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510, and herein.

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

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

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

3.2.4 Schematic circuits. The schematic circuits shall be submitted to the preparing activity prior to inclusion of a manufacturer's device in this specification and shall be submitted to the qualifying activity and agent activity (DESC-ECS) as a prerequisite for qualification. All qualified manufacturers' schematics shall be maintained by the agent activity and will be available upon request.

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

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

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

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$	Device type	Limits Min	Limits Max	Unit
High-level output voltage	V_{OH}	V_{CC} = +4.5 V, V_{IN} = +0.7 V I_{OH} = -400 µA	01, 02	+2.5		V
Low-level output voltage	V_{OL}	V_{CC} = +4.5 V, I_{OL} = +4 mA V_{IN} = +2.0 V	All		+0.4	V
High-level input current	I_{IH1}	V_{CC} = +5.5 V, V_{IN} = +2.7 V	01, 02		+20	µA
		V_{CC} = +5.5 V, V_{IN} = +2.7 V	03		+40	µA
High-level input current	I_{IH2}	V_{CC} = +5.5 V, V_{IN} = +5.5 V	01, 02		+100	µA
		V_{CC} = +5.5 V, V_{IN} = +5.5 V	03		+200	µA
Collector cut-off current	I_{CEX}	V_{CC} = +4.5 V, V_{IN} = +0.7 V V_{OH} = +5.5 V	03		+100	µA
Low-level input current	I_{IL}	V_{CC} = +5.5 V, V_{IN} = +0.4 V	01, 02	-30	-400	µA
		V_{CC} = +5.5 V, V_{IN} = +0.4 V	03	-200	-760	µA
Short-circuit output current	I_{OS}	V_{CC} = +5.5 V, 2/ V_{IN} = 0 V	01, 02	-15	-130	mA
Input-clamp voltage	V_{IC}	V_{CC} = +4.5 V, I_{IN} = -18 mA T_C = +25°C	All		-1.5	V
High-level supply current	I_{CCH}	V_{CC} = +5.5 V, V_{IN} = 0 V	01		+3.2	mA
			02		+4.0	
Low-level supply current	I_{CCL}	V_{CC} = +5.5 V, V_{IN} = +4.5 V	01		+5.4	mA
			02		+6.8	
Supply current	I_{CC}	V_{CC} = +5.5 V 3/	03		+13	mA
Propagation delay time, high-to-low-level	t_{PHL}	C_L = 50 pF ±10% R_L = 2 kΩ ±5% V_{CC} = +5.0 V	01	+2.0	+30	ns
			02	+2.0	+26	
	t_{PHL1}	From A or B; Other input low; C_L = 50 pF ±10%, R_L = 2 kΩ ±5%, V_{CC} = +5.0 V	03	+2.0	+45	ns
	t_{PHL2}	From A or B; Other input high		+2.0	+45	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$		Device type	Limits Min	Limits Max	Unit
Propagation delay time, low-to-high-level	t_{PLH}	C_L = 50 pF ±10% R_L = 2 kΩ ±5% V_{CC} = +5.0 V		01,02	+2.0	+30	ns
	t_{PLH1}	From A or B	Other input low C_L = 50 pF ±10% R_L = 2 kΩ ±5% V_{CC} = +5.0 V	03	+2.0	+56	ns
	t_{PLH2}	From A or B	Other input high		+2.0	+56	ns

1/ Complete terminal conditions shall be as specified in table III.
2/ Not more than one output should be shorted at a time.
3/ I_{CC} is measured with one input of each gate at +4.5 V, the other inputs grounded, and the outputs open.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (see table III) Class S devices	Subgroups (see table III) Class B devices
Interim electrical parameters (method 5004)	1	1
Final electrical test parameters (method 5004)	1*, 2, 3, 9, 10, 11	1*, 2, 3, 9
Group A test requirements (method 5005)	1, 2, 3, 9, 10, 11	1, 2, 3, 9, 10, 11
Group B test requirements (method 5005), subgroup 5	1, 2, 3, 9, 10, 11	N/A
Group C end-point electrical parameters (method 5005)	N/A	1, 2, 3
Group D end-point electrical parameters (method 5005)	1, 2, 3	1, 2, 3

*PDA applies to subgroup 1 (see 4.2c.).

Pin number		Pin name		Pin name		Pin name	
		Device type 01		Device type 02		Device type 03	
Cases							
2 and X	A, B, C and D	2 and X	A, B, C and D	2 and X	A, B, C and D	2 and X	A, B, C and D
1	1	NC	1Y	NC	1A	NC	
2	2	1Y	1A	1A	1B	1A	
3	3	1A	1B	1B	2A	1B	
4	4	1B	2Y	2A	2B	1Y	
5	5	NC	2A	NC	2C	NC	
6	6	2Y	2B	2B	2Y	2Y	
7	7	NC	GND	NC	GND	NC	
8	8	2A	3A	2C	3Y	2A	
9	9	2B	3B	2Y	3A	2B	
10	10	GND	3Y	GND	3B	GND	
11	11	NC	4A	NC	3C	NC	
12	12	3A	4B	3Y	1Y	3A	
13	13	3B	4Y	3A	1C	3B	
14	14	3Y	V_{CC}	3B	V_{CC}	3Y	
15		NC		NC		NC	
16		4A		3C		4Y	
17		NC		NC		NC	
18		4B		1Y		4A	
19		4Y		1C		4B	
20		V_{CC}		V_{CC}		V_{CC}	

FIGURE 1. Terminal connections.

Device type 01

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

X = Irrelevant

Positive logic: $Y = \overline{A + B}$

Device type 02

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

X = Irrelevant

Positive logic: $Y = \overline{A+B+C}$

Device type 03

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

Positive logic: $Y = \overline{A \oplus B} = AB + \overline{A}\,\overline{B}$

FIGURE 2. Truth tables and logic equations.

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

3.7 Microcircuit group assignment. The devices covered by this specification shall be microcircuit group number 8 (see MIL-M-38510, appendix E).

4. QUALITY ASSURANCE PROVISIONS

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

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

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

(1) Test condition D, E, or F, using the circuit shown on figure 3 or equivalent.

(2) T_A = +125°C minimum.

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. The percent defective allowable (PDA) shall be as specified in MIL-M-38510.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510 and as specified herein. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, 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 I of method 5005 of MIL-STD-883 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 method 5005 of MIL-STD-883. Electrical parameters shall be as specified in table II herein.

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

a. End-point electrical parameters shall be as specified in table II herein.

