

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 Scope. 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).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 Device types. The device types should be as follows:

<u>Device type</u>	<u>Circuit</u>
01	4 - bit cascadable bistable latch
02	Quad cascadable $\bar{S}$ - $\bar{R}$ 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:

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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, P. O. Box 3990, Columbus, OH 43216-5000, by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 5962

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

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V to 7.0 V
Input voltage range	-1.5 V at -18 mA to 5.5 V
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 (θ_{JC}):	
Cases E, F, X, and 2	(See MIL-STD-1835)
Junction temperature (T_J) <u>2/</u>	+175°C

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	4.5 V minimum to 5.5 V maximum
Minimum high level input voltage (V_{IH})	2.0 V
Maximum low level input voltage (V_{IL})	0.7 V
Normalized fanout (each output)	10 maximum
Case operating temperature range (T_C)	-55°C to +125°C
Setup time, $t_{(SETUP)}$:	
Data to enable:	
Device types 01 and 04	20 ns minimum
Data to enable $\uparrow$:	
Device type 03	17 ns minimum
Device type 05	24 ns minimum
Address to enable $\downarrow$:	
Device type 03	15 ns minimum
Device type 05	0 ns minimum
Input hold time, $t_{(HOLD)}$:	
Data to enable:	
Device type 01 and 04	0 ns minimum
Data to enable $\uparrow$:	
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.

1/ Must withstand the added P_D due to short-circuit test (e.g., I_{OS}).

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

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

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

3.7 Marking. Marking shall be in accordance with MIL-PRF-38535.

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 10 (see MIL-PRF-38535, appendix A).

4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

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

- a. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.
- b. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.
- c. Additional screening for space level product shall be as specified in MIL-PRF-38535, appendix B.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.

4.4 Technology Conformance Inspection (TCI). Technology conformance inspection shall be in accordance with MIL-PRF-38535 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table III of MIL-PRF-38535 and as follows:

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

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C	Device type	Limits		Unit
				Min	Max	
High level output voltage	V _{OH}	V _{CC} = 4.5 V, V _{IH} = 2.0 V V _{IL} = 0.7 V, I _{OH} = -400 μA	All	2.5		V
Low level output voltage	V _{OL}	V _{CC} = 4.5 V, V _{IH} = 2.0 V V _{IL} = 0.7 V, I _{OL} = 4 mA	All		0.4	V
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V, I _{IN} = -18 mA, T _C = +25°C	All		-1.5	V
Low level input current: At data At $\bar{S}$, $\bar{R}$ At all inputs	I _{IL1}	V _{CC} = 5.5 V, V _{IN} = 0.4 V	01	-.03	-0.42	mA
			04	-.0005	-0.4	
			02	0	-0.4	
			03, 05	-.005	-0.72	
Low level input current enable	I _{IL2}	V _{CC} = 5.5 V, V _{IN} = 0.4 V	01	-.06	-1.6	mA
			04	0	-1.6	
High level input current: At data At $\bar{S}$, $\bar{R}$ At all inputs	I _{IH1}	V _{CC} = 5.5 V, V _{IN} = 2.7 V	01, 04		20	μA
			02		20	
			03, 05		20	
High level input current enable	I _{IH2}	V _{CC} = 5.5 V, V _{IN} = 2.7 V	01, 04		80	μA
High level input current: At data At $\bar{S}$, $\bar{R}$ At all inputs	I _{IH3}	V _{CC} = 5.5 V, V _{IN} = 5.5 V	01, 04		100	μA
			02		100	
			03, 05		100	
High level input current enable	I _{IH4}	V _{CC} = 5.5 V, V _{IN} = 5.5 V	01, 04		400	μA
Short circuit output current	I _{OS}	V _{CC} = 5.5 V <u>1/</u>	All	-15	-100	mA
Supply current	I _{CC}	V _{CC} = 5.5 V	01, 04		12	mA
			02		7	
			03, 05		36	
Low to high level, from D input to Q output	t _{PLH1}	C _L = 50 pF ±10%, R _L = 2 kΩ ±5% V _{CC} = 5.0 V	01, 04	3	42	ns
High to low level, from D input to Q output	t _{PHL1}		01, 04	3	29	ns
Low to high level, from D input to $\bar{Q}$ output	t _{PLH2}		01, 04	3	32	ns
High to low level, from D input to $\bar{Q}$ output	t _{PHL2}		01, 04	3	26	ns
Low to high level, from enable input to Q output	t _{PLH3}		01, 04	3	42	ns
High to low level, from enable input to Q output	t _{PHL3}		01, 04	3	39	ns

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

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C	Device type	Limits		Unit
				Min	Max	
Low to high level, from enable input to Q output	t _{PLH4}	C _L = 50 pF ±10%, R _L = 2 kΩ ±5% V _{CC} = 5.0 V	01, 04	3	46	ns
High to low level, from enable input to Q output	t _{PHL4}		01, 04	3	26	ns
Low to high level, from $\bar{S}$ input to Q output	t _{PLH1}		02	3	35	ns
High to low level, from $\bar{S}$ input to Q output	t _{PHL1}		02	3	26	ns
High to low level, from $\bar{R}$ input to Q output	t _{PHL2}		02	3	42	ns
High to low level, from clear input to Q output	t _{PHL1}		03	3	42	ns
			05	3	30	
Low to high level, from data input to Q output	t _{PLH2}		03	3	48	ns
			05	3	46	
High to low level, from data input to Q output	t _{PHL2}		03	3	34	ns
			05	3	33	
Low to high level, from address input to Q output	t _{PLH3}		03	3	56	ns
			05	3	42	
High to low level, from address input to Q output	t _{PHL3}		03	3	44	ns
			05	3	42	
Low to high level, from enable input to Q output	t _{PLH4}		03	3	52	ns
			05	3	38	
High to low level, from enable input to Q output	t _{PHL4}		03, 05	3	38	ns

TABLE II. Electrical test requirements.

MIL-PRF-38535 test requirements	Subgroups (see table III)	
	Class S devices	Class B devices
Interim electrical parameters	1	1
Final electrical test parameters	1*, 2, 3, 7, 9, 10, 11	1*, 2, 3, 7, 9
Group A test requirements	1, 2, 3, 7, 8, 9, 10, 11	1, 2, 3, 7, 8, 9, 10, 11
Group B electrical test parameters when using 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.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II MIL-PRF-38535.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table IV of MIL-PRF-38535 and as follows:

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

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

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

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

Pin number	Pin symbol Device type 01		Pin symbol Device type 02		Pin symbol Device type 03		Pin symbol Device type 04		Pin symbol Device type 05	
	Case 2, X	Case E, F	Case 2, X	Case E, F	Case 2, X	Case E, F	Case 2, X	Case E, F	Case 2, X	Case E, F
1	NC	$1\bar{Q}$	NC	$1\bar{R}$	NC	A	NC	1D	NC	A
2	$1\bar{Q}$	1D	$1\bar{R}$	$1\bar{S} 1$	A	B	1D	$1\bar{Q}$	A	B
3	1D	2D	$1\bar{S} 1$	$1\bar{S} 2$	B	C	$1\bar{Q}$	1Q	B	C
4	2D	ENBL 3-4	$1\bar{S} 2$	1Q	C	Q0	1Q	ENBL 1-2	C	Q0
5	ENBL 3-4	V _{CC}	1Q	$2\bar{R}$	Q0	Q1	ENBL 1-2	2Q	Q0	Q1
6	NC	3D	NC	$2\bar{S}$	NC	Q2	NC	$2\bar{Q}$	NC	Q2
7	V _{CC}	4D	$2\bar{R}$	2Q	Q1	Q3	2Q	2D	Q1	Q3
8	3D	$4\bar{Q}$	$2\bar{S}$	GND	Q2	GND	$2\bar{Q}$	GND	Q2	GND
9	4D	4Q	2Q	3Q	Q3	Q4	2D	3D	Q3	Q4
10	$4\bar{Q}$	3Q	GND	$3\bar{R}$	GND	Q5	GND	$3\bar{Q}$	GND	Q5
11	NC	$3\bar{Q}$	NC	$3\bar{S} 1$	NC	Q6	NC	3Q	NC	Q6
12	4Q	GND	3Q	$3\bar{S} 2$	Q4	Q7	3D	ENBL 3-4	Q4	Q7
13	3Q	ENBL 1-2	$3\bar{R}$	4Q	Q5	DATA IN	$3\bar{Q}$	4Q	Q5	DATA IN
14	$3\bar{Q}$	$2\bar{Q}$	$3\bar{S} 1$	$4\bar{R}$	Q6	$\overline{\text{ENBL}}$	3Q	$4\bar{Q}$	Q6	$\overline{\text{ENBL}}$
15	GND	2Q	$3\bar{S} 2$	$4\bar{S}$	Q7	$\overline{\text{CLR}}$	ENBL 3-4	4D	Q7	$\overline{\text{CLR}}$
16	NC	1Q	NC	V _{CC}	NC	V _{CC}	NC	V _{CC}	NC	V _{CC}
17	ENBL 1-2		4Q		DATA IN		4Q		DATA IN	
18	$2\bar{Q}$		$4\bar{R}$		$\overline{\text{ENBL}}$		$4\bar{Q}$		$\overline{\text{ENBL}}$	
19	2Q		$4\bar{S}$		$\overline{\text{CLR}}$		4D		$\overline{\text{CLR}}$	
20	1Q		V _{CC}		V _{CC}		V _{CC}		V _{CC}	

FIGURE 1. Terminal connections.

