

INCH-POUND

MIL-M-38510/307D

12 March 2003

SUPERSEDING

MIL-M-38510/307C

5 November 1987

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR LOW-POWER SCHOTTKY TTL, DECODERS, MONOLITHIC SILICON

Inactive for new design after 18 April 1997.

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, decoder 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).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 number. The part number shall be in accordance with MIL-PRF-38535, and as specified herein.

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

<u>Device type</u>	<u>Circuit</u>
01	Single 3 to 8 line decoder
02	Dual 2 to 4 line decoder
03	BCD-to-decimal decoder
04	BCD-to-seven segment decoder/driver (15-volt, open collector output)

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

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

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
X	CQCC2-N20	20	Square leadless chip carrier
2	CQCC1-N20	20	Square leadless chip carrier

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, P. O. Box 3990, Columbus, OH 43216-5000, 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

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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° to +150°C
Maximum power dissipation (P_D) <u>1/</u>	
Device type 01	55 mW dc
Device type 02	60.5 mW dc
Device type 03 and 04	71.5 mW dc
Output voltage (off state) (device type 04)	15 V dc
Output current (device type 04)	12 mA dc
Lead temperature (soldering, 10 seconds)	300°C
Thermal resistance, junction to case (θ_{JC}):	
Cases E, F, X, 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})	0.7 V dc
Case operating temperature range (T_C)	-55° to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 shall be those listed in the issue of the Departments of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

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

STANDARDS

DEPARTMENT OF DEFENSE

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

(Unless otherwise indicated, copies of the above specifications and standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this 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_{OS}).

2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions 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 Terminal connections. The terminal connections shall be as specified on figure 1.

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

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

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

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

3.5 Electrical performance characteristics. 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 11 (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 quality conformance inspection. The following additional criteria shall apply:

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

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified		Device types	Limits		Unit
					Min	Max	
High level output voltage	V _{OH1}	V _{IL} = 0.7 V V _{CC} = 4.5 V V _{IH} = 2.0 V	I _{OH} = -50 μA	04	2.4		V
High level output voltage	V _{OH2}		I _{OH} = -400 μA	01, 02, 03	2.5		V
Low level output voltage at BI/RBO	V _{OL1}		I _{OL} = 1.6 mA	04		0.40	V
Low level output voltage	V _{OL2}		I _{OL} = <u>1</u> /	01, 02, 03, 04		0.40	V
Input clamp voltage	V _{IC}		I _{IN} = -18 mA, T _C = +25°C	All		-1.5	V
Maximum collector cut-off current	I _{CEX}		V _{OH} = 15 V	04		250	μA
Low level input current at A, B, C, D, G	I _{IL1}	V _{CC} = 5.5 V V _{IN} = 0.4 V		01	-0.001	-0.38	mA
				02, 03	-0.03	-0.40	
				04	-0.10	-0.34	
Low level input current at LT and RBI	I _{IL2}			04	-0.11	-0.36	mA
Low level input current at BI/RBO	I _{IL3}			04	-0.36	-1.37	mA
High level input current	I _{IH1}		V _{IN} = 2.7 V	All		20	μA
	I _{IH2}		V _{IN} = 7.0 V	All		100	μA
Short circuit output current	I _{OS}		V _{IH} = 5.5 V <u>2</u> / V _{IL} = GND	01, 03	-6	-130	mA
				02	-15	-100	
Supply current	I _{CC}			01		10	mA
				02		11	
				03, 04		13	
Propagation delay time, low to high level	t _{PLH1}	V _{CC} = 5.0 V C _L = 50 pF ±10%	R _L = 665Ω ±10%	04	5	158	ns
Propagation delay time, low to high level through 2 levels of logic (binary select to output)	t _{PLH2}		R _L = 2.0 kΩ ±10%	01, 02	5	38	ns
				03	5	45	ns
Propagation delay time, low to high level through 2 levels of logic (A, B, C, or D to output)	t _{PLH2}			01	5	35	ns
				02	5	44	
Propagation delay time, low to high level through 2 levels of logic (enable to output)	t _{PLH3}						

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified		Device types	Limits		Unit
					Min	Max	
Propagation delay time, low to high level through 3 levels of logic (binary select to output)	t _{PLH4}	V _{CC} = 5.0 V C _L = 50 pF ±10%	R _L = 2.0 kΩ ±10%	01	5	48	ns
				02	5	51	
Propagation delay time, low to high level through 3 levels of logic (A, B, C, or D to output)	t _{PLH4}			03	5	53	ns
Propagation delay time, low to high level through 3 levels of logic (enable to output)	t _{PLH5}			01	5	47	ns
Propagation delay time, high to low level	t _{PHL1}		R _L = 665Ω ±10%	04	5	158	ns
Propagation delay time, high to low level through 2 levels of logic (binary select to output)	t _{PHL2}		R _L = 2.0 kΩ ±10%	01	5	69	ns
		02		5	57		
Propagation delay time, high to low level through 2 levels of logic (A, B, C, or D to output)	t _{PHL2}	03		5	45	ns	
Propagation delay time, high to low level through 2 levels of logic (enable to output)	t _{PHL3}	01, 02		5	56	ns	
Propagation delay time, high to low level through 3 levels of logic (binary select to output)	t _{PHL4}	01		5	81	ns	
		02		5	65		
Propagation delay time, high to low level through 3 levels of logic (A, B, C, or D to output)	t _{PHL4}	03		5	53	ns	
Propagation delay time, high to low level through 3 levels of logic (enable to output)	t _{PHL5}	01		5	65	ns	

1/ I_{OL} = 4 mA for device types 01, 02, and 03; I_{OL} = 12 mA for device type 04.

2/ Not more than one output should be shorted at one time.

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, 7, 9, 10, 11	1*, 2, 3, 7, 9, 10, 11
Group A test requirements	1, 2, 3, 7, 8, 9, 10, 11	1, 2, 3, 7, 8, 9, 10, 11
Group C end-point electrical parameters	1, 2, 3, 7, 8 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, and 6 shall be omitted.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II 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 and 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.

Pin number	Pin number Device type 01		Pin number Device type 02		Pin number Device type 03		Pin number Device type 04	
	Cases							
	X, 2	E, F	X, 2	E, F	X, 2	E, F	X, 2	E, F
1	NC	A	NC	1G	NC	0	NC	B
2	A	B	1G	1A	0	1	B	C
3	B	C	1A	1B	1	2	C	LT
4	C	G2A	1B	1Y0	2	3	LT	BI/RBO
5	G2A	G2B	1Y0	1Y1	3	4	BI/RBO	RBI
6	NC	G1	NC	1Y2	NC	5	NC	D
7	G2B	Y7	1Y1	1Y3	4	6	RBI	A
8	G1	GND	1Y2	GND	5	GND	D	GND
9	Y7	Y6	1Y3	2Y3	6	7	A	e
10	GND	Y5	GND	2Y2	GND	8	GND	d
11	NC	Y4	NC	2Y1	NC	9	NC	c
12	Y6	Y3	2Y3	2Y0	7	D	e	b
13	Y5	Y2	2Y2	2B	8	C	d	a
14	Y4	Y1	2Y1	2A	9	B	c	g
15	Y3	Y0	2Y0	2G	D	A	b	f
16	NC	V _{CC}	NC	V _{CC}	NC	V _{CC}	NC	V _{CC}
17	Y2		2B		C		a	
18	Y1		2A		B		g	
19	Y0		2G		A		f	
20	V _{CC}		V _{CC}		V _{CC}			

FIGURE 1. Terminal connections.

DEVICE TYPE 01

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

*G2 = G2A + G2B

H = high level, L = low level, X = irrelevant.

DEVICE TYPE 02

INPUTS			OUTPUTS			
ENABLE	SELECT					
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

H = high level, L = low level, X = irrelevant.

