

INCH-POUND
MIL-M-38510/163B
12 October 2005
SUPERSEDING
MIL-M-38510/163A
7 August 1984

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR, TTL, HEX BUS DRIVERS WITH THREE-STATE OUTPUTS,  
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, TTL, hex bus driver (3-state) microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.4)

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 should be as follows:

<u>Device type</u>	<u>Circuit</u>
01	Hex bus driver, gated enable inputs for X-Y coincident bus control
02	Hex inverter bus driver, gated enable inputs for X-Y coincident bus control
03	Hex bus driver, 4-line and 2-line enable inputs
04	Hex inverter bus driver, 4-line and 2-line enable inputs

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>
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, 3990 East Broad St., Columbus, OH 43218-3990, or email <mailto:bipolar@dsc.c.dla.mil> . Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil> .

1.3 Absolute maximum ratings.

Supply voltage range .....	-0.5 V dc to 7.0 V dc
Input voltage range .....	-1.5 V dc at -12 mA to +5.5 V dc
Storage temperature range .....	-65°C to 150°C
Maximum power dissipation per gate ( $P_D$ ) per device <u>1/</u> :	
Device type 01 and 03 .....	275 mW
Device type 02 .....	550 mW
Device type 04 .....	165 mW
Lead temperature (soldering, 10 seconds) .....	+300°C
Thermal resistance, junction-to-case ( $\theta_{JC}$ ):	
Cases E and F .....	See MIL-STD-1835
Junction temperature ( $T_J$ ) .....	+175°C <u>2/</u>

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
Normalized fanout (each input) .....	20 maximum <u>3/</u>
Case operating temperature range ( $T_C$ ) .....	-55°C to +125°C

## 2. APPLICABLE DOCUMENTS

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

2.2 Government documents.

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

## DEPARTMENT OF DEFENSE 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 <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

1/ Must withstand the added  $P_D$  due to short circuit condition (e.g.  $I_{OS}$ ) at one output for five seconds duration.

2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions per method 5004 of MIL-STD-883.

3/ The device shall fanout in both high and low levels to the specified number of inputs of the same device type as that being tested.

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 shall takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Qualification. Microcircuits furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.3 and 6.3).

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 and logic diagrams. The terminal connections and logic diagrams 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 Case outlines. The case outlines shall be as specified in 1.2.3.

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. 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 2 (see MIL-PRF-38535, appendix A).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$	Device type	Limits		Unit
				Min	Max	
High-level output voltage	$V_{OH}$	$V_{CC} = 4.5\text{ V}$ , $V_{IN} = 0.8\text{ V}$ or $2.0\text{ V}$ , $I_{OH} = -2\text{ mA}$	All	2.4		V
Low-level output voltage	$V_{OL}$	$V_{CC} = 4.5\text{ V}$ , $V_{IN} = 2.0\text{ V}$ or $0.8\text{ V}$ , $I_{OL} = 32\text{ mA}$	All		0.4	V
Input clamp voltage	$V_{IC}$	$V_{CC} = 4.5\text{ V}$ , $I_{IN} = -12\text{ mA}$ , $T_C = 25^{\circ}\text{C}$	All		-1.5	V
High-level input current	$I_{IH1}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 2.4\text{ V}$	All		40	$\mu\text{A}$
High-level input current	$I_{IH2}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 5.5\text{ V}$	All		1	mA
Output clamp voltage	$V_{OC}$	$V_{CC} = 0.0\text{ V}$ , $I_{OC} = -12\text{ mA}$ , $T_C = 25^{\circ}\text{C}$	All		-1.5	V
Inhibited-state output leakage current	$I_{O1}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 2.0\text{ V}$ or $0.8\text{ V}$ , $V_{OUT} = 2.4\text{ V}$	All		40	$\mu\text{A}$
	$I_{O2}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 2.0\text{ V}$ or $0.8\text{ V}$ , $V_{OUT} = 0.4\text{ V}$	All		-40	$\mu\text{A}$
Low-level input current at A input	$I_{IL1}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 0.5\text{ V}$ , Both $\bar{G}$ inputs at $2.0\text{ V}$	All		-40	$\mu\text{A}$
Low-level input current at A input	$I_{IL2}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 0.4\text{ V}$ , Both $\bar{G}$ inputs at $0.4\text{ V}$	All		-1.6	mA
Low-level input current at $\bar{G}$ input	$I_{IL3}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 0.4\text{ V}$	All		-1.6	mA
Short-circuit output current	$I_{OS}$	$V_{CC} = 5.5\text{ V } 1/$	All	-40	-130	mA
Supply current	$I_{CC}$	$V_{CC} = 5.5\text{ V}$	01 02 03 04		85 77 85 77	mA
Propagation delay time (low-to-high level output)	$t_{PLH}$	$V_{CC} = 5.0\text{ V}$ , $R_L = 400\ \Omega$ , $C_L = 50\text{ pF} \pm 10\%$	01	2	21	ns
			02	2	22	
			03	2	21	
			04	2	22	

See footnote at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$	Device type	Limits		Unit
				Min	Max	
Propagation delay time (high-to-low level output)	$t_{\text{PHL}}$	$V_{\text{CC}} = 5.0 \text{ V}$ , $R_L = 400 \Omega$ , $C_L = 50 \text{ pF} \pm 10\%$	01	2	27	ns
			02	2	21	
			03	2	27	
			04	2	21	
Propagation delay time (disabled to high-level output)	$t_{\text{PZH}}$	$V_{\text{CC}} = 5.0 \text{ V}$ , $R_L = 400 \Omega$ , $C_L = 50 \text{ pF} \pm 10\%$	01	2	40	ns
			02	2	40	
			03	2	40	
			04	2	40	
Propagation delay time (high-level to disabled output)	$t_{\text{PHZ}}$	$V_{\text{CC}} = 5.0 \text{ V}$ , $R_L =$ (see figure 3), $C_L = 50 \text{ pF} \pm 10\%$	01	2	20	ns
			02	2	20	
			03	2	20	
			04	2	20	
Propagation delay time (disabled to low-level output)	$t_{\text{PZL}}$	$V_{\text{CC}} = 5.0 \text{ V}$ , $R_L = 400 \Omega$ , $C_L = 50 \text{ pF} \pm 10\%$	01	2	42	ns
			02	2	42	
			03	2	42	
			04	2	42	
Propagation delay time (low-level to disabled output)	$t_{\text{PLZ}}$	$V_{\text{CC}} = 5.0 \text{ V}$ , $R_L =$ (see figure 3), $C_L = 50 \text{ pF} \pm 10\%$	01	2	32	ns
			02	2	32	
			03	2	32	
			04	2	32	

1/ Not more than one output should be shorted at a 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, 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.

