INCH-POUND MIL-M-38510/316E 14 July 2003 SUPERSEDING MIL-M-38510/316D 10 December 1987

# MILITARY SPECIFICATION

# MICROCIRCUITS, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL, CASCADABLE LATCHES, 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 <u>Scope.</u> This specification covers the detail requirements for monolithic silicon, low-power Schottky TTL, latches. 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).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 should be in accordance with MIL-PRF-38535, and as specified herein.

1.2.1 <u>Device types.</u> The device types should be as follows:

Device type	<u>Circuit</u>
01	4 - bit cascadable bistable latch
02	Quad cascadable $\overline{S} - \overline{R}$ latch
03	8 - bit cascadable addressable latch
04	4 - bit cascadable bistable latch
05	8 - bit cascadable addressable latch

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

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

Outline letter	Descriptive designator	<u>Terminals</u>	Package style
Е	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
Х	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.

FSC 5962

# 1.3 Absolute maximum ratings.

Supply voltage range Input voltage range	
Storage temperature range	65° to +150°C
Maximum power dissipation ( $P_D$ ) <u>1</u> /	
Device types 01 and 04	. 66 mW
Device type 02	. 38.5 mW
Device type 03	. 198 mW
Lead temperature (soldering, 10 seconds)	. 300°C
Thermal resistance, junction to case ( $\theta_{JC}$ ):	
Cases E, F, X, and 2	. (See MIL-STD-1835)
Junction temperature (T <sub>J</sub> ) <u>2</u> /	. +175°C

# 1.4 Recommended operating conditions.

$\begin{array}{l} Supply \mbox{ voltage } (V_{CC}) \ \\ Minimum \ high \ level \ input \ voltage \ (V_{IH}) \ \\ Maximum \ low \ level \ input \ voltage \ (V_{IL}) \ \\ Normalized \ fanout \ (each \ output) \ \\ Case \ operating \ temperature \ range \ (T_C) \ \\ Setup \ time, \ t_{(SETUP)}: \\ Data \ to \ enable: \end{array}$	2.0 V 0.7 V 10 maximum
Device types 01 and 04	20 ns minimum
Data to enable $\uparrow$ :	
Device type 03	17 ns minimum
Device type 05	24 ns minumum
Address to enable $\downarrow$ :	
Device type 03 Device type 05	
Input hold time, t <sub>(HOLD)</sub> : Data to enable:	
Device type 01 and 04	o ns minimum
Data to enable 1:	
Device type 03	5 ns minimum
Device type 05	0 ns minimum
Address to enable $\downarrow$ :	
Device type 03	15 ns minimum
Device type 05	0 ns minimum

NOTE: Refers to rising  $\uparrow$  or falling  $\downarrow$  edge of the enable pulse.

<sup>1/</sup> Must withstand the added P<sub>D</sub> due to short-circuit test (e.g., I<sub>OS</sub>). 2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions in accordance with MIL-PRF-38535.

# 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.

### 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 <u>Truth table.</u> The truth table 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 <u>Electrical performance characteristics</u>. 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 <u>Electrical test requirements.</u> 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 <u>Microcircuit group assignment</u>. The devices covered by this specification shall be in microcircuit group number 10 (see MIL-PRF-38535, appendix A).

### 4. VERIFICATION

4.1 <u>Sampling and inspection</u>. 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 <u>Screening</u>. 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.
- 4.3 <u>Qualification inspection</u>. Qualification inspection shall be in accordance with MIL-PRF-38535.

4.4 <u>Technology Conformance Inspection (TCI)</u>. 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.

Test	Symbol	Conditions	Device	Lim	its	Unit
		$-55^{\circ}C \le T_C \le +125^{\circ}C$	type	Min	Max	
High level output voltage	V <sub>OH</sub>	$V_{CC} = 4.5 \text{ V}, \text{ V}_{IH} = 2.0 \text{ V}$	All	2.5		V
		$V_{IL} = 0.7 V$ , $I_{OH} = -400 \ \mu A$				
Low level output voltage	Vol	$V_{CC} = 4.5 \text{ V}, \text{ V}_{IH} = 2.0 \text{ V}$	All		0.4	V
		$V_{IL} = 0.7 V, I_{OL} = 4 mA$				
Input clamp voltage	Vic	$V_{CC} = 4.5 \text{ V}, I_{IN} = -18 \text{ mA},$ $T_{C} = +25^{\circ}\text{C}$	All		-1.5	V
Low level input current:	$I_{IL1}$	$V_{CC} = 5.5 \text{ V}, V_{IN} = 0.4 \text{ V}$	01	03	-0.42	mA
At data			04	0005	-0.4	
At $\overline{S}$ , $\overline{R}$			02	0	-0.4	
At all inputs	-		03, 05	005	-0.72	
Low level input current	I <sub>IL2</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IN} = 0.4 \text{ V}$	01	06	-1.6	mA
enable	-122		04	0	-1.6	
High level input current: At data	I <sub>IH1</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IN} = 2.7 \text{ V}$	01, 04		20	μA
$\underline{$ At $\overline{S}$ , $\overline{R}$			02		20	
	-					
At all inputs	1		03, 05		20	۸
High level input current enable	I <sub>IH2</sub>	$V_{CC} = 5.5 \text{ V}, V_{IN} = 2.7 \text{ V}$	01, 04		80	μA
High level input current: At data	I <sub>IH3</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IN} = 5.5 \text{ V}$	01, 04		100	μA
At S, R			02		100	
At all inputs			03, 05		100	
High level input current enable	I <sub>IH4</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IN} = 5.5 \text{ V}$	01, 04		400	μA
Short circuit output current	I <sub>OS</sub>	V <sub>CC</sub> = 5.5 V <u>1</u> /	All	-15	-100	mA
Supply current	I <sub>CC</sub>	V <sub>CC</sub> = 5.5 V	01, 04		12	mA
			02		7	
			03, 05		36	
Low to high level, from D input to Q output	t <sub>PLH1</sub>	$C_L = 50 \text{ pF} \pm 10\%, R_L = 2 \text{ k}\Omega \pm 5\%$ $V_{CC} = 5.0 \text{ V}$	01, 04	3	42	ns
High to low level, from D input to Q output	t <sub>PHL1</sub>		01, 04	3	29	ns
Low to high level, from	t <sub>PLH2</sub>	1	01, 04	3	32	ns
D input to $\overline{Q}$ output						
High to low level, from	t <sub>PHL2</sub>		01, 04	3	26	ns
D input to $\overline{\overline{Q}}$ output						
Low to high level, from enable input to Q output	t <sub>PLH3</sub>		01, 04	3	42	ns
High to low level, from enable input to Q output	t <sub>PHL3</sub>		01, 04	3	39	ns

# TABLE I. Electrical performance characteristics.

 $\underline{1}$ / Not more than one output should be shorted at one time.

Test	Symbol	Conditions	Device	Lim	nits	Unit
		$-55^{\circ}C \le T_{C} \le +125^{\circ}C$	type	Min	Max	
Low to high level, from	t <sub>PLH4</sub>	$C_L = 50 \text{ pF} \pm 10\%, R_L = 2 \text{ k}\Omega \pm 5\%$	01, 04	3	46	ns
enable input to Q output		$V_{CC} = 5.0 V$				
High to low level, from	t <sub>PHL4</sub>		01, 04	3	26	ns
enable input to Q output						
Low to high level, from	t <sub>PLH1</sub>		02	3	35	ns
S input to Q output						
High to low level, from	t <sub>PHL1</sub>		02	3	26	ns
S input to Q output						
High to low level, from	t <sub>PHL2</sub>		02	3	42	ns
R input to Q output						
High to low level, from	t <sub>PHL1</sub>		03	3	42	ns
clear input to Q output			05	3	30	
Low to high level, from	t <sub>PLH2</sub>		03	3	48	ns
data input to Q output		J	05	3	46	
High to low level, from	t <sub>PHL2</sub>		03	3	34	ns
data input to Q output			05	3	33	
Low to high level, from	t <sub>PLH3</sub>		03	3	56	ns
address input to Q output		]	05	3	42	
High to low level, from	t <sub>PHL3</sub>		03	3	44	ns
address input to Q output		]	05	3	42	
Low to high level, from	t <sub>PLH4</sub>		03	3	52	ns
enable input to Q output			05	3	38	
High to low level, from	t <sub>PHL4</sub>		03, 05	3	38	ns
enable input to Q output						

# TABLE I. Electrical performance characteristics - Continued.

	Subgroups (see table III)		
MIL-PRF-38535	Class S	Class B	
test requirements	devices	devices	
Interim electrical parameters	1	1	
Final electrical test parameters	1*, 2, 3, 7, 9,	1*, 2, 3, 7, 9	
	10, 11		
Group A test requirements	1, 2, 3, 7, 8,	1, 2, 3, 7, 8,	
	9, 10, 11	9, 10, 11	
Group B electrical test parameters	1, 2, 3, 9,	N/A	
when using method 5005 QCI option	10, 11		
Group C end-point electrical parameters	1, 2, 3, 9,	1, 2, 3	
	10, 11		
Group D end-point electrical parameters	1, 2, 3	1, 2, 3	

### TABLE II. Electrical test requirements.

\*PDA applies to subgroup 1.

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 <u>Group D inspection</u>. 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 <u>Methods of inspection</u>. Methods of inspection shall be specified and as follows:

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

		ymbol type 01	Pin sy Device	/mbol type 02	Pin sy Device		Pin sy Device			ymbol type 05
Pin	Case	Case	Case	Case	Case	Case	Case	Case	Case	Case
number	2, X	E, F	2, X	E, F	2, X	E, F	2, X	E, F	2, X	E, F
1	NC	1 Q	NC	1 R	NC	А	NC	1D	NC	А
2	1 Q	1D	1 R	1 <del>-</del> 5 1	А	В	1D	1 Q	А	В
3	1D	2D	1 <del>S</del> 1	1 <del>S</del> 2	В	С	1 Q	1Q	В	С
4	2D	ENBL 3-4	1 <del>S</del> 2	1Q	С	Q0	1Q	ENBL 1-2	С	Q0
5	ENBL 3-4	V <sub>cc</sub>	1Q	2R	Q0	Q1	ENBL 1-2	2Q	Q0	Q1
6	NC	3D	NC	2 S	NC	Q2	NC	2 Q	NC	Q2
7	Vcc	4D	2R	2Q	Q1	Q3	2Q	2D	Q1	Q3
8	3D	4 Q	2Š	GND	Q2	GND	2 Q	GND	Q2	GND
9	4D	4Q	2Q	3Q	Q3	Q4	2D	3D	Q3	Q4
10	4 <del>Q</del>	3Q	GND	3R	GND	Q5	GND	зQ	GND	Q5
11	NC	3Q	NC	3 <del>-</del> 5 1	NC	Q6	NC	3Q	NC	Q6
12	4Q	GND	3Q	3 <del>-</del> 5 2	Q4	Q7	3D	ENBL 3-4	Q4	Q7
13	3Q	ENBL 1-2	3R	4Q	Q5	DATA IN	зQ	4Q	Q5	DATA IN
14	3Q	2Q	3 <del>-</del> 5 1	4R	Q6	ENBL	3Q	4 Q	Q6	ENBL
15	GND	2Q	3 <del>-</del> 5 2	4 S	Q7	CLR	ENBL 3-4	4D	Q7	CLR
16	NC	1Q	NC	Vcc	NC	Vcc	NC	Vcc	NC	Vcc
17	ENBL 1-2		4Q		DATA IN		4Q		DATA IN	
18	2 Q		4 R		ENBL		4 Q		ENBL	
19	2Q		4 <del>-</del> S		CLR		4D		CLR	
20	1Q		V <sub>CC</sub>		V <sub>CC</sub>		V <sub>CC</sub>		V <sub>CC</sub>	

FIGURE 1. Terminal connections.