Device type 01 and 04

Inputs		Outputs	
D	Enable	Q	$\bar{Q}$
L	H	L	H
H	H	H	L
X	L	Q0	$\bar{Q} 0$

H = high level, L = low level, X = irrelevant
 Q0 = the level of Q before the high-to-low transition of enable

Device type 02

Inputs		Outputs
$\bar{S} \dagger$	$\bar{R}$	Q
H	H	Q0
L	H	H
H	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 $\bar{S}$ and $\bar{R}$ inputs return to their inactive (high) level.

† For latches with double $\bar{S}$ inputs:

H = both $\bar{S}$ inputs high

L = one or both $\bar{S}$ inputs low

FIGURE 2. Truth tables.

Device type 03 and 05

Inputs		Output of addressed latch	Each other output	Function
Clear	Enable			
H	L	D	Qio	Addressable latch
H	H	Qio	Qio	Memory
L	L	D	L	8-line demultiplexer
L	H	L	L	Clear

Latch Selection Table

Select inputs			Latch addressed
C	B	A	
L	L	L	0
L	L	H	1
L	H	L	2
L	H	H	3
H	L	L	4
H	L	H	5
H	H	L	6
H	H	H	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.

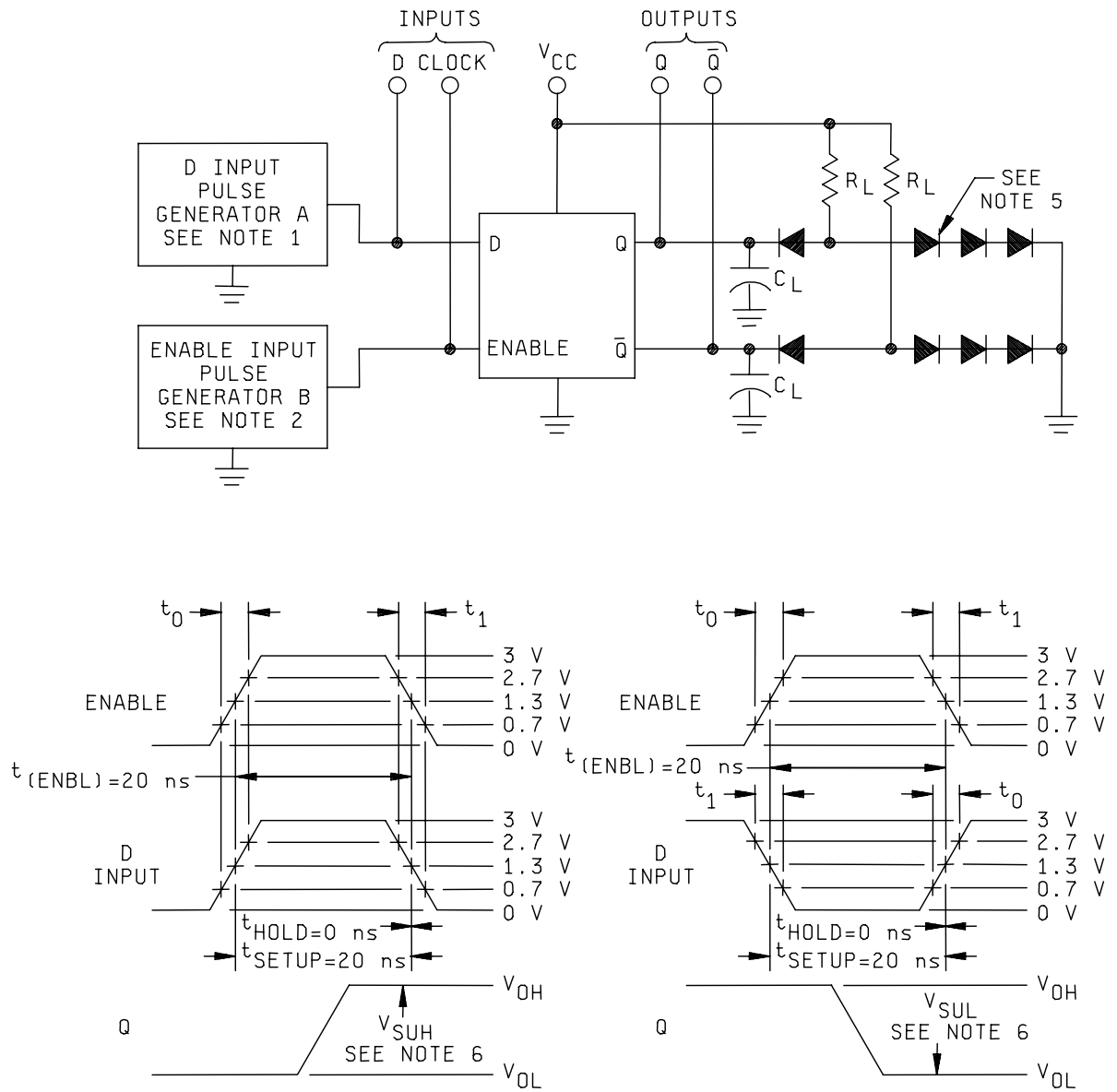
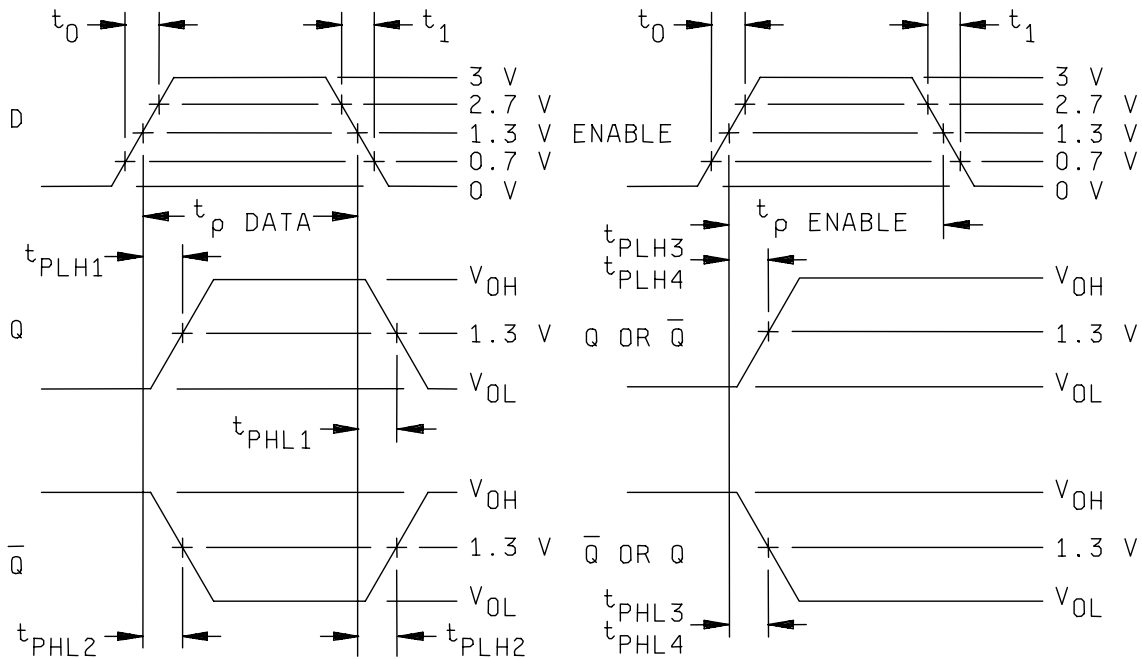


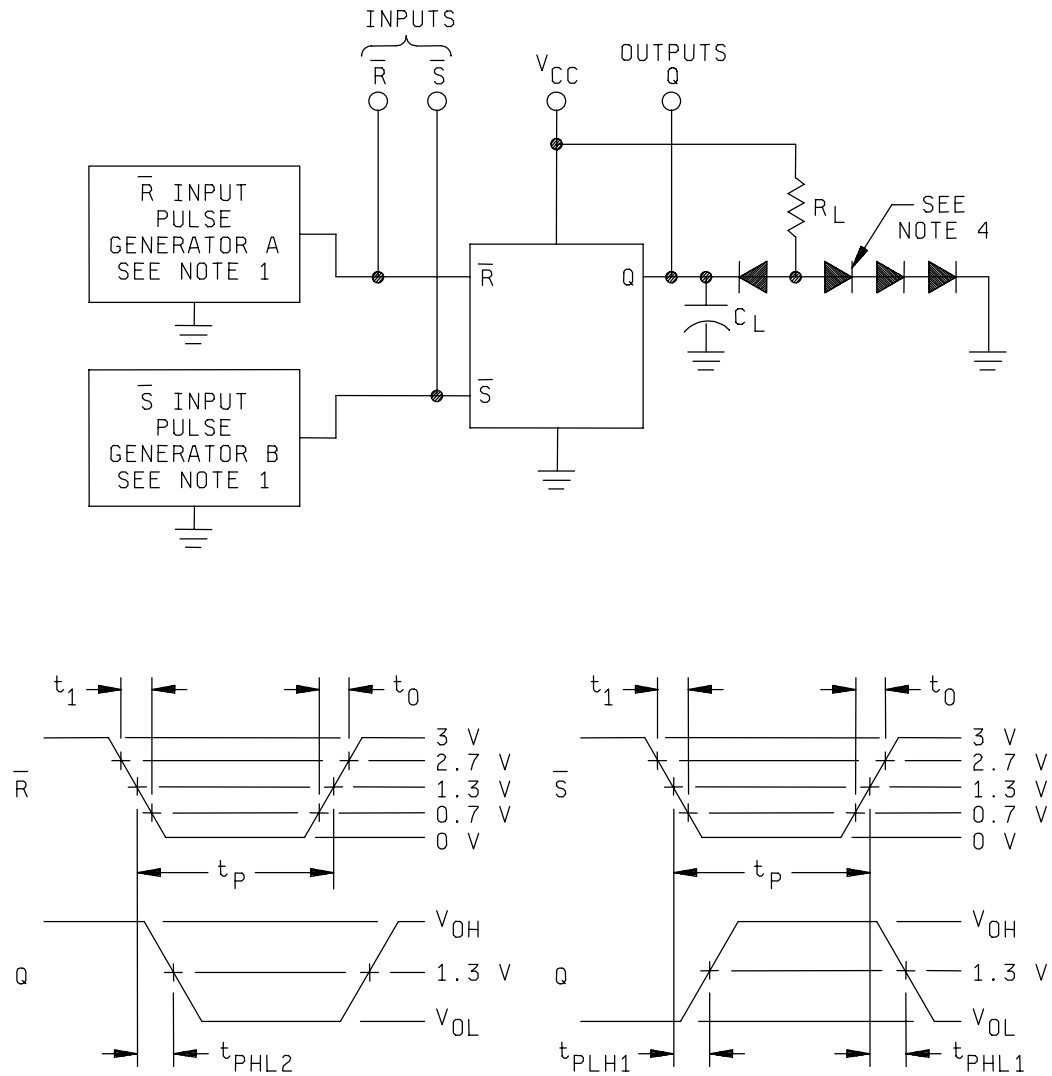
FIGURE 3. Switching test circuit and waveforms for device types 01 and 04.