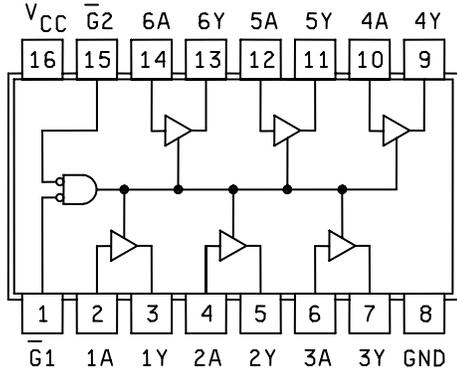
#### 4. VERIFICATION.

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.

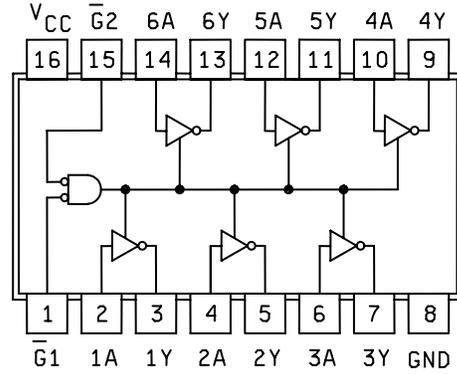
4.2 Screening. Screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

- 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.

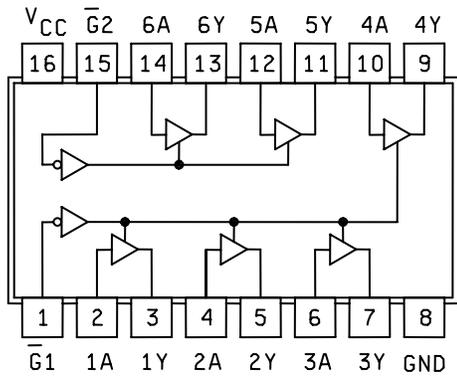
DEVICE TYPE 01



DEVICE TYPE 02



DEVICE TYPE 03



DEVICE TYPE 04

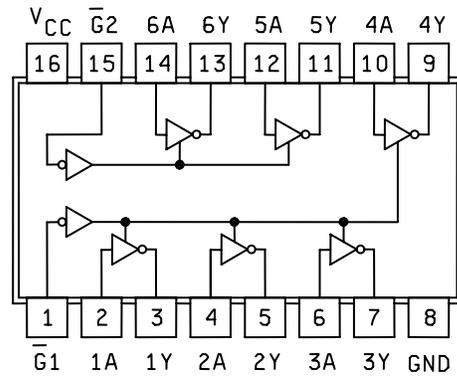


Figure 1. Terminal connections and logic diagrams.

Device type 01

Inputs			Output
$\overline{G1}$	$\overline{G2}$	A	Y
H	X	X	Z
X	H	X	Z
L	L	H	H
L	L	L	L

Device type 02

Inputs			Output
$\overline{G1}$	$\overline{G2}$	A	Y
H	X	X	Z
X	H	X	Z
L	L	H	L
L	L	L	H

Device type 03

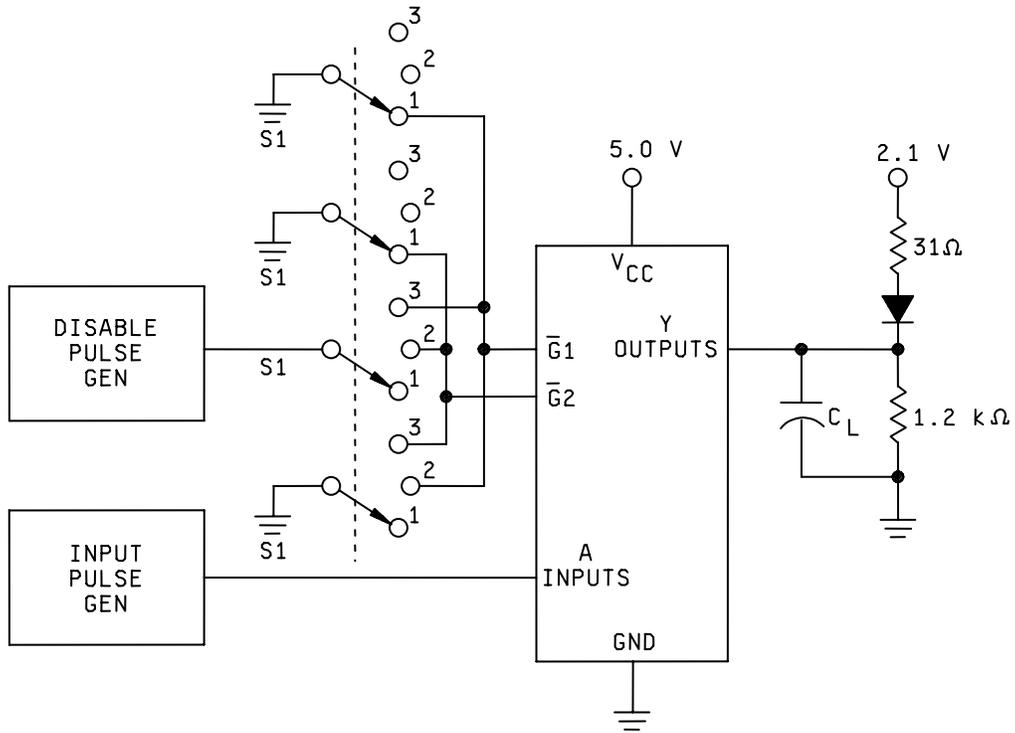
Inputs		Output
$\overline{G}$	A	Y
H	X	Z
L	H	H
L	L	L

Device type 04

Inputs		Outputs
$\overline{G}$	A	Y
H	X	Z
L	H	L
L	L	H

H = High logic level, L = Low logic level,  
X = Irrelevant, Z = high-impedance

Figure 2. Truth tables (each driver).



	S1	C <sub>L</sub>
t <sub>PLH</sub>	Pos. 1	50 pF ± 10%
t <sub>PHL</sub>	Pos. 1	50 pF ± 10%
t <sub>PHZ</sub>	Pos. 2 or 3	50 pF ± 10%
t <sub>PLZ</sub>	Pos. 2 or 3	50 pF ± 10%
t <sub>PZL</sub>	Pos. 2 or 3	50 pF ± 10%
t <sub>PZH</sub>	Pos. 2 or 3	50 pF ± 10%

Figure 3. Switching time test circuit.