### Device type 01 and 04

Inp	uts	Out	puts
D	Enable	Q	IQ
L	Н	L	Н
Н	Н	H	L
X	L	Q0	Q 0

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

Q0 = the level of Q before the high-to-low transition of enable

# Device type 02

Inp	Outputs	
s†	Q	
Н	Н	Q0
L	H	Н
Н	L	L
L	L	H*

- H = high level, L = low level, Q0 = the level of Q before the indicated input conditions were established.
- \* This output level is pseudo stable; that is, it may not persist when the
- $\overline{S}$  and  $\overline{R}$  inputs return to their inactive (high) level.
- † For latches with double  $\overline{S}$  inputs:
  - $H = both \overline{S}$  inputs high
  - L = one or both  $\overline{S}$  inputs low

FIGURE 2. Truth tables.

# Device type 03 and 05

Inp	outs	Output of addressed	Each other	Function
Clear	Enable	latch	output	
Н	L	D	Qio	Addressable latch
Н	Н	Qio	Qio	Memory
L	L	D	L	8-line demultiplexer
L	н	L	L	Clear

# Latch Selection Table

S	elect inpu	uts	Latch
С	В	А	addressed
L	L	L	0
L	L	Н	1
L	н	L	2
L	н	Н	3
Н	L	L	4
Н	L	Н	5
Н	Н	L	6
Н	н	Н	7

H = high level, L = low level

Q = the level at the data input

Qio = the level of Qi (i = 0, 1, ..., 7, as appropriate) before the indicated steady-state input conditions were established.

FIGURE 2. Truth tables - Continued.

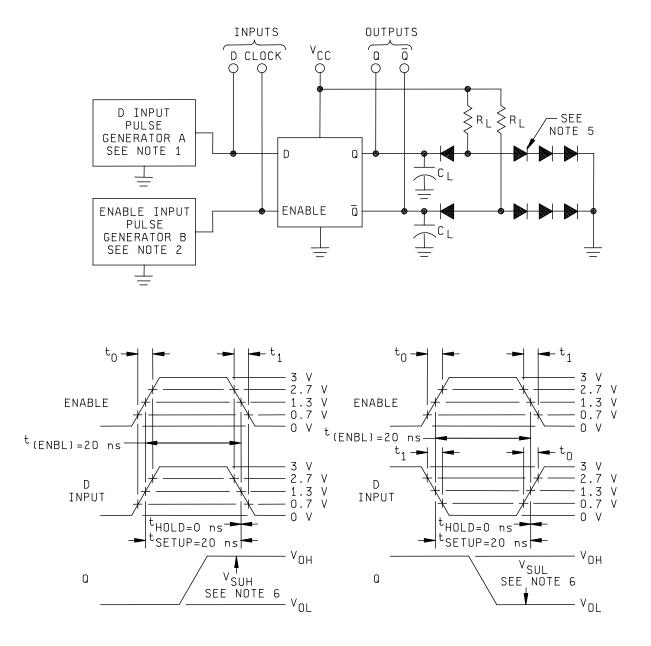
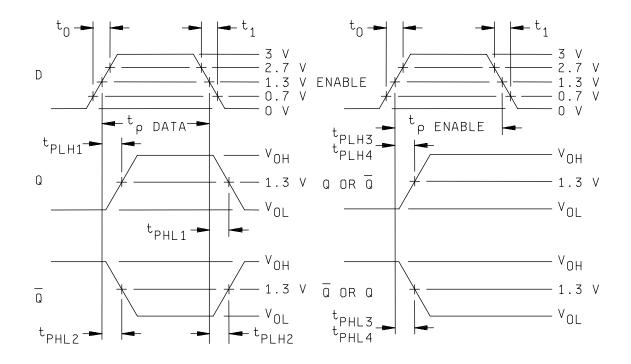


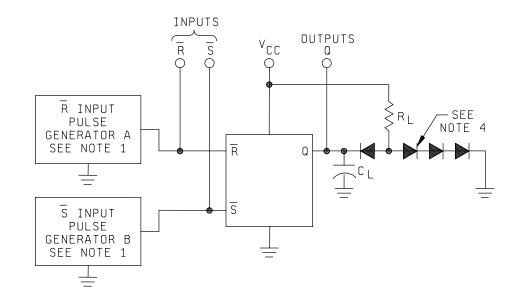
FIGURE 3. Switching test circuit and waveforms for device types 01 and 04.

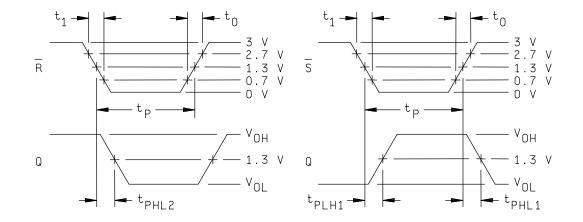


# NOTES:

- 1. The D input pulse generator has the following characteristics:  $V_{GEN} = 3 \text{ V}$ ,  $t_0 \le 15 \text{ ns}$ ,  $t_1 \le 6 \text{ ns}$ ,  $t_P = 30 \text{ ns}$ , and  $Z_{OUT} = 50\Omega$  except when measuring  $V_{SETUP}$ .
- 2. The enable pulse generator is identical to the D input pulse generator.
- 3.  $C_L = 50 \text{ pF} \pm 10\%$  and includes probe and jig capacitance.
- 4.  $R_L = 2 k\Omega \pm 5$  percent.
- 5. All diodes are 1N3064 or equivalent.
- 6. V<sub>SETUP</sub> is to be measured 500 ns minimum after input transitions to assure that the device has latched with minimum setup and maximum hold conditions applied to inputs.

FIGURE 3. Switching test circuit and waveforms for device types 01 and 04 - Continued.

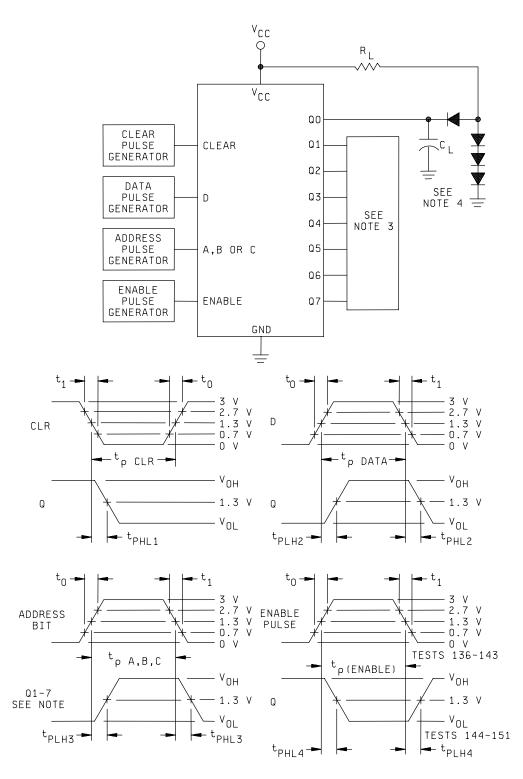




# NOTES:

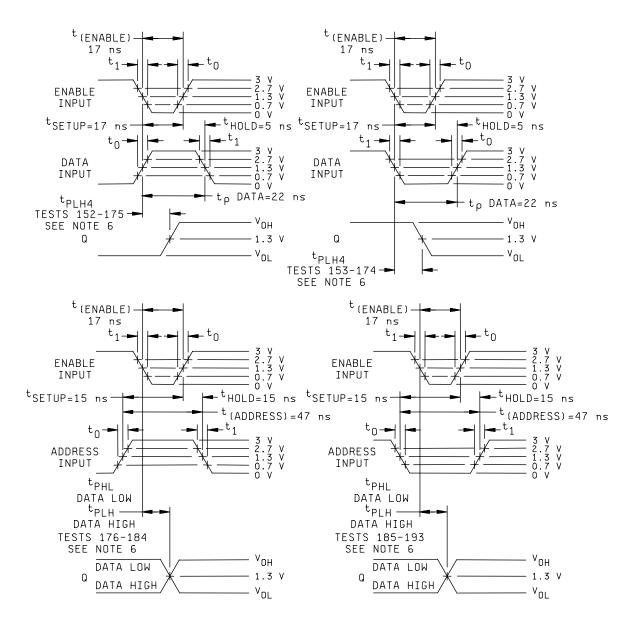
- 1.  $\overline{R}$  and  $\overline{S}$  pulse generator has the following characteristics:  $t_P = 40 \pm 10$  ns,  $t_0 \le 15$  ns,  $t_1 \le 6$  ns, and PRR  $\le 1.0$  MHz.
- 2.  $C_L = 50 \text{ pF} \pm 10\%$  and includes probe and jig capacitance.
- 3.  $R_L = 2 k\Omega \pm 5$  percent.
- 4. All diodes are 1N3064 or equivalent.

FIGURE 4. Switching test circuit and waveforms for device type 02.



NOTE: For Q0 output waveform is inverted and tPLH3 and tPHL3 are interchanged.

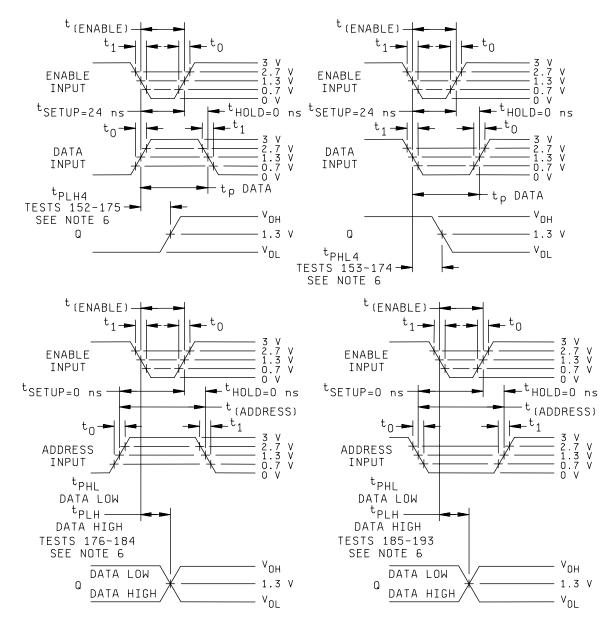
# FIGURE 5. Switching test circuit and waveforms for device types 03 and 05



### NOTES:

- 1.  $R_L = 2 k\Omega \pm 5$  percent.
- 2.  $C_L = 50 \text{ pF} \pm 10\%$  and includes probe and jig capacitance.
- 3. All loads are the same as the  $Q_0$  load.
- 4. All diodes are 1N3064 or equivalent.
- 5. The clear, enable, data, and address pulse generator have the following characteristics:  $V_{GEN} = 3 V$ ,  $t_0 \le 15 ns$ ,  $t_1 \le 6 ns$ ,  $t_P = 30 ns$ , and PRR  $\le 1 MHz$  except when measuring test nos. 152 thru 193,  $t_{P(ENABLE)} = 17 ns$ ,  $t_{P(DATA)} = 22 ns$ ,  $t_{P(ADDRESS)} = 47 ns$ , and  $t_{SETUP}$  and  $t_{HOLD}$  are as specified on the waveforms above.
- 6. Immediately prior to test 152, all outputs shall be cleared low; then beginning with test 152, test 152 thru 193 are to be performed in sequence with a wait of 500 ns minimum between each test. These tests are to assure latchup of the outputs under worst case setup and hold input conditions.

FIGURE 6. Switching test circuit and waveforms for device type 03 - Continued.