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

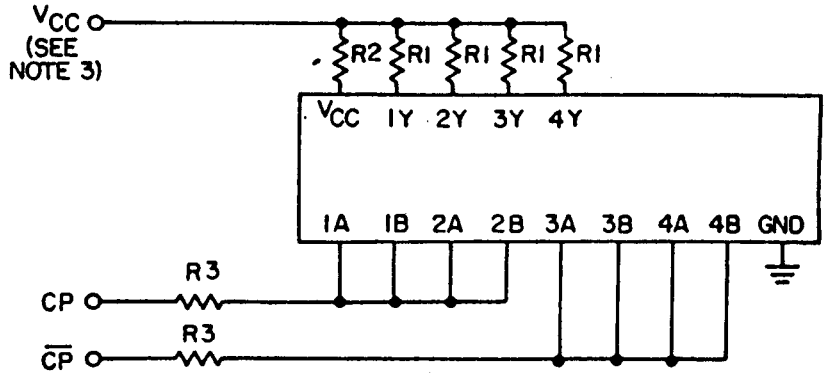
(1) Test condition D, E, or F, using the circuit shown on figure 3, or equivalent.

(2) T_A = +125°C, minimum.

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

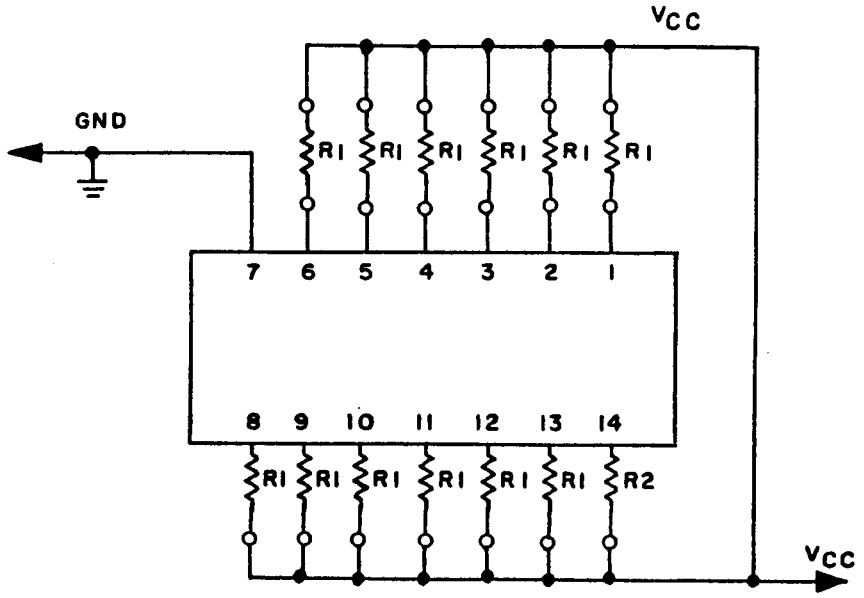
4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical parameters shall be as specified in table II herein.

Device type 01



NOTES:
1. CP and CP - 100 kHz ±50 percent square wave; duty cycle = 50 ±15 percent; V_{IH} = 2.0 V minimum to 5.5 V maximum; V_{IL} = -0.5 V minimum to +0.7.
2. R_1 = 1 kΩ ±5 percent; R_2 = 10Ω ±5 percent; R_3 = 27Ω ±5 percent.
3. V_{CC} shall be high enough to insure that 5.0 V minimum is present at V_{CC} device terminal.

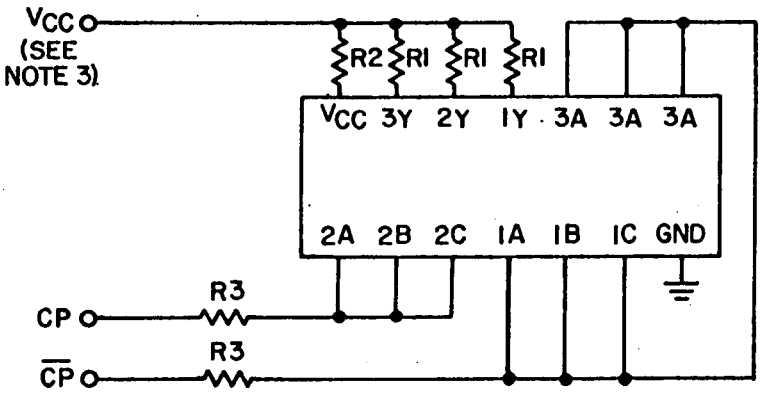
High temperature burn-in



NOTES:
1. High temperature conditions F(175°C) condition F burn-in only.
2. R_1 = 2 kΩ.
3. V_{CC} shall be chosen such that 5.0 V minimum is present at device terminal.

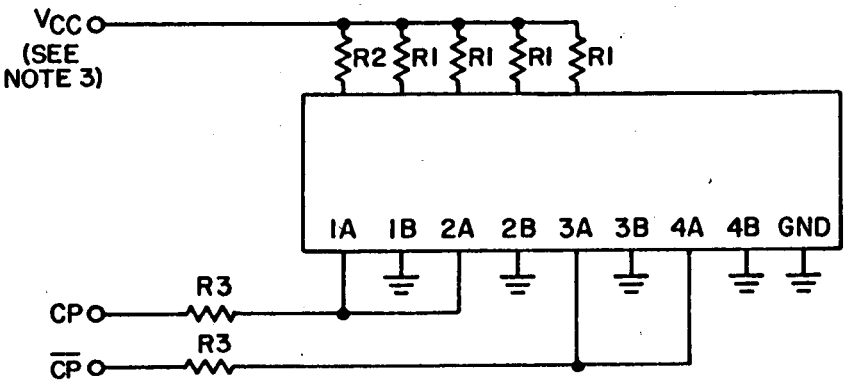
FIGURE 3. Burn-in and life test circuits.

Device type 02



NOTES:
1. CP and $\overline{CP}$ = 100 kHz ±50% square wave; duty cycle = 50 ±15%; V_{IH} = 2.0 V minimum to 5.5 V maximum; V_{IL} = -0.5 V minimum to +0.7 maximum.
2. R_1 = 1 kΩ ±5%; R_2 = 10Ω ±5%; R_3 = 27Ω ±5%.
3. V_{CC} shall be high enough to insure 5.0 V at device V_{CC} terminal.