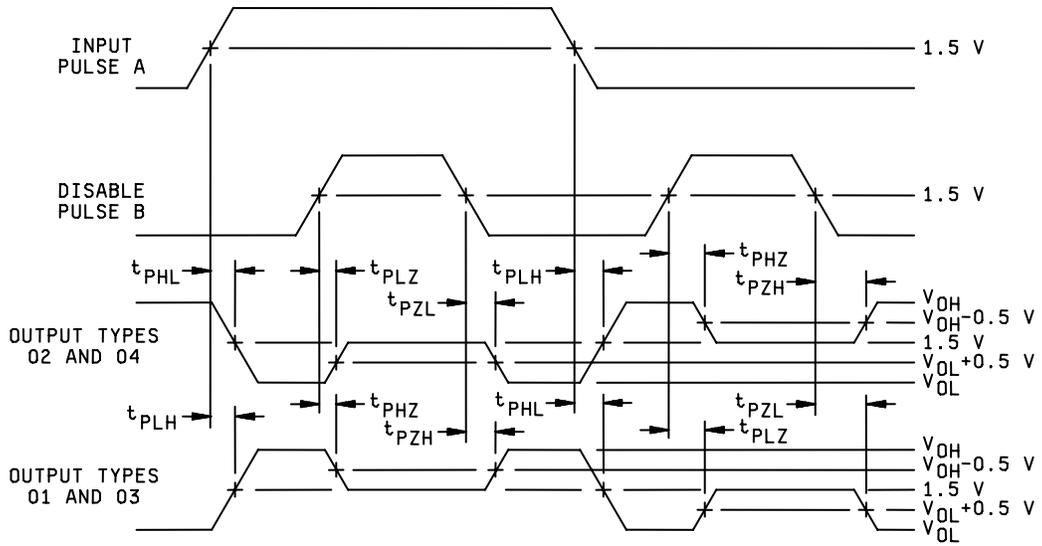


Figure 3. Switching time test circuit – Continued.

TABLE III. Group A inspection for device type 01.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit					
				Test no.	$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$		V <sub>CC</sub>	Min		Max				
1 T <sub>C</sub> =+25°C	V <sub>OH</sub>	3006	1	0.8 V	2.0 V	-2 mA														0.8 V	4.5 V	1Y	2.4		V			
			2	"	"	"	2.0 V	-2 mA													"	"	2Y	"		"		
			3	"	"	"	"	"	"													"	"	3Y	"		"	
			4	"	"	"	"	"	"													"	"	4Y	"		"	
			5	"	"	"	"	"	"													"	"	5Y	"		"	
			6	"	"	"	"	"	"													"	"	6Y	"		"	
	V <sub>OL</sub>	3007	7	"	0.8 V	32 mA															"	"	1Y		0.4	"		
			8	"	"	"	0.8 V	32 mA													"	"	2Y		"	"		
			9	"	"	"	"	"													"	"	3Y		"	"		
			10	"	"	"	"	"													"	"	4Y		"	"		
			11	"	"	"	"	"														"	"	5Y		"	"	
			12	"	"	"	"	"														"	"	6Y		"	"	
	I <sub>O1</sub>			13	2.0 V	2.0 V	2.4 V														"	5.5 V	1Y		40	μA		
				14	0.8 V	0.8 V	2.4 V															"	"	1Y		"	"	
				15	2.0 V	"	"	2.0 V	2.4 V														"	"	2Y		"	"
				16	0.8 V	"	"	"	"														"	"	2Y		"	"
				17	2.0 V	"	"	"	"	2.0 V	2.4 V												"	"	3Y		"	"
				18	0.8 V	"	"	"	"	"	"												"	"	3Y		"	"
				19	2.0 V	"	"	"	"	"	"												"	"	4Y		"	"
				20	0.8 V	"	"	"	"	"	"	2.0 V	2.4 V										"	"	4Y		"	"
				21	2.0 V	"	"	"	"	"	"	"	"										"	"	5Y		"	"
				22	0.8 V	"	"	"	"	"	"	"	"										"	"	5Y		"	"
				23	2.0 V	"	"	"	"	"	"	"	"	2.4 V	2.4 V								"	"	6Y		"	"
				24	0.8 V	"	"	"	"	"	"	"	"	"	"								"	"	6Y		"	"
	I <sub>O2</sub>			25	2.0 V	0.8 V	0.4 V														0.8 V	"	1Y		-40	"		
				26	0.8 V	2.0 V	0.4 V															2.0 V	"	1Y		"	"	
				27	2.0 V	"	"	0.8 V	0.4 V													0.8 V	"	2Y		"	"	
				28	0.8 V	"	"	"	"													"	"	2Y		"	"	
				29	2.0 V	"	"	"	"													"	"	3Y		"	"	
				30	0.8 V	"	"	"	"	0.8 V	0.4 V											"	"	3Y		"	"	
				31	2.0 V	"	"	"	"	"	"											"	"	4Y		"	"	
				32	0.8 V	"	"	"	"	"	"											"	"	4Y		"	"	
				33	2.0 V	"	"	"	"	"	"											"	"	5Y		"	"	
				34	0.8 V	"	"	"	"	"	"											"	"	5Y		"	"	
				35	2.0 V	"	"	"	"	"	"											"	"	6Y		"	"	
				36	0.8 V	"	"	"	"	"	"											"	"	6Y		"	"	
	V <sub>IC</sub>			37		-12 mA															4.5 V	"	1A		-1.5	V		
				38		"	"															"	"	2A		"	"	
				39		"	"															"	"	3A		"	"	
				40		"	"															"	"	4A		"	"	
				41		"	"															"	"	5A		"	"	
				42		"	"															"	"	6A		"	"	
				43		"	"															"	"	G1		"	"	
				44		"	"															"	"	G2		"	"	
	I <sub>IH1</sub>	3010	45	2.4 V																	5.5 V	"	G1		40	μA		
			46	"	2.4 V																"	"	1A		"	"		
			47	"	"																"	"	2A		"	"		
			48	"	"				2.4 V												"	"	3A		"	"		
			49	"	"				"												"	"	4A		"	"		
			50	"	"				"						2.4 V						"	"	5A		"	"		
			51	"	"				"						"						"	"	6A		"	"		
			52	"	"				"						"						"	"	G2		"	"		

See footnotes at end of table.