### NOTES:

- 1.  $R_L = 2 k\Omega \pm 5$  percent.
- 2.  $C_L = 50 \text{ pF} \pm 10\%$  and includes probe and jig capacitance.
- 3. All loads are the same as the  $Q_0$  load.
- 4. All diodes are 1N3064 or equivalent.
- 5. The clear, enable, data, and address pulse generator have the following characteristics:  $V_{GEN} = 3 V$ ,  $t_0 \le 15 ns$ ,  $t_1 \le 6 ns$ ,  $t_P = 30 ns$ , and PRR  $\le 1$  MHz except when measuring test nos. 152 thru 193,  $t_{P(ENABLE)} = 24 ns$ ,  $t_{P(DATA)} = 24 ns$ ,  $t_{P(ADDRESS)} = 24 ns$ , and  $t_{SETUP}$  and  $t_{HOLD}$  are as specified on the waveforms above.
- 6. Immediately prior to test 152, all outputs shall be cleared low; then beginning with test 152, test 152 thru 193 are to be performed in sequence with a wait of 500 ns minimum between each test. These tests are to assure latchup of the outputs under worst case setup and hold input conditions.

FIGURE 5. Switching test circuit and waveforms for device type 05 - Continued.

				Unit		>	-						= :		-		-	-	=	=	-	mA "	=	-	-	=	hA	-	-		=	-	=	-	mA			-	=	=	=	-	-	-	=
				ts	Max									0.4	-		-	-	-	-	-	4	-	-	-	- 6	R م	-	-	80	80	-	-	=	0.4	0.4	-100	-	-	-	-	-	-	-	12
				Limits	Min	2.5	-	-					-									4/	=	-	-	-										1	-15	-		-		-	-	-	=
				Measured terminal		IQ	10	2 Q	2Q	3 Q	3Q	4 10	4Q	۱۵	1Q	2 Q	2Q	ها ۳	3Q	4 O	4Q	Ð	02 CE	g <del>4</del>	EN 1-2	EN 3-4	2D	3D	4D	EN 1-2	10.4	2D	3D	4D	EN 1-2	EN 3-4	۲ ۱۵	10	2 <u>0</u>	2Q	3 Q	3Q	4 10	4Q	Vcc
	16	20	ო	4	d 1		-0.4 mA		_		_				4 mA											T		ľ							_			GND							
	15	19	ъ	7	2Q				-0.4 mA								4 mA						l			T		l												GND					
	14	18	9	ø	2 Q I			-0.4 mA	Ŷ							4 mA	-																						GND						
or open)	13	17	4	5	EN 1-2 2	-1	-	Ģ -			_			1/	-	4	-					4.5 V	> 0		0.4 V	+		ł		2.7 V					5.5 V		4.5 V	-	•	-				_	GND
0.7 V; c									_		_											4.	4		0					5					5.	-	4			-				_	U
Iditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V; or open).	12	15	œ	10		GND	-	-		" An		-					-	-	-	-	-		-	-	-		-	-	-	-  -	-	-	-	-				-	-	-	- -	-	-	-	=
≥ 2.0 V	1	14	10	13	n S S				•	-0.4 mA	4							4 mA				_									_										GND				
oe high	10	13	5	14	30 30						-0.4 mA								4 mA																							GND			
d may l	<b>0</b>	12	13	17	4Q							_	-0.4 mA								4 mA																							GND	
signate	Ø	10	14	18	4 10							-0.4 mA								4 mA																							GND		
i not de	7	6	15	19	4D							0.7 \	2.0 V							2.0 V	0.7 V			0.4 V		4.5 V			2.7 V					5.5 V									GND	4.5 V	GND
ns (pins	9	8	ი	12	3D					0.7 V	2.0 V							2.0 V	0.7 V				1110	r io		4.5 V		2.7 V					5.5 V								GND	4.5 V			GND
condition	5	7	16	20	V <sub>CC</sub>	4.5 V	-	-					-				-	-	-	-	-	5.5 V	=	-	-		-	-			=	-						-	-	-	-	-	-	-	=
Terminal con	4	5	12	15	EN 3-4					1/								4	-	-	-		4 5 V	4.5 V		0.4 V				7 11	× 1.7					5.5 V					4.5 V	-	-	-	GND
	б	4	7	6	2D			0.7 V	2.0 V							2.0 V	0.7 V						0.4 V		4.5 V	Ī	2.7 V			Ī		5.5 V							GND	4.5 V					GND
	0	e	~	7	1D	0.7 V	2.0 V							2.0 V	0.7 V							0.4 V	Ī		4.5 V	~ ~ ~ ~	2.1 V				55V					1	GND	4.5 V							GND
	-	7	2	e	١۵	-0.4 mA							$\vdash$	4 mA									╏			╡		T		+	T					1	GND							H	
	Type 01 Cases E. F	Cases 2, X	Type 04 Cases E. F	Cases 2, X	Test no.	1	2	ო	4	5	9	7	8		10	11	12	13	14	15	16	17	10	20	21	22	24	25	26	27	20	30	31	32	33	34	35	36	37	38	39	40	41	42	43
		<u>.</u>	MIL-STD-	883 method	1	3006	-						-	3007	-		-	-	-	=	-	3009		-	-	= 000	3010 "	=	=		=	-	-	=		=	3011	-	-	-	-	-		-	3005
			2	Symbol		V <sub>он</sub>								VoL								- IIC 4			1112	-	1H1			I <sub>H2</sub>	9	Ê			IH4	-	so								loc
				Subgroup		-	Tc = 25°C						1												L										I										_

See footnotes at end of device type 01 and 04.

				Unit		>			-	-							ns "		-		-	=		-	-	-	-	-	-	-	-	-	=	-			-	=	=	=	=	=	-
				Limits	Max	-1.5			-	-							22	07	32	20	32	20	32	20	22	25	22	25	22	25	22	25	32			. 00	۰ ع	-	=	35	-	-	-
				Lin	Min							10	) =	-	-		m =		-		=		=	-	=	-	-	-	=	-	=	-	=				-	-	=		-	-	-
				Measured terminal		1D	2D	30	4U EN 1-2	EN 3-4							1D to 1Q	1D to 1 0	2D to 2Q	2D to 2 0	3D to 3Q	3D to 3 0	4D to 4Q	4D to 4 0	1D to 1Q	1D to 1 0	2D to 2Q	2D to 2 0	3D to 3Q	3D to 3 0	4D to 4Q	4D to 4 0	EN to 1Q	EN to 2Q	EN to 3Q	EN to 4Q	EN to 10	EN to 3Q	EN to 4Q	EN to 1 G	EN to 2 G	EN to 3 0	EN to 4 G
	16	20	ო	4	10							3	-	-			INO								OUT								OUT			Ę							
	15	19	ى	7	2Q							3	-						OUT								OUT							OUT			ШO	5					
n).	14	18	g	ω	2 <u>0</u>							-	J =	= (	т	-				OUT								OUT										t			OUT		
; or ope	13	17	4	5	EN 1-2			T	-18 mA			<	с m	в	A		4.5 V		-						4.5 V	-	=						Z	z		-	zz	2		z	z		-
≤ 0.7 V; or open).	12	15	ω	10		GND				-			-	=	-	-	GND		-		=	=	=	=	=		=	-	-		=	-	=					-	=	-	=	=	-
2.0 V; low	11	14	10	13	3 Q I			+				-	J =	= ;	т	-						OUT								OUT								+				OUT	
$\wedge$ I	10	13	1	14	30				T			-	-	= ,		-					OUT								OUT						OUT			OUT					
ay be hi	6	12	13	17	4Q		-					-		= ,		-					0		OUT						0		OUT				_	OUL						-	-
nated m	8	10	44	18	IQ							-	J =	-	т	-							0	OUT							_	OUT			(	5		+	0				OUT
Terminal conditions (pins not designated may be high	7	თ	15	19	4D 4			10			omitted.	mitted.	< ◄	в	в	-							N								z					4.5 V		+	GND				GND
(pins no	6	ω	თ	12	3D			-18 mA	-		C and V <sub>IC</sub> tests are omitted.	and V <sub>IC</sub> tests are omitted.	(∢	в	ш	°C.					N	z							Z	Z					4.5 V	4		GND	$\vdash$			GND	0
ditions	5	7	16	20		4.5 V		-12	-	_	°C and V	5°C and V <sub>IC</sub> 1	> =	-	-	$d T_c = -5t$	> 0				=	-	-	-	=		-		-		=		=		4			-	-	-	-	-	-
inal con	4	ى د		15	EN 3-4 \	4.	+	+		-18 mA	$T_{c} = +125$	T <sub>C</sub> = -55°C	с ш	В	A	+125°C ar	5.				4.5 V	-	-						4.5 V		=	-			z	z		z	N			Z	Z
Term	3	4	2	о О	2D EN		-18 mA	+		-18	1, except	1, except	-	в	ш	cept T <sub>c</sub> =			z		4.						N	Z	4.					4.5 V				_			GND	-	
	2	m	-	5	1D	-18 mA	-18	+	T		subgroup	subgroup	< ◄		в	group 7 ex	z	Z							N	Z							4.5 V	4		4	GND	,		GND	U	<u> </u>	<u> </u>
		2	5	е	1 a	-15	+	╉			d limits as	d limits as	J =		т	as for sub;	ŀ	10															4.			0	و	+	$\vdash$	OUT G		-	$\left  \right $
	Type 01 Cases E, F	ases , X	Type 04 Cases E, F			44	45	46	4/ 48	49	Same tests, terminal conditions, and limits as subgroup 1, except $T_c = +125^{\circ}$	nditions, an	12	52	53	Same tests and terminal conditions as for subgroup 7 except $T_c = +125^{\circ}C$ and $T_c = -55^{\circ}C$	24	ך גנ	56	57	58	59	60	61	62		64	<b>55</b>	66	57	68	69	70	71	72	5	75 75	76	77		79	80	81
	Ca	S C			Tes	7	1		4	7	rminal con	rminal con				terminal (		4			4		9		ę	f	ę	Ŷ	e.	÷	6	Ŷ			I							<u> </u>	<u> </u>
			MIL-STD-	bol 883 method						_	e tests, tei	e tests, ter	t =		-	e tests and	300	2 FIG. 4	-	5	1	2	-	-	1		=		-		-		3				୍ = ମ୍	-	-	-	-	-	-
				oup Symbol		Vic	5°C						5°C table			Same		5°C tPHL2	tpLH1	tpHL2	tPLH1	tPHL2	tPLH1	tPHL2	tPHL1	t <sub>PLH2</sub>	t <sub>PHL1</sub>	t <sub>PLH2</sub>	tPHL1	tpHL2	tpHL1	t <sub>PLH2</sub>	tpLH3				[PHL3			tpLH4			
				Subgroup		1	Tc = 25°C				2	с <sup>с</sup>	, ≦/ Tc = 25°C			8	ດ ເ ເ	I C = 2;																									

See footnotes at end of device types 01 and 04.

TABLE III. <u>Group A inspection for device type 01 and 04</u> - Continued.