Device type 03



NOTES:
1. CP and $\overline{CP}$ = 100 kHz ±50% square wave; duty cycle = 50 ±15%; V_{IH} = 2.0 V minimum to 5.5 V maximum; V_{IL} = -0.5 V minimum to +0.7 V maximum.
2. R_1 = 1 kΩ ±5%; R_2 = 10Ω ±5%; R_3 = 27Ω ±5%.
3. V_{CC} shall be high enough to insure 5.0 V at device V_{CC} terminal.

FIGURE 3. Burn-in and life test circuits - Continued.

TABLE III. Group A inspection for device type 01.
Terminal conditions (pins not designated may be high $\geq$ 2.0 V, low $\leq$ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D, Cases X,2 1/ Test no.	1 / 2 / 1Y	2 / 3 / 1A	3 / 4 / 1B	4 / 6 / 2Y	5 / 8 / 2A	6 / 9 / 2B	7 / 10 / GND	8 / 12 / 3A	9 / 13 / 3B	10 / 14 / 3Y	11 / 16 / 4A	12 / 18 / 4B	13 / 19 / 4Y	14 / 20 / V_{CC}	Measured terminal	Limits Min	Limits Max	Unit
1 T_C = +25°C	V_{OH}	3006	1	-400 µA	0.7 V	0.7 V		5.5 V	5.5 V	GND	5.5 V	5.5 V		5.5 V	5.5 V		4.5 V	1Y	2.5		V
		"	2		5.5 V	5.5 V	-400 µA	0.7 V	0.7 V	"	5.5 V	5.5 V		"	"		"	2Y	"		"
		"	3		"	"		5.5 V	5.5 V	"	0.7 V	0.7 V	-400 µA	"	"		"	3Y	"		"
		"	4		"	"		5.5 V	5.5 V	"	5.5 V	5.5 V		0.7 V	0.7 V	-400 µA	"	4Y	"		"
	V_{OL}	3007	5	4 mA	2.0 V	GND		GND	GND	"	GND	GND		GND	GND		"	1Y		0.4	"
		"	6	4 mA	GND	2.0 V		GND	"	"	"	"		"	"		"	1Y		"	"
		"	7		"	GND	4 mA	2.0 V	"	"	"	"		"	"		"	2Y		"	"
		"	8		"	"	4 mA	GND	2.0 V	"	"	"		"	"		"	2Y		"	"
		"	9		"	"		"	GND	"	2.0 V	"	4 mA	"	"		"	3Y		"	"
		"	10		"	"		"	"	"	GND	2.0 V	4 mA	"	"		"	3Y		"	"
		"	11		"	"		"	"	"	"	GND		2.0 V	"	4 mA	"	4Y		"	"
		"	12		"	"		"	"	"	"	GND		GND	2.0 V	4 mA	"	4Y		"	"
	V_{IC}		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							"				-18 mA			"	4A		"	"
			20							"					-18 mA		"	4B		"	"
	I_{IH1}	3010	21		2.7 V	GND		GND	GND	"	GND	GND		GND	GND		5.5 V	1A		20	µA
		"	22		GND	2.7 V		GND	"	"	"	"		"	"		"	1B		"	"
		"	23		"	GND		2.7 V	"	"	"	"		"	"		"	2A		"	"
		"	24		"	"		GND	2.7 V	"	"	"		"	"		"	2B		"	"
		"	25		"	"		"	GND	"	2.7 V	"		"	"		"	3A		"	"
		"	26		"	"		"	"	"	GND	2.7 V		"	"		"	3B		"	"
		"	27		"	"		"	"	"	"	GND		2.7 V	"		"	4A		"	"
		"	28		"	"		"	"	"	"	"		GND	2.7 V		"	4B		"	"
	I_{IH2}	"	29		5.5 V	"		"	"	"	"	"		"	GND		"	1A		100	"
		"	30		GND	5.5 V		"	"	"	"	"		"	"		"	1B		"	"
		"	31		"	GND		5.5 V	"	"	"	"		"	"		"	2A		"	"
		"	32		"	"		GND	5.5 V	"	"	"		"	"		"	2B		"	"
		"	33		"	"		"	GND	"	5.5 V	"		"	"		"	3A		"	"
		"	34		"	"		"	"	"	GND	5.5 V		"	"		"	3B		"	"
		"	35		"	"		"	"	"	"	GND		5.5 V	"		"	4A		"	"
		"	36		"	"		"	"	"	"	GND		GND	5.5 V		"	4B		"	"
	I_{IL} 2/	3009	37		0.4 V	5.5 V		5.5 V	5.5 V	"	5.5 V	5.5 V		5.5 V	"		"	1A	2/	2/	"
		"	38		5.5 V	0.4 V		5.5 V	"	"	"	"		"	"		"	1B	"	"	"
		"	39		"	5.5 V		0.4 V	"	"	"	"		"	"		"	2A	"	"	"
		"	40		"	"		5.5 V	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	"	"	"
	I_{OS} 3/	3011	45	GND	GND	GND		GND	GND	"							"	1Y	3/	3/	mA
		"	46				GND			"	GND	GND	GND				"	2Y	"	"	"
		"	47							"				GND	GND	GND	"	3Y	"	"	"
		"	48							"							"	4Y	"	"	"
	I_{CCH}	3005	49		GND	GND		GND	GND	"	GND	GND		GND	GND		"	V_{CC}		3.2	"
	I_{CCL}	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		"	V_{CC}		5.4	"

See footnotes at end of device type 01.