TABLE III. Group A inspection for device type 01 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit		
				Test no.	$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$		$V_{CC}$	Min		Max	
1 $T_C=+25^\circ\text{C}$	$I_{IH2}$	3010	53	5.5 V	5.5 V		5.5 V				GND								5.5 V	$\bar{G}1$		1	mA		
			54																		1A				
			55																			2A			
			56																			3A			
			57												5.5 V							4A			
			58														5.5 V					5A			
	59																	5.5 V		6A					
	60																			$\bar{G}2$					
	$I_{IL1}$	3009	61	2.0 V	0.5 V		0.5 V												2.0 V		1A		-40	$\mu\text{A}$	
			62																			2A			
			63																			3A			
			64												0.5 V							4A			
			65														0.5 V					5A			
66																0.5 V			6A						
$I_{IL2}$		67	0.4 V	0.4 V		0.4 V													0.4 V		1A		-1.6	mA	
		68																			2A				
		69																			3A				
		70												0.4 V							4A				
		71														0.4 V					5A				
72																0.4 V			6A						
$I_{IL3}$		73																		$\bar{G}1$					
		74																	0.4 V	$\bar{G}2$					
$V_{OC}$		75				-12 mA													0.0		1Y		-1.5	V	
		76							-12 mA												2Y				
		77																			3Y				
		78																			4Y				
		79																			5Y				
80																			6Y						
$I_{OS}$	3011	81	0.8 V	5.5 V	GND	5.5 V	GND	5.5 V	GND									0.8 V	5.5 V	1Y	-40	-130	mA		
		82																			2Y				
		83																			3Y				
		84																			4Y				
		85																			5Y				
		86																			6Y				
$I_{CC}$	3005	87	GND	GND		GND							GND		GND	GND	GND		$V_{CC}$			85			
2	Same tests, terminal conditions and limits as for subgroup 1, except $V_{IC}$ and $V_{OC}$ tests are omitted and $T_C = +125^\circ\text{C}$																								
3	Same tests, terminal conditions and limits as for subgroup 2, except $T_C = -55^\circ\text{C}$ .																								
9 $T_C=+25^\circ\text{C}$	$I_{PLH}$	3003 (Fig. 3)	88	GND	A	OUT	A	OUT	A	OUT	GND								GND	5.0 V	1A to 1Y	2	16	ns	
			89																			2A to 2Y			
			90																			3A to 3Y			
			91																			4A to 4Y			
			92																				5A to 5Y		
93																				6A to 6Y					

See footnotes at end of table.

TABLE III. Group A inspection for device type 01 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit			
				$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$	$V_{CC}$		Min	Max				
9 $T_c=+25^\circ\text{C}$	t <sub>PHL</sub>	3003 (Fig. 3)	94	GND	A	OUT	A	OUT	A	OUT	GND								GND	5.0 V	1A to 1Y	2	22	ns		
		"	95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
		"	96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
		"	97	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A				"	"	"	"	"	"	"
		"	98	"	"	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A		"	"	"	"	"	"	"
	"	99	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A		"	"	"	"	"	"	"	
	"	t <sub>PZH</sub>	"	100	B	3.0 V	OUT	3.0 V		3.0 V		"		3.0 V		3.0 V		3.0 V	"	"	$\bar{G}1$ to 1Y	"	35	"		
	"	t <sub>PZL</sub>	"	101	GND	GND	"	GND		GND		"		GND		GND		GND	"	"	$\bar{G}2$ to 1Y	"	37	"		
	"	t <sub>PHZ</sub>	"	102	B	3.0 V	"	3.0 V		3.0 V		"		3.0 V		3.0 V		3.0 V	B	"	$\bar{G}1$ to 1Y	"	16	"		
	"	t <sub>PLZ</sub>	"	103	B	GND	"	GND		GND		"		GND		GND		GND	"	"	$\bar{G}1$ to 1Y	"	27	"		
10 $T_c=+125^\circ\text{C}$	t <sub>PLH</sub>	"	104	GND	A	OUT	A	OUT	A	OUT	"							"	"	1A to 1Y	"	21	"			
		"	105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"		
		"	106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"		
		"	107	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A			"	"	4A to 4Y	"	"	"		
		"	108	"	"	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A	"	"	5A to 5Y	"	"	"		
	"	109	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A	"	"	6A to 6Y	"	"	"		
	t <sub>PHL</sub>	"	110	"	"	A	OUT	A	OUT	A	OUT	"							"	"	1A to 1Y	"	27	"		
		"	111	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"	
		"	112	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"	
		"	113	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A			"	"	4A to 4Y	"	"	"		
		"	114	"	"	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A	"	"	5A to 5Y	"	"	"		
	"	115	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A		"	"	6A to 6Y	"	"	"		
	t <sub>PZH</sub> t <sub>PZL</sub> t <sub>PHZ</sub> t <sub>PLZ</sub>	"	116	B	3.0 V	OUT	3.0 V		3.0 V			"		3.0 V		3.0 V		3.0 V	"	"	$\bar{G}1$ to 1Y	"	40	"		
		"	117	GND	GND	"	GND		GND			"		GND		GND		GND	"	"	$\bar{G}2$ to 1Y	"	42	"		
		"	118	B	3.0 V	"	3.0 V		3.0 V			"		3.0 V		3.0 V		3.0 V	B	"	$\bar{G}1$ to 1Y	"	20	"		
"		119	B	GND	"	GND		GND			"		GND		GND		GND	GND	"	"	$\bar{G}1$ to 1Y	"	32	"		
11	Same tests, terminal conditions, and limits as subgroup 10, except $T_c = -55^\circ\text{C}$ .																									

A = Pulse from input pulse gen.

B = Pulse from disable gen.