NOTES:

1. The D input pulse generator has the following characteristics: $V_{GEN} = 3\text{ V}$, $t_0 \leq 15\text{ ns}$, $t_1 \leq 6\text{ ns}$, $t_P = 30\text{ ns}$, 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. $R_L = 2\text{ k}\Omega \pm 5\text{ percent}$.
5. All diodes are 1N3064 or equivalent.
6. V_{SETUP} 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.

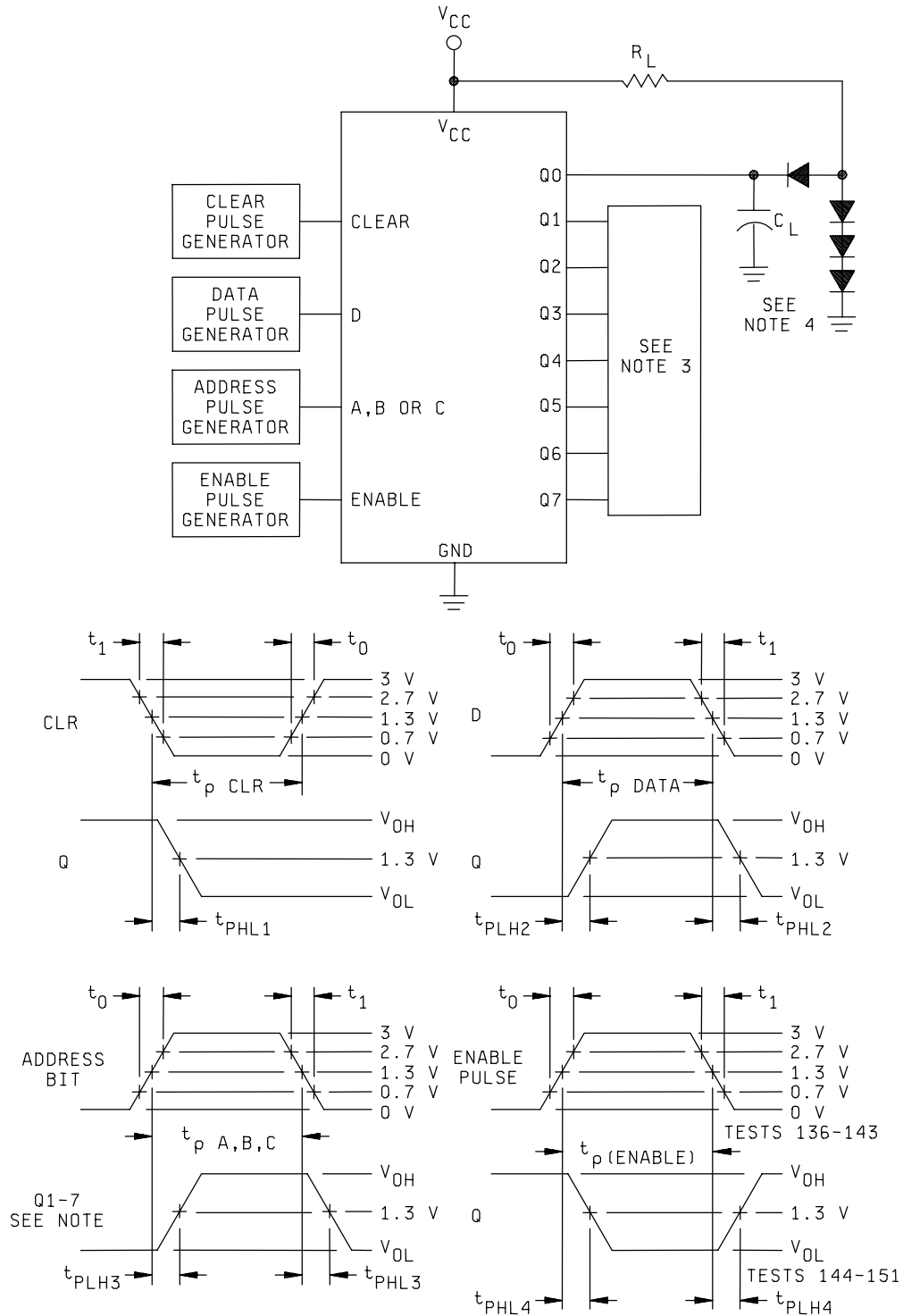
FIGURE 3. Switching test circuit and waveforms for device types 01 and 04 - Continued.



NOTES:

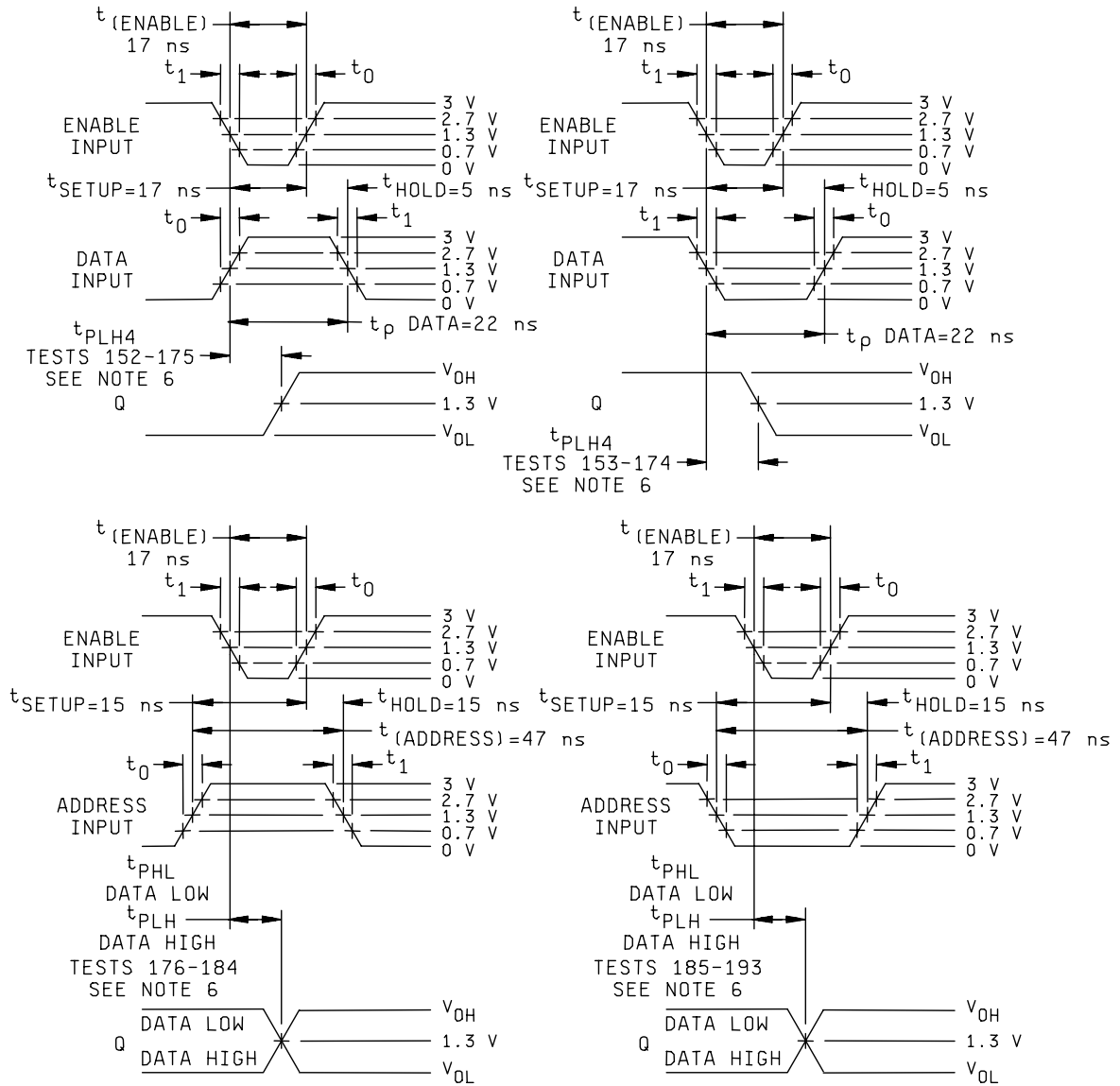
1. $\bar{R}$ and $\bar{S}$ pulse generator has the following characteristics: $t_P = 40 \pm 10$ ns, $t_0 \leq 15$ ns, $t_1 \leq 6$ ns, and $PRR \leq 1.0$ MHz.
2. $C_L = 50$ pF $\pm 10\%$ and includes probe and jig capacitance.
3. $R_L = 2$ k Ω ± 5 percent.
4. All diodes are 1N3064 or equivalent.