FIGURE 2. Truth tables.

DEVICE TYPE 03

INPUTS				OUTPUTS									
D	C	B	A	0	1	2	3	4	5	6	7	8	9
L	L	L	L	L	H	H	H	H	H	H	H	H	H
L	L	L	H	H	L	H	H	H	H	H	H	H	H
L	L	H	L	H	H	L	H	H	H	H	H	H	H
L	L	H	H	H	H	H	L	H	H	H	H	H	H
L	H	L	L	H	H	H	H	L	H	H	H	H	H
L	H	L	H	H	H	H	H	H	L	H	H	H	H
L	H	H	L	H	H	H	H	H	H	L	H	H	H
L	H	H	H	H	H	H	H	H	H	H	L	H	H
H	L	L	L	H	H	H	H	H	H	H	H	L	H
H	L	L	H	H	H	H	H	H	H	H	H	H	L
H	L	H	L	H	H	H	H	H	H	H	H	H	H
H	L	H	H	H	H	H	H	H	H	H	H	H	H
H	H	L	L	H	H	H	H	H	H	H	H	H	H
H	H	L	H	H	H	H	H	H	H	H	H	H	H
H	H	H	L	H	H	H	H	H	H	H	H	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H

FIGURE 2. Truth tables - Continued.

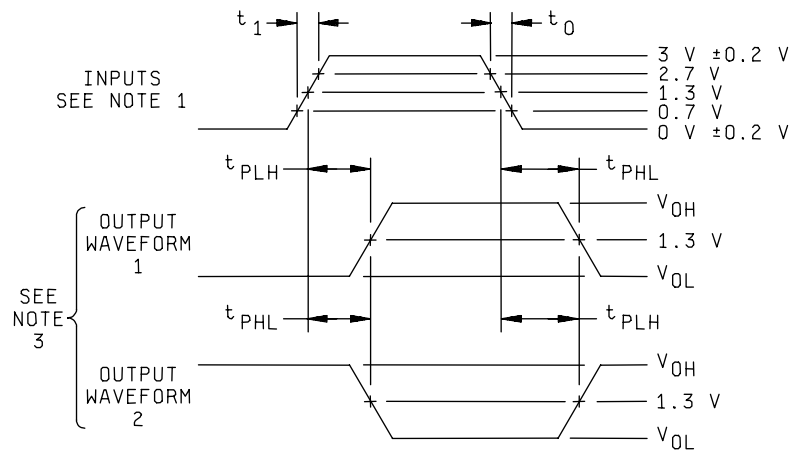
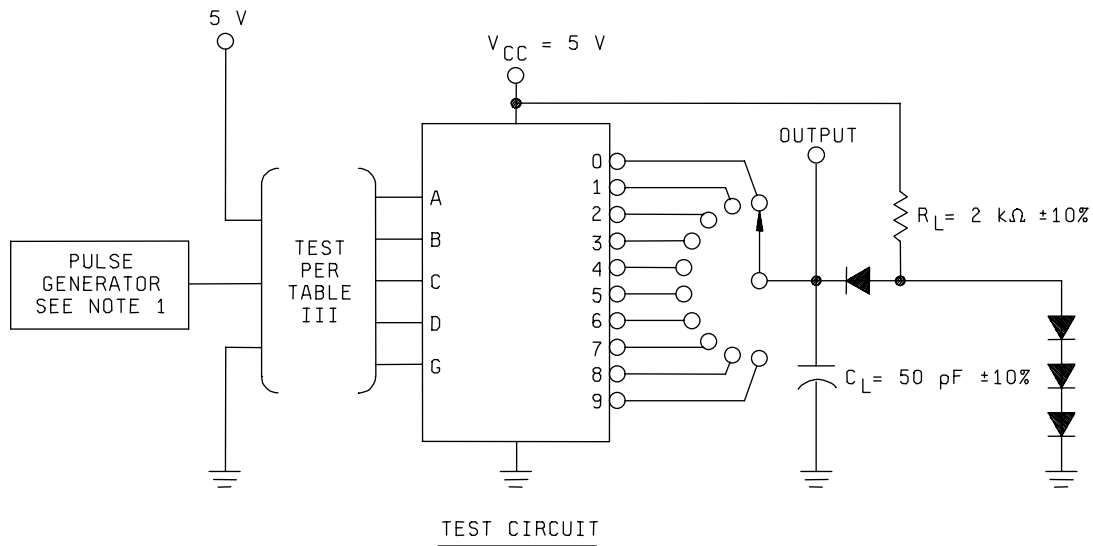
DEVICE TYPE 04

DECIMAL OR FUNCTION	INPUTS							OUTPUTS							
	LT	RBI	D	C	B	A	BI/RB0	a	b	c	d	e	f	g	NOTE
0	H	H	L	L	L	L	H	L	L	L	L	L	L	H	1
1	H	X	L	L	L	H	H	H	L	L	H	H	H	H	1
2	H	X	L	L	H	L	H	L	L	H	L	L	H	L	
3	H	X	L	L	H	H	H	L	L	L	L	H	H	L	
4	H	X	L	H	L	L	H	H	L	L	H	H	L	L	
5	H	X	L	H	L	H	H	L	H	L	L	H	L	L	
6	H	X	L	H	H	L	H	H	H	L	L	L	L	L	
7	H	X	L	H	H	H	H	L	L	L	H	H	H	H	
8	H	X	H	L	L	L	H	L	L	L	L	L	L	L	
9	H	X	H	L	L	H	H	L	L	L	H	H	L	L	
10	H	X	H	L	H	L	H	H	H	H	L	L	H	L	
11	H	X	H	L	H	H	H	H	H	L	L	H	H	L	
12	H	X	H	H	L	L	H	H	L	H	H	H	L	L	
13	H	X	H	H	L	H	H	L	H	H	L	H	L	L	
14	H	X	H	H	H	L	H	H	H	H	L	L	L	L	
15	H	X	H	H	H	H	H	H	H	H	H	H	H	H	
BI	X	X	X	X	X	X	L	H	H	H	H	H	H	H	2
RBI	H	L	L	L	L	L	L	H	H	H	H	H	H	H	3
LT	L	X	X	X	X	X	H	L	L	L	L	L	L	L	4

NOTES:

1. BI/RBO is wire-OR logic serving as blanking input (BI) and/or ripple-blanking output (RBO). The blanking input must be open or held at a high logic level when output functions 0 through 15 are desired and ripple-blanking input (RBI) must be held open or at a high logic level during the decimal 0 input, X = input may be high or low.
2. When a low logic level is applied to the blanking input (forced condition) all segment outputs go to a high logic level regardless of the state of any other input condition.
3. When ripple-blanking input (RBI) is at a low logic level, lamp test input is at high logic level and A = B = C = D = low logic level, all segment outputs go to a high logic level and the ripple-blanking output goes to a low logic level (response condition).
4. When blanking input/ripple-blanking output is open or held at a high logic level, and a low logic level is applied to lamp-test input, all segment outputs go to a low logic level.