TABLE III. Group A inspection for device type 02.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit				
				Test no.	G1	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	G2		V <sub>CC</sub>	Min		Max			
1 T <sub>C</sub> =+25°C	V <sub>OL</sub>	3007	1	0.8 V	2.0 V	32 mA													0.8 V	4.5 V	1Y		0.4	V			
			2	"			2.0 V	32 mA												"	"	2Y		"	"		
			3	"					2.0 V												"	"	3Y		"	"	
			4	"							2.0 V										"	"	4Y		"	"	
			5	"										32 mA	2.0 V						"	"	5Y		"	"	
			6	"												32 mA	2.0 V				"	"	6Y		"	"	
	V <sub>OH</sub>	3006	7	"	0.8 V	-2 mA														"	"	1Y	2.4		"		
			8	"			0.8 V	-2 mA												"	"	2Y			"		
			9	"				0.8 V	-2 mA											"	"	3Y			"		
			10	"					0.8 V	-2 mA										"	"	4Y			"		
			11	"							0.8 V	-2 mA									"	"	5Y			"	
			12	"												-2 mA	0.8 V			"	"	6Y			"		
	I <sub>01</sub>			13	2.0 V	2.0 V	2.4 V													"	5.5 V	1Y		40	μA		
				14	0.8 V	0.8 V	2.4 V														"	"	1Y		"	"	
				15	2.0 V			2.0 V	2.4 V													"	"	2Y		"	"
				16	0.8 V			2.0 V	2.4 V													"	"	2Y		"	"
				17	2.0 V					2.0 V	2.4 V											"	"	3Y		"	"
				18	0.8 V							2.0 V	2.4 V									"	"	3Y		"	"
				19	2.0 V																	"	"	3Y		"	"
				20	0.8 V																	"	"	4Y		"	"
				21	2.0 V																	"	"	4Y		"	"
				22	0.8 V																	"	"	5Y		"	"
				23	2.0 V																	"	"	5Y		"	"
				24	0.8 V																	"	"	6Y		"	"
	I <sub>02</sub>			25	2.0 V	0.8 V	0.4 V														"	"	1Y		-40	"	
				26	0.8 V	2.0 V	0.4 V														"	"	1Y		"	"	
				27	2.0 V			0.8 V	0.4 V													"	"	2Y		"	"
				28	0.8 V			0.8 V	0.4 V													"	"	2Y		"	"
				29	2.0 V					0.8 V	0.4 V											"	"	3Y		"	"
				30	0.8 V							0.8 V	0.4 V									"	"	3Y		"	"
				31	2.0 V																	"	"	4Y		"	"
				32	0.8 V																	"	"	4Y		"	"
				33	2.0 V																	"	"	5Y		"	"
				34	0.8 V																	"	"	5Y		"	"
				35	2.0 V																	"	"	6Y		"	"
				36	0.8 V																	"	"	6Y		"	"
	V <sub>IC</sub>			37		-12 mA															4.5 V	1A		-1.5	V		
				38				-12 mA														"	"	2A		"	"
				39					-12 mA													"	"	3A		"	"
				40																		"	"	4A		"	"
				41																		"	"	5A		"	"
				42																		"	"	6A		"	"
				43	-12 mA																	"	"	G1		"	"
				44																		"	"	G2		"	"
	I <sub>IH1</sub>	3010		45	2.4 V																	5.5 V	G1		40	μA	
				46		2.4 V																"	"	1A		"	"
				47				2.4 V														"	"	2A		"	"
				48					2.4 V													"	"	3A		"	"
				49						2.4 V												"	"	4A		"	"
				50							2.4 V											"	"	5A		"	"
				51																		"	"	6A		"	"
				52																		"	"	G2		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 02 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit				
				$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$	V <sub>CC</sub>		Min	Max					
1 T <sub>C</sub> =+25°C	I <sub>IH2</sub>	3010	53	5.5 V							GND								5.5 V	$\bar{G}1$		1	mA				
			54	5.5 V																	1A						
			55					5.5 V														2A					
			56								5.5 V											3A					
			57												5.5 V							4A					
			58														5.5 V					5A					
	59																5.5 V			6A							
	60																	5.5 V		G2							
	I <sub>IL1</sub>	3009	61	2.0 V	0.5 V															2.0 V	1A		-40	μA			
			62						0.5 V												2A						
			63								0.5 V										3A						
			64											0.5 V							4A						
			65														0.5 V				5A						
66																	0.5 V			6A							
I <sub>IL2</sub>		67	0.4 V	0.4 V															0.4 V	1A		-1.6	mA				
		68						0.4 V												2A							
		69								0.4 V										3A							
		70											0.4 V							4A							
		71														0.4 V				5A							
72															0.4 V			6A									
I <sub>IL3</sub>		73																		$\bar{G}1$							
		74																	0.4 V	G2							
V <sub>OC</sub>		75				-12 mA														1Y		-1.5	V				
		76						-12mA												2Y							
		77								-12 mA										3Y							
		78											-12 mA							4Y							
		79																		5Y							
		80																		6Y							
I <sub>OS</sub>	3011	81	0.8 V	GND	GND														0.8 V	5.5 V	1Y	-40	-130	mA			
		82																			2Y						
		83						GND													3Y						
		84								GND											4Y						
		85																			5Y						
		86																			6Y						
I <sub>CC</sub>	3005	87	GND	GND																V <sub>CC</sub>		77					
2	Same tests, terminal conditions and limits as for subgroup 1, except V <sub>IC</sub> and V <sub>OC</sub> tests are omitted and T <sub>C</sub> = +125°C																										
3	Same tests, terminal conditions and limits as for subgroup 2, except T <sub>C</sub> = -55°C.																										
9 T <sub>C</sub> =+25°C	I <sub>PLH</sub>	3003 (Fig. 3)	88	GND	A	OUT					GND									GND	5.0 V	1A to 1Y	2	17	ns		
			89				A	OUT					OUT	A									2A to 2Y				
			90						A	OUT														3A to 3Y			
			91																					4A to 4Y			
			92																					5A to 5Y			
			93																					6A to 6Y			

See footnotes at end of table.

TABLE III. Group A inspection for device type 02 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit		
				$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$	$V_{CC}$		Min	Max			
9 $T_c=+25^\circ\text{C}$	t <sub>PHL</sub>	3003	94	GND	A	OUT	A	OUT	A	OUT	GND	OUT	A	OUT	A	OUT	A	$\bar{G}2$	$V_{CC}$	1A to 1Y	2	16	ns		
		"	95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"	
		"	96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"
		"	97	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4A to 4Y	"	"	"
		"	98	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5A to 5Y	"	"	"
	"	99	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6A to 6Y	"	"	"	
	t <sub>PZH</sub>	"	100	B	GND	OUT	GND	"	GND	"	"	"	GND	"	GND	"	GND	"	"	"	$\bar{G}1$ to 1Y	"	35	"	
t <sub>PZL</sub>	"	101	GND	3.0 V	"	3.0 V	"	3.0 V	"	"	"	3.0 V	"	3.0 V	"	3.0 V	B	"	"	$\bar{G}2$ to 1Y	"	37	"		
t <sub>PHZ</sub>	"	102	B	GND	"	GND	"	GND	"	"	"	GND	"	GND	"	GND	GND	"	"	$\bar{G}1$ to 1Y	"	16	"		
t <sub>PLZ</sub>	"	103	B	3.0 V	"	3.0 V	"	3.0 V	"	"	"	3.0 V	"	3.0 V	"	3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	27	"		
10 $T_c=+125^\circ\text{C}$	t <sub>PLH</sub>	"	104	GND	A	"	A	OUT	A	OUT	"	OUT	A	OUT	A	OUT	A	"	"	1A to 1Y	"	22	"		
		"	105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"	
		"	106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"	
		"	107	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4A to 4Y	"	"	"	
		"	108	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5A to 5Y	"	"	"	
	"	109	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6A to 6Y	"	"	"		
	t <sub>PHL</sub>	"	110	"	A	OUT	A	OUT	A	OUT	"	OUT	A	OUT	A	OUT	A	"	"	"	1A to 1Y	"	21	"	
		"	111	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"	
		"	112	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"	
		"	113	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4A to 4Y	"	"	"	
		"	114	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5A to 5Y	"	"	"	
	"	115	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6A to 6Y	"	"	"		
	t <sub>PZH</sub>	"	116	B	GND	OUT	GND	"	GND	"	"	"	GND	"	GND	"	GND	"	"	"	$\bar{G}1$ to 1Y	"	40	"	
t <sub>PZL</sub>	"	117	GND	3.0 V	"	3.0 V	"	3.0 V	"	"	"	3.0 V	"	3.0 V	"	3.0 V	B	"	"	$\bar{G}2$ to 1Y	"	42	"		
t <sub>PHZ</sub>	"	118	B	GND	"	GND	"	GND	"	"	"	GND	"	GND	"	GND	GND	"	"	$\bar{G}1$ to 1Y	"	20	"		
t <sub>PLZ</sub>	"	119	B	3.0 V	"	3.0 V	"	3.0 V	"	"	"	3.0 V	"	3.0 V	"	3.0 V	GND	"	"	$\bar{G}1$ to 1Y	"	32	"		
11	Same tests, terminal conditions, and limits as subgroup 10, except $T_c = -55^\circ\text{C}$ .																								