ĺ				Unit		su	-	-	-	>		-	-	-	-			ns	-	=		-	-	-		>	>	
				its	Мах	20	-	-	-					0.4	=	-	-	42	29	32	26	42	39	46	26		0.4	
				Limits	Min	ю	-	-	-	2.5	-			-	=	=	=	3	-	=	=	-	=	=	-	2.5		
				Measured terminal	1	EN to 1 0	EN to 2 G	EN to 3 G	EN to 4 0	β	2Q	3Q	4Q	1Q	2Q	3Q	4Q											
	16	20	ę	4	1a					OUT				OUT														
	15	19	2	7	2Q						OUT				OUT													
en).	14	18	ø	ω	2 Q -		OUT																					
V; or op	13	17	4	5	EN 1-2	z	z			z	N			N	N													
Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V; or open)	12	15	ω	10	GND	GND	=	-	-	-	-				-													
2.0 V; lo	11	14	10	13	ع ۵			OUT																				
e high ≥	10	13	11	14	3Q							OUT				OUT												
may b∈	6	12	13	17	4Q								OUT				OUT											
ignated	8	10	14	18	4 10				OUT												hown							
not des	2	6	15	19	4D				4.5 V				N				Z				= +125°C and test limits as shown							
ns (pins	9	8	ი	12	3D			4.5 V				N				Z					C and test							
conditio	5	7	16	20	V <sub>cc</sub>	5.0 V	-	-	-	-	-			-	=	=	=				<sub>c</sub> = +125°							= -55°C.
rminal c	4	5	12	15	EN 3-4			≥	≥			N	N			Z	Z				9, except T							except T <sub>C</sub> =
Те	3	4	7	ი	2D		4.5 V				Z				N						subgroup (							jroup 10, ∈
	2	3	-	2	1D	4.5 V				z				Z							ons as for :							as for subg
	1	2	2	ю	۔ ام	OUT															nal conditic							and limits ¿
	Type 01 Cases E, F	Cases 2, X	Type 04 Cases E, F	Cases 2, X	Test no.	82	83	84	85	86	87	88	89	06	91	92	93				Same tests and terminal conditions as for subgroup 9, except $T_{C}$							Same tests, terminal conditions and limits as for subgroup 10, except $T_c = -55^{\circ}C$
			MIL-STD-	883 method	1	3003	Fig. 3	-	=	=	-	=	=	=	-						Same tests							ts, terminal
			~			tpHL4				V <sub>SUH</sub>				V <sub>SUL</sub>					t <sub>PHL1</sub>	t <sub>PLH2</sub>			t <sub>PHL3</sub>	terua	tour 4	V <sub>SUH</sub>	V <sub>SUL</sub>	Same test
				Subgroup Symbol		6	Tc = 25°C											10	T <sub>c</sub> =125°C									11

TABLE III. <u>Group A inspection for device type 01 and 04</u> - Continued.

1/ Apply 0V/3V - 5V/0V momentary pulse 500 ns minimum prior to measurement.

2/ A = 2.4 V, B = 0.4 V.

<u>3</u>/ H≥ 1.5 V, L≤ 1.5 V.

 $\frac{4}{1}$  I<sub>IL</sub> limits are as follows:

		Min/	Min/max limits (mA)	A)	
Test	Circuit A, B	Circuit C	Circ	Circuit D	Circuit E
			Device 01	Device 01 Device 04	
I <sub>IL1</sub>	16/40	0005/40	03/40	16/40	19/42
112	64/-1.60	0/-1.20	12/-1.20	12/-1.2064/-1.60	75/-1.60

		Unit		>		=	= :			ШA	-	-		-	-	-	-	-	-	μA	-	-	-	-	-	-	-	=	-	=	-	-	-	=	-	-	-		-
ľ		lits	Мах				0.4			4/	=	=	-		-	=	=	=	=	20					-		-	-	=	100	=	=	-	=	-	-	-	-	=
		Limits	Min	2.5	-	-				4/	-	-	-	-		-	-	-	=																				
		Measured terminal		4Q	р С	a t	10	20 20	ğ	, - 5 г. –	1 S 1	1 <u>5</u> 2	2 R	2 <u>S</u>	3R1	3 S 1	3 S 2	4 F	4 S	1 R	1 <u>5</u> 1	1 <u>5</u> 2	2 R	2 <u>5</u>	зR	3 <del>5</del> 1	3 <u>5</u> 2	4 F	4 <u>5</u>	1 F	1 <del>S</del> 1	1 <u>S</u> 2	2 R	2 S	аRI В	3 <u>5</u> 1	3 <del>5</del> 2	4 F	4 S
	16	20	V <sub>cc</sub>	4.5 V		-	-			5.5 V	=	-	-	-	-	-	-	=	-		-	-		-	=	-	-	-	-	-	-	-	-	-	-	-	-	-	=
	15	19	4 <u>5</u>	1/					20.11	× 0.7								GND	0.4 V										2.7 V										5.5 V
.(L	14	18	4 E	2.0 V		ľ			1/	-1								0.4 V	GND									2.7 V										5.5 V	
or oper	13	17		-0.4 mA		Ī			1 m∆																									-					
\$ 0.7 V;	12	15	<u>5</u> 2		-i	Ī			2.0 V						GND	4.5 V	0.4 V										2.7 V										5.5 V		
Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V; or open).	~		3						_						U											٨.	2.							-			5.		
ר 2.0 ל	<del>,</del>	14	3 <u>5</u> 1		× 2.0 V			•	2.0 V						>	0.4 V	0 4.5 V				-	-		-		2.7 V								-		5.5 V			
be high	10	13	3 R -		A 2.0 V				1						0.4 V	GND	GND								2.7 V										5.5 V				
ed may	თ		3Q		-0.4 mA				4 mA																												<u> </u>		
esignat	œ	10	GND	GND		-		•		-	-	-	-	-	-	=	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
is not d	2	6	2Q		-0 4 mA	5		4 mA																													<u> </u>		
ons (pir	9	œ	2 S		1			2.0 V						0.4 V										2.7 V										5.5 V					
conditio	£	2	$_{2\overline{R}}$		201			1					0.4 V	GND									2.7 V										5.5 V						
erminal	4	5	1α			-0.4 mA	4 mA																																
	ო	4	1 <u>S</u> 2			1/	2.0 V			GND	4.5 V	0.4 V										2.7 V										5.5 V							
	7	93	1 <u>S</u> 1			2.0 V	2.0 V				0.4 V	4.5 V									2.7 V										5.5 V								
	-	2	1 R I			2.0 V	1/			0.4 V	GND	GND								2.7 V										5.5 V									
	Cases E, F	Cases 2, X	Test no.	(	2 0	4	5	91	7	ი	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
	MIL-STD-	883 method		3006		-	3007			3009	-	-		-		•	-		-	3010	-	-	-	-	•	-	-	-		-		-	•	-		-	-	=	-
ľ		Symbol		V <sub>OH</sub>			VoL			IL1										l <sub>iH1</sub>										Інз									
		Subgroup		L I	I c = 25°C					•																				-									

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See footnotes at end of device type 02.

		Unit		mA	-			>	-	-		-	=	-	=		-							su	-	-	-	-	-	-	=	-	-	-	-
		<i>(</i> )	Мах	-100	-			-1.5	-	-		-	=	-	=		-							27	-	-	-	-	-	20	=	-	-	-	-
		Limits	Min	-15	-														3/	-	-			з	=	-	-	-	-	-	=	-	=	-	=
		Measured terminal		ğ	2Q	g	p (	ות הו	5 1	5 2	2 R	2 S	3 R	S 1	S 2	١œ	IN							S 1 to 1Q	<u>S</u> 2 to 1Q	to 2Q	3 <del>S</del> 1 to 3Q	3 S 2 to 3Q	to 4Q	<u>S</u> 1 to 1Q	<u>S</u> 2 to 1Q	to 2Q	3 <del>5</del> 1 to 3Q	3 5 2 to 3Q	$4\overline{S}$ to $4Q$
							1		-	-	2	2	e	3	3	4	4		/			Т		~	15.2	2 S	3S1	351	4 S I	151	15.2	2 S	351	381	4 S
	16	20	V <sub>CC</sub>	5.5 V	-			4.5 V	=	-	-	-	=	-	=	-	=		5.0 V	-	-			5.0 V	-	-	-	-	-	-	-	-	-	-	-
	15	19	4 S I			0	GND	2									-18 mA		В	A	A	ш	B						Z						z
en).	14	18	4 1 R I				2 U V	5								-18 mA			В	в	A								GND						GND
≤ 0.7 V; or open)	13	17	4Q				GND												т	_	_	I	I						OUT						OUT
	12	15	3 <u>5</u> 2			GND	151								-18 mA				В	A		= (	в				4.5 V	N					4.5 V	z	
2.0 V; low	11	14	3 S 1			GND	1 5 \/	2						-18 mA					в	A	A	В·	A				z	4.5 V					≥	4.5 V	
$\wedge$ I	10	13	3 R			5.0 V		2					-18 mA						в	в	A						GND	GND					GND	GND	
nay be l	6	12	30			GND							•						Т	_	Ļ	H:	I				OUT	OUT					OUT	OUT	
nated n	8	10	GND	GND				-	-	-	-	-	-	-	-	-	-		GND		-		-	GND	=	-	-	-	-	-	-	-	-	-	-
ot desig	7		2Q		GND	_												e omitted.			_	т:	I	_		OUT						OUT			
ns (pins no	9	œ	۱v		GND		151					-18 mA						c tests are	B	A	A	В	B -55°C.			u Z						Z		-	
ditions	5	7	R		5.0 V G	_		-			18 mA	÷						C and V	B	в	A		- "			GND						GND	-	-	
Terminal conditions (pins not designated may be high	4	5	10 <sub>2</sub>	GND	5.		C				-18							$\Gamma_{\rm C} = +125^{\circ}$			Γ				OUT	σ				OUT	OUT	σ	-	-	
	3	4		GND G			151			-18 mA								except	, except	4			B Cent T <sub>c</sub> = -	0 0	o ⊾					4.5 V O	o N			_	-
	2	Э			_		151	-	-18 mA	-18								ubgroup.	dnoifioup 8		A		A A A	4.						IN 4.					
			2 1 <u>5</u> 1	V GND		_			-18									limits as s			1	_	s for suba		D 4.5 V						ID 4.5 V			-	
	1	s 2	JD. 1 R	5.0 V				-18 mA										ions, and		۵ ۵	A	-	nditions as	GN	GND					GND	GND		-	╞	$\parallel$
	E, F	Cases 2, X	Test no.	39	40	41	42	4	45	46	47	48	49	50	51	52	53	nal conditi	54	55	56	57	rminal con	59	60	61	62	63	64	65	99	67	68	69	70
	MIL-STD-	883 method		3011	-		3005	0000										Same tests, terminal conditions, and limits as subgroup 1, except $T_c = +125^{\circ}C$ and $V_{1c}$ tests are omitted Sense tests terminal conditions, and limits considerations 1, except $T_c = +25^{\circ}C$ and $V_{1c}$ tests are omitted		-	-		sts and te	tputri 3003 59 GND IN 4.5 V OUT	Fig. 4	-	=	-	•	=	•	-	-	-	-
		Symbol		los			-	V <sub>IC</sub>										Same te	Truth	table	tests		Same te	tPLH1						tPHL1					
		Subgroup		Ļ	Tc = 25°C													0 0	7 2/	Tc = 25°C			œ	6	Tc = 25°C										

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See footnotes at end of device type 02.

									r		
			Unit		su	-	-	-	=	=	=
			lits	Мах	32	-	-	-	35	26	42
			Limits	Min	3	-	-	-	=	=	
			Measured terminal	<u>,                                     </u>	1 E to 1Q	$2\overline{R}$ to $2Q$	3 R to 3Q	4 E to 4Q			
		16	20	V <sub>cc</sub>	5.0 V	-	-	-			
		15	19	4 S				4.5 V			
	en).	14	18	4 R I				Z			
	V; or op(	13	17	4Q				OUT			
	Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V; or open).	12	15	3 S 2			4.5 V				
ce iype i	2.0 V; lo	11	14	3 S 1			4.5 V				
IADLE III. GIOUP A INSPECTION IOI GEVICE LYPE UZ.	e high ≥	10	13	3 R I			Z				
Decilon	may be	ი	12	ЗQ			OUT				
sill a dr	ignated	8	10	GND	GND	-	-	-		shown	
<u>פ</u> וס פוס	not des	7	6	2Q		OUT				t limits as	
ADL	suid) sr	9	æ	2 S		4.5 V				<sup>o</sup> C and tes	
-	conditior	5	7	2 R		Z				Γ <sub>c</sub> = +125°	
	rminal c	4	5	1Q	OUT					9, except 7	
	Te	e	4	1 <u>5</u> 2	4.5 V					subgroup	
		2	3	1 <u>5</u> 1	4.5 V					ons as for	
		1	2	1 R	N					nal condition	
		Cases E, F	Cases 2, X	Test no.	12	72	23	74		ts and termin	
		MIL-STD- E, F	883 method		2003	Fig. 4	-	-		$_{\rm C}$ =125°C $_{\rm TeH,1}$ Same tests and terminal conditions as for subgroup 9, except T <sub>c</sub> = +125°C and test limits as shown	
			Symbol	_	t <sub>PHL2</sub>				tPLH1	t <sub>PHL1</sub>	t <sub>PHL2</sub>
			Subgroup Symbol		6	Tc = 25°C			10	T <sub>c</sub> =125°C	

12 - 120 which can be called a neutrinoid unitation of the set of a subgroup of except C = 7120 v and test initial 11 Same tests, terminal conditions and limits as for subgroup 10, except  $T_c = -55^{\circ}C$ .