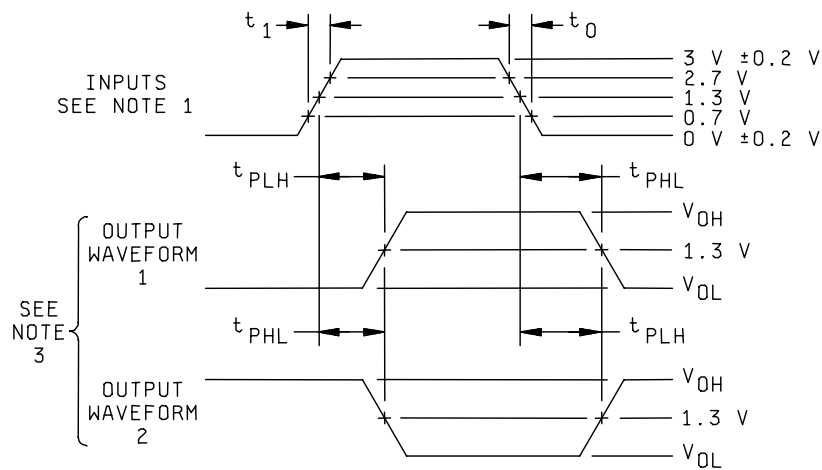
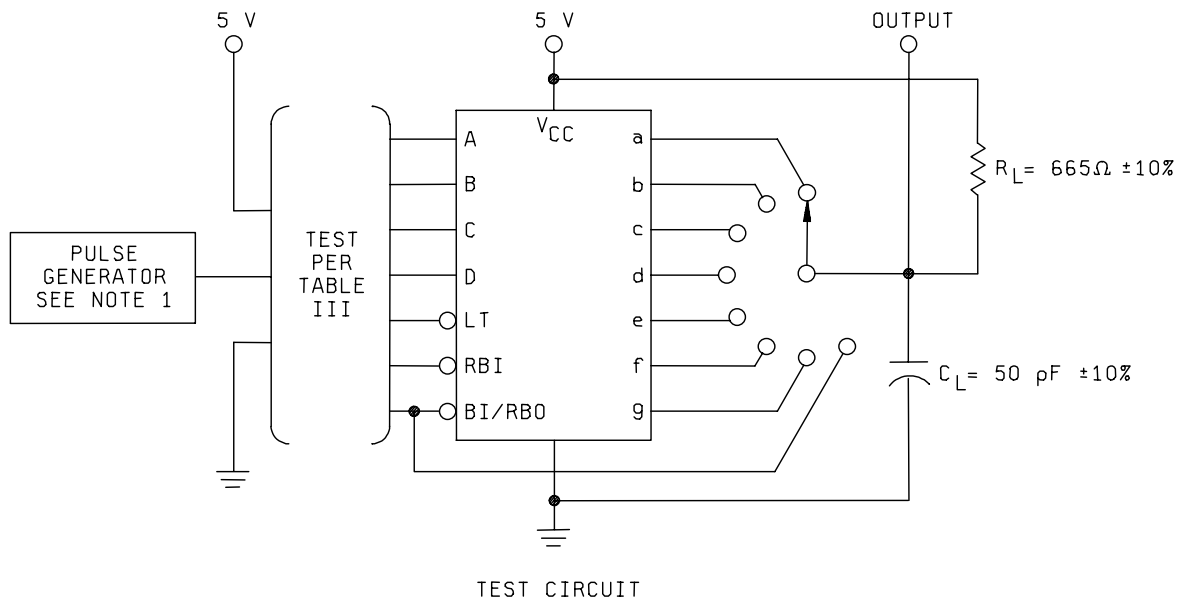
FIGURE 2. Truth tables - Continued.



NOTES:

1. The pulse generator has the following characteristics: $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, PRR ≤ 1 MHz.
2. C_L includes probe and jig capacitance.
3. Input - output waveform combination in accordance with the truth tables (see figure 2).
4. All diodes are 1N3064, or equivalent.

FIGURE 3. Switching times for device types 01, 02, and 03.



NOTES:

1. Pulse generator characteristics: $PRR \leq 1.0 \text{ MHz}$, $t_1 \leq 15 \text{ ns}$, $t_0 \leq 6 \text{ ns}$, and $Z_{out} \approx 50\Omega$.
2. C_L includes probe and jig capacitance.
3. Input - output waveform combination in accordance with the truth tables (see figure 2).

FIGURE 4. Switching test circuit and waveforms for device type 04.

TABLE III. Group A inspection for device type 01. 1/

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	
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max		
			Test no.	A	B	C	G2A	G2B	G1	Y7	GND	Y6	Y5	Y4	Y3	Y2	Y1	Y0	V _{CC}					
1 T _C = 25°C	V _{OH2}	3006	1						0.7 V		GND							-4 mA	-4 mA	4.5 V	Y0	2.5		V
			2																		Y1			
			3													-4 mA					Y2			
			4												-4 mA						Y3			
			5											-4 mA							Y4			
			6																		Y5			
			7										-4 mA								Y6			
			8									-4 mA									Y7			
V	OL2	3007	9	0.7 V	0.7 V	0.7 V	0.7 V	0.7 V	2.0 V									4 mA	4 mA		Y0		0.4	
			10	2.0 V	0.7 V													4 mA			Y1			
			11	0.7 V	2.0 V											4 mA	4 mA				Y2			
			12	2.0 V	2.0 V										4 mA						Y3			
			13	0.7 V	0.7 V	2.0 V								4 mA							Y4			
			14	2.0 V	0.7 V								4 mA								Y5			
			15	0.7 V	2.0 V								4 mA								Y6			
			16	2.0 V	2.0 V						4 mA										Y7			
V	IC		17	-18 mA																A		-1.5		
			18		-18 mA															B				
			19			-18 mA															C			
			20				-18 mA														G2A			
			21					-18 mA													G2B			
			22						-18 mA												G1			
			23	0.4 V															5.5 V		A	2/	2/	2/
			24		0.4 V																B			
I	3009	25			0.4 V															C				
		26				0.4 V														G2A				
		27					0.4 V													G2B				
		28						0.4 V												G1				
	IH1	29	2.7 V																	A		20	μA	
		30		2.7 V																B				
		31			2.7 V															C				
		32				2.7 V														G2A				
I	3010	33					2.7 V													G2B				
		34							2.7 V											G1				
		35	7.0 V																	A		100		
		36		7.0 V																B				
	37			7.0 V															C					
	38				7.0 V															G2A				
	39					7.0 V														G2B				
	40						7.0 V													G1				
I	OS	3011	41				5.5 V	5.5 V										GND		Y0	-15	-100	mA	
			42															GND		Y1				
			43																	Y2				
			44													GND	GND			Y3				
			45																	Y4				
			46												GND					Y5				
			47																	Y6				
			48									GND								Y7				
CC	3005	49					GND	GND	5.5 V										V _{CC}		10.0			
2	Same tests, terminal conditions and limits as subgroup 1, except T _C = +125°C and V _{IC} tests omitted.																							
3	Same tests, terminal conditions and limits as subgroup 1, except T _C = -55°C and V _{IC} tests omitted.																							

See footnotes at end of device type 01.