A = Pulse from input pulse gen.

B = Pulse from disable gen.

TABLE III. Group A inspection for device type 03.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit			
				Test no.	G1	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	G2		V <sub>CC</sub>	Min		Max		
1 T <sub>C</sub> =+25°C	V <sub>OH</sub>	3006	1	0.8 V	2.0 V	-2 mA														4.5 V	1Y	2.4		V		
			2	"			2.0 V	-2 mA													"	2Y	"		"	
			3	"							2.0 V	-2 mA										"	3Y	"		"
			4	"										-2 mA	2.0 V						"	4Y	"		"	
			5	"												-2 mA	2.0 V				"	5Y	"		"	
			6	"														-2 mA	2.0 V	0.8 V	"	6Y	"		"	
	V <sub>OL</sub>	3007	7	0.8 V	0.8 V	32 mA															"	1Y		0.4	V	
			8	"			0.8 V	32 mA													"	2Y			"	
			9	"					0.8 V	32 mA											"	3Y			"	
			10	"							0.8 V	32 mA									"	4Y			"	
			11	"									0.8 V	32 mA							"	5Y			"	
			12	"											0.8 V	32 mA	0.8 V	0.8 V	0.8 V	"	6Y				"	
	I <sub>O1</sub>			13	2.0 V	2.0 V	2.4 V														5.5 V	1Y		40	μA	
				14	"	0.8 V	2.4 V															"	1Y			"
				15	"			2.0 V	2.4 V													"	2Y			"
				16	"			0.8 V		2.0 V	2.4 V											"	2Y			"
				17	"							2.0 V	2.4 V									"	3Y			"
				18	"									2.0 V	2.4 V							"	3Y			"
				19	"											2.4 V	2.0 V					"	4Y			"
				20	"													2.4 V	0.8 V			"	4Y			"
				21	"																2.0 V	"	5Y			"
				22	"																	"	5Y			"
				23	"														2.4 V	2.0 V		"	6Y			"
				24	"														2.4 V	0.8 V		"	6Y			"
I <sub>O2</sub>			25	2.0 V	0.8 V	0.4 V														"	1Y		-40	"		
			26	"	2.0 V	0.4 V															"	1Y			"	
			27	"			0.8 V	0.4 V													"	2Y			"	
			28	"			2.0 V		0.4 V												"	2Y			"	
			29	"						0.8 V	0.4 V										"	3Y			"	
			30	"								0.4 V	0.4 V								"	3Y			"	
			31	"										0.4 V	0.8 V						"	4Y			"	
			32	"												0.4 V	0.8 V				"	4Y			"	
			33	"														0.4 V	0.8 V		"	5Y			"	
			34	"																2.0 V	"	5Y			"	
			35	"																	"	6Y			"	
			36	"														0.4 V	0.8 V		"	6Y			"	
V <sub>IC</sub>			37		-12 mA															4.5 V	1A		-1.5	V		
			38				-12 mA														"	2A			"	
			39																		"	3A			"	
			40																		"	4A			"	
			41																		"	5A			"	
			42																		"	6A			"	
			43																		"	G1			"	
			44			-12 mA																"	G2			"
I <sub>IH1</sub>	3010	45	2.4 V																	5.5 V	G1		40	μA		
		46	"	2.4 V																"	1A			"		
		47	"				2.4 V													"	2A			"		
		48	"							2.4 V										"	3A			"		
		49	"											2.4 V						"	4A			"		
		50	"												2.4 V					"	5A			"		
		51	"															2.4 V		"	6A			"		
		52	"																2.4 V	"	G2			"		

See footnotes at end of table.

TABLE III. Group A inspection for device type 03 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit				
				Test no.	$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$		$V_{CC}$	Min		Max			
1 $T_C = +25^\circ\text{C}$	$I_{IH2}$	3010	53	5.5 V							GND								5.5 V	$\bar{G}1$		1	mA				
			54	5.5 V																	1A						
			55																			2A					
			56						5.5 V													3A					
			57												5.5 V							4A					
			58														5.5 V					5A					
	59																5.5 V			6A							
	60																	5.5 V		$\bar{G}2$							
	$I_{IL1}$	3009	61	2.0 V	0.5 V															2.0 V	1A		-40	$\mu\text{A}$			
			62																			2A					
			63																			3A					
			64												0.5 V							4A					
			65														0.5 V					5A					
			66																0.5 V			6A					
	$I_{IL2}$		67	0.4 V	0.4 V															0.4 V	1A		-1.6	mA			
			68																		2A						
			69						0.4 V												3A						
			70											0.4 V							4A						
71															0.4 V					5A							
72																0.4 V			6A								
$I_{IL3}$		73																		$\bar{G}1$							
		74																	0.4 V	$\bar{G}2$							
$V_{OC}$		75				-12 mA														0.0	1Y		-1.5	V			
		76							-12 mA												2Y						
		77																			3Y						
		78																			4Y						
		79																			5Y						
80																			6Y								
$I_{OS}$	3011	81	0.8 V	5.5 V	GND														0.8 V	5.5 V	1Y	-40	-130	mA			
		82																			2Y						
		83																			3Y						
		84																			4Y						
		85																			5Y						
		86																			6Y						
$I_{CC}$	3005	87	GND	GND			GND													$V_{CC}$			85				
2	Same tests, terminal conditions and limits as for subgroup 1, except $V_{IC}$ and $V_{OC}$ tests are omitted and $T_C = +125^\circ\text{C}$																										
3	Same tests, terminal conditions and limits as for subgroup 2, except $T_C = -55^\circ\text{C}$ .																										
9 $T_C = +25^\circ\text{C}$	$t_{PLH}$	3003 (Fig. 3)	88	GND	A	OUT					GND									GND	5.0 V	1A to 1Y	2	16	ns		
			89																				2A to 2Y				
			90						A	OUT													3A to 3Y				
			91																					4A to 4Y			
			92																					5A to 5Y			
93																					6A to 6Y						

See footnotes at end of table.