<u>1</u>/ Apply a 3V - 5V  $- \int_{0} V$  momentary pulse 500 ns minimum prior to measurement.

2/A = 2.4 V, B = 0.4 V.

<u>3</u>/ H≥ 1.5 V, L≤ 1.5 V.

 $\frac{4}{1}$  I<sub>L</sub> limits are as follows:

			Mi	/lin/max limits (mA)	()		
Test	Circuit A	uit A	Circuit B	Circuit C	Circuit D	uit D	Circuit E
	Tests	Limits			Tests	Limits	
_=	9, 12,	0/-0.2	16/40	135/370	9, 12,	001/15	16/40
	14, 17				14, 17		
	10, 11, 13	0/-0.2			10, 11, 13	03/30	
	15, 16, 18				15, 16, 18		

		Unit		^			-	-	-	=	=					-	-	ШA	-		-	-	-	4	5	-		=	-	-	-	-	-	-	-	>	=	-	-	-	-	ШA	-		-	-			-
		ts	Мах								0.4		-			-	-	4/	-	-			=	20	2 =	-	-		-	100	8		-	-	-	-1.5	-	-		-		-100	-	-	-				36
		Limits	Min	2.5		-	-	-	-	-								4/	=	-	-	-	-																			-15	-	-	-				
		Measured terminal		Q0	a c	200	04	05	80	Q7	Q0	01 01	200	c G	4 7 7	c O U	07	A	в	с О	DATA IN	ENBL	8  2	4	с œ	U	DATA IN	ENBL	ª	<	ζ Δ	<u>ہ</u> م	DATA IN	ENBL	CLR	A	в	o	DATAIN	ENBL	CLR	00	Q1	Q2	Q3	Q4	05 05	07	Vcc
1	0	20	V <sub>cc</sub>	4.5 V		-	-	=	-	=	-		-			-	=	5.5 V	=		-	-	=	=	=	=	=	-	-	=	-	-	-		-	4.5 V	=	-		-	-	5.5 V	-	-	-				-
14	10	19	CLR	2.0 V		-	-	=	-	=	-		-			-	-						0.4 V						2.7 V						5.5 V						-18 mA	5.0 V		-	-				GND
n).	<u>+</u>	18	ENBL	1/		-	=	-	-	-	-		-			-	-					0.4 V						2.7 V						5.5 V						-18 mA		GND	-	-	-				=
or ope	2	17	DATA IN	2.0 V		-	-	-	-	-	0.7 V		-				-				0.4 V						2.7 V						5.5 V						-18 mA	•		5.0 V	-	-	-				GND
ditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V; or open).	7	15	Ω7							-0.4 mA				T		T	4 mA								T														•								+	GND	+
V; Iow	=	14	06						-0.4 mA	<u>-</u>		_				4 m∆																															<u>c</u>	GND	-
gh ≥ 2.0			Q5					-0 4 mA	-						×	4 mA																														!	GND		-
y be hig							mA		- -					<		4																															פֿ		_
ated may			D Q4	Q			-0.4 mA	5				_		-	4 mA																								_							GND	+		_
designat	0	10		GND		-	"	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-		-		-
ns not (	`	6	03		<	-	-0.4 IIIA						+	4 mA																														_	GND	_	+		
ions (pi	D	ω	Q2		A 0.4 m	-0.4						_	4 mA																															GND		_	_		_
I condit	n	2	ð	-	-0.4 mA							4 mA																											_				GND				_		
l erminal con	4	Ω	00	-0.4 mA							4 mA																															GND					_		
	0	4	ပ	0.7 V		-	2.0 V	- -	-	-	0.7 V		-		7 0 Z	-	-			0.4 V						2.7 V						5.5 V					-	-18 mA				GND	-	-	-	5.0 V			GND
c	V	3	ш	0.7 V	0.7 V	> 0.2	2.0 V 0.7 V	120	2.0 V	2.0 V	0.7 V	0.7 V	2.0.2	2.0 \	0.7 \	201	2.0 V		0.4 V						2.7 V						5 E //	> c.c					-18 mA					GND	GND	5.0 V	5.0 V	GND	GND	5.0 \	GND
	-	2	A	0.7 V	2.0 V	V. / V	2.U V 0.7 V	201	0.7 V	2.0 V	0.7 V	2.0 V	0.7 V	2.0 V	0.7 V	2.0 V	2.0 V	0.4 V						2 7 V	·					E E VI	V C.C					-18 mA						GND	5.0 V	GND	5.0 V	GND	5.0 V	5 0 V	GND
	E, F	Cases 2, X	Test no.	1	2 0	0	4 rC	o u	7	8	6	10	= ;	12	13	15	16	17	18	19	20	21	22	23	24	25	26	27	28	00	30	31 %	32	33	34	T		37	38	30	40	41	42	43	44	45	46	4/ 48	49
		883 method	1	3006		-	-	-	-	=	3007						-	3009	-	=	-		=	3010	2 =	-	=	-	-	=	-	-	-	-	-		1				L	3011	-	-	-		 		3005
		Symbol		V <sub>OH</sub>							V <sub>oL</sub>																				IH3					Vic	2					30							20
		Subgroup Sy			Tc = 25°C																															Ĺ													

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TABLE III. Group A inspection for device type 03.

MIL-M-38510/316E

See footnotes at end of device type 05.

		Unit																																																
		Limits	Min Max		3/	õl =	-		-		-	=	=	-	-				-	-	-	=	-	=		-	-	-	-	-					=	=	-	=					-	=	=	=		-	-	
		Measured terminal	I																																															
	16	20	V <sub>cc</sub>		501	>	-	-	-	=	-	-	-	-	-				-	-	-	-	-	-	-	-	-	=	=	-				-	=	-	-	-	=	-	-	-	-	-	=	-	-	=	-	
	15	19	CLR		α	= ۵	-	-	=	=		-	-	-	-			-	-	-	A	-		-	-	-	-			-					-	-	-	-	=	-	-		-	-	-	-	=		-	
n).	14	18	ENBL		V	< @	A	в	A	в	A	в	A	в	A	ш·	A	ю	A	в	A	-	-	-	-	-	-	-	в	A	٩	<b>л</b> -	A <	₹ α	<u>ہ</u>	τ 🗆	< m	A	×	В	A	A	в	A	A	в	A	A	в	
; or ope	13	17	DATA IN		V	τ =	-	-	-	=	-	-	-	-	-			-	-	-	-	в	-	-	-	-	-	A	=	-					-	-	-	-	-	-	-	-	-	-	-	-	-		-	
Terminal conditions (pins not designated may be high $\geq 2.0$ V; low $\leq 0.7$ V; or open).	12	15	α7		_	- 1	-	-	-	=	-		-	-	-				-	т				-	-	-		-	-	-				-	-	-	-	=	=	-	-	-	-	-	-	-	=		-	
ins (pins not designated may be high $\ge 2.0$ V; low	1	14	Q6		_		-	-	-	=	-	-	-	-	-		- :	T		-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	=	=	-	=	-	-	-	-	т	=		-	
<u>bigh≥2</u>	10	13	Q5		-		-	=	-	=	-	-	-	-	-	т.	-		-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-	=	-	-	-	т	-	-	=	-		-	
nay be	0	12	Q4		_	J =	=	=	-	=	=	-	-	т					-	=	=	-	-	-	-	-		=	=	-				-	=	=	-	=	-	т	: =	=	-	=	=	=	-		=	
gnated i	8	10	GND	ed.		-	-	-	-	=	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	=	=	-					-	-	-	-	-	-	-	-	-	-	-	-	-		-	
not desig	7	<b>б</b>	Q3	are omitte			-	-	-	=	-	т	_	-	-				-	-	=	-	-	-	-	-	-	=	=	-				-	-	-	т	=	=	-	=	-	-	=	=	=	=		-	
s (pins r	9	œ	Q2	d V <sub>IC</sub> tests	V C 10013 0	-	-	-	-	т	_	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-					= =	-	-	=	=	-	-	-	-	-	-	=	=		-	55°C.
nditions	5	7	a 1	125°C and		- 1	-	т		=	-	-	-	-	-				-	-	-	-	-	-	-	-	-	-	-	-	. :	г -		-	-	-	-	-	-	-	-	-	-	-	-	=	=		-	and $T_c = -$
ninal cc	4	5	g	ept $T_c = +$		Ξ	_	=	-	=	-	-	-	-	-				-	-	=	-	-	-	-	-	-	=	т	-				-	-	-	-	=	=	-	=	-	-	=	=	=	=		-	= +125°C
	e	4	ပ	roup 1 exc	- 400	= ۵	-	=	-	=	=	-	A	=	-			-	-	-	-	-	-	-	в	-	-	=	=	-				-	=	=	=	=	A	=	=	-	=	-	-	=	=	=	-	except T <sub>c</sub>
	7	ю	ш	s for subg		= ۵	-	-	A	=	=	-	в	=	-	= •	A		-	=	-	-	в	в	A	A	в	=	=	-				4 =	=	=	=	-	в	=	=	=	=	-	A	=	=	=	-	ubgroup 7
	-	2	A	and limits a		<u>م</u> م	A	A	в	в	A	A	в	в	A	4	8	в	A	-	-	в	A	в	A	в	A	в	=	-	A :			œ ≖	=	4	: =	-	в	=	=	A	-	-	в	-	-	A	A	is as for su
	Cases E, F	Cases 2, X	Test no.	Same tests, terminal conditions, and limits as for subgroup 1 except $T_c = +125$ °C and V <sub>1</sub> c tests are omitted. Some tests terminal modifience and limits as for subgroup 1 except $T_c = -55$ °C and V <sub>1</sub> - tests are omitted.		51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	//	70	6/ Va	00 10	0 I	83	84	85	86	87	88	89	06	91	92	93	94	95	Same tests and terminal conditions as for subgroup 7 except $T_c$ = +125°C and $T_c$ = -55°C.
	MIL-STD-	883 method	1	s, terminal	3011	+	=	=	=	=	=	-	-	=					-	=		-	-	-	-	-		=	=					-	=	=	-	-	=	-	-	-	=	-	-	=	=	=	-	s and termi
	Σ	Symbol		Same tests	Truth 1000	table	tests																																											Same tests
		Subgroup		5 6	10 2	, <u>≤</u> / Tc = 25°C																																												8

See footnotes at end of device type 05.