TABLE III. Group A inspection for device type 01 - Continued. 1/

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	
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max		
			Test no.	A	B	C	G2A	G2B	G1	Y7	GND	Y6	Y5	Y4	Y3	Y2	Y1	Y0	V _{CC}					
7 3/ T _C = 25°C	Truth table tests	3014	50	A	A	A	A	A	A	H	GND	H	H	H	H	H	H	H	5.0 V	3/				
		"	51	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"					
		"	52	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"					
		"	53	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"					
		"	54	"	"	"	B	A	"	"	"	"	"	"	"	"	"	"	"					
		"	55	"	"	"	A	B	"	"	"	"	"	"	"	"	"	"	"					
		"	56	"	"	"	A	B	B	"	"	"	"	"	"	"	"	"	"					
		"	57	"	"	"	B	A	"	"	"	"	"	"	"	"	"	"	"					
		"	58	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"					
		"	59	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"	L					
		"	60	A	"	"	"	"	"	"	"	"	"	"	"	"	"	L	H					
		"	61	B	A	"	"	"	"	"	"	"	"	"	"	"	L	H	"					
		"	62	A	A	"	"	"	"	"	"	"	"	"	"	L	H	"	"					
		"	63	B	B	A	"	"	"	"	"	"	"	"	"	L	H	"	"					
		"	64	A	B	"	"	"	"	"	"	"	"	"	L	H	"	"	"					
		"	65	B	A	"	"	"	"	"	"	"	"	L	H	"	"	"	"					
		"	66	A	A	"	"	"	"	"	L	"	H	H	"	"	"	"	"					
8 3/ test	Truth table	3014	67 thru 83	Same tests as subgroup 7, except T _C = +125°C																				
	table	3014	84 thru 100	Same tests as subgroup 7, except T _C = -55°C																				
T _C = 25°C truth test	t _{PLH2} t _{PHL2}	3003 Fig. 3	101 & 102	IN	GND	GND	GND	GND	5.0 V		GND							OUT	5.0 V	A to Y0	5	25/46	ns	
			103 & 104	"	5.0 V	GND	"	"	"		"								"	A to Y2	"	"	"	
			105 & 106	"	GND	5.0 V	"	"	"		"				OUT				"	A to Y4	"	"	"	
			107 & 108	"	5.0 V	5.0 V	"	"	"		"	OUT							"	A to Y6	"	"	"	
			109 & 110	GND	IN	GND	"	"	"		"								OUT	"	B to Y0	"	"	"
			111 & 112	5.0 V	"	GND	"	"	"		"							OUT	"	B to Y1	"	"	"	
			113 & 114	GND	"	5.0 V	"	"	"		"				OUT				"	B to Y4	"	"	"	
			115 & 116	5.0 V	"	5.0 V	"	"	"		"			OUT					"	B to Y5	"	"	"	
			117 & 118	GND	GND	IN	"	"	"		"								OUT	"	C to Y0	"	"	"
			119 & 120	5.0 V	GND	"	"	"	"		"							OUT	"	C to Y1	"	"	"	
			121 & 122	GND	5.0 V	"	"	"	"		"						OUT		"	C to Y2	"	"	"	
			123 & 124	5.0 V	5.0 V	"	"	"	"		"						OUT		"	C to Y3	"	"	"	
t _t	t _{PLH3} t _{PHL3}	3003 Fig. 3	125 & 126	GND	GND	GND	IN	"	"		"							OUT	"	G2A to Y0	"	23/37	"	
			127 & 128	5.0 V	GND	"	"	"	"		"								"	G2A to Y1	"	"	"	
			129 & 130	GND	5.0 V	"	"	"	"		"						OUT	"	G2A to Y2	"	"	"		
			131 & 132	5.0 V	5.0 V	"	"	"	"		"						OUT	"	G2A to Y3	"	"	"		
			133 & 134	GND	GND	5.0 V	"	"	"		"				OUT			"	G2A to Y4	"	"	"		
			135 & 136	5.0 V	GND	"	"	"	"		"			OUT				"	G2A to Y5	"	"	"		
			137 & 138	GND	5.0 V	"	"	"	"		"	OUT						"	G2A to Y6	"	"	"		
			139 & 140	5.0 V	5.0 V	"	"	"	"	OUT	"							"	G2A to Y7	"	"	"		
			141 & 142	GND	GND	GND	GND	IN	"		"								OUT	"	G2B to Y0	"	"	"
			143 & 144	5.0 V	GND	"	"	"	"		"							OUT	"	G2B to Y1	"	"	"	
			145 & 146	GND	5.0 V	"	"	"	"		"						OUT	"	G2B to Y2	"	"	"		
			147 & 148	5.0 V	5.0 V	"	"	"	"		"					OUT		"	G2B to Y3	"	"	"		
			149 & 150	GND	GND	5.0 V	"	"	"		"				OUT			"	G2B to Y4	"	"	"		
			151 & 152	5.0 V	GND	"	"	"	"		"			OUT				"	G2B to Y5	"	"	"		
			153 & 154	GND	5.0 V	"	"	"	"		"	OUT						"	G2B to Y6	"	"	"		
			155 & 156	5.0 V	5.0 V	"	"	"	"	OUT	"							"	G2B to Y7	"	"	"		

See footnotes at end of device types 01.

TABLE III. Group A inspection for device type 01 - Continued. 1/

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
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	
			Test no.	A	B	C	G2A	G2B	G1	Y7	GND	Y6	Y5	Y4	Y3	Y2	Y1	Y0	V _{CC}				
9 T _C = 25°C	t _{PLH4} t _{PHL4} 3003	Fig. 3 " " " " " " " " " " "	157 & 158	IN	GND	GND	GND	GND	5.0 V										5.0 V	A to Y1	5	32/54	ns
			159 & 160	"	5.0 V	GND	"	"	"		"					OUT		OUT		A to Y3	"	"	"
			161 & 162	"	GND	5.0 V	"	"	"		"		OUT						"	A to Y5	"	"	"
			163 & 164	"	5.0 V	5.0 V	"	"	"	OUT									"	A to Y7	"	"	"
			165 & 166	GND	IN	GND	"	"	"		"						OUT		"	B to Y2	"	"	"
			167 & 168	5.0 V	"	GND	"	"	"		"					OUT			"	B to Y3	"	"	"
			169 & 170	GND	"	5.0 V	"	"	"		"	OUT							"	B to Y6	"	"	"
			171 & 172	5.0 V	"	5.0 V	"	"	"	OUT	"								"	B to Y7	"	"	"
			173 & 174	GND	GND	IN	"	"	"		"				OUT				"	C to Y4	"	"	"
			175 & 176	5.0 V	GND	"	"	"	"		"		OUT						"	C to Y5	"	"	"
			177 & 178	GND	5.0 V	"	"	"	"		"	OUT							"	C to Y6	"	"	"
			179 & 180	5.0 V	5.0 V	"	"	"	"	OUT	"								"	C to Y7	"	"	"
t t	PLH5 PHL5 3003 Fig. 3 " " " "	181 & 182	GND	GND	GND	"	"	IN		"								OUT	"	G1 to Y0	"	31/43	"
		183 & 184	5.0 V	GND	"	"	"	"		"								"	G1 to Y1	"	"	"	
		185 & 186	GND	5.0 V	"	"	"	"		"						OUT		"	G1 to Y2	"	"	"	
		187 & 188	5.0 V	5.0 V	"	"	"	"		"					OUT			"	G1 to Y3	"	"	"	
		189 & 190	GND	GND	5.0 V	"	"	"		"			OUT					"	G1 to Y4	"	"	"	
		191 & 192	5.0 V	GND	"	"	"	"		"		OUT						"	G1 to Y5	"	"	"	
		193 & 194	GND	5.0 V	"	"	"	"		"	OUT							"	G1 to Y6	"	"	"	
		195 & 196	5.0 V	5.0 V	"	"	"	"	OUT	"								"	G1 to Y7	"	"	"	
10	Same tests and terminal conditions as for subgroup 9, except T _C = +125°C and for following limits: t _{PLH2} = 5 to 38 ns; t _{PHL2} = 5 to 69 ns; t _{PLH3} = 5 to 35 ns; t _{PHL3} = 5 to 56 ns; t _{PLH4} = 5 to 48 ns; t _{PHL4} = 5 to 81 ns; t _{PLH5} = 5 to 47 ns; t _{PHL5} = 5 to 65 ns.																						
11	Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C.																						

1/ Pins not designated are high ≥ 2.0 V; low ≤ 0.7 V; or open. Case X and 2 pins not referenced are NC.2/ I_{IL1} limits are as follows:

I _{IL1}	Min/Max limits (mA) for circuits				
	A	B	C, E, F	D	G
	-.001/- .150 except -.11/- .35 for tests 26, 27, 28	-.030/- .300	-.12/- .36	-.10/- .34	-.15/- .38

3/ A = 2.5 V and B = 0.4 V; H ≥ 1.5 V; L ≤ 1.5 V.