TABLE III. Group A inspection for device type 01 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 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
			Cases X,2 1/	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Min	Max	
			Test no.	1Y	1A	1B	2Y	2A	2B	GND	3A	3B	3Y	4A	4B	4Y	V_{CC}				
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
9 T_C = +25°C	t_{PHL}	3003 (Fig. 4)	51	OUT	IN	GND		IN	GND	GND		GND	OUT		GND	OUT	5.0 V	1A to 1Y	2.0	16	ns
		"	52	OUT	GND	IN	OUT	GND	IN	"	IN	IN	OUT	IN	IN	OUT	"	1B to 1Y	"	"	"
		"	53				OUT			"	GND	GND	OUT	GND	GND	OUT	"	2A to 2Y	"	"	"
		"	54					IN	GND	"	OUT	OUT	OUT	OUT	IN	OUT	"	2B to 2Y	"	"	"
		"	55					GND	IN	"				IN	GND	OUT	"	3A to 3Y	"	"	"
		"	56							"				GND	IN	OUT	"	3B to 3Y	"	"	"
		"	57							"				IN	GND	OUT	"	4A to 4Y	"	"	"
		"	58							"				GND	IN	OUT	"	4B to 4Y	"	"	"
	t_{PLH}	"	59	OUT	IN	GND		IN	GND	"		GND	OUT		GND	OUT	"	1A to 1Y	"	22	"
		"	60	OUT	GND	IN	OUT	GND	IN	"	IN	IN	OUT	IN	IN	OUT	"	1B to 1Y	"	"	"
		"	61				OUT			"	GND	GND	OUT	GND	GND	OUT	"	2A to 2Y	"	"	"
		"	62					IN	GND	"	OUT	OUT	OUT	OUT	IN	OUT	"	2B to 2Y	"	"	"
		"	63					GND	IN	"				IN	GND	OUT	"	3A to 3Y	"	"	"
		"	64							"				GND	IN	OUT	"	3B to 3Y	"	"	"
		"	65							"				IN	GND	OUT	"	4A to 4Y	"	"	"
		"	66							"				GND	IN	OUT	"	4B to 4Y	"	"	"
10 T_C = +125°C	t_{PHL}	"	67	OUT	IN	GND		IN	GND	"		GND	OUT		GND	OUT	"	1A to 1Y	"	26	"
		"	68	OUT	GND	IN	OUT	GND	IN	"	IN	IN	OUT	IN	IN	OUT	"	1B to 1Y	"	"	"
		"	69				OUT			"	GND	GND	OUT	GND	GND	OUT	"	2A to 2Y	"	"	"
		"	70					IN	GND	"	OUT	OUT	OUT	OUT	IN	OUT	"	2B to 2Y	"	"	"
		"	71					GND	IN	"				IN	GND	OUT	"	3A to 3Y	"	"	"
		"	72							"				GND	IN	OUT	"	3B to 3Y	"	"	"
		"	73							"				IN	GND	OUT	"	4A to 4Y	"	"	"
		"	74							"				GND	IN	OUT	"	4B to 4Y	"	"	"
	t_{PLH}	"	75	OUT	IN	GND		IN	GND	"		GND	OUT		GND	OUT	"	1A to 1Y	"	30	"
		"	76	OUT	GND	IN	OUT	GND	IN	"	IN	IN	OUT	IN	IN	OUT	"	1B to 1Y	"	"	"
		"	77				OUT			"	GND	GND	OUT	GND	GND	OUT	"	2A to 2Y	"	"	"
		"	78					IN	GND	"	OUT	OUT	OUT	OUT	IN	OUT	"	2B to 2Y	"	"	"
		"	79					GND	IN	"				IN	GND	OUT	"	3A to 3Y	"	"	"
		"	80							"				GND	IN	OUT	"	3B to 3Y	"	"	"
		"	81							"				IN	GND	OUT	"	4A to 4Y	"	"	"
		"	82							"				GND	IN	OUT	"	4B to 4Y	"	"	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C.																				

1/ Cases X and 2 pins not referenced are N/C.
2/ I_{IL} limits in µA shall be as follows:

Parameters	Circuits						
	A	B	C	D	E	F	G
I_{IL}	-120/-360	-30/-300	-160/-400	-120/-360	-150/-380	-100/-340	-160/-400

3/ I_{OS} limits for circuits A, B, C, D, E, and F are -15/-100 mA; for circuit G, -30/-130 mA.

TABLE III. Group A inspection for device type 02.
Terminal conditions (pins not designated may be high $\geq$ 2.0 V, low $\leq$ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D, Cases X,2 1/ Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits Min	Limits Max	Unit
				2	3	4	6	8	9	10	12	13	14	16	18	19	20				
				1A	1B	2A	2B	2C	2Y	GND	3Y	3A	3B	3C	1Y	1C	V_{CC}				
1 T_C = +25°C	V_{OH}	3006	1	0.7 V	0.7 V	5.5 V	5.5 V	5.5 V		GND		5.5 V	5.5 V	5.5 V	-400 µA	0.7 V	4.5 V	1Y	2.5		V
		"	2	5.5 V	5.5 V	0.7 V	0.7 V	0.7 V	-400 µA	"		5.5 V	5.5 V	5.5 V		5.5 V	"	2Y	"		"
		"	3	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V		"	-400 µA	0.7 V	0.7 V	0.7 V		5.5 V	"	3Y	"		"
	V_{OL}	3007	4	2.0 V	GND	GND	GND	GND		"		GND	GND	GND	4 mA	GND	"	1Y		0.4	"
		"	5	GND	2.0 V	"	"	"		"		"	"	"	"	GND	"	1Y		"	"
		"	6	"	GND	"	"	"		"		"	"	"		2.0 V	"	1Y		"	"
		"	7	"	"	2.0 V	"	"	4 mA	"		"	"	"		GND	"	2Y		"	"
		"	8	"	"	GND	2.0 V	"	"	"		"	"	"		"	"	2Y		"	"
		"	9	"	"	"	GND	2.0 V	"	"		"	"	"		"	"	2Y		"	"
		"	10	"	"	"	"	GND		"	4 mA	2.0 V	"	"		"	"	3Y		"	"
		"	11	"	"	"	"	"		"	"	GND	2.0 V	"		"	"	3Y		"	"
		"	12	"	"	"	"	"		"	"	GND	GND	2.0 V		"	"	3Y		"	"
	V_{IC}		13	-18 mA						"							"	1A		-1.5	"
			14		-18 mA					"							"	1B		"	"
			15			-18 mA				"							"	2A		"	"
			16				-18 mA			"							"	2B		"	"
			17					-18 mA		"							"	2C		"	"
			18							"		-18 mA					"	3A		"	"
			19							"			-18 mA				"	3B		"	"
			20							"				-18 mA			"	3C		"	"
			21							"						-18 mA	"	1C		"	"
	I_{IH1}	3010	22	2.7 V	GND	GND	GND	GND		"		GND	GND	GND		GND	5.5 V	1A		20	µA
		"	23	GND	2.7 V	GND	"	"		"		"	"	"		"	"	1B		"	"
		"	24	"	GND	2.7 V	"	"		"		"	"	"		"	"	2A		"	"
		"	25	"	"	GND	2.7 V	"		"		"	"	"		"	"	2B		"	"
		"	26	"	"	"	GND	2.7 V		"		"	"	"		"	"	2C		"	"
		"	27	"	"	"	"	GND		"		2.7 V	"	"		"	"	3A		"	"
		"	28	"	"	"	"	"		"		GND	2.7 V	"		"	"	3B		"	"
		"	29	"	"	"	"	"		"		"	GND	2.7 V		"	"	3C		"	"
		"	30	"	"	"	"	"		"		"	"	GND		2.7 V	"	1C		"	"
	I_{IH2}	"	31	5.5 V	"	"	"	"		"		"	"	"		GND	"	1A		100	"
		"	32	GND	5.5 V	"	"	"		"		"	"	"		"	"	1B		"	"
		"	33	"	GND	5.5 V	"	"		"		"	"	"		"	"	2A		"	"
		"	34	"	"	GND	5.5 V	"		"		"	"	"		"	"	2B		"	"
		"	35	"	"	"	GND	5.5 V		"		"	"	"		"	"	2C		"	"
		"	36	"	"	"	"	GND		"		5.5 V	"	"		"	"	3A		"	"
		"	37	"	"	"	"	"		"		GND	5.5 V	"		"	"	3B		"	"
		"	38	"	"	"	"	"		"		"	GND	5.5 V		"	"	3C		"	"
		"	39	"	"	"	"	"		"		"	GND	GND		5.5 V	"	1C		"	"
	I_{IL} 2/	3009	40	0.4 V	5.5 V	5.5 V	5.5 V	5.5 V		"		5.5 V	5.5 V	5.5 V			"	1A	2/	2/	"
		"	41	5.5 V	0.4 V	5.5 V	"	"		"		"	"	"			"	1B	"	"	"
		"	42	"	5.5 V	0.4 V	"	"		"		"	"	"			"	2A	"	"	"
		"	43	"	"	5.5 V	0.4 V	"		"		"	"	"			"	2B	"	"	"
		"	44	"	"	"	5.5 V	0.4 V		"		"	"	"			"	2C	"	"	"
		"	45	"	"	"	"	5.5 V		"		0.4 V	"	"			"	3A	"	"	"
		"	46	"	"	"	"	"		"		5.5 V	0.4 V	"		5.5 V	"	3B	"	"	"
		"	47	"	"	"	"	"		"		"	5.5 V	0.4 V		5.5 V	"	3C	"	"	"
		"	48	"	"	"	"	"		"		"	5.5 V	5.5 V		0.4 V	"	1C	"	"	"
	I_{OS} 3/	3011	49	GND	GND					"					GND	GND	"	1Y	3/	3/	mA
		"	50			GND	GND	GND	GND	"							"	2Y	"	"	"
		"	51							"	GND	GND	GND	GND			"	3Y	"	"	"