	Unit		ns	=	-	-	=	-	-	-		=		-		-	=		-		=	-		=			=		-		-			-			-	=	-	-	=
	lits	Max	32	-	=	-	-	=	=	-	37	= :		-		26	=		-		=	43		-			=	34	-		-		- -	20 =			-	-	-	-	=
	Limits	Min	3		-	=	=		-	-				-		-	-		-		-	-		-					-		-								=	-	
	Measured terminal		CLR to Q0	CLR to Q1	CLR to Q2	CLR to Q3	CLR to Q4	CLR to Q5	CLR to Q6	CLR to Q7	DI to Q0	DI to Q2	DI to Q3 DI to Q4	DI to Q5	DI to Q6	DI to Q0	DI to Q1	DI to Q2	DI to Q4	DI to Q5	DI to Q7	A to Q0	A to Q1	A to Q3	C to Q4	A to Q5 B to Q6	A to Q7	A to Q0	B to Q2	A to Q3	C to Q4 A to Q5	B to Q6	A to Q7	ENBL to Q0	ENBL to Q1	ENBL to Q2	ENBL to Q3	ENBL to Q4	ENBL to Q5	ENBL to Q6	
16	20	V <sub>cc</sub>	5.0 V	-	-	-	-	-	-	-		-		-		-	-		-		-	-		-			-		-		-			-			-	-	-	-	=
15	19	CLR	Z	-	-	-	-	=	=	-	GND =	= :		-		-	=		-		-			-			-							-			-	-		-	-
14	18	ENBL	<u>6</u> /	-	-	-	-	-	-	-	GND -	-		-		-	=		-		-	-		-			-		-		-		. 2	<u>-</u>			-	-	-	-	-
13	17	DATA IN	4.5 V	-	-	=	-	-	-	-	z⊧	-		-		-	-		-		-	4.5 V		-			-		-					-			-	-		-	-
12	15	Q7								OUT			T		Ē	IND					OUT						OUT					!	INO								OUT
11	14	Q6							OUT				T		OUT			T		Ē	200			l		DUT						OUT								OUT	
10	13	Q5						OUT						OUT						OUT					!	OUT					OUT								OUT		
6	12	Q4					OUT						OUT						OUT						OUT					Ŀ	Inn							OUT			
8	10	GND	GND	-	-	-	-	-	-	-				-		-	=				-	-		-			=				-	= :		-				-	-	-	=
7		03 03	0			OUT							OUT					Ξ	2					OUT						OUT							OUT				
4 5 6 7 8 9 10 11 12 13 1	ω	Q2			OUT						+	OUT						OUT ,					ΞŪ	-					OUT						ł	IND	0				
5		<u>م</u> 1		OUT							0 IT						OUT						OUT					ΤIΓ	_					ШO		5					
4			OUT	0								,				OUT						OUT						OUT					Ш		, ,						
3			GND 0	-	-	-	4.5 V				GND =	= ;	4.5 V	, ; =		GND	$\square$		4.5 V		-	GND			Z	-5 <	+	GND =			4.5 V							4.5 V	-	-	-
2	ю г			GND	4.5 V	4.5 V	GND 4	GND	4.5 V		CND CND	5 V	_	-	5 V	_		5 <		$\vdash$	5 V	+	QN N	_		_		_	Z		-	Z	_	_		4.5 V			GND	4.5 V	4.5 V
-	2						GND G	4.5 V G			GND G	++	-	-		_			-	$\vdash$	-	+	-	-		_	-	-			+		-	-					-	GND 4.	4.5 V 4.
Cases E, F	Cases 2, X	est no.			98 G		100 G	101 4.			104 G			+								120					$\mathbf{T}$											140 G	141 4.	142 G	143 4.
					6	66	10	10	10	10	1	1	Q	Ę			1				÷	1	<del>[</del> ]	1	1	÷ ÷	1	1	0	÷,	202	Ę	÷.	2001	2	1	1	1	12	1	12
MIL-STD-	ol 883 method			Fig. 5	-	=	=	-	-	-		•		•		-	-		•	• •	•	-		•	•		-		•	• •	-	• •					-	-	•	-	-
	Symbol		t <sub>PLH1</sub>	Fc = 25°C							tpLH2					teHL2						t <sub>PLH3</sub>						t <sub>PHL3</sub>					+	PLH4							

		Unit		su	-	-	-	-	=	-	-	=	=	-	-	-	-	-	-	-	-		=	-	-	-	-	-	=		-	=	=	-	-	-	-	=
- 1		lits	Max	29	-	=	-	-	=	=	=	39	29	<del>6</del> 8	68	29	68	68	29	68	<del>6</del> 8	29	90 30	30	29	39	68	29	39	30 30	29	30	39	29	66	29	68	29
		Limits	Min	3	-	-		-	-	-		"			-		-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-
		Measured terminal		ENBL to Q0		ENBL to Q2	ENBL to Q3		ENBL to Q5	ENBL to Q6	ENBL to Q7	ENBL to Q0	ENBL to Q0	ENBL to Q0	ENBL to Q1	ENBL to Q1	ENBL to Q1	ENBL to Q2	ENBL to Q2	ENBL to Q2	ENBL to Q3	ENBL to Q3	ENBL to Q3	ENBL to Q4	ENBL to Q4	ENBL to Q4	ENBL to Q5	ENBL to Q5	ENBL to Q5	ENBL to Q6	ENBL to Q6	ENBL to Q6	ENBL to Q7	ENBL to Q7	ENBL to Q7	ENBL to Q1	ENBL to Q1	
16	2	20	V <sub>cc</sub>	5.0 V	-	-	-	-	-	-	-	=	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	=
15	2	19	CLR	GND		-	-	-	-	-	=	4.5 V	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-		-	-	-	=	-	-
311). 14	:	18	ENBL	z	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	=	-	-	-	-	-	-	-	-	-	-	-	-
13 U	2	17	DATA IN	4.5 V	-		-	-		-	-	Z	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	GND	4.5 V	GND
Terrifical conditions (prins not designated rilay be ingrize 2.0 V, $10W \ge 0.7$ V, or open) 4 5 6 7 8 9 10 11 12 12 13 1	!	15	Q7								OUT																						OUT	-	-			
11 0	:	14	Qe							OUT																				OUT	-	-						
10 × z.	2	13	Q5						OUT																		OUT											
9 De l	,	12	Q4					OUT																OUT			-											
8 8	,	10		GND	=	=		-	=	=	-	-	-	-		-			-	-	-	-	=	-	-	-		-	-		=	=	-	-	-	-	-	-
		ი	03 03				OUT														OUT																	
6 III	,	æ	Q2			OUT	0											OUT	-	-	0																	
5	,	7	6 1		OUT	0									OUT	-	-	0																		OUT	-	-
111al CUI 4		5		OUT	0							OUT		-	0																					0		
3 16111	,	4		GND 0	-	-		4.5 V	-	-		GND 0		-	-	-	-	-	-		-	-	-	4.5 V	-	-	-	-	-			-	-	-	-	GND	-	-
2	1	e			GND	4.5 V	4.5 V		GND	4.5 V		GND 0		-	-	-	-	4.5 V	-		-	-		GND 4	-	-	-	-	-	4.5 V		-	-	-		GND	-	-
1		2			4.5 V G		4.5 V 4.		-			GND G	-	=	4.5 V	=		GND 4	-	=	4.5 V	-		GND	-	=	4.5 V	-		GND 4.	-	-	4.5 V	-	-	o z	=	-
ses	E, F	Cases 2, X	ö		145 4.								153			156			159			162			165			168		170 G	171			174	175		177	178
						-	-	-	-	-			1	-	1	1	1	1	-	1	1	-	-	-	-	1	1	-	-	-	-	-	-	1	1	-	1	-
	_	ool 883 method			Fig 6	-	•	-	-	-	-	4 <u>5/</u>	4	-	-		-	-	-		-	-	-	=	-	-	-	-	=	-	-	-	=		-	=	-	-
		Subgroup Symbol		9 t <sub>PHL4</sub>	Γ <sub>C</sub> = 25°C							t <sub>PLH4</sub>	tpHL4	tpLH4	tpLH4	tpHL4	tpLH4	tpLH4	tpHL4	tpLH4	tpLH4	tpHL4	t <sub>PLH4</sub>	tpLH4	tpHL4	tpLH4	tpHL4	tpLH4	tpHL4									

# MIL-M-38510/316E

See footnotes at end of device type 05.

	Unit		su	-	-	-			-	-	-	-	-	-	-	-	-	-	-	=		-	=	
	lits	Max	29	96 30	29	29	39	29	29	39	29	29	39	29	29	39	29	42	48	34	56	44	52	38
	Limits	Min	3	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-			=	
	Measured terminal		ENBL to Q2	ENBL to Q2	ENBL to Q2	ENBL to Q4	ENBL to Q4	ENBL to Q4	ENBL to Q0	ENBL to Q0	ENBL to Q0	ENBL to Q5	ENBL to Q5	ENBL to Q5	ENBL to Q3	ENBL to Q3	ENBL to Q3							
16	20	V <sub>cc</sub>	5.0 V	-	=	=	=	=	=	=	=	=	=	-	=	=	=							
15	19	CLR	4.5 V	-		-		-	-					-	-	-								
9N). 14	18	ENBL	z	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
/; or ope 13	17	DATA IN	GND	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	GND							
v≤0.7 \ 12	15	Q7																						
11 () () () () () () () () () () () () ()	14	Q6																						
Lerminal conditions (pins not designated may be high $\geq 2.0$ V; low $\leq 0.7$ V; or open) 4 5 6 7 8 9 10 11 12 13 1 1 $= 12$ 13 1	13	Q5										OUT	-	-										
<sup>9</sup> 9	12	Q4				OUT	-	-																
gnated r 8	10	GND	GND	-		-	=	-	-					-		-			uwou					
not desig	ი	Q3													OUT	-			imits as sh					
s (pins r 6	80	Q2	OUT	-															and test l					
5 5	7	6																	s = +125°C					
	5	00							OUT	-									except T <sub>c</sub>	-				
3 ler	4	ပ	GND	-	-	z	-	-	GND	-		4.5 V	-	-	z	-	-		abgroup 9	-				
2	ю	ш	z	-	-	GND	-	-	-	-		z	-	-	4.5 V	-	-		ns as for s					
-	7	A	GND		-				z	-		4.5 V	-						al condition					
Cases E, F	Cases 2, X	Test no.	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193		and termina					
MIL-STD-	883 method	<u> </u>	3003	Fig 6	I	I	<u> </u>	<u> </u>	I	I	<u> </u>	<u> </u>	I	1	<u> </u>	<u> </u>	I		Same tests and terminal conditions as for subgroup 9, except $T_c = +125^{\circ}C$ and test limits as shown					tpHL4
W			tPHL4	t <sub>PLH4</sub>	tPHL4	tPHL4	t <sub>PLH4</sub>	t <sub>PHL4</sub>	t <sub>PHL4</sub>	t <sub>PLH4</sub>	tpHL4	tPHL4	t <sub>PLH4</sub>	t <sub>PHL4</sub>	tpHL4	t <sub>PLH4</sub>	tpHL4	t <sub>PHL1</sub>		1	t <sub>PLH3</sub>	t <sub>PHL3</sub>	t <sub>PLH4</sub>	t <sub>PHL4</sub>
	Subgroup Symbol		9	Γ <sub>c</sub> = 25°C 1														10 1	T <sub>c</sub> =125°C 1					

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See footnotes at end of device type 05.