TABLE III. Group A inspection for device type 02. 1/

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
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20				
			Test no.	1G	1A	1B	1Y0	1Y1	1Y2	1Y3	GND	2Y3	2Y2	2Y1	2Y0	2B	2A	2G	V _{CC}		Min	Max	
1 T _C = 25°C	V _{OH2}	3006	1	2.0 V						-4 mA	GND								4.5 V	1Y3	2.5		V
			2	"					-4 mA	"									"	1Y2	"		"
			3	"				-4 mA		"									"	1Y1	"		"
			4	"			-4 mA			"									"	1Y0	"		"
			5							"	-4 mA							2.0 V	"	2Y3	"		"
			6							"		-4 mA							"	2Y2	"		"
			7							"			-4 mA					"	"	2Y1	"		"
			8							"				-4 mA				"	"	2Y0	"		"
	V	3007	9	0.7 V	2.0 V	2.0 V				4 mA	"								"	1Y3		0.4	"
			10	"	0.7 V	2.0 V			4 mA	"									"	1Y2		"	"
			11	"	2.0 V	0.7 V		4 mA		"									"	1Y1		"	"
			12	"	0.7 V	0.7 V	4 mA			"									"	1Y0		"	"
			13							"	4 mA					2.0 V	2.0 V	0.7 V	"	2Y3		"	"
			14							"		4 mA				2.0 V	0.7 V	"	"	2Y2		"	"
			15							"			4 mA			0.7 V	2.0 V	"	"	2Y1		"	"
			16							"				4 mA		0.7 V	0.7 V	"	"	2Y0		"	"
	V	IC	17	-18 mA						"									"	1G		-1.5	"
			18		-18 mA					"									"	1A		"	"
			19			-18 mA				"									"	1B		"	"
			20							"						-18 mA			"	2B		"	"
			21							"							-18 mA		"	2A		"	"
			22							"								-18 mA	"	2G		"	"
			23	0.4 V						"									5.5 V	1G	2/	2/	mA
			24		0.4 V					"									"	1A		"	"
	I	3009	25			0.4 V				"									"	1B		"	"
			26				0.4 V			"						0.4 V			"	2B		"	"
			27							"							0.4 V		"	2A		"	"
			28							"								0.4 V	"	2G		"	"
		IH1	29	2.7 V						"									"	1G		20	μA
			30		2.7 V					"									"	1A		"	"
			31			2.7 V				"									"	1B		"	"
			32							"						2.7 V			"	2B		"	"
			33							"							2.7 V		"	2A		"	"
			34							"								2.7 V	"	2G		"	"
		IH2	35	7.0 V						"									"	1G		100	"
			36		7.0 V					"									"	1A		"	"
			37			7.0 V				"									"	1B		"	"
			38							"						7.0 V			"	2B		"	"
			39							"							7.0 V		"	2A		"	"
			40							"								7.0 V	"	2G		"	"
	I	3011	41	5.5 V			GND			"									"	1Y0	-15	-100	mA
			42	"				GND		"									"	1Y1	"	"	"
			43	"					GND	"									"	1Y2	"	"	"
			44	"						GND	"								"	1Y3	"	"	"
			45							"	GND							5.5 V	"	2Y3	"	"	"
			46							"		GND						"	"	2Y2	"	"	"
			47							"				GND				"	"	2Y1	"	"	"
			48							"					GND			"	"	2Y0	"	"	"
	CC	3005	49	GND	5.5 V	5.5 V				"						5.5 V	5.5 V	GND	"	V _{CC}		11.0	"
2	Same tests, terminal conditions and limits as subgroup 1, except T _C = +125°C and V _{IC} tests omitted.																						
3	Same tests, terminal conditions and limits as subgroup 1, except T _C = -55°C and V _{IC} tests omitted.																						

See footnotes at end of device type 02.

TABLE III. Group A inspection for device type 02 - Continued. 1/

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	
			Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max		
			Test no.	1G	1A	1B	1Y0	1Y1	1Y2	1Y3	GND	2Y3	3Y2	2Y1	2Y0	2B	2A	2G	V _{CC}					
7 3/ T _C = 25°C	Truth table tests	3014	50	A	A	A	H	H	H	H	GND	H	H	H	H	A	A	A	5.0 V	3/				
			51	"	B	A	"	"	"	"	"	"	"	"	"	A	B	"	"					
			52	"	A	B	"	"	"	"	"	"	"	"	"	B	A	"	"					
			53	"	B	"	"	"	"	"	"	"	"	"	"	"	B	"	"		"			
			54	B	B	"	L	"	"	"	"	"	"	"	L	"	B	B	"					
			55	"	A	"	H	L	"	"	"	"	"	L	H	"	A	"	"		"			
			56	"	B	A	"	H	L	"	"	"	L	H	"	A	B	"	"		"			
			57	"	A	A	"	H	H	L	"	L	H	H	"	A	A	"	"		"			
8 3/ test	Truth table	3014	58 thru 65	Same tests as subgroup 7, except T _C = +125°C																				
	table	3014	66 thru 73	Same tests as subgroup 7, except T _C = -55°C																				
9 truth T _C = 25°C test	t _{PLH3} t _{PHL3}	3003 Fig. 3	74 & 75	IN	GND	GND	OUT				GND								5.0 V	1G to 1Y0	5	29/37	ns	
			76 & 77	"	5.0 V	GND		OUT			"								"	1G to 1Y1	"	"	"	
			78 & 79	"	GND	5.0 V			OUT		"								"	1G to 1Y2	"	"	"	
			80 & 81	"	5.0 V	5.0 V				OUT	"								"	1G to 1Y3	"	"	"	
	PLH2 PHL2	"	82 & 83	GND	IN	GND	OUT				"								"	1A to 1Y0	"	25/38	"	
			84 & 85	"	IN	5.0 V			OUT		"							"	1A to 1Y2	"	"	"		
			86 & 87	"	GND	IN	OUT				"							"	1B to 1Y0	"	"	"		
			88 & 89	"	5.0 V	IN		OUT			"							"	1B to 1Y1	"	"	"		
	PLH3 PHL3	"	90 & 91								"				OUT	GND	GND	IN	"	2G to 2Y0	"	29/37	"	
			92 & 93								"			OUT	GND	5.0 V	"	"	2G to 2Y1	"	"	"		
			94 & 95								"		OUT		5.0 V	GND	"	"	2G to 2Y2	"	"	"		
			96 & 97								"	OUT			5.0 V	5.0 V	"	"	2G to 2Y3	"	"	"		
	PLH3 PHL3	"	98 & 99								"				OUT	GND	IN	GND	"	2A to 2Y0	"	25/38	"	
			100 & 101								"			OUT		5.0 V	IN	"	"	2A to 2Y2	"	"	"	
			102 & 103								"				OUT	IN	GND	"	"	2B to 2Y0	"	"	"	
			104 & 105								"			OUT		IN	5.0 V	"	"	2B to 2Y1	"	"	"	
	PLH4 PHL4	"	106 & 107	GND	IN	GND		OUT			"								"	1A to 1Y1	"	34/43	"	
			108 & 109	"	IN	5.0 V				OUT	"								"	1A to 1Y3	"	"	"	
			110 & 111	"	GND	IN			OUT		"								"	1B to 1Y2	"	"	"	
			112 & 113	"	5.0 V	IN				OUT	"								"	1B to 1Y3	"	"	"	
			114 & 115								"			OUT		GND	IN	GND	"	2A to 2Y1	"	"	"	
			116 & 117								"	OUT				5.0 V	IN	"	"	2A to 2Y3	"	"	"	
			118 & 119								"		OUT			IN	GND	"	"	2B to 2Y2	"	"	"	
			120 & 121								"	OUT				IN	5.0 V	"	"	2B to 2Y3	"	"	"	
10	Same tests and terminal conditions as for subgroup 9, except T _C = +125°C and for following limits: t _{PLH2} = 5 to 38 ns; t _{PHL2} = 5 to 57 ns; t _{PLH3} = 5 to 44 ns; t _{PHL3} = 5 to 56 ns; t _{PLH4} = 5 to 51 ns; t _{PHL4} = 5 to 65 ns.																							
11	Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C																							

1/ Pins not designated are high ≥ 2.0 V; low ≤ 0.7 V; or open. Case X and 2 pins not referenced are NC.2/ I_{IL1} limits are as follows:

I _{IL1}	Min/Max limits (mA) for circuits			
	A, C, E, F	B	D	G
	-.012/- .36	-.03/- .300	-.10/- .34	-.15/- .38

3/ H ≥ 1.5 V; L ≤ 1.5 V; A = 2.5 V; B = 0.4 V.