See footnotes at end of device type 02.

TABLE III. Group A inspection for device type 02 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D, Cases X,2 1/ Test no.	1 / 2 / 1A	2 / 3 / 1B	3 / 4 / 2A	4 / 6 / 2B	5 / 8 / 2C	6 / 9 / 2Y	7 / 10 / GND	8 / 12 / 3Y	9 / 13 / 3A	10 / 14 / 3B	11 / 16 / 3C	12 / 18 / 1Y	13 / 19 / 1C	14 / 20 / V_{CC}	Measured terminal	Limits Min	Limits Max	Unit
1 T_C = +25°C	I_{CCH}	3005	52	GND	GND	GND	GND	GND		GND		GND	GND	GND		GND	5.5 V	V_{CC}		4.0	mA
	I_{CCL}	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	5.5 V	V_{CC}		6.8	mA
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
9 T_C = +25°C	t_{PHL}	3003 (Fig. 4)	54	IN	GND					GND					OUT	GND	5.0 V	1A to 1Y	2	16	ns
			55	GND	IN					"					"	GND	"	1B to 1Y	"	"	"
			56	GND	GND					"						IN	"	1C to 1Y	"	"	"
			57			IN	GND	GND	OUT	"							"	2A to 2Y	"	"	"
			58			GND	IN	GND	"	"							"	2B to 2Y	"	"	"
			59			GND	GND	IN	"	"							"	2C to 2Y	"	"	"
			60							"	OUT	IN	GND	GND			"	3A to 3Y	"	"	"
			61							"	"	GND	IN	GND			"	3B to 3Y	"	"	"
			62							"	"	GND	GND	IN			"	3C to 3Y	"	"	"
	t_{PLH}	"	63	IN	GND					"					OUT	GND	"	1A to 1Y	"	22	"
		"	64	GND	IN					"					"	GND	"	1B to 1Y	"	"	"
		"	65	GND	GND					"						IN	"	1C to 1Y	"	"	"
		"	66			IN	GND	GND	OUT	"							"	2A to 2Y	"	"	"
		"	67			GND	IN	GND	"	"							"	2B to 2Y	"	"	"
		"	68			GND	GND	IN	"	"							"	2C to 2Y	"	"	"
		"	69							"	OUT	IN	GND	GND			"	3A to 3Y	"	"	"
		"	70							"	"	GND	IN	GND			"	3B to 3Y	"	"	"
		"	71							"	"	GND	GND	IN			"	3C to 3Y	"	"	"
10 T_C = +125°C	t_{PHL}	"	72	IN	GND					"					OUT	GND	"	1A to 1Y	"	26	"
		"	73	GND	IN					"					"	GND	"	1B to 1Y	"	"	"
		"	74	GND	GND					"						IN	"	1C to 1Y	"	"	"
		"	75			IN	GND	GND	OUT	"							"	2A to 2Y	"	"	"
		"	76			GND	IN	GND	"	"							"	2B to 2Y	"	"	"
		"	77			GND	GND	IN	"	"							"	2C to 2Y	"	"	"
		"	78							"	OUT	IN	GND	GND			"	3A to 3Y	"	"	"
		"	79							"	"	GND	IN	GND			"	3B to 3Y	"	"	"
		"	80							"	"	GND	GND	IN			"	3C to 3Y	"	"	"
	t_{PLH}	"	81	IN	GND					"					OUT	GND	"	1A to 1Y	"	30	"
		"	82	GND	IN					"					"	GND	"	1B to 1Y	"	"	"
		"	83	GND	GND					"						IN	"	1C to 1Y	"	"	"
		"	84			IN	GND	GND	OUT	"							"	2A to 2Y	"	"	"
		"	85			GND	IN	GND	"	"							"	2B to 2Y	"	"	"
		"	86			GND	GND	IN	"	"							"	2C to 2Y	"	"	"
		"	87							"	OUT	IN	GND	GND			"	3A to 3Y	"	"	"
		"	88							"	"	GND	IN	GND			"	3B to 3Y	"	"	"
		"	89							"	"	GND	GND	IN			"	3C to 3Y	"	"	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C																				

1/ Cases X and 2 pins not referenced are N/C.
2/ I_{IL} limits in µA shall be as follows:

Parameters	Circuits						
	A	B	C	D	E	F	G
I_{IL}	-120/-360	-30/-300	-160/-400	-120/-360	-100/-340	-160/-400	-150/-380

3/ I_{OS} limits for circuits A, B, C, D, E, F are -15/-100 mA; for circuit G, -30/-130 mA.