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



NOTE: For Q0 output waveform is inverted and t_{PLH3} and t_{PLH3} are interchanged.

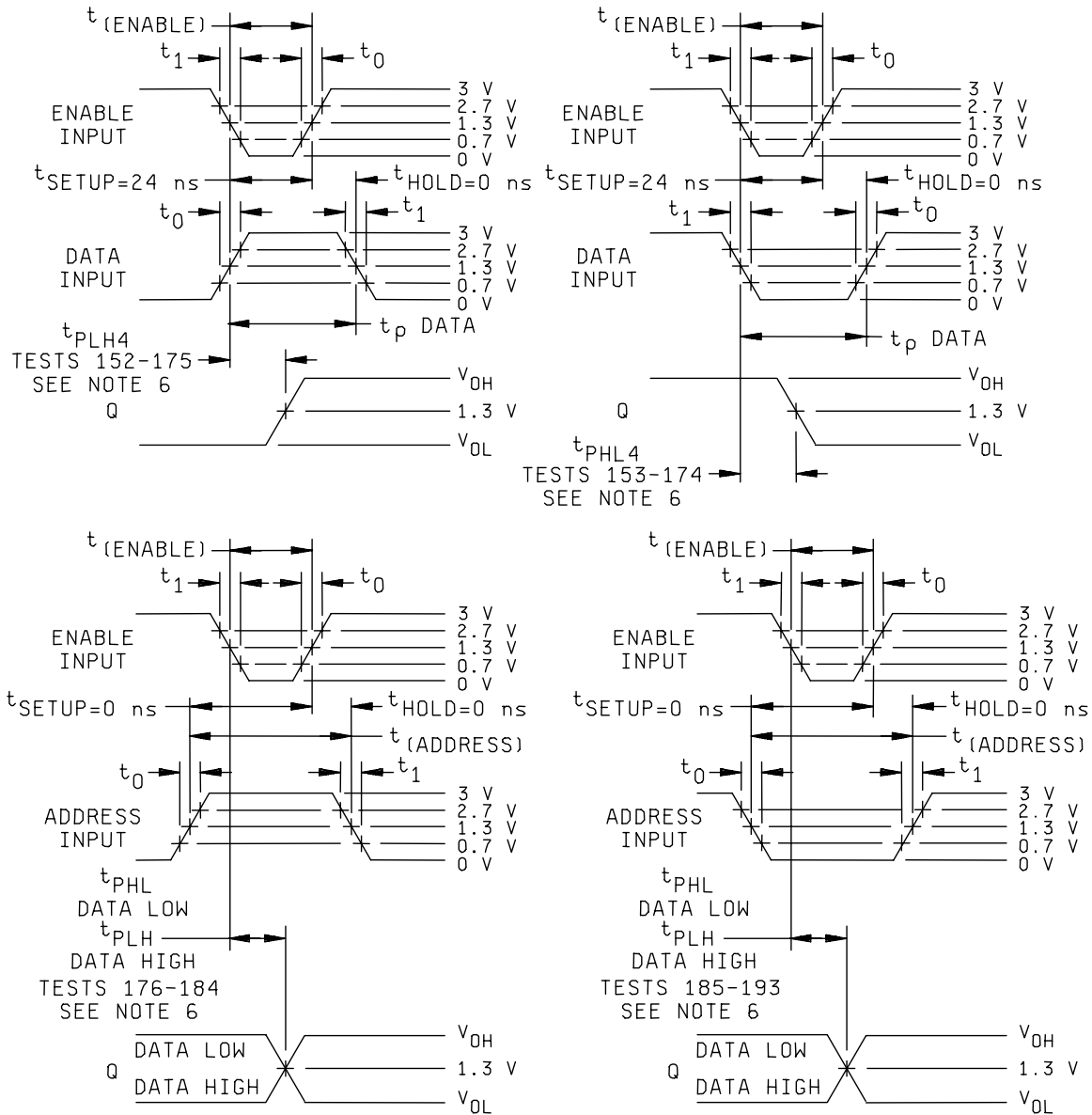
FIGURE 5. Switching test circuit and waveforms for device types 03 and 05



NOTES:

1. $R_L = 2 \text{ k}\Omega \pm 5 \text{ percent}$.
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: $V_{\text{GEN}} = 3 \text{ V}$, $t_0 \leq 15 \text{ ns}$, $t_1 \leq 6 \text{ ns}$, $t_p = 30 \text{ ns}$, and $\text{PRR} \leq 1 \text{ MHz}$ except when measuring test nos. 152 thru 193, $t_p(\text{ENABLE}) = 17 \text{ ns}$, $t_p(\text{DATA}) = 22 \text{ ns}$, $t_p(\text{ADDRESS}) = 47 \text{ ns}$, 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. $R_L = 2\text{ k}\Omega \pm 5\text{ percent}$.
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: $V_{GEN} = 3\text{ V}$, $t_0 \leq 15\text{ ns}$, $t_1 \leq 6\text{ ns}$, $t_p = 30\text{ ns}$, and $PRR \leq 1\text{ MHz}$ except when measuring test nos. 152 thru 193, $t_{p(ENABLE)} = 24\text{ ns}$, $t_{p(DATA)} = 24\text{ ns}$, $t_{p(ADDRESS)} = 24\text{ ns}$, 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 latching of the outputs under worst case setup and hold input conditions.

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

TABLE III. Group A inspection for device type 01 and 04.

See footnotes at end of device type 01 and 04.

TABLE III. Group A inspection for device type 01 and 04 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Type 01 Cases E, F, 2, X																Measured terminal	Limits		Unit					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max						
1 T _C = 25°C	V _{IC}		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20									
			2	1	7	12	16	9	15	14	13	11	10	8	4	6	5	3									
			3	2	9	15	20	12	19	18	17	14	13	10	5	8	7	4									
			Test no.	1 Q	2D	EN 3-4	V _{CC}	3D	4D	4 Q	4Q	3Q	3 Q	GND	EN 1-2	2 Q	2Q	1Q									
			44	-18 mA	-18 mA		4.5 V							GND						1D	-1.5	V					
2 T _C = 25°C			45																2D		"						
			46						-18 mA											3D		"					
			47							-18 mA											4D		"				
			48												-18 mA						EN 1-2		"				
			49				-18 mA															EN 3-4		"			
2	Same tests, terminal conditions, and limits as subgroup 1, except T _C = +125°C and V _{IC} tests are omitted.																										
3	Same tests, terminal conditions, and limits as subgroup 1, except T _C = -55°C and V _{IC} tests are omitted.																										
7 2/ 3014 T _C = 25°C	Truth table tests		50	L	A	A	A	5.0 V	A	A	A	L	H	H	L	A	GND	A	L	H	H	3/					
			51	"	A	A	B	"	A	A	"	"	"	"	"	"	B	"	"	"	"	"	"				
			52	"	B	B	B	"	B	B	"	"	"	"	"	"	B	"	"	"	"	"	"				
			53	H	B	B	A	"	B	B	H	L	L	H	"	A	H	L	L				"				
			54	IN	IN			5.0 V																			
9 T _C = 25°C	t _{PH1} Fig. 4		55	OUT	IN													4.5 V			OUT	1D to 1Q	3	32	ns		
			56		IN														"			OUT	1D to 1 Q	"	20	"	
			57		IN														"				2D to 2Q	"	32	"	
			58				4.5 V	"												"				2D to 2 Q	"	20	"
			59				"		IN					OUT					"				3D to 3Q	"	32	"	
			60				"	"	IN		OUT								"				3D to 3 Q	"	20	"	
			61				"	"	IN		OUT								"				4D to 4Q	"	32	"	
			62		IN														4.5 V				4D to 4 Q	"	20	"	
			63		IN														"				1D to 1Q	"	22	"	
			64			IN													"			OUT	1D to 1 Q	"	25	"	
			65			IN													"			OUT	2D to 2Q	"	22	"	
			66				4.5 V	"		IN									"				2D to 2 Q	"	25	"	
			67				"	"	IN						OUT				"				3D to 3Q	"	22	"	
			68				"	"											"				3D to 3 Q	"	25	"	
			69				"	"		IN		IN		OUT					"				4D to 4Q	"	22	"	
			70																				4D to 4 Q	"	25	"	
4 T _C = 25°C			71		4.5 V													IN				EN to 1Q	"	32	"		
			72																IN		OUT		EN to 2Q	"	"	"	
			73																"				EN to 3Q	"	"	"	
			74																IN				EN to 4Q	"	"	"	
			75																IN		OUT		EN to 1Q	"	30	"	
			76																IN		OUT		EN to 2Q	"	"	"	
			77																IN				EN to 3Q	"	"	"	
			78	OUT															"				EN to 4Q	"	"	"	
			79																IN				EN to 1 Q	"	35	"	
			80																IN	OUT			EN to 2 Q	"	"	"	
			81																"				EN to 3 Q	"	"	"	
																				"				EN to 4 Q	"	"	"

See footnotes at end of device types 01 and 04.