		Unit		>		=	-	-	-	-	-		-	-	-	=	-	шA	-	-	-	-	-	Ψ		=		-	-	-			-	-	-	>	-	-	-	=	-	٧w	HII	-	=	-	=		-
·		its	Max								0.4		=	-	=	=	-	4/	-	-	-		-	20	2 =	=	-	-	-	007	100		-	-	-	-1.5	-	=	-	-	-	100	2=	-	=	-	= :		36
		Limits	Min	2.5		=	-	-	-	-								4/	-	-	-	-	-																			15	2 =	-	=	-	-		
		Measured terminal	1	Q0	9 6	2 S	80 80	Q5	QG	Q7	Q0	9 6	2 2 2 0	04	05	06	Ω7	A	В	ပ	DATA IN	ENBL	<u>CLR</u>	A	: @	υ	DATA IN	ENBL	a  c	CLR.	Ā	מ ני	DATAIN	ENBL	CLR	A	в	ပ	DATA IN	ENBL		5	35	02	Q3	Q4	Q5	06 07	V <sub>cc</sub>
-	16	20	V <sub>cc</sub>	4.5 V		-	-	-	-	-	-		-	-	=	=	-	5.5 V	-	-	-	-	-	-	-	-	-	-	=					-	-	4.5 V	-	-	-	-		2 2 2	> - -	-	-	-	= 1		-
	15	19	CLR	2.0 V		=	-	-	-	-	-		-	-	=	-	-						0.4 V						2.7 V						5.5 V						-18 mA	2011	>	-	-	-	= 1		GND
-).	14	18	ENBL	1/		-	-	-	-	=	-		-	-	=	=	=					0.4 V						2.7 V						5.5 V						-18 mA			פֿיַר פֿיַר	-	=	-	= '		-
or oper	13	17	DATA	2.0 V		-	-	-		-	0.7 V		-	-	=	=	=				0.4 V						2.7 V						5.5 V						-18 mA			201	> =	-	=	-	= '		GND
iditions (pins not designated may be high $\geq 2.0$ V; low $\leq 0.7$ V; or open).	12	15	Q7 I							-0.4 mA	-						4 mA				-																		`.				-	T					+
V; Iow <u>s</u>	11		90 90						-0.4 mA	-0		+		+		4 mA	-															+											-	+				GND	,
n ≥ 2.0								Am	-			-			A																	-											-	+				Ū	+
/ be hig			Q5				PA	-0.4 mA						⊲	4 mA																												_	-			GND	_	_
ted may			0 Q4	0			-0.4 mA							4 mA																		_												╞		GND		_	
esignat	œ	10	GND	GND		-		-	-	-	-		-	=	=	-	-	-	-	-	-	-	-	-	=	-	-	-	-	-		-	-	-	-	-	-	=	-	-	-	=	=	-	-	-	-		-
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conditio	ى ع	2	6		-0.4 mA							4 mA																															GND	į					
l erminal con	4	2	8	-0.4 mA							4 mA																																ۆز						
	ო	4	ပ	0.7 V		-	2.0 V	-	-	=	0.7 V		=	V 0.5	=	=	-			0.4 V						2.7 V						257	0.00					-18 mA					פואם	-	=	5.0 V	=		GND
	2	з	В	0.7 V	0.7 V	2011	2.U V 0.7 V	0.7 V	2.0 V	2.0 V	0.7 V	0.7 V	2.0.7	0.7 V	0.7 V	2.0 V	2.0 V		0.4 V						2.7 V							5.5 V					-18 mA						UND UND	5.0 V	5.0 V	GND	GND	5.0 V	GND
	~	2	A	0.7 V	2.0 V	201	2.U V 0.7 V	2.0 V	0.7 V	2.0 V	0.7 V	2.0 V	201	0.7 V	2.0 V	0.7 V	2.0 V	0.4 V						2.7 V	i						5.5 V					-18 mA							207	GND	5.0 V	GND	5.0 V	GND	GND
ŀ	Cases E, F	Cases 2, X	Test no.	-	0 0	o ₹	5 4	9	7	8	<b>б</b>	10	10	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	00	29	31	32	33	34			37	38	39	40	44	41	43	44	45	46	47	49
-	MIL-STD-	883 method		3006		-		-		-	3007		-	-	=	-	-	3009	-	-	-			3010	2 =	-	-		-					-	-						<u> </u>	2011	=	-	=	-	-		3005
ļ	ž	Symbol		V <sub>OH</sub>							VoL							r1						.,						_	H3					Vic.	2					_	sol						8
		Subgroup S		-	Tc = 25°C																			1																									

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TABLE III. Group A inspection for device type 05.

See footnotes at end of device type 05.

		Unit																																												Π
		Limits	n Max																																											
		pe I	Min		e	ði =	-	-			=	-	-			-	-	-	-	-	-	-			-	-	-	-	-	-				-	-	-	-	-	-	-	-		: =	-	-	
		Measured terminal																																												
	16	20	V <sub>cc</sub>		501		-	-			=	-	-		-	=	-	-	=		-	-		-	-	=	-	-	=	-			-	-	-	=		-	=	-	-			-	-	
	15	19	CLR		ď	- C	-	-	-		-	-	-		-	-	-	-	A			-		-	-	-	-	-	-	-				-	-	=		-	-	-	-				-	
en).	14	18	ENBL		Δ	c m	A	в	A	8 ⊲	. 8	A	В	4 د	n <	c ۵	⊳ د	В	A		-	-		-	-	α	A د	A	в	A	۷	а <	A 4	с m	A	A	В	A	A	в	A	4 م	8 ⊲	< ⊲	( m	'
; or ope	13	17	DATA IN		A	( =	-	-	-		-	-	-			-	-	-	=	В	-	-		-	V	< =	-	-	=	-				-	-	=		-	-	-	-			-	-	
Terminal conditions (pins not designated may be high ≥ 2.0 V; Iow ≤ 0.7 V; or open)	12	15	Q7		_	1 =	=	-			=	-	-			-	-	т	=		=	-			=	-	-	-	=	-				-	-	=		-	-	-	-			-	-	
IABLE III. Group A inspection for device type us ins (pins not designated may be high $\ge 2.0$ V; low	11	14	Q6		-	1 =	-	-			=	-	-			Т	-	1 =	=		-	-		-	-	-	-	-	=	-				-	-	=		-	=	-	-	- :	т =	-	-	
igh≥2.	10	13	Q5			1 =	=	-			=	-	=	- :	с _	-	-	-	=			-			=	-	-	-	=	=				-	-	=		-	=	т	-				-	
ay be h	ი	12	Q4			1 =	=	-			=	-	н	=		=	-	-	=			-			-	=	-	=	=	=				=	-	=	н		=	-	-			-	-	
<u>A Irispe</u> nated m	8	10	GND	-	GND	-	=	-	. :		=	-	=			-	-	-	=			-			=	-	-	-	=	=				-	-	=		-	-	-	-			-	-	
<u>לווטוט</u> t design	7	6	03 03	rre omitted		, 1 =	-	-			Т		-			-	-	-	=			-				-	-	-	=	-				н	=	-			-	-	-			-	-	
DLE III. (pins no	9	8	Q2	5°C and V <sub>IC</sub> tests are omitted. C and V <sub>ic</sub> tests are omitted	1	] =	-		-	I -	1 =	-	=			=	-	-	-			_				=	-	-	=	=	- :	I -		-	-	-		-	-	-	-				-	5°C.
I AI Iditions	5	7	۵1 م	25°C and V		1 =	=	н	-		=	-	=			=	-	-	=			-			=	-	-	=	т	=				-	-	=			=	-	=			_	-	nd $T_c = -5$
inal cor	4	5	00	pt $T_c = +1$ ; of $T_c = -5$		ιI	_	-			=	-	=			-	-	-	=			-			=	Т	-	=	=	=				-	-	=			=	-	=			_	-	+125°C ai
Term	e	4	U U	up 1 exce	B - 2200	ב ב	=	-	. :		=	A	=			-	-	-	=			-	а -		-	-	-	-	=	=				-	-	A		-	-	-	-			_	-	(cept T <sub>c</sub> =
	2	3	ш	for subgro	B B	) =	-	-	A		-	в	-			c =	-	-	=		В	в	A.	< □	n =	-	-	-	=	-	A -			-	-	В			-	-	-	A -		_	-	group 7 e)
	+	2	A	l limits as	B	ы <i>ш</i>	A	A	В	8 ⊲		в	В	٩.	A a	- a		: =	-	В	A	В	۲	n <	<b>≺</b> α		-	A	=	-	<u>е</u>		. 4	< =	-	В		-	A	-	-	<u>е</u>		A	(∢	as for sub
	Cases E, F	Cases 2, X	Test no.	Same tests, terminal conditions, and limits as for subgroup 1 except $T_c = +12$ . Same tests, terminal conditions, and limits as for submound 1 except $T_c = -55$ .		51			_					_					36	_			_		-		75				-	<u>0</u> ,	+		7		_		_	62	00	2	92			ditions
			Tes	minal conc	4	, <u>s</u>	2	5	9	<u>م</u> ري	, c	2	ŝ	9	2	2	9	9	9	6	6	6	<u>`</u>	- 1	- 1			2	7	2	~	ω		ő	8	8	3	3	30	ω	5	50	סינ	σ	<u></u>	terminal c
	MIL-STD-	bol 883 method		ests, ter tests ter	h 301.		= ()	-	•		-	-	-		-	-	-	•	-	-	-	-		-	•	-	-	-	-	-	• •			-	-	-	-		-	-	-			-	•	tests and
		lp Symbol		Same	Trut	°C table																																								Same
		Subgroup		3 5	10 2	, <u>≤</u> / Tc = 25°C																																								8

See footnotes at end of device type 05.

	Unit		su	-	-	-	-	=	=	=	=		-	-			-	=			-	=			-	-			-	-			-	-		-	=		=		-	-	-	-	
	lits	Max	23	=	=	-	-	-	-	-	35		=	=			25	-	=		-	= :	- 0	32	=	-			-	=			=	=		29	=	r	-	-	-	-	=	-	
	Limits	Min	3	-	-	=	=	-		=	-		-				-		-		-	-			-	-			-	=			-	-		-	-					-	-	-	
	Measured terminal		CLR to Q0	CLR to Q1	CLR to Q2	CLR to Q3	CLR to Q4	CLR to Q5	CLR to Q6	CLR to Q7	DI to Q0		DI to Q3	DI to Q4	DI to Q5		DItoO0	DI to Q1	DI to Q2	DI to Q3	DI to Q5	DI to Q6	DI to Q7	A to Q0 A to Q1	B to Q2	A to Q3		A to U5 B to O6	A to Q7	A to Q0	A to Q1	B to Q2	C to Q4	A to Q5	B to Q6				ENBL to Q2	ENBL to Q3	ENBL to Q4				ENBL to Q7
16	20	V <sub>cc</sub>	5.0 V	=	-	-	=	-	-	=	-		-	=			-	=	-		-	= :			=	-			-	=			=	=		-	=	r	-	-	-	-	-	-	_
15	19	CLR	z	-	-	-	-	-		-	GND		=	=			-	=	-		-	= ;			-	-				-			-	-		-	-		-	-			-	-	
11 12 13 14	18	ENBL	6/	-	-	-	-	-	-	-	GND		-	=			-	=	-		-	= :			-	-				-			-	-		Z	-		-			-	-	-	
13	17	DATA	4.5 V	-	=	=	=	=	-	=	z		-	=			-	-	-		-		= 1	4.5 V "	-	-				-			-	-		-	-	-				-	-	-	
12	15	Q7								OUT		T				Ц	2						OUT						OUT						E	0		+						OUT	-
11	14	06							OUT						-							OUT						UIT 0	+						OUT			_					OUT		_
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10	13	Q5					_	OUT							OUT						OUT							5						OUT				_				OUT			
0	12	0 Q4	0				OUT							OUT						DUT							OUT						OUT					_			OUT				
œ	10	GND	GND	-	=	-	-	-	-	-	-		-	-		•	-	-	-		-				-	-			-	-	• •		-	-		-	-	-	-	-	-	-	-	-	
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4	5	ő	OUT								OUT						OUT						Ę	OUT						OUT						OUT									
ო	4	ပ	GND	-	=	-	4.5 V	-	-	-	GND		-	4.5 V			GND	-	-	4.5 V	=		-	GND GND	-	-	N	4.5 <	-	GND			Z	4.5 V		GND	-		-		4.5 V	-	-	-	
2	ю	в	GND	GND	4.5 V	4.5 V	GND	GND	4.5 V	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	4.5 V GND	GND	4.5 V	4.5 V	GND	Z	4.5 V	GND	n N N	4.5 V	GND	GND	N N N	GND	GND	N	GND	GND	1	4.5 V	4.5 V	GND	GND	4.5 V	4.5 V	> ).†
~	7	A	GND	4.5 V	GND	4.5 V	GND	4.5 V	GND	4.5 V	GND	4.5 V	4.5 V	GND	4.5 V	GND	GND	4.5 V	GND	4.5 V GND	4.5 V	GND	4.5 V	zz	GND	z	GND		Z	z	z	enu GND	GND	z	GND	ßND	4.5 V	· · · ·	GND	4.5 V	GND	4.5 V	GND	4.5 V	> 2.5
Cases E, F	Cases 2, X	Test no.	96	26	86	66	100	101	102	103	104	105	107	108	109	110	112	113	114	115 116	117	118	119	120	122	123	124	125	127	128	129	130	132	133	134	136	137		138	139	140	141	142	143	2
MIL-STD-	883 method	<u> </u>	3003	Fig. 5	-	-	-	=	-	-	-		=	-			=	-	-		-	-			-	-			-	-			-	-		-	-		-		=	-	-	-	
MIL	Symbol		t <sub>PHL1</sub>	ш							t <sub>PLH2</sub>						tours	1						tpLH3						tPHL3						t <sub>PLH4</sub>									
	Subgroup Sy		9 fr	c = 25°C							<sup>±</sup>						1-	•						+-'						±						<b>T</b>									