TABLE III. Group A inspection for device type 03 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit			
				$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$	$V_{CC}$		Min	Max				
9 $T_c=+25^\circ\text{C}$	t <sub>PHL</sub>	3003 (Fig. 3)	94	GND	A	OUT	A	OUT	A	OUT	GND								GND	5.0 V	1A to 1Y	2	22	ns		
		"	95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
		"	96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
		"	97	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A				"	"	"	"	"	"	"
		"	98	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A		"	"	"	"	"	"	"
	"	99	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A		"	"	"	"	"	"	"	
	t <sub>PZH</sub>	"	100	B	3.0 V	OUT	3.0 V		3.0 V		"		3.0 V		3.0 V		3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	35	"		
t <sub>PZL</sub>	"	101	"	GND	"	GND		GND		"		GND		GND		GND	"	"	"	$\bar{G}1$ to 1Y	"	37	"			
t <sub>PHZ</sub>	"	102	"	3.0 V	"	3.0 V		3.0 V		"		3.0 V		3.0 V		3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	16	"			
t <sub>PLZ</sub>	"	103	"	GND	"	GND		GND		"		GND		GND		GND	"	"	"	$\bar{G}1$ to 1Y	"	27	"			
10 $T_c=+125^\circ\text{C}$	t <sub>PLH</sub>	"	104	GND	A	"	A	OUT	A	OUT	"							"	"	"	1A to 1Y	"	21	"		
		"	105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"	
		"	106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"	
		"	107	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A			"	"	"	4A to 4Y	"	"	"	
		"	108	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A	"	"	"	5A to 5Y	"	"	"	
	"	109	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A	"	"	"	6A to 6Y	"	"	"		
	t <sub>PHL</sub>	"	110	"	A	OUT	A	OUT	A	OUT	"								"	"	"	1A to 1Y	"	27	"	
		"	111	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"	
		"	112	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"	
		"	113	"	"	"	"	"	"	"	"	"	OUT	A	OUT	A			"	"	"	4A to 4Y	"	"	"	
		"	114	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A	"	"	"	5A to 5Y	"	"	"	
	"	115	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	A	"	"	"	6A to 6Y	"	"	"		
	t <sub>PZH</sub>	"	116	B	3.0 V	OUT	3.0 V		3.0 V		"		3.0 V		3.0 V		3.0 V	"	"	"	"	$\bar{G}1$ to 1Y	"	40	"	
t <sub>PZL</sub>		"	117	"	GND	"	GND		GND		"		GND		GND		GND	"	"	"	$\bar{G}1$ to 1Y	"	42	"		
t <sub>PHZ</sub>		"	118	"	3.0 V	"	3.0 V		3.0 V		"		3.0 V		3.0 V		3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	20	"		
t <sub>PLZ</sub>		"	119	"	GND	"	GND		GND		"		GND		GND		GND	"	"	"	$\bar{G}1$ to 1Y	"	32	"		
11	Same tests, terminal conditions, and limits as subgroup 10, except $T_c = -55^\circ\text{C}$ .																									

A = Pulse from input pulse gen.

B = Pulse from disable gen.

TABLE III. Group A inspection for device type 04.  
Terminal conditions (pins not designated may be  $H \geq 2.0$  V,  $L \leq 0.8$  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	Test limits		Unit				
				Test no.	$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$		$V_{CC}$	Min		Max			
1 $T_C=+25^\circ\text{C}$	$V_{OL}$	3007	1	0.8 V	2.0 V	32 mA														4.5 V	1Y			V			
			2	"			2.0 V	32 mA													"	2Y		0.4	"		
			3	"						2.0 V												"	3Y			"	
			4	"										32 mA								"	4Y			"	
			5	"												32 mA						"	5Y			"	
			6	"													2.0 V			0.8 V		"	6Y			"	
	$V_{OH}$	3006	7	0.8 V	0.8 V	-2 mA															"	1Y	2.4		V		
			8	"				0.8 V	-2 mA												"	2Y			"		
			9	"						0.8 V	-2 mA										"	3Y			"		
			10	"										-2 mA		0.8 V					"	4Y			"		
			11	"														-2 mA		0.8 V		"	5Y			"	
			12	"															0.8 V		0.8 V	"	6Y			"	
	$I_{O1}$			13	2.0 V	2.0 V	2.4 V														5.5 V	1Y		40	$\mu\text{A}$		
				14	"	0.8 V	2.4 V															"	2Y			"	
				15	"			2.0 V	2.4 V													"	3Y			"	
				16	"			0.8 V		2.0 V	2.4 V												"	4Y			"
				17	"							2.0 V	2.4 V										"	5Y			"
				18	"																		"	6Y			"
				19	"								0.8 V										"				"
				20	"											2.4 V	2.0 V						"				"
				21	"													2.4 V	2.0 V				"				"
				22	"																	2.0 V	"				"
				23	"															2.4 V	2.0 V		"				"
				24	"															0.8 V			"				"
	$I_{O2}$			25	2.0 V	0.8 V	0.4 V															"	1Y		-40	"	
				26	"	2.0 V	0.4 V																"	2Y			"
				27	"				0.8 V	0.4 V													"	3Y			"
				28	"				2.0 V														"	4Y			"
				29	"						0.8 V	0.4 V											"	5Y			"
				30	"																		"	6Y			"
				31	"										0.4 V	0.8 V							"				"
				32	"																		"				"
				33	"																		"				"
				34	"																		"				"
				35	"																		"				"
				36	"																		"				"
	$V_{IC}$			37		-12 mA															4.5 V	1A		-1.5	V		
				38																		"	2A			"	
				39					-12 mA													"	3A			"	
				40																		"	4A			"	
				41																		"	5A			"	
				42																		"	6A			"	
				43																		"	$\bar{G}1$			"	
				44																			"	$\bar{G}2$			"
	$I_{IH1}$	3010	45	2.4 V																	5.5 V	$\bar{G}1$		40	$\mu\text{A}$		
			46	"	2.4 V																"	1A			"		
			47	"																	"	2A			"		
			48	"				2.4 V													"	3A			"		
			49	"							2.4 V										"	4A			"		
			50	"											2.4 V						"	5A			"		
			51	"																	"	6A			"		
			52	"																	"	$\bar{G}2$			"		

See footnotes at end of table.