TABLE III. Group A inspection for device type 01 and 04 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Type 01 Cases E, F, 2, X	Type 04 Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Limits		Unit
					Test no.	1 Q	2D	EN 3-4	V _{CC}	3D	4D	4 Q	4Q	3Q	3 Q	GND	EN 1-2	2 Q	2Q	1Q	Min	Max	
9	t _{PHL4}	3003 Fig. 3	82	OUT	4.5 V				5.0 V							GND	IN				3	20	ns
			83		4.5 V				"							"	IN	OUT			"	"	"
			84					IN	"	4.5 V					OUT	"					"	"	"
			85					IN	"		4.5 V	OUT				"					"	"	"
			86			IN			"							"	IN		OUT		2.5	"	V
10	t _{PHL1} t _{PHL2} t _{PHL3} t _{PHL4} t _{PHL5} t _{PHL6} t _{PHL7} t _{PHL8} t _{PHL9} t _{PHL10}	Same tests and terminal conditions as for subgroup 9, except T _C = +125°C and test limits as shown	87			IN			"							"	IN		OUT		"	"	"
			88					IN	"				OUT			"					"	"	"
			89					IN	"		IN					"					"	"	"
			90			IN			"							"	IN		OUT		"	0.4	"
			91				IN		"							"	IN		OUT		"	"	"
			92					IN	"		IN		OUT			"					"	"	"
			93					IN	"							"					"	"	"
									"							"					3	42	ns
									"							"					"	29	"
									"							"					"	32	"
11	t _{PHL1} t _{PHL2} t _{PHL3} t _{PHL4} t _{PHL5}	Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C.							"							"					"	26	"
									"							"					"	42	"
									"							"					"	39	"
									"							"					"	46	"
									"							"					2.5	0.4	V

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

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

3/ H ≥ 1.5 V, L ≤ 1.5 V.

4/ I_L limits are as follows:

Test	Min/max limits (mA)			
	Circuit A, B	Circuit C	Circuit D	Circuit E
I _{L1}	-16/-40	-0005/-40	Device 01 -03/-40	Device 04 -16/-40
I _{L2}	-64/-160	0/-1.20	-12/-1.20	-64/-160 -75/-160

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open)																Measured terminal	Limits		Unit
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	
1 T _C = 25°C	V _{OH}	3006	Test no.	1R	1S1	1S2	1Q	2R	2S	2Q	GND	3Q	3R	3S1	3S2	4Q	4R	4S	4V	4Q	2.5		V
		"	2									-0.4 mA								3Q			"
		"	3					2.0 V	1J											2Q			"
		"	4	2.0 V	2.0 V	1J	-0.4 mA													1Q		0.4	"
	OL	3007		1J	2.0 V	2.0 V	4 mA		2.0 V	4 mA										2Q			"
		"	6					1J												3Q			"
		"	7									4 mA								2Q			"
		"	8										1J	2.0 V	2.0 V	4 mA				3Q			"
	IL1	3009	9	0.4 V																4Q			"
		"	10	GND	0.4 V	4.5 V													5.5 V	1R	4/	4/	mA
I		"	11	GND	4.5 V	0.4 V														1S1			"
		"	12					0.4 V	GND											1S2			"
		"	13						0.4 V											2R			"
		"	14										0.4 V							2S			"
		"	15											GND	4.5 V					3R			"
		"	16											GND	4.5 V	0.4 V				3S1			"
		"	17														0.4 V	GND		3S2			"
		"	18														GND	0.4 V		4R			"
	IH1	3010	19	2.7 V																4S			"
		"	20		2.7 V															1R	20		μA
I		"	21			2.7 V														1S1			"
		"	22					2.7 V												1S2			"
		"	23																	2R			"
		"	24																	2S			"
		"	25										2.7 V							3R			"
		"	26												2.7 V					3S1			"
		"	27													2.7 V				3S2			"
		"	28														2.7 V			4R			"
	IH3	"	29	5.5 V														2.7 V		4S			"
		"	30		5.5 V															1R	100		"
I		"	31																	1S1			"
		"	32					5.5 V												1S2			"
		"	33																	2R			"
		"	34																	2S			"
		"	35										5.5 V							3R			"
		"	36												5.5 V					3S1			"
		"	37														5.5 V			3S2			"
		"	38														5.5 V	5.5 V		4R			"
		"																		4S			"
		"																					"

See footnotes at end of device type 02.

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits	Unit
1 $T_c = 25^\circ\text{C}$	I_{OS}	3011	Test no.	1R	1S1	1S2	1Q	2R	2S	2Q	GND	3Q	3R	3S1	3S2	4Q	4R	4S	V _{CC}	1Q	Min	Max
		"	39	5.0 V	GND	GND	GND	5.0 V	GND	GND	GND	GND	5.0 V	4.5 V	4.5 V	GND	5.0 V	4.5 V	5.5 V	1Q	-15	-100
		"	40																	2Q	"	"
		"	41																	3Q	"	"
		"	42																	4Q	"	"
	α_C	3005	Test no.	1R	1S1	1S2	1Q	2R	2S	2Q	GND	3Q	3R	3S1	3S2	4Q	4R	4S	4.5 V	V _{CC}	7	-1.5
		"	43	GND	4.5 V	4.5 V	GND	GND	4.5 V	GND	GND	GND	GND	4.5 V	4.5 V	GND	5.0 V	4.5 V	4.5 V	1R	"	"
		"	44	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	-18 mA	1S1	"	"
		"	45																	1S2	"	"
		"	46																	2R	"	"
2 $T_c = 25^\circ\text{C}$	Truth table tests	3014	54	B	B	B	H	B	B	H	GND	H	B	B	B	H	B	B	5.0 V	3/	"	"
			55	B	A	A	L	B	A	L	"	L	B	A	A	L	B	A	"	"	"	"
			56	A	A	"	L	A	A	L	"	L	A	A	"	L	A	A	"	"	"	"
			57	"	B	"	H	"	B	H	"	H	"	B	"	H	"	B	"	"	"	"
			58	"	A	B	H	"	B	H	"	H	"	A	B	H	"	B	"	"	"	"
			59	GND	IN	4.5 V	OUT				GND								5.0 V	1S1 to 1Q	3	27
			60	GND	4.5 V	IN	OUT				"								"	1S2 to 1Q	"	"
			61					GND	IN	OUT	"								"	2S to 2Q	"	"
			62								"	OUT		IN	4.5 V				"	3S1 to 3Q	"	"
			63								"	OUT	GND	4.5 V	IN				"	3S2 to 3Q	"	"
3 $T_c = 25^\circ\text{C}$	PHL1	3003	64								"					OUT	GND	IN	"	4S to 4Q	"	"
			65	GND	IN	4.5 V	OUT				"								"	1S1 to 1Q	20	"
			66	GND	4.5 V	IN	OUT				"								"	1S2 to 1Q	"	"
			67					GND	IN	OUT	"								"	2S to 2Q	"	"
			68								"	OUT	GND	IN	4.5 V				"	3S1 to 3Q	"	"
			69								"	OUT	GND	4.5 V	IN				"	3S2 to 3Q	"	"
			70								"					OUT	GND	IN	"	4S to 4Q	"	"
											"								"		"	"
											"								"		"	"
											"								"		"	"
4 $T_c = 25^\circ\text{C}$	Same tests, terminal conditions, and limits as subgroup 1, except $T_c = +125^\circ\text{C}$ and V_{IC} tests are omitted.	3014	54	B	B	B	H	B	B	H	GND	H	B	B	B	H	B	B	5.0 V	3/	"	"
			55	B	A	A	L	B	A	L	"	L	B	A	A	L	B	A	"	"	"	"
			56	A	A	"	L	A	A	L	"	L	A	A	"	L	A	A	"	"	"	"
			57	"	B	"	H	"	B	H	"	H	"	B	"	H	"	B	"	"	"	"
			58	"	A	B	H	"	B	H	"	H	"	A	B	H	"	B	"	"	"	"
			59	GND	IN	4.5 V	OUT				GND								5.0 V	1S1 to 1Q	3	27
			60	GND	4.5 V	IN	OUT				"								"	1S2 to 1Q	"	"
			61					GND	IN	OUT	"								"	2S to 2Q	"	"
			62								"	OUT		IN	4.5 V				"	3S1 to 3Q	"	"
			63								"	OUT	GND	4.5 V	IN				"	3S2 to 3Q	"	"

See footnotes at end of device type 02.

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits		Unit
				Test no.	1R	1S 1	1S 2	1Q	2R	2S	2Q	GND	3Q	3R	3S 1	3S 2	4Q	4R	4S		V _{CC}	Min	
9 T _C = 25°C		3003 Fig. 4 " "	71	IN	4.5 V	4.5 V	OUT		2R	2S	GND	3Q	3R	3S 1	3S 2	4Q	4R		5.0 V	1R to 1Q	3	32	ns
			72					IN	4.5 V	OUT		GND							"	2R to 2Q	"	"	"
			73								"	OUT	IN	4.5 V	4.5 V				"	3R to 3Q	"	"	"
			74								"		OUT	IN	4.5 V				"	4R to 4Q	"	"	"
10 T _C = 125°C	t _{PHL1}	Same tests and terminal conditions as for subgroup 9, except T _C = +125°C and test limits as shown																				35	"
t _{PHL1}																					26	"	
PHL2																						42	"
11	Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C.																						

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

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

3/ H ≥ 1.5 V, L ≤ 1.5 V.