TABLE III. Group A inspection for device type 03.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D, Cases X,2 1/ Test no.	1 / 2 / 1A	2 / 3 / 1B	3 / 4 / 1Y	4 / 6 / 2Y	5 / 8 / 2A	6 / 9 / 2B	7 / 10 / GND	8 / 12 / 3A	9 / 13 / 3B	10 / 14 / 3Y	11 / 16 / 4Y	12 / 18 / 4A	13 / 19 / 4B	14 / 20 / V_{CC}	Measured terminal	Limits Min	Limits Max	Unit
1 T_C = +25°C	V_{OL}	3007	1	0.7 V	2.0 V	4 mA		5.5 V	5.5 V	GND	5.5 V	5.5 V			5.5 V	5.5 V	4.5 V	1Y		0.4	V
		"	2	2.0 V	0.7 V	4 mA		5.5 V	5.5 V	"	"	"			"	"	"	1Y		"	"
		"	3	5.5 V	5.5 V		4 mA	0.7 V	2.0 V	"	"	"			"	"	"	2Y		"	"
		"	4	"	"		4 mA	2.0 V	0.7 V	"	"	"			"	"	"	2Y		"	"
		"	5	"	"			5.5 V	5.5 V	"	0.7 V	2.0 V	4 mA		"	"	"	3Y		"	"
		"	6	"	"			"	"	"	2.0 V	0.7 V	4 mA		"	"	"	3Y		"	"
		"	7	"	"			"	"	"	5.5 V	5.5 V		4 mA	0.7 V	2.0 V	"	4Y		"	"
		"	8	"	"			"	"	"	"	"		4 mA	2.0 V	0.7 V	"	4Y		"	"
	I_{CEX}		9	0.7 V	0.7 V	5.5 V		"	"	"	"	"			5.5 V	5.5 V	"	1Y		100	µA
			10	2.0 V	2.0 V	5.5 V		"	"	"	"	"			"	"	"	1Y		"	"
			11	5.5 V	5.5 V		5.5 V	0.7 V	0.7 V	"	"	"			"	"	"	2Y		"	"
			12	"	"		5.5 V	2.0 V	2.0 V	"	"	"			"	"	"	2Y		"	"
			13	"	"			5.5 V	5.5 V	"	0.7 V	0.7 V	5.5 V		"	"	"	3Y		"	"
			14	"	"			"	"	"	2.0 V	2.0 V	5.5 V		"	"	"	3Y		"	"
			15	"	"			"	"	"	5.5 V	5.5 V		5.5 V	0.7 V	0.7 V	"	4Y		"	"
			16	"	"			"	"	"	5.5 V	5.5 V		5.5 V	0.7 V	2.0 V	"	4Y		"	"
	V_{IC} 1		17	-18 mA						"							"	1A		-1.5	V
			18		-18 mA					"							"	1B		"	"
			19					-18 mA		"							"	2A		"	"
			20						-18 mA	"							"	2B		"	"
			21							"	-18 mA						"	3A		"	"
			22							"		-18 mA					"	3B		"	"
			23							"					-18 mA		"	4A		"	"
			24							"						-18 mA	"	4B		"	"
	I_{IH1}	3010	25	2.7 V	GND			GND	GND	"	GND	GND			GND	GND	5.5 V	1A		40	µA
		"	26	GND	2.7 V			GND	"	"	"	"			"	"	"	1B		"	"
		"	27	"	GND			2.7 V	"	"	"	"			"	"	"	2A		"	"
		"	28	"	"			GND	2.7 V	"	"	"			"	"	"	2B		"	"
		"	29	"	"			"	GND	"	2.7 V	"			"	"	"	3A		"	"
		"	30	"	"			"	"	"	GND	2.7 V			"	"	"	3B		"	"
		"	31	"	"			"	"	"	"	GND			2.7 V	"	"	4A		"	"
		"	32	"	"			"	"	"	"	"			GND	2.7 V	"	4B		"	"
	I_{IH2}	"	33	5.5 V	"			"	"	"	"	"			"	GND	"	1A		200	"
		"	34	GND	5.5 V			"	"	"	"	"			"	"	"	1B		"	"
		"	35	"	GND			5.5 V	"	"	"	"			"	"	"	2A		"	"
		"	36	"	"			GND	5.5 V	"	"	"			"	"	"	2B		"	"
		"	37	"	"			"	GND	"	5.5 V	"			"	"	"	3A		"	"
		"	38	"	"			"	"	"	GND	5.5 V			"	"	"	3B		"	"
		"	39	"	"			"	"	"	"	GND			5.5 V	"	"	4A		"	"
		"	40	"	"			"	"	"	"	"			GND	5.5 V	"	4B		"	"
	I_{IL} 2/	3009	41	0.4 V	5.5 V			5.5 V	5.5 V	"	5.5 V	5.5 V			5.5 V	"	"	1A	2/	2/	"
		"	42	5.5 V	0.4 V			5.5 V	"	"	"	"			"	"	"	1B	"	"	"
		"	43	"	5.5 V			0.4 V	"	"	"	"			"	"	"	2A	"	"	"
		"	44	"	"			5.5 V	0.4 V	"	"	"			"	"	"	2B	"	"	"
		"	45	"	"			"	5.5 V	"	0.4 V	"			"	"	"	3A	"	"	"
		"	46	"	"			"	"	"	5.5 V	0.4 V			"	"	"	3B	"	"	"
		"	47	"	"			"	"	"	"	5.5 V			0.4 V	"	"	4A	"	"	"
		"	48	"	"			"	"	"	"	5.5 V			5.5 V	0.4 V	"	4B	"	"	"
	I_{CC}	3005	49	GND	4.5 V			GND	4.5 V	"	GND	4.5 V			GND	4.5 V	"	V_{CC}		13	mA
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D, Cases X,2 1/ Test no.	1 2 1A	2 3 1B	3 4 1Y	4 6 2Y	5 8 2A	6 9 2B	7 10 GND	8 12 3A	9 13 3B	10 14 3Y	11 16 4Y	12 18 4A	13 19 4B	14 20 V_{CC}	Measured terminal	Limits Min	Limits Max	Unit
9 T_C = +25°C	t_{PHL1}	3003 (Fig. 4)	50	IN	GND	OUT	OUT	IN	GND	GND	IN	GND	OUT	OUT	IN	GND	5.0 V	1A to 1Y	2	40	ns
		"	51	GND	IN	OUT	OUT	GND	IN	"	GND	IN	OUT	OUT	GND	IN	"	1B to 1Y	"	"	"
		"	52							"							"	2A to 2Y	"	"	"
		"	53							"							"	2B to 2Y	"	"	"
		"	54							"							"	3A to 3Y	"	"	"
		"	55							"							"	3B to 3Y	"	"	"
		"	56							"							"	4A to 4Y	"	"	"
		"	57							"							"	4B to 4Y	"	"	"
	t_{PLH1}	"	58	IN	GND	OUT	OUT	IN	GND	"	IN	GND	OUT	OUT	IN	GND	"	1A to 1Y	"	45	"
		"	59	GND	IN	OUT	OUT	GND	IN	"	GND	IN	OUT	OUT	GND	IN	"	1B to 1Y	"	"	"
		"	60							"							"	2A to 2Y	"	"	"
		"	61							"							"	2B to 2Y	"	"	"
		"	62							"							"	3A to 3Y	"	"	"
		"	63							"							"	3B to 3Y	"	"	"
		"	64							"							"	4A to 4Y	"	"	"
		"	65							"							"	4B to 4Y	"	"	"
	t_{PHL2}	"	66	IN	2.7 V	OUT	OUT	IN	2.7 V	"	IN	2.7 V	OUT	OUT	IN	2.7 V	"	1A to 1Y	"	40	"
		"	67	2.7 V	IN	OUT	OUT	2.7 V	IN	"	2.7 V	IN	OUT	OUT	2.7 V	IN	"	1B to 1Y	"	"	"
		"	68							"							"	2A to 2Y	"	"	"
		"	69							"							"	2B to 2Y	"	"	"
		"	70							"							"	3A to 3Y	"	"	"
		"	71							"							"	3B to 3Y	"	"	"
		"	72							"							"	4A to 4Y	"	"	"
		"	73							"							"	4B to 4Y	"	"	"
	t_{PLH2}	"	74	IN	2.7 V	OUT	OUT	IN	2.7 V	"	IN	2.7 V	OUT	OUT	IN	2.7 V	"	1A to 1Y	"	45	"
		"	75	2.7 V	IN	OUT	OUT	2.7 V	IN	"	2.7 V	IN	OUT	OUT	2.7 V	IN	"	1B to 1Y	"	"	"
		"	76							"							"	2A to 2Y	"	"	"
		"	77							"							"	2B to 2Y	"	"	"
		"	78							"							"	3A to 3Y	"	"	"
		"	79							"							"	3B to 3Y	"	"	"
		"	80							"							"	4A to 4Y	"	"	"
		"	81							"							"	4B to 4Y	"	"	"
10 T_C = +125°C	t_{PHL1}	"	82	IN	GND	OUT	OUT	IN	GND	"	IN	GND	OUT	OUT	IN	GND	"	1A to 1Y	"	"	"
		"	83	GND	IN	OUT	OUT	GND	IN	"	GND	IN	OUT	OUT	GND	IN	"	1B to 1Y	"	"	"
		"	84							"							"	2A to 2Y	"	"	"
		"	85							"							"	2B to 2Y	"	"	"
		"	86							"							"	3A to 3Y	"	"	"
		"	87							"							"	3B to 3Y	"	"	"
		"	88							"							"	4A to 4Y	"	"	"
		"	89							"							"	4B to 4Y	"	"	"
	t_{PLH1}	"	90	IN	GND	OUT	OUT	IN	GND	"	IN	GND	OUT	OUT	IN	GND	"	1A to 1Y	"	56	"
		"	91	GND	IN	OUT	OUT	GND	IN	"	GND	IN	OUT	OUT	GND	IN	"	1B to 1Y	"	"	"
		"	92							"							"	2A to 2Y	"	"	"
		"	93							"							"	2B to 2Y	"	"	"
		"	94							"							"	3A to 3Y	"	"	"
		"	95							"							"	3B to 3Y	"	"	"
		"	96							"							"	4A to 4Y	"	"	"
		"	97							"							"	4B to 4Y	"	"	"
	t_{PHL2}	"	98	IN	2.7 V	OUT	OUT	IN	2.7 V	"	IN	2.7 V	OUT	OUT	IN	2.7 V	"	1A to 1Y	"	45	"
		"	99	2.7 V	IN	OUT	OUT	2.7 V	IN	"	2.7 V	IN	OUT	OUT	2.7 V	IN	"	1B to 1Y	"	"	"
		"	100							"							"	2A to 2Y	"	"	"
		"	101							"							"	2B to 2Y	"	"	"
		"	102							"							"	3A to 3Y	"	"	"
		"	103							"							"	3B to 3Y	"	"	"
		"	104							"							"	4A to 4Y	"	"	"
		"	105							"							"	4B to 4Y	"	"	"