TABLE III. Group A inspection for device type 04 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit			
				$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$	V <sub>CC</sub>		Min	Max				
1 T <sub>C</sub> =+25°C	I <sub>IH2</sub>	3010	53	5.5 V							GND								5.5 V	$\bar{G}1$		1	mA			
			54	5.5 V																	1A					
			55					5.5 V														2A				
			56								5.5 V											3A				
			57												5.5 V							4A				
			58														5.5 V					5A				
	59																5.5 V			6A						
	60																	5.5 V		G2						
	I <sub>IL1</sub>	3009	61	2.0 V	0.5 V															2.0 V	1A		-40	μA		
			62						0.5 V												2A					
			63								0.5 V											3A				
			64											0.5 V								4A				
			65													0.5 V						5A				
66																	0.5 V				6A					
I <sub>IL2</sub>	"	"	67	0.4 V	0.4 V															0.4 V	1A		-1.6	mA		
			68						0.4 V												2A					
			69								0.4 V										3A					
			70										0.4 V								4A					
			71												0.4 V						5A					
72														0.4 V				6A								
I <sub>IL3</sub>	"	"	73																	$\bar{G}1$						
			74																0.4 V	G2						
V <sub>OC</sub>	"	"	75			-12 mA															1Y		-1.5	V		
			76						-12 mA													2Y				
			77								-12 mA											3Y				
			78										-12 mA									4Y				
			79												-12 mA							5Y				
			80														-12 mA					6Y				
I <sub>OS</sub>	3011	"	81	0.8 V	GND	GND													0.8 V	5.5 V	1Y	-40	-130	mA		
			82																			2Y				
			83					GND														3Y				
			84							GND												4Y				
			85													GND						5Y				
			86														GND					6Y				
I <sub>CC</sub>	3005	87	GND	GND			GND													V <sub>CC</sub>		77				
2	Same tests, terminal conditions and limits as for subgroup 1, except V <sub>IC</sub> and V <sub>OC</sub> tests are omitted and T <sub>C</sub> = +125°C																									
3	Same tests, terminal conditions and limits as for subgroup 2, except T <sub>C</sub> = -55°C.																									
9 T <sub>C</sub> =+25°C	I <sub>PLH</sub>	3003 (Fig. 3)	88	GND	A	OUT					GND								GND	5.0V	1A to 1Y	2	17	ns		
			89				A	OUT						OUT	A							2A to 2Y				
			90						A	OUT													3A to 3Y			
			91								A	OUT											4A to 4Y			
			92																				5A to 5Y			
			93																				6A to 6Y			

See footnotes at end of table.

TABLE III. Group A inspection for device type 04 – Continued.  
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 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	Test limits		Unit		
				$\bar{G}1$	1A	1Y	2A	2Y	3A	3Y	GND	4Y	4A	5Y	5A	6Y	6A	$\bar{G}2$	V <sub>CC</sub>		Min	Max			
9 T <sub>C</sub> =+25°C	t <sub>PHL</sub>	3003	94	GND	A	OUT	A	OUT	A	OUT	GND	OUT	A	OUT	A	OUT	A	$\bar{G}2$	V <sub>CC</sub>	1A to 1Y	2	16	ns		
		"	95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"	
		"	96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"
		"	97	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4A to 4Y	"	"	"
		"	98	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5A to 5Y	"	"	"
	"	99	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6A to 6Y	"	"	"	
	t <sub>PZH</sub>	"	100	B	GND	OUT	GND	GND	GND	GND	"	"	GND	GND	GND	GND	GND	"	"	"	$\bar{G}1$ to 1Y	"	35	"	
t <sub>PZL</sub>	"	101	"	3.0 V	"	3.0 V	3.0 V	3.0 V	3.0 V	"	"	3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	37	"						
t <sub>PHZ</sub>	"	102	"	GND	"	GND	GND	GND	GND	"	"	GND	GND	GND	GND	GND	"	"	"	$\bar{G}1$ to 1Y	"	16	"		
t <sub>PLZ</sub>	"	103	"	3.0 V	"	3.0 V	3.0 V	3.0 V	3.0 V	"	"	3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	27	"						
10 T <sub>C</sub> =+125°C	t <sub>PLH</sub>	"	104	GND	A	"	A	OUT	A	OUT	"	"	"	"	"	"	"	"	"	"	1A to 1Y	"	22	"	
		"	105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"
		"	106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"
		"	107	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4A to 4Y	"	"	"
		"	108	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5A to 5Y	"	"	"
	"	109	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6A to 6Y	"	"	"	
	t <sub>PHL</sub>	"	110	"	A	OUT	A	OUT	A	OUT	"	"	"	"	"	"	"	"	"	"	"	1A to 1Y	"	21	"
		"	111	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A to 2Y	"	"	"
		"	112	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3A to 3Y	"	"	"
		"	113	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4A to 4Y	"	"	"
		"	114	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5A to 5Y	"	"	"
	"	115	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6A to 6Y	"	"	"	
	t <sub>PZH</sub>	"	116	B	GND	OUT	GND	GND	GND	GND	"	"	GND	OUT	GND	GND	GND	"	"	"	$\bar{G}1$ to 1Y	"	40	"	
t <sub>PZL</sub>	"	117	"	3.0 V	"	3.0 V	3.0 V	3.0 V	3.0 V	"	"	3.0 V	"	3.0 V	3.0 V	3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	42	"		
t <sub>PHZ</sub>	"	118	"	GND	"	GND	GND	GND	GND	"	"	GND	"	GND	GND	GND	"	"	"	$\bar{G}1$ to 1Y	"	20	"		
t <sub>PLZ</sub>	"	119	"	3.0 V	"	3.0 V	3.0 V	3.0 V	3.0 V	"	"	3.0 V	"	3.0 V	3.0 V	3.0 V	"	"	"	$\bar{G}1$ to 1Y	"	32	"		
11	Same tests, terminal conditions, and limits as subgroup 10, except T <sub>C</sub> = -55°C.																								

A = Pulse from input pulse gen.

B = Pulse from disable gen.

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 as specified and as follows.

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

## 5. PACKAGING

5.1 Packaging requirements. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD 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

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

6.1 Intended use. Microcircuits conforming to this specification are intended for 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 acquiring activity in addition to notification of the qualifying activity, if applicable.
- f. Requirements for failure analysis (including required test condition of MIL-STD-883, method 5003), 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 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 43128-3990.

6.4 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.

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6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535 and MIL-STD-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.
$T_{PHZ}$	.....	Output disable time (of a three-state output) from high level. The time between the specified reference points on the input and output voltage waveforms with the three-state output changing from the defined high level to a high impedance (off) state.
$T_{PLZ}$	.....	Output disable time (of a three-state output) from low level. The time between the specified reference points on the input and output voltage waveforms with the three-state output changing from the defined low level to a high impedance (off) state.
$T_{PZH}$	.....	Output enable time (of a three-state output) to high level. The time between the specified reference points on the input and output voltage waveforms with the three-state output changing from a high impedance (off) state to the defined high level.
$T_{PZL}$	.....	Output enable time (of a three-state output) to low level. The time between the specified reference points on the input and output voltage waveforms with the three-state output changing from a high impedance (off) state to the defined low level.

6.6 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), 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	54365
02	54366
03	54367
04	54368

6.8 Manufacturer's designations. Manufacturer's circuit included in this specification are designated with an "X" as shown in table IV herein.

Table IV. Manufacturer's designations.

Device type	Circuits		
	A Texas Instruments	B Signetics Corp.	C National Semiconductor Corp.
01	X	X	
02	X	X	
03	X	X	
04	X	X	X

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

Custodians:

Army – CR  
Navy - EC  
Air Force - 11  
NASA - NA  
DLA – CC

Preparing activity:

DLA - CC

Project 5962-2005-041

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