4/ I_{IL} limits are as follows:

Test	Min/max limits (mA)					
	Circuit A		Circuit B	Circuit C	Circuit D	
	Tests	Limits			Tests	Limits
I_{IL}	9, 12, 14, 17	0/-0.2	-1.16/- .40	-1.35/- .370	9, 12, 14, 17	- .001/- .15
	10, 11, 13 15, 16, 18	0/-0.2			10, 11, 13 15, 16, 18	- .03/- .30

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits	Unit
			Test no.	A	B	C	Q0	Q1	Q2	Q3	GND	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR	V _{CC}		Min	Max
1 T _c = 25°C	V _{OH}	3006	1	0.7 V	0.7 V	0.7 V	-0.4 mA	-0.4 mA	-0.4 mA	-0.4 mA	GND					2.0 V	1/	2.0 V	4.5 V	Q0	2.5	V
		"	2	2.0 V	0.7 V	"					"					"	"	"	"	Q1	"	"
		"	3	0.7 V	2.0 V	"			-0.4 mA	-0.4 mA	"					"	"	"	"	Q2	"	"
		"	4	2.0 V	2.0 V	"					"					"	"	"	"	Q3	"	"
		"	5	0.7 V	0.7 V	2.0 V					"	-0.4 mA				"	"	"	"	Q4	"	"
		"	6	2.0 V	0.7 V	"					"		-0.4 mA			"	"	"	"	Q5	"	"
		"	7	0.7 V	2.0 V	"					"			-0.4 mA		"	"	"	"	Q6	"	"
		"	8	2.0 V	2.0 V	"					"				-0.4 mA	"	"	"	"	Q7	"	"
	OL	3007	9	0.7 V	0.7 V	0.7 V	4 mA	4 mA			"					0.7 V	"	"	"	Q0	0.4	"
		"	10	2.0 V	0.7 V	"					"					"	"	"	"	Q1	"	"
		"	11	0.7 V	2.0 V	"			4 mA		"					"	"	"	"	Q2	"	"
		"	12	2.0 V	2.0 V	"				4 mA	"					"	"	"	"	Q3	"	"
		"	13	0.7 V	0.7 V	2.0 V					"	4 mA				"	"	"	"	Q4	"	"
		"	14	2.0 V	0.7 V	"					"		4 mA			"	"	"	"	Q5	"	"
		"	15	0.7 V	2.0 V	"					"			4 mA		"	"	"	"	Q6	"	"
		"	16	2.0 V	2.0 V	"					"				4 mA	"	"	"	"	Q7	"	"
2 T _c = 25°C	IL1	3009	17	0.4 V							"									A	4/	mA
		"	18			0.4 V					"									B	"	"
		"	19								"									C	"	"
		"	20								"					0.4 V					"	"
		"	21								"										"	"
		"	22								"										"	"
		"	23	2.7 V							"										A	20
		"	24		2.7 V						"										B	"
	IH3	3010	25								"										C	"
		"	26			2.7 V					"					2.7 V						"
		"	27								"											"
		"	28								"							2.7 V				"
		"	29	5.5 V							"										A	100
		"	30		5.5 V						"										B	"
		"	31			5.5 V					"										C	"
		"	32								"											"
3 T _c = 25°C	IC		33								"					5.5 V						"
		"	34								"											"
			35	-18 mA							"											"
			36		-18 mA						"											"
			37								"											"
			38			-18 mA					"											"
			39								"											"
			40								"											"
	OS	3011	41	GND	GND	GND	GND	GND			"											"
		"	42	5.0 V	GND	"			GND		"					5.0 V	GND	5.0 V	5.5 V	Q0	-15	mA
		"	43	GND	5.0 V	"				GND	"					"	"	"	"	Q1	"	"
		"	44	5.0 V	5.0 V	"				GND	"					"	"	"	"	Q2	"	"
		"	45	GND	GND	5.0 V					"	GND				"	"	"	"	Q3	"	"
		"	46	5.0 V	GND	"					"					"	"	"	"	Q4	"	"
		"	47	GND	5.0 V	"					"					"	"	"	"	Q5	"	"
		"	48	5.0 V	5.0 V	"					"									Q6	"	"
4 T _c = 25°C	OC	3005	49	GND	GND	GND					"											"
											"											"
											"											"
											"											"
											"											"
											"											"
											"											"
											"											"
	V _{CC}										"											"
											"											"
											"											"
											"											"
											"											"
											"											"
											"											"
											"											"

See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 03.

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits	Unit
			Test no.	A	B	C	Q0	Q1	Q2	Q3	GND	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR	V _{CC}		Min	Max
2																						
3																						
7 2/	Truth table tests	3014	50	B	B	B	L	L	L	L	GND	L	L	L	L	A	A	B	5.0 V		3/	
			51	B	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			52	A	"	"	L	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			53	A	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			54	B	A	"	"	L	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			55	B	"	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"
			56	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			57	A	"	"	"	"	L	"	"	"	"	"	"	"	"	"	"	"	"	"
			58	B	B	A	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"
			59	B	"	"	"	"	"	"	"	H	"	"	"	"	"	"	"	"	"	"
			60	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			61	A	"	"	"	"	"	"	"	"	H	"	"	"	"	"	"	"	"	"
			62	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			63	B	"	"	"	"	"	"	"	"	L	"	"	"	"	"	"	"	"	"
			64	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			65	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			67	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			68	A	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			69	B	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			70	A	A	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			71	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			72	A	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			73	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			74	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			76	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			77	"	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			79	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			81	"	"	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"
			82	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			83	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			84	"	"	"	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"
			85	B	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			87	"	"	"	"	"	"	"	"	H	"	"	"	"	"	"	"	"	"	"
			88	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			89	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			90	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			91	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			93	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			94	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			95	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
8																						

Same tests and terminal conditions as for subgroup 7 except $T_c = +125^\circ\text{C}$ and $T_c = -55^\circ\text{C}$.

See footnotes at end of device type 05.

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal		Limits		Unit
					A	B	C	Q0	Q1	Q2	Q3	GND	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR	V _{CC}	CLR to Q0	CLR to Q1	Min	Max	
9	T _{PH1}	3003 Fig. 5	96	GND	GND	GND	GND	OUT				GND					4.5 V	ENBL	IN	5.0 V	CLR to Q0	CLR to Q1	3	32	ns
			97	4.5 V	GND				OUT												CLR to Q1				"
			98	GND	4.5 V					OUT											CLR to Q2				"
			99	4.5 V	4.5 V						OUT										CLR to Q3				"
			100	GND	GND	GND	4.5 V						OUT								CLR to Q4				"
			101	4.5 V	GND									OUT							CLR to Q5				"
			102	GND	4.5 V										OUT						CLR to Q6				"
			103	4.5 V	4.5 V											OUT					CLR to Q7				"
			104	GND	GND	GND	GND	OUT									IN	GND	GND		DI to Q0	DI to Q1		37	"
			105	4.5 V	GND				OUT												DI to Q2				"
			106	GND	4.5 V					OUT											DI to Q3				"
			107	4.5 V	4.5 V						OUT										DI to Q4				"
	T _{PH2}		108	GND	GND	GND	4.5 V						OUT								DI to Q5				"
			109	4.5 V	GND									OUT							DI to Q6				"
			110	GND	4.5 V										OUT						DI to Q7				"
			111	4.5 V	4.5 V											OUT					DI to Q0	DI to Q1		26	"
			112	GND	GND	GND	GND	OUT													DI to Q2				"
			113	4.5 V	GND				OUT												DI to Q3				"
			114	GND	4.5 V					OUT											DI to Q4				"
			115	4.5 V	4.5 V						OUT										DI to Q5				"
			116	GND	GND	GND	4.5 V						OUT								DI to Q6				"
			117	4.5 V	GND									OUT							DI to Q7				"
			118	GND	4.5 V										OUT						A to Q0	A to Q1			"
			119	4.5 V	4.5 V											OUT					A to Q2	A to Q3			"
	T _{PH3}		120	IN	GND	GND	GND	OUT									4.5 V				A to Q4	A to Q5		43	"
			121	IN	GND				OUT												A to Q6	A to Q7			"
			122	GND	IN					OUT											B to Q0	B to Q1			"
			123	IN	4.5 V						OUT										B to Q2	B to Q3			"
			124	GND	GND	IN							OUT								C to Q4	C to Q5			"
			125	IN	GND	GND	4.5 V							OUT							B to Q6	B to Q7			"
			126	GND	IN										OUT						A to Q7	A to Q8			"
			127	IN	4.5 V											OUT					A to Q9	A to Q10			"
			128	IN	GND	GND	GND	OUT													A to Q11	A to Q12		34	"
			129	IN	GND				OUT												B to Q1	B to Q2			"
			130	GND	IN					OUT											A to Q3	A to Q4			"
			131	IN	4.5 V						OUT										C to Q4	C to Q5			"
			132	GND	GND	GND	IN						OUT								A to Q5	A to Q6			"
	T _{PH4}		133	IN	GND	GND	4.5 V								OUT						B to Q6	B to Q7			"
			134	GND	IN											OUT					A to Q7	A to Q8			"
			135	IN	4.5 V											OUT					ENBL to Q0	ENBL to Q1		39	"
			136	GND	GND	GND	GND	OUT										IN			ENBL to Q2	ENBL to Q3			"
			137	4.5 V	GND				OUT												ENBL to Q4	ENBL to Q5			"
			138	GND	4.5 V					OUT											ENBL to Q6	ENBL to Q7			"
			139	4.5 V	4.5 V						OUT														"
			140	GND	GND	GND	4.5 V						OUT												"
			141	4.5 V	GND										OUT										"
			142	GND	4.5 V											OUT									"
			143	4.5 V	4.5 V																				"

See footnotes at end of device type 05.