TABLE III. Group A inspection for device type 03. 1/

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		
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max			
			Test no.	0	1	2	3	4	5	6	GND	7	8	9	D	C	B	A	V _{CC}						
1 T _C = 25°C	V _{OH2}	3006	1	-4 mA							GND	7	8	9	D	C	B	A	V _{CC}	0	2.5	V			
		2		mA						"					2.0 V	2.0 V	2.0 V	2.0 V	4.5 V	1	"	"			
		3			-4 mA					"					"	"	"	"	"	2	"	"	"		
		4				-4 mA				"					"	"	"	"	"	3	"	"	"		
		5					-4 mA			"					"	"	"	"	"	4	"	"	"		
		6						-4 mA		"					"	"	"	"	"	5	"	"	"		
		7							-4 mA	"					"	"	"	"	"	6	"	"	"		
		8								"	-4 mA				"	"	"	"	"	7	"	"	"		
		9								"		-4 mA			"	"	"	"	"	8	"	"	"		
		10								"			-4 mA		"	"	"	"	"	9	"	"	"		
	V _{OL2}	3007	11	4 mA							"					0.7 V	0.7 V	0.7 V	0.7 V	"		0.4	"		
		12			4 mA						"					"	"	0.7 V	2.0 V	"	1	"	"		
		13				4 mA					"					"	"	2.0 V	0.7 V	"	2	"	"		
		14					4 mA				"					"	"	2.0 V	2.0 V	"	3	"	"		
		15						4 mA			"					"	2.0 V	0.7 V	0.7 V	"	4	"	"		
		16							4 mA		"					"	"	0.7 V	2.0 V	"	5	"	"		
		17								4 mA	"					"	"	2.0 V	0.7 V	"	6	"	"		
		18									"	4 mA				"	"	2.0 V	2.0 V	"	7	"	"		
		19									"		4 mA			"	"	0.7 V	0.7 V	"	8	"	"		
		20									"			4 mA		"	"	0.7 V	2.0 V	"	9	"	"		
V _{IC}		21								"								-18 mA	"	A		-1.5	"		
		22								"									"	B		"	"		
		23								"							-18 mA		"	C		"	"		
		24								"						-18 mA		"	"	D		"	"		
I _{H1}	3010	25								"									2.7 V	5.5 V	A		20	μA	
		26								"									2.7 V	"	B		"	"	
		27								"								2.7 V	"	"	C		"	"	
		28								"										"	D		"	"	
I _{H2}	3010	29								"										7.0 V	"	A		100	"
		30								"										"	B		"	"	
		31								"									7.0 V	"	"	C		"	"
		32								"										"	D		"	"	
I _{IL1 2/}	3009	33								"										0.4 V	"	A	2/	2/	mA
		34								"										"	B	"	"	"	
		35								"									0.4 V	"	"	C	"	"	"
		36								"										"	D	"	"	"	
I _{OS 3/}	3011	37	GND							"						5.5 V	5.5 V	5.5 V	5.5 V	"	0	-15	-100	"	
		38			GND					"						"	"	"	"	"	1	"	"	"	
		39				GND				"						"	"	"	"	"	2	"	"	"	
		40					GND			"						"	"	"	"	"	3	"	"	"	
		41						GND		"						"	"	"	"	"	4	"	"	"	
		42							GND	"						"	"	"	"	"	5	"	"	"	
		43								GND	"					"	"	"	"	"	6	"	"	"	
		44									"	GND				"	"	"	"	"	7	"	"	"	
		45									"			GND		"	"	"	"	"	8	"	"	"	
		46									"				GND	"	"	"	"	"	9	"	"	"	
I _{CC}	3005	47								"					GND	GND	GND	GND	"	V _{CC}		13	"		
2	Same tests, terminal conditions and limits as subgroup 1, except T _C = +125°C and V _{IC} tests omitted.																								
3	Same tests, terminal conditions and limits as subgroup 1, except T _C = -55°C and V _{IC} tests omitted.																								

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued. 1/

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	
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max		
			Test no.	0	1	2	3	4	5	6	GND	7	8	9	D	C	B	A	V _{CC}					
7 4/ T _C = 25°C	Truth table tests	3014	48	L	H	H	H	H	H	H	GND	H	H	H	B	B	B	B	5.0 V	4/				
		"	49	H	L	H	"	"	"	"	"	"	"	"	"	"	B	A	"					
		"	50	"	H	L	"	"	"	"	"	"	"	"	"	"	A	B	"					
		"	51	"	"	H	L	"	"	"	"	"	"	"	"	"	A	A	"					
		"	52	"	"	"	H	L	"	"	"	"	"	"	"	A	B	B	"					
		"	53	"	"	"	"	H	L	"	"	"	"	"	"	"	B	A	"					
		"	54	"	"	"	"	"	H	L	"	"	"	"	"	"	A	B	"					
		"	55	"	"	"	"	"	"	H	"	L	"	"	"	"	A	A	"					
		"	56	"	"	"	"	"	"	"	"	H	L	"	A	B	B	B	"					
		"	57	"	"	"	"	"	"	"	"	"	H	L	"	"	B	A	"					
		"	58	"	"	"	"	"	"	"	"	"	"	H	"	"	A	B	"					
		"	59	"	"	"	"	"	"	"	"	"	"	"	"	"	A	A	"					
		"	60	"	"	"	"	"	"	"	"	"	"	"	"	A	B	B	"					
		"	61	"	"	"	"	"	"	"	"	"	"	"	"	"	B	A	"					
		"	62	"	"	"	"	"	"	"	"	"	"	"	"	"	A	B	"					
		"	63	"	"	"	"	"	"	"	"	"	"	"	"	"	A	A	"					
8 4/ test truth	table	3014	64 thru 79	Same tests as subgroup 7, except T _C = +125°C																				
	table	3014	80 thru 95	Same tests as subgroup 7, except T _C = -55°C																				
T _C = 25°C test truth	t	t _{PLH4} t _{PHL4} Fig. 3	96 & 97			OUT					GND				GND	GND	IN	GND	5.0 V	B to 2	5	35	ns	
			98 & 99		OUT						"				"	GND	GND	IN	"	A to 1	"	"	"	
			100 & 101								"	OUT				"	5.0 V	5.0 V	IN	"	A to 7	"	"	"
			102 & 103		OUT						"				"	GND	IN	5.0 V	"	B to 1	"	30	"	
			104 & 105					OUT			"				"	5.0 V	IN	GND	"	B to 4	"	"	"	
			106 & 107	OUT							"				"	GND	GND	IN	"	A to 0	"	"	"	
			108 & 109			OUT					"				"	IN	5.0 V	GND	"	C to 2	"	"	"	
			110 & 111				OUT				"				"	"	5.0 V	5.0 V	"	C to 3	"	"	"	
			112 & 113								"		OUT		5.0 V	"	GND	GND	"	C to 8	"	"	"	
			114 & 115								"			OUT	5.0 V	"	"	5.0 V	"	C to 9	"	"	"	
			116 & 117					OUT			"				GND	"	"	GND	"	C to 4	"	35	"	
			118 & 119						OUT		"				"	"	"	5.0 V	"	C to 5	"	"	"	
			120 & 121							OUT	"				"	"	5.0 V	GND	"	C to 6	"	"	"	
			122 & 123								"	OUT			"	"	"	5.0 V	"	C to 7	"	"	"	
			124 & 125				OUT				"				IN	GND	"	5.0 V	"	D to 3	"	30	"	
			126 & 127					OUT			"				"	5.0 V	GND	GND	"	D to 4	"	"	"	
			128 & 129						OUT		"				"	"	GND	5.0 V	"	D to 5	"	"	"	
			130 & 131							OUT	"				"	"	5.0 V	GND	"	D to 6	"	"	"	
			132 & 133								"	OUT			"	"	5.0 V	5.0 V	"	D to 7	"	"	"	
			134 & 135								"		OUT		"	GND	GND	GND	"	D to 8	"	35	"	
			136 & 137								"			OUT	"	GND	GND	5.0 V	"	D to 9	"	35	"	
10	Same tests and terminal conditions as for subgroup 9, except T _C = +125°C and for following limits: t _{PLH2} = 5 to 45 ns; t _{PHL2} = 5 to 45 ns; t _{PLH4} = 5 to 53 ns; t _{PHL4} = 5 to 53 ns.																							
11	Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C																							