See footnotes at end of device type 03.

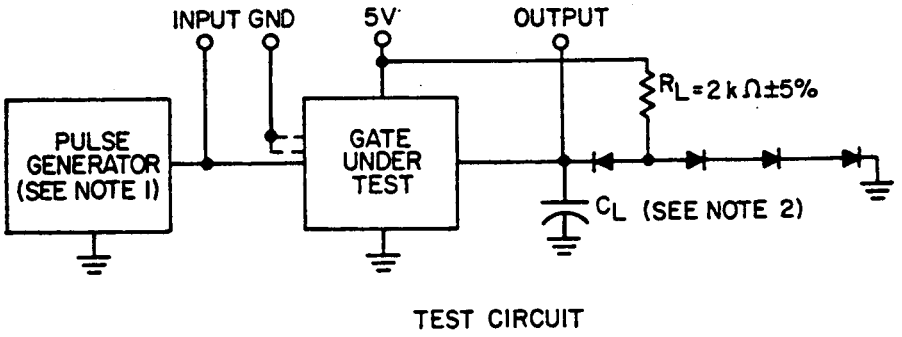
TABLE III. Group A inspection for device type 03 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D, Cases X,2 1/ Test no.	1 / 2 / 1A	2 / 3 / 1B	3 / 4 / 1Y	4 / 6 / 2Y	5 / 8 / 2A	6 / 9 / 2B	7 / 10 / GND	8 / 12 / 3A	9 / 13 / 3B	10 / 14 / 3Y	11 / 16 / 4Y	12 / 18 / 4A	13 / 19 / 4B	14 / 20 / V_{CC}	Measured terminal	Limits Min	Limits Max	Unit
10 T_C = +125°C	t_{PLH2}	3003 (Fig. 4)	106	IN	2.7 V	OUT				GND							5.0 V	1A to 1Y	2	56	ns
		"	107	2.7 V	IN	OUT				"							"	1B to 1Y	"	"	"
		"	108				OUT	IN	2.7 V	"							"	2A to 2Y	"	"	"
		"	109				OUT	2.7 V	IN	"							"	2B to 2Y	"	"	"
		"	110							"	IN	2.7 V	OUT				"	3A to 3Y	"	"	"
		"	111							"	2.7 V	IN	OUT				"	3B to 3Y	"	"	"
		"	112							"				OUT	IN	2.7 V	"	4A to 4Y	"	"	"
		"	113							"				OUT	2.7 V	IN	"	4B to 4Y	"	"	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C.																				