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits		Unit		
																					Min	Max			
9	t _{PHL4}	3003 Fig 6	144	GND	GND	GND	GND	OUT			GND					4.5 V	IN	GND	5.0 V	ENBL to Q0	3	29	ns		
			145	4.5 V	GND	"		OUT				"					"		"	"	ENBL to Q1	"	"	"	
			146	GND	4.5 V	"		OUT				"					"		"	"	ENBL to Q2	"	"	"	
			147	4.5 V	4.5 V	"			OUT			"					"		"	"	ENBL to Q3	"	"	"	
			148	GND	GND	4.5 V				OUT		"					"		"	"	ENBL to Q4	"	"	"	
			149	4.5 V	GND	"					OUT	"					"		"	"	ENBL to Q5	"	"	"	
			150	GND	4.5 V	"						"					"		"	"	ENBL to Q6	"	"	"	
			151	4.5 V	4.5 V	"						"					"		"	"	ENBL to Q7	"	"	"	
			152	GND	GND	GND	OUT						"				IN	IN	4.5 V	"	ENBL to Q0	"	39	"	
			153	"	"	"	"						"				"		"	"	ENBL to Q0	"	29	"	
			154	"	"	"	"						"				"		"	"	ENBL to Q0	"	39	"	
			155	4.5 V	"	"		OUT					"				"		"	"	ENBL to Q1	"	39	"	
			156	"	"	"	"						"				"		"	"	ENBL to Q1	"	29	"	
			157	"	"	"	"						"				"		"	"	ENBL to Q1	"	39	"	
			158	GND	4.5 V	"						OUT	"					"		"	"	ENBL to Q2	"	39	"
			159	"	"	"	"					"	"					"		"	"	ENBL to Q2	"	29	"
			160	"	"	"	"					"	"					"		"	"	ENBL to Q2	"	39	"
			161	4.5 V	"	"	"						OUT	"				"		"	"	ENBL to Q3	"	39	"
			162	"	"	"	"						"	"				"		"	"	ENBL to Q3	"	29	"
			163	"	"	"	"						"	"				"		"	"	ENBL to Q3	"	39	"
			164	GND	GND	4.5 V								"	OUT			"		"	"	ENBL to Q4	"	39	"
			165	"	"	"								"				"		"	"	ENBL to Q4	"	29	"
			166	"	"	"								"	"			"		"	"	ENBL to Q4	"	39	"
			167	4.5 V	"	"								"		OUT		"		"	"	ENBL to Q4	"	39	"
			168	"	"	"								"		"		"		"	"	ENBL to Q5	"	39	"
			169	"	"	"								"		"		"		"	"	ENBL to Q5	"	29	"
			170	GND	4.5 V	"								"			OUT	"		"	"	ENBL to Q5	"	39	"
			171	"	"	"								"			"	"		"	"	ENBL to Q6	"	29	"
			172	"	"	"								"			"	"		"	"	ENBL to Q6	"	39	"
			173	4.5 V	"	"								"				OUT	"		"	ENBL to Q6	"	39	"
			174	"	"	"								"				"		"	"	ENBL to Q7	"	39	"
			175	"	"	"								"			"	"		"	"	ENBL to Q7	"	29	"
			176	"	IN	GND		OUT						"				GND	"	"	"	ENBL to Q7	"	39	"
			177	"	"	"					"			"				4.5 V	"	"	"	ENBL to Q1	"	29	"
			178	"	"	"					"			"				GND	"	"	"	ENBL to Q1	"	39	"

See footnotes at end of device type 05.

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

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits		Unit		
				Test no.	A	B	C	Q0	Q1	Q2	Q3	GND	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR		V _{cc}	Min		Max	
9	t_{PHL4} t_{PLH4} $T_C = 25^{\circ}\text{C}$	3003 Fig 6	179	GND	IN	GND			OUT		GND					GND	IN	4.5 V	5.0 V	ENBL to Q2	3	29	ns		
			180	"	"	"			"							4.5 V	"	"	"	ENBL to Q2	"	39	"		
			181	"	"	"			"							GND	"	"	"	ENBL to Q2	"	29	"		
			182	"	GND	IN					OUT						GND	"	"	"	ENBL to Q4	"	29	"	
			183	"	"	"					"					4.5 V	"	"	"	"	ENBL to Q4	"	39	"	
			184	"	"	"					"					GND	"	"	"	"	ENBL to Q4	"	29	"	
			185	IN	"	GND	OUT					"				GND	"	"	"	"	ENBL to Q0	"	29	"	
			186	"	"	"	"					"				4.5 V	"	"	"	"	ENBL to Q0	"	39	"	
			187	"	"	"	"					"					GND	"	"	"	"	ENBL to Q0	"	29	"
			188	4.5 V	IN	4.5 V							"		OUT			GND	"	"	"	ENBL to Q5	"	29	"
10	$T_C = 125^{\circ}\text{C}$	Same tests and terminal conditions as for subgroup 9, except $T_C = +125^{\circ}\text{C}$ and test limits as shown	189	"	"	"					"		"			4.5 V	"	"	"	ENBL to Q5	"	39	"		
			190	"	"	"						"		"			GND	"	"	"	ENBL to Q5	"	29	"	
			191	"	4.5 V	IN					OUT					GND	"	"	"	"	ENBL to Q3	"	29	"	
			192	"	"	"					"					4.5 V	"	"	"	"	ENBL to Q3	"	39	"	
			193	"	"	"					"					GND	"	"	"	"	ENBL to Q3	"	29	"	
			t_{PHL1}	"	"	"						"						GND	"	"	"	"	42	"	
			t_{PH2}	"	"	"						"							"	"	"	"	48	"	
11	Same tests, terminal conditions and limits as for subgroup 10, except $T_C = -55^{\circ}\text{C}$.	Same tests and terminal conditions as for subgroup 9, except $T_C = +125^{\circ}\text{C}$ and test limits as shown	t_{PH2}	"	"	"				"							"	"	"	"	34	"			
			t_{PH3}	"	"	"					"							"	"	"	"	56	"		
			t_{PH3}	"	"	"					"							"	"	"	"	44	"		
			t_{PH4}	"	"	"					"							"	"	"	"	52	"		
11	t_{PH4}	"	"	"					"							"	"	"	"	38	"				

See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 05.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits	Unit
			Test no.	A	B	C	Q0	Q1	Q2	Q3	GND	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR	V _{CC}		Min	Max
1 T _c = 25°C	V _{OH}	3006	1	0.7 V	0.7 V	0.7 V	-0.4 mA	-0.4 mA	-0.4 mA	-0.4 mA	GND					2.0 V	1	2.0 V	4.5 V	Q0	2.5	V
		"	2	2.0 V	0.7 V	"					"					"	"	"	"	Q1	"	"
		"	3	0.7 V	2.0 V	"			-0.4 mA	-0.4 mA	"					"	"	"	"	Q2	"	"
		"	4	2.0 V	2.0 V	"					"					"	"	"	"	Q3	"	"
		"	5	0.7 V	0.7 V	2.0 V					"	-0.4 mA				"	"	"	"	Q4	"	"
		"	6	2.0 V	0.7 V	"					"		-0.4 mA			"	"	"	"	Q5	"	"
		"	7	0.7 V	2.0 V	"					"			-0.4 mA		"	"	"	"	Q6	"	"
		"	8	2.0 V	2.0 V	"					"				-0.4 mA	"	"	"	"	Q7	"	"
	OL	3007	9	0.7 V	0.7 V	0.7 V	4 mA	4 mA			"					0.7 V	"	"	"	Q0	0.4	"
		"	10	2.0 V	0.7 V	"					"					"	"	"	"	Q1	"	"
		"	11	0.7 V	2.0 V	"			4 mA		"					"	"	"	"	Q2	"	"
		"	12	2.0 V	2.0 V	"				4 mA	"					"	"	"	"	Q3	"	"
		"	13	0.7 V	0.7 V	2.0 V					"	4 mA				"	"	"	"	Q4	"	"
		"	14	2.0 V	0.7 V	"					"		4 mA			"	"	"	"	Q5	"	"
		"	15	0.7 V	2.0 V	"					"			4 mA		"	"	"	"	Q6	"	"
		"	16	2.0 V	2.0 V	"					"				4 mA	"	"	"	"	Q7	"	"
1	IL1	3009	17	0.4 V							"								"	Q0		
		"	18			0.4 V					"								"	Q1		
		"	19								"								"	Q2		
		"	20								"								"	Q3		
		"	21								"								"	Q4		
		"	22								"								"	Q5		
		"	23	2.7 V							"								"	Q6		
		"	24		2.7 V						"								"	Q7		
	IH1	3010	25								"								"	A	4/	mA
		"	26								"								"	B		
		"	27								"								"	C		
		"	28								"								"	DATA IN		
		"	29	5.5 V							"								"	ENBL		
		"	30		5.5 V						"								"	CLR		
		"	31			5.5 V					"								"	A	100	"
		"	32								"								"	B		
1	IH3	"	33								"								"	C		
		"	34								"								"	DATA IN		
		"	35	-18 mA							"								"	ENBL		
		"	36		-18 mA						"								"	CLR		
		"	37								"								"	A	-1.5	V
		"	38			-18 mA					"								"	B		"
		"	39								"								"	C		"
		"	40								"								"	DATA IN		"
	IC	"	41	GND	GND	GND	GND	GND			"								"	ENBL		"
		"	42	5.0 V	GND	"					"								"	CLR		"
		"	43	GND	5.0 V	"			GND		"								"	Q0	-15	mA
		"	44	5.0 V	5.0 V	"				GND	"								"	Q1	"	"
		"	45	GND	GND	5.0 V					"	GND							"	Q2	"	"
		"	46	5.0 V	GND	"					"								"	Q3	"	"
		"	47	GND	5.0 V	"					"								"	Q4	"	"
		"	48	5.0 V	5.0 V	"					"								"	Q5	"	"
1	OC	3005	49	GND	GND	GND					"								"	Q6	"	"
		"	50	5.0 V	5.0 V	"					"								"	Q7	"	"
		"	51	GND	GND	GND					"								"	V _{CC}	36	"
		"	52	5.0 V	5.0 V	"					"								"			"
		"	53	GND	GND	GND					"								"			"
		"	54	5.0 V	5.0 V	"					"								"			"
		"	55	GND	GND	GND					"								"			"
		"	56	5.0 V	5.0 V	"					"								"			"
		"	57	GND	GND	GND					"								"			"
		"	58	5.0 V	5.0 V	"					"								"			"
		"	59	GND	GND	GND					"								"			"
		"	60	5.0 V	5.0 V	"					"								"			"
		"	61	GND	GND	GND					"								"			"
		"	62	5.0 V	5.0 V	"					"								"			"
		"	63	GND	GND	GND					"								"			"
		"	64	5.0 V	5.0 V	"					"								"			"