1/ Pins not designated are high ≥ 2.0 V; low ≤ 0.7 V; or open. Case X and 2 pins not referenced are NC.2/ I_{IL1} limits are as follows:

I _{IL1}	Min/Max limits (mA) for circuits						
	A	B	C	D	E	F	G
	-.12/- .36	-.030/- .300	-.12/- .36	-.12/- .36	-.12/- .36	-.12/- .36	-.16/- .40

3/ For circuit C, limits are: -15 to -130 mA.

4/ H ≥ 1.5 V; L ≤ 1.5 V; A = 2.5 V; B = 0.4 V.

TABLE III. Group A inspection for device type 04. 1/

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
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20				
			Test no.	B	C	LT	RBO	RBI	D	A	GND	e	d	c	b	a	g	f	V _{CC}		Min	Max	
1 T _C = 25°C	V _{OL2}	3006	1	X	X	0.7 V		X	X	X	GND	12 mA							4.5 V	e		0.4	V
			2	"	"	"		"	"	"	"		12 mA						"	d		"	"
			3	"	"	"		"	"	"	"			12 mA					"	c		"	"
			4	"	"	"		"	"	"	"				12 mA				"	b		"	"
			5	"	"	"		"	"	"	"					12 mA			"	a		"	"
			6	"	"	"		"	"	"	"						12 mA		"	g		"	"
			7	"	"	"		"	"	"	"							12 mA	"	f		"	"
	OL1 CEX	3006	8	0.7 V	0.7 V	2.0 V	1.6 mA	0.7 V	0.7 V	0.7 V	"								"	RBO			"
			9	"	"	"		"	"	"	"	15 V							"	e		250	μA
			10	"	"	"		"	"	"	"		15 V						"	d		"	"
			11	"	"	"		"	"	"	"			15 V					"	c		"	"
			12	"	"	"		"	"	"	"				15 V				"	b		"	"
			13	"	"	"		"	"	"	"					15 V			"	a		"	"
			14	"	"	"		"	"	"	"						15 V		"	g		"	"
	OH1 IC	3007	15	"	"	"		"	"	"	"							15 V	"	f		"	"
			16	0.7 V	0.7 V	2.0 V	-50 μA	2.0 V	0.7 V	0.7 V	"								"	RBO	2.4		V
			17	-18 mA							"								"	B		-1.5	"
			18		-18 mA						"								"	C		"	"
			19			-18 mA					"								"	LT		"	"
			20				-18 mA				"								"	RBI		"	"
			21					-18 mA			"								"	D		"	"
	IL1	3009	22						-18 mA	"									"	A		"	"
			23	0.4 V	5.5 V	5.5 V		5.5 V	5.5 V	5.5 V	"								5.5 V	B	-10	-34	mA
			24	5.5 V	0.4 V	"		"	5.5 V	"	"								"	C		"	"
			25	"	5.5 V	"		"	0.4 V	"	"								"	D		"	"
	IL2	3009	26	"	"	"		"	5.5 V	0.4 V	"								"	A		"	"
			27	"	"	0.4 V		"	"	5.5 V	"								"	LT	2/	2/	"
			28	"	"	5.5 V		0.4 V	"	"	"								"	RBI		"	"
			29	"	"	5.5 V	0.4 V	5.5 V	"	"	"								"	RBO		"	"
	IH1	3010	30	2.7 V	GND	GND		GND	GND	GND	"								"	B		20	μA
			31	GND	2.7 V	GND		"	"	"	"								"	C		"	"
			32	"	GND	2.7 V		"	"	"	"								"	LT		"	"
			33	"	"	GND		2.7 V	"	"	"								"	RBI		"	"
			34	"	"	"		GND	2.7 V	"	"								"	D		"	"
			35	"	"	"		"	GND	2.7 V	"								"	A		"	"
	IH2	3010	36	7.0 V	"	"		"	"	GND	"								"	B		100	"
			37	GND	7.0 V	"		"	"	"	"								"	C		"	"
			38	"	GND	7.0 V		"	"	"	"								"	LT		"	"
			39	"	"	GND		7.0 V	"	"	"								"	RBI		"	"
			40	"	"	"		GND	7.0 V	"	"								"	D		"	"
			41	"	"	"		GND	GND	7.0 V	"								"	A		"	"
	CC	3005	42	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	"								"	V _{CC}		13	mA
2	Same tests, terminal conditions and limits as subgroup 1, except T _C = +125°C and V _{IC} tests omitted.																						
3	Same tests, terminal conditions and limits as subgroup 1, except T _C = -55°C and V _{IC} tests omitted.																						

See footnotes at end of device type 04.