		Unit		su	=	-	-	-	=	=	=	=	=	-	=	-	=	-	=	-	=	-	-	=	-	-	-	=	=	-	=	-	=	=	-	=	-	=
		its	Max	29	=	-	-		=	=	-	-	-	-	-	-	-	-	-	-	-	-	-	=	-	-	-	-	-		=		-	-	-	-	-	-
		Limits	Min	3	=	-	-		=	=			-	-	-	-		-		-	-	-	-	=	-	-	-				=			-	-		-	-
		Measured terminal		ENBL to Q0	ENBL to Q1	ENBL to Q2	ENBL to Q3	ENBL to Q4	ENBL to Q5	ENBL to Q6	ENBL to Q7	ENBL to Q0	ENBL to Q0	ENBL to Q0	ENBL to Q1	ENBL to Q1	ENBL to Q1	ENBL to Q2	ENBL to Q2	ENBL to Q2	ENBL to Q3	ENBL to Q3	ENBL to Q3	ENBL to Q4	ENBL to Q4	ENBL to Q4	ENBL to Q5	ENBL to Q5	ENBL to Q5	ENBL to Q6	ENBL to Q6	ENBL to Q6	ENBL to Q7	ENBL to Q7	ENBL to Q7	ENBL to Q1	ENBL to Q1	ENBL to Q1
	16	20	V <sub>cc</sub>	5.0 V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	15	19	CLR	GND	-		-		-	-	=	4.5 V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n).	14	18	ENBL	z			-	-		-	-	z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
; or ope	13	17	DATA IN	4.5 V	-		-	-	-	-	-	z	-	-	-	-	=	-	-	-	-	-	-	-	-	-	-	-	=	-	-	-	=	-	-	GND	4.5 V	GND
ns (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V	12	15	α7								OUT																						OUT	-	-			
Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V; or open)	11	14	Q6							OUT																				OUT	-							
gh ≥ 2.(	10	13	Q5						OUT	0																	OUT	-	-	0								
ay be hi	<u> </u>	12	Q4 0					OUT	0															OUT			0											
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	e	4		GND C	-	•		0 4.5 V	-	- >		GND 0	-	-	-	-	-	" ^	-	-	-	-		0 4.5 V	-	-	-	-	-	•	-	=	-	-		GND	-	-
	0	с С			/ GND	-			-			GND	-	-	. /	-		0 4.5 V	=	-		-		GND	-	-		=		4.5 V	-	=		-	-	GND	-	-
	-	5				GND	4.5 V	GND	4.5 V	GND	4.5 V	GND	-	-	4.5 V	-	-	GND	-	-	4.5 V	-	-	GND	-	-	4.5 V	-	-	GND	-	-	4.5 V	-	-	Z	=	-
	Cases E, F	Cases 2, X	Test no.	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178
	MIL-STD-	883 method		3003	Fig 5						-	" <u>5</u> /	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-
		Symbol		tpHL4								t <sub>PLH4</sub>	tpHL4	t <sub>PLH4</sub>	t <sub>PLH4</sub>	t <sub>PHL4</sub>	t <sub>PLH4</sub>	tpLH4	tpHL4	t <sub>PLH4</sub>	t <sub>PLH4</sub>	t <sub>PHL4</sub>	tpLH4	tpLH4	tpHL4	t <sub>PLH4</sub>	tpLH4	t <sub>PHL4</sub>	t <sub>PLH4</sub>	tpLH4	tPHL4	t <sub>PLH4</sub>	t <sub>PLH4</sub>	t <sub>PHL4</sub>	t <sub>PLH4</sub>	t <sub>PHL4</sub>	tpLH4	tpHL4
		Subgroup		ი	$T_{\rm C}=25^{\circ}{\rm C}$															-																		

See footnotes at end of device type 05.

		Unit		su	=	=	=	-	=	-	-	-	-	-	=	-	=	-	-	-	=	-	=	=	=	
		ts	Max	29	-	-	=	-	-	-	-	-	-	-	-	-	-	-	30	46	33	42	42	38	38	
		Limits	Min	ю	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	=	=	=	=	=		
		Measured terminal		ENBL to Q2	ENBL to Q2	ENBL to Q2	ENBL to Q4	ENBL to Q4	ENBL to Q4	ENBL to Q0	ENBL to Q0	ENBL to Q0	ENBL to Q5	ENBL to Q5	ENBL to Q5	ENBL to Q3	ENBL to Q3	ENBL to Q3								
	16	20	V <sub>cc</sub>	5.0 V	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
	15	19	CLR	4.5 V	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
en).	14	18	ENBL	z	-	-	=	-	-	-	-	-	-	-	-	-	-	-								
V; or op	13	17	DATA IN	GND	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	GND	GND	4.5 V	GND								
Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.7$ V; or open)	12	15	Q7																							
2.0 V; lo	11	14	80 80																							
e high ≥ 2	10	13	Q5										OUT	-	-											
may be	თ	12	Q4				OUT	-	-																	
ignated	ω	10	GND	GND	-	-	-	-	-	-	-	-	-	-	-	-	-	-		hown						
not desi	7	6	Q3													OUT	-	-		limits as s						
s (pins	g	ω	Q2	OUT	-	-														+125°C and test limits as shown						
ondition	ъ	7	a 1																	c = +125°	,					= -55°C.
minal c	4	2	<b>0</b> 0							OUT	-	-								), except T	-					xcept T <sub>C</sub> =
Tei	ო	4	ပ	GND	-	-	Z	-	-	GND	-	-	4.5 V	-	-	Z	-	-		subgroup 5	-					roup 10, e
	5	ю	Ф	Z	-	-	GND	-	-		-	-	Z	-	-	4.5 V	-	-		ins as for s						as for subg
	-	2	A	GND	-	-	-	-	-	z	-	-	4.5 V	-	-	-	-	-		al conditio						and limits a
	Cases E, F	Cases 2, X	Test no.	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193		Same tests and terminal conditions as for subgroup 9, except $T_{\rm C}$ =						conditions a
	MIL-STD-	883 method	1	3003	Fig 5		]			1										Same tests						Same tests, terminal conditions and limits as for subgroup 10, except $T_{\rm C}$ = -55°C.
	_	Symbol		t <sub>PHL4</sub>	t <sub>PLH4</sub>	tPHL4	tpHL4	t <sub>PLH4</sub>	t <sub>PHL4</sub>	t <sub>PHL4</sub>	t <sub>PLH4</sub>	tPHL4	tPHL4	t <sub>PLH4</sub>	t <sub>PHL4</sub>	t <sub>PHL4</sub>	t <sub>PLH4</sub>	t <sub>PHL4</sub>	tpHL1			tpi.H3	tpHL3	t <sub>PLH4</sub>	tpHL4	Same tes
		Subgroup Symbol		6	$T_{\rm C}=25^{\circ}{\rm C}$														10	T <sub>C</sub> =125°C	)					11

1/ Apply a 3V/0V/3V momentary pulse 500 ns minimum prior to measurements.

<u>2</u>/ A = 2.4 V, B = 0.4 V.

 $\underline{4}$ / I<sub>IL</sub> limits are as follows: <u>3</u>/ H≥ 1.5 V, L≤ 1.5 V.

		Min/max limits (mA)	mits (mA)	
Symbol	Circuit B, C	t B, C	С	Circuit A
	Device 03	ie 03	De	Device 05
ارر	12/36	36		16/40
	Test 21	005/72	Test 21	005/-0.20

 $\overline{5}$ / See note 6 of figure 5.

4.5V — 1.5v momentary pulse prior to each test. 0V <u>6</u>/ Apply

# 5. PACKAGING

5.1 <u>Packaging requirements.</u> 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

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

6.1 <u>Intended use.</u> 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 <u>Superseding information</u>. 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 <u>Qualification</u>. 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 <u>Abbreviations, symbols, and definitions.</u> The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535, MIL-HDBK-1331, and as follows:

GND	Ground zero voltage potential.
I <sub>IN</sub>	Current flowing into an input terminal.
V <sub>IN</sub>	
V <sub>SUH</sub>	Setup high
V <sub>SUL</sub>	Setup low

6.6 <u>Logistic support</u>. Lead materials and finishes (see 3.4) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.

6.7 <u>Substitutability.</u> 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	Generic-industry
type	type
01	54LS75
02	54LS279
03	54LS259
04	54LS375
05	54LS259B

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

			CIRCUITS		
	А	В	С	D	E
Device type	Texas Instruments	Motorola Inc.	Fairchild Co.	Signetics Corp.	National Semconductor
01	Х	Х		Х	Х
02	Х	Х	Х	Х	Х
03	Х	Х	Х		Х
04	X	Х	Х	Х	
05	Х				

TABLE IV. Manufacturer's designator.

6.9 <u>Changes from previous issue</u>. 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 5962-1965)

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

STANDARDIZ	ATION DOCUMENT IMPI		OSAL
1. The preparing activity must complete block	<b>INSTRUCTIONS</b> ts 1, 2, 3, and 8. In block 1, both the	document number and rev	ision letter should be given.
2. The submitter of this form must complete b	locks 4, 5, 6, and 7, and send to pre	paring activity.	
3. The preparing activity must provide a reply	within 30 days from receipt of the fc	orm.	
NOTE: This form may not be used to reques Comments submitted on this form do not cons contractual requirements.			
I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-M-38510/316E		IT DATE (YYYYMMDD) 3-07-14
3. DOCUMENT TITLE MICROCIRCUITS, DIGITAL, BIPOLAR	R, LOW-POWER SCHOTTKY T	L, CASCADABLE LATC	CHES, MONOLITHIC SILICON
4. NATURE OF CHANGE (Identify paragraph i			
5. REASON FOR RECOMMENDATION			
6. SUBMITTER a. NAME (Last, First Middle Initial)	b. ORGANIZ	ATION	
c. ADDRESS (Include Zip Code)	d. TELEPHO (1) Commerc (2) DSN ( <i>If applica</i> )		7. DATE SUBMITTED (YYYYMMDD)
8. PREPARING ACTIVITY			
a. NAME Defense Supply Center, Columbus		NE <i>(Include Area Code</i> ial 614-692-0536	(2) DSN 850-0536
c. ADDRESS (Include Zip Code) DSCC-VA P. O. Box 3990 Columbus, Ohio 43216-5000	Defense St 8725 John Fort Belvoir	OT RECEIVE A REPLY WI andardization Program Offi J. Kingman Road, Suite 25: , Virginia 22060-6221 (703)767-6888 DSN 427-	33 `
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