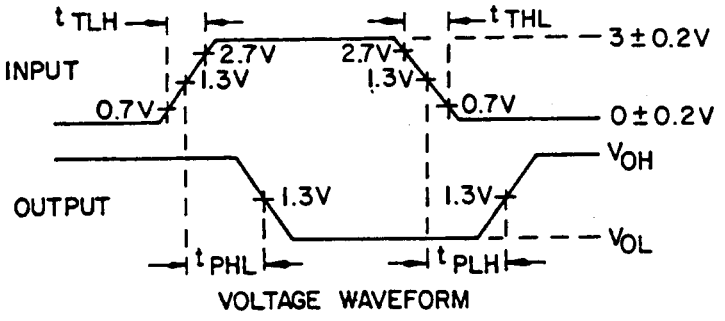
1/ Cases X and 2 pins not referenced are N/C.
2/ I_{IL} limits in μA shall be as follows:

Parameters	Circuits A	B	C	D	E	F	G
I_{IL}	-200/-680	-230/-600	-275/-600	-230/-600	-300/-760	-200/-720	-300/-760

Device types 01 and 02



TEST CIRCUIT

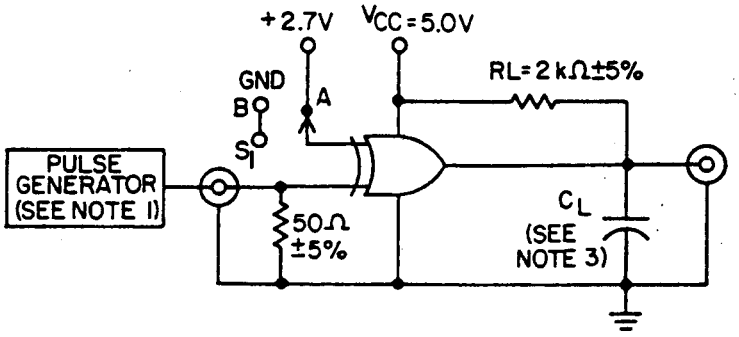


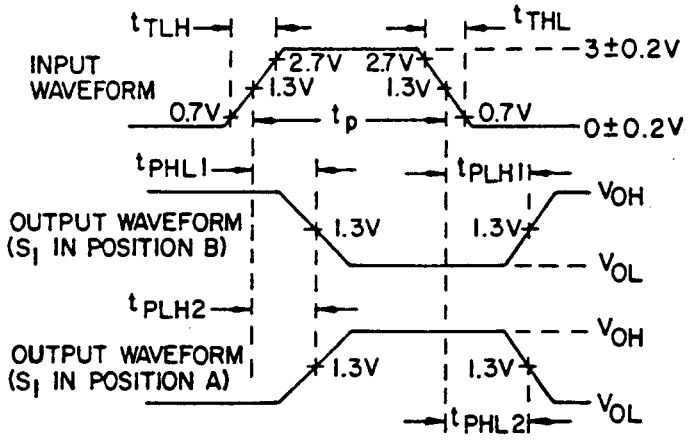
VOLTAGE WAVEFORM

NOTES:
1. Pulse generator has the following characteristics: $t_{THL} \leq 6$ ns, $t_{TLH} \leq 15$ ns, PRR ≤ 1 MHz, $t_p = .5$ µs, $Z_{out} = 50\Omega$.
2. $C_L = 50$ pF ±10 percent, including scope probe, wiring, and stray capacitance, without package in test fixture.
3. Voltage measurements are to be made with respect to network ground terminal.
4. Diodes are 1N3064 or equivalent.

FIGURE 4. Switching time test circuit and waveforms for device types 01 through 03.

Device type 03





VOLTAGE WAVEFORM

NOTES:
1. The generator has the following characteristics: $t_{THL} \leq 6$ ns, $t_{TLH} \leq 15$ ns, $t_p = .5\ \mu s$, PRR ≤ 1 MHz, $Z_{out} = 50\Omega$.
2. All diodes are 1N3064, or equivalent.
3. $C_L = 50$ pF $\pm 10\%$, including scope probe, wiring, and stray capacitance, without package in test fixture.
4. Voltage measurements are to be made with respect to network ground terminal.

FIGURE 4. Switching time test circuit and waveforms for device types 01 through 03 - Continued.

4.5 Methods of inspection. Methods of inspection shall be 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.

5. PACKAGING

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

6. NOTES

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

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

a. Complete part number (see 1.2).

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

c. Requirements for certificate of compliance, if applicable.

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

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

f. Requirements for product assurance options.

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

h. Requirements for "JAN" marking.

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

GND - - - - - - - - - - - - - - -	Ground zero voltage potential.
I_{IN} - - - - - - - - - - - - - - -	Current flowing into an input terminal.
V_{IN} - - - - - - - - - - - - - - -	Voltage level at an input terminal.

6.4 Logistic support. Lead materials and finishes (see 3.3) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2) and lead material for finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

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

Military device type	Generic-industry type
01	54LS02
02	54LS27
03	54LS266

6.6 Manufacturers' designation. Manufacturers' circuits which form a part of this specification are designated as shown in table IV herein.

TABLE IV. Manufacturer's designation.

Military device types	Manufacturer					
	Texas Instruments	Signetics Corp.	National Company	Raytheon Company	Motorola Inc.	Fairchild Semiconductor
01	A	B	C	G	E	F
02	A	B	C	F	G	E
03	A	B	C	D	E	F

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

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

Review activities:
Army - AR, MI
Navy - SH, OS
Air Force - 11, 19, 85, 99
DLA - ES

User activities:
Army - SM
Navy - AS, CG, MC

Preparing activity:
Air Force - 17

Agent:
DLA - ES

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