TABLE III. Group A inspection for device type 04 - Continued. 1/

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	
			Cases 1/2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max		
			Test no.	B	C	LT	RBO	RBI	D	A	GND	e	d	c	b	a	g	f	V _{CC}		5.0 V			
7 T _C = 25°C 3/, 4/	Truth table tests	3014	43	B	B	A	A	A	B	B	GND	L	L	L	L	L	H	H	L	5.0 V	5/			
			44	B	"	"	"	"	X	"	A	"	H	H	L	"	H	H	H	"				
			45	A	"	"	"	"	"	"	B	"	L	L	H	"	L	L	"	"				
			46	A	"	"	"	"	"	"	A	"	H	L	L	"	"	"	"	"				
			47	B	A	"	"	"	"	"	B	"	"	H	"	"	H	"	L	"				
			48	B	"	"	"	"	"	"	A	"	"	L	"	"	H	L	"	"				"
			49	A	"	"	"	"	"	"	B	"	"	L	L	"	H	H	"	"				"
			50	A	"	"	"	"	"	"	A	"	H	H	"	"	L	L	H	H				"
			51	B	B	"	"	"	"	"	A	B	"	L	L	"	"	"	L	L				"
			52	B	"	"	"	"	"	"	A	"	H	H	"	"	"	"	"	L				"
			53	A	"	"	"	"	"	"	B	"	L	L	H	H	H	"	H	H				"
			54	A	"	"	"	"	"	"	A	"	H	L	L	H	"	"	H	H				"
			55	B	A	"	"	"	"	"	B	"	"	H	H	L	"	"	L	"				"
			56	B	"	"	"	"	"	"	A	"	"	L	"	"	H	L	"	"				"
			57	A	"	"	"	"	"	"	B	"	"	L	L	"	"	H	"	"				"
			58	A	"	"	"	"	"	"	A	"	H	H	"	"	"	"	H	H				"
			59	X	X	X	B	"	X	X	"	"	"	"	"	"	"	"	"	"				"
			60	B	B	5.0 V	L	B	B	B	"	"	"	"	"	"	"	"	"	"				"
			61	X	X	B	A	X	X	X	"	"	L	L	L	L	L	L	L	"				
			8 3/, 4/ test	Truth table	3014	62 thru 80	Same tests as subgroup 7, except T _C = +125°C																	
table	3014	81 thru 99		Same tests as subgroup 7, except T _C = -55°C																				
T _C = 25°C truth test	t _{PLH1} t _{PHL1}	3003 Fig. 4	100 & 101	GND	GND	5.0 V	"	5.0 V	GND	IN	GND	"	"	"	"	OUT	"	"	5.0 V	A to a	5	105	ns	
			102 & 103	GND	5.0 V	"	"	"	5.0 V	"	"	"	"	"	"	"	"	"	"	A to a	"	"	"	
			104 & 105	5.0 V	"	"	"	"	GND	"	"	"	"	"	"	"	"	"	"	A to a	"	"	"	
			106 & 107	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	A to b	"	"	"	
			108 & 109	5.0 V	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	"	A to b	"	"	"
			110 & 111	5.0 V	GND	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	A to c	"	"	"
			112 & 113	GND	GND	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	A to d	"	"	"
			114 & 115	GND	5.0 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	A to d	"	"	"
			116 & 117	5.0 V	5.0 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	A to d	"	"	"
			118 & 119	GND	GND	"	"	"	"	"	"	"	"	OUT	OUT	"	"	"	"	"	A to e	"	"	"
			120 & 121	5.0 V	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	"	A to e	"	"	"
			122 & 123	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A to f	"	"	"
			124 & 125	5.0 V	5.0 V	"	"	"	"	5.0 V	"	"	"	"	"	"	"	"	"	OUT	A to f	"	"	"
			126 & 127	5.0 V	5.0 V	"	"	"	"	5.0 V	"	"	"	"	"	"	"	OUT	"	"	A to g	"	"	"
			128 & 129	GND	GND	"	OUT	GND	GND	"	"	"	"	"	"	"	"	"	"	"	A to RBO	"	"	"
			130 & 131	IN	"	"	"	5.0 V	5.0 V	GND	GND	"	"	"	"	"	"	OUT	OUT	"	B to a	"	"	"
			132 & 133	"	"	"	"	"	GND	5.0 V	"	"	"	"	"	"	"	"	"	"	B to a	"	"	"
			134 & 135	"	5.0 V	"	"	"	GND	GND	"	"	"	"	"	"	OUT	"	"	"	B to b	"	"	"
			136 & 137	"	GND	"	"	"	5.0 V	GND	"	"	"	"	"	"	"	"	"	"	B to b	"	"	"
			138 & 139	"	5.0 V	"	"	"	GND	5.0 V	"	"	"	"	"	"	"	"	"	"	B to b	"	"	"
			140 & 141	"	GND	"	"	"	5.0 V	5.0 V	"	"	"	"	"	"	"	"	"	"	B to b	"	"	"
			142 & 143	"	"	"	"	"	"	GND	GND	"	"	"	"	"	"	"	"	"	B to c	"	"	"
			144 & 145	"	"	"	"	"	"	5.0 V	"	"	"	"	OUT	OUT	"	"	"	"	B to d	"	"	"
			146 & 147	"	5.0 V	"	"	"	"	GND	GND	"	"	"	"	"	"	"	"	"	B to d	"	"	"
			148 & 149	"	"	"	"	"	"	GND	"	OUT	"	"	"	"	"	"	"	"	B to e	"	"	"
			150 & 151	"	"	"	"	"	"	5.0 V	"	"	"	"	"	"	"	"	"	OUT	B to f	"	"	"
			152 & 153	"	GND	"	"	"	"	"	GND	"	"	"	"	"	"	"	"	"	B to f	"	"	"
			154 & 155	"	"	"	"	"	"	5.0 V	"	"	"	"	"	"	"	"	"	"	B to f	"	"	"
156 & 157	"	"	"	"	"	"	GND	"	"	"	"	"	"	"	"	OUT	"	B to g	"	"	"			
158 & 159	GND	IN	"	"	"	"	5.0 V	"	"	"	"	"	"	"	OUT	OUT	"	C to a	"	"	"			
160 & 161	5.0 V	"	"	"	"	"	GND	"	"	"	"	"	"	"	"	"	"	C to b	"	"	"			
162 & 163	GND	"	"	"	"	"	5.0 V	5.0 V	"	"	"	"	OUT	"	OUT	"	"	C to c	"	"	"			

See footnotes at end of device type 04.

TABLE III. Group A inspection for device type 04 - Continued. 1/

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
			Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	
			Test no.	B	C	LT	RBO	RBI	D	A	GND	e	d	c	b	a	g	f	V _{CC}				
9 T _c = 25°C	t _{PLH1} t _{PHL1}	3003 Fig. 4	164 & 165	GND	IN	5.0 V		5.0 V	GND	GND	GND		OUT						5.0 V	C to d	5	105	ns
			166 & 167	"	"	"		"	GND	"	"	OUT							"	C to e	"	"	"
			168 & 169	5.0 V	"	"		"	5.0 V	"	"							OUT	"	C to f	"	"	"
			170 & 171	GND	GND	IN		"	GND	5.0 V	"							OUT	"	C to f	"	"	"
			172 & 173	5.0 V	5.0 V	"		"	IN	5.0 V	"					OUT			"	D to a	"	"	"
			174 & 175	GND	5.0 V	"		"	"	GND	"			OUT					"	D to c	"	"	"
			176 & 177	"	GND	"		"	"	"	"							OUT	"	D to g	"	"	"
			178 & 179	"	"	"		GND	GND	"	"					OUT			"	LT to a	"	"	"
			180 & 181	"	"	"	OUT	GND	"	"	"								"	LT to RBO	"	"	"
			182 & 183	"	"	5.0 V	IN	5.0 V	"	"	"					OUT			"	RBO to a	"	"	"
			184 & 185	"	"	"		IN	"	"	"					OUT			"	RBI to a	"	"	"
			186 & 187	"	"	"	OUT	"	"	"	"								"	RBI to RBO	"	"	"
10	Same tests and terminal conditions as for subgroup 9, except T _c = +125°C and for following limits: t _{PLH1} = 5 to 158 ns; t _{PHL1} = 5 to 158 ns.																						
11	Same tests, terminal conditions and limits as for subgroup 10, except T _c = -55°C																						

1/ Pins not designated are high ≥ 2.0 V; low ≤ 0.7 V; or open. Case X and 2 pins not referenced are NC.

2/ Test limits shall be as follows:

Test	Min/Max limits (mA) for circuits		
	A	E	G
I _{IL2}	-.12/- .36	-.11/- .35	-.12/- .36
I _{IL3}	-.36/-1.08	-.36/-1.37	-.36/-1.08

3/ X = Input may be high level or low level.

4/ A pullup resistor of 665 Ω to 2 k Ω shall be connected between each output and V_{CC}.

5/ H ≥ 1.5 V; L ≤ 1.5 V; A = 2.5 V; B = 0.4 V.

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 personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department of Defense Agency, or within the Military Department'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. Complete part number (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.
- j. Requirements for "JAN" marking.

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.
RBI	Ripple blanking input.
RBO	Ripple blanking output.
BI	Blanking input.

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 shall 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 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-PRF-38535.

Military device type	Generic-industry type
01	54LS138
02	54LS139
03	54LS42
04	54LS47

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

TABLE IV. Manufacturer's designator.

Device type	A	B	C	D	E	F	G
	Texas Instruments Inc.	Signetics Corporation	Raytheon Company	Fairchild Semiconductor or	Motorola Inc	Advanced Micro Devices	National Semiconductor Corp
01	X	X	X	X	X	X	X
02	X	X	X	X	X	X	X
03	X	X		X	X		X
04	X				X		X

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

Preparing activity:
 DLA - CC
 (Project 5962-1955)

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