See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 05.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E, F 2, X	Test no.	Same tests, terminal conditions, and limits as for subgroup 1 except T _c = +125°C and V _{CC} tests are omitted.																Measured terminal	Limits		Unit
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	
2																								
3																								
7 2/ T _c = 25°C	Truth table tests	3014	50	B	B	B	L	L	L	L	L	GND	L	L	L	L	A	A	B	5.0V	3/			
			51	B	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			52	A	"	"	L	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			53	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			54	B	A	"	"	L	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			55	B	"	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"		"	"	
			56	A	"	"	"	"	L	"	"	"	"	"	"	"	"	"	"	"		"	"	
			57	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			58	B	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			59	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			60	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			61	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			62	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			63	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			64	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			65	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			67	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			68	A	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			69	B	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			70	A	A	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			71	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			72	A	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			73	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			74	"	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			76	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			77	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			79	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			81	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			82	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			83	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			84	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			85	B	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			88	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			89	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			90	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			91	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			93	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			94	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
			95	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	
8	Same tests and terminal conditions as for subgroup 7 except T _c = +125°C and T _c = -55°C.																							

See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 05.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal		Limits		Unit
					A	B	C	Q0	Q1	Q2	Q3	GND	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR	V _{CC}	CLR to Q0	CLR to Q1	Min	Max	
9	t _{PHL1}	3003 Fig. 5	96	GND	GND	GND	GND	OUT				GND					4.5 V	ENBL	IN	5.0 V	CLR to Q0	CLR to Q1	3	23	ns
			97	4.5 V	GND				OUT												CLR to Q1				"
			98	GND	4.5 V					OUT											CLR to Q2				"
			99	4.5 V	4.5 V						OUT										CLR to Q3				"
			100	GND	GND	GND	4.5 V						OUT								CLR to Q4				"
			101	4.5 V	GND									OUT							CLR to Q5				"
			102	GND	4.5 V										OUT						CLR to Q6				"
			103	4.5 V	4.5 V											OUT					CLR to Q7				"
			104	GND	GND	GND	GND	OUT									IN	GND	GND		DI to Q0	DI to Q1		35	"
			105	4.5 V	GND				OUT												DI to Q2				"
			106	GND	4.5 V					OUT											DI to Q3				"
			107	4.5 V	4.5 V						OUT										DI to Q4				"
	PHL2		108	GND	GND	GND	4.5 V						OUT								DI to Q5				"
			109	4.5 V	GND									OUT							DI to Q6				"
			110	GND	4.5 V										OUT						DI to Q7				"
			111	4.5 V	4.5 V											OUT					DI to Q0	DI to Q1		25	"
			112	GND	GND	GND	GND	OUT													DI to Q2				"
			113	4.5 V	GND				OUT												DI to Q3				"
			114	GND	4.5 V					OUT											DI to Q4				"
			115	4.5 V	4.5 V						OUT										DI to Q5				"
			116	GND	GND	GND	4.5 V						OUT								DI to Q6				"
			117	4.5 V	GND									OUT							DI to Q7				"
			118	GND	4.5 V										OUT						DI to Q0	DI to Q1			"
			119	4.5 V	4.5 V											OUT					DI to Q2				"
	PHL3		120	IN	GND	GND	GND	OUT									4.5 V				A to Q0	A to Q1		32	"
			121	IN	IN	GND			OUT												A to Q2				"
			122	GND	IN					OUT											B to Q0	B to Q1			"
			123	IN	4.5 V						OUT										A to Q3				"
			124	GND	GND	IN							OUT								C to Q4				"
			125	IN	GND	GND	4.5 V							OUT							A to Q5				"
			126	GND	IN										OUT						B to Q6				"
			127	IN	4.5 V											OUT					A to Q7				"
			128	IN	IN	GND	GND	OUT													A to Q0				"
			129	IN	IN	GND			OUT												A to Q1				"
			130	GND	IN					OUT											B to Q2				"
			131	IN	4.5 V						OUT										A to Q3				"
			132	GND	GND	GND	IN						OUT								C to Q4				"
	PHL4		133	IN	GND	GND	4.5 V							OUT							A to Q5				"
			134	GND	IN										OUT						B to Q6				"
			135	IN	4.5 V											OUT					A to Q7				"
			136	GND	GND	GND	GND	OUT										IN			ENBL to Q0			29	"
			137	4.5 V	GND				OUT												ENBL to Q1				"
			138	GND	4.5 V					OUT											ENBL to Q2				"
			139	4.5 V	4.5 V						OUT										ENBL to Q3				"
			140	GND	GND	GND	4.5 V						OUT								ENBL to Q4				"
			141	4.5 V	GND									OUT							ENBL to Q5				"
			142	GND	4.5 V										OUT						ENBL to Q6				"
			143	4.5 V	4.5 V											OUT					ENBL to Q7				"

See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 05.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E, F Cases 2, X	Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits		Unit	
					A	B	C	Q0	Q1	Q2	Q3	GND	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR	V _{cc}		Min	Max		
9 T _C = 25°C	t _{PHL4}	3003	144	GND	GND	GND	GND	OUT				GND					4.5 V	IN	GND	5.0 V	ENBL to Q0	3	29	ns	
		Fig 5	145	4.5 V	GND	"		OUT					"					"	"	"	ENBL to Q1	"	"	"	
		"	146	GND	4.5 V	"							"					"	"	"	ENBL to Q2	"	"	"	
		"	147	4.5 V	4.5 V	"							"					"	"	"	ENBL to Q3	"	"	"	
		"	148	GND	GND	4.5 V							"					"	"	"	ENBL to Q4	"	"	"	
		"	149	4.5 V	GND	"							"					"	"	"	ENBL to Q5	"	"	"	
		"	150	GND	4.5 V	"							"			OUT		"	"	"	ENBL to Q6	"	"	"	
		"	151	4.5 V	4.5 V	"							"					"	"	"	ENBL to Q7	"	"	"	
		"	152	GND	GND	GND	OUT						"					IN	IN	4.5 V	"	ENBL to Q0	"	"	"
		PHL4	"	153	"	"	"	"	"				"					"	"	"	ENBL to Q0	"	"	"	
		PHL4	"	154	"	"	"	"	"				"					"	"	"	ENBL to Q0	"	"	"	
		PHL4	"	155	4.5 V	"	"	"		OUT			"					"	"	"	ENBL to Q0	"	"	"	
		PHL4	"	156	"	"	"	"	"	"			"					"	"	"	ENBL to Q1	"	"	"	
		PHL4	"	157	"	"	"	"	"	"			"					"	"	"	ENBL to Q1	"	"	"	
		PHL4	"	158	GND	4.5 V	"	"				OUT	"					"	"	"	"	ENBL to Q2	"	"	"
		PHL4	"	159	"	"	"	"	"			"	"					"	"	"	"	ENBL to Q2	"	"	"
		PHL4	"	160	"	"	"	"	"			"	"					"	"	"	"	ENBL to Q2	"	"	"
		PHL4	"	161	4.5 V	"	"	"	"				OUT	"				"	"	"	"	ENBL to Q3	"	"	"
		PHL4	"	162	"	"	"	"	"				"					"	"	"	"	ENBL to Q3	"	"	"
		PHL4	"	163	"	"	"	"	"				"					"	"	"	"	ENBL to Q3	"	"	"
		PHL4	"	164	GND	GND	4.5 V	"					"		OUT			"	"	"	"	ENBL to Q4	"	"	"
		PHL4	"	165	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q4	"	"	"
		PHL4	"	166	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q4	"	"	"
		PHL4	"	167	4.5 V	"	"	"	"				"		"			"	"	"	"	ENBL to Q5	"	"	"
		PHL4	"	168	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q5	"	"	"
		PHL4	"	169	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q5	"	"	"
		PHL4	"	170	GND	GND	4.5 V	"					"			OUT		"	"	"	"	ENBL to Q5	"	"	"
		PHL4	"	171	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q6	"	"	"
		PHL4	"	172	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q6	"	"	"
		PHL4	"	173	4.5 V	"	"	"	"				"		"			OUT	"	"	"	ENBL to Q7	"	"	"
		PHL4	"	174	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q7	"	"	"
		PHL4	"	175	"	"	"	"	"				"		"			"	"	"	"	ENBL to Q7	"	"	"
		PHL4	"	176	IN	GND	GND		OUT				"						GND	"	"	ENBL to Q1	"	"	"
		PHL4	"	177	"	"	"	"	"				"						4.5 V	"	"	ENBL to Q1	"	"	"
		PHL4	"	178	"	"	"	"	"				"						GND	"	"	ENBL to Q1	"	"	"

See footnotes at end of device type 05.

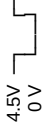
TABLE III. Group A inspection for device type 05.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E, F, 2, X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Limits		Unit		
				Test no.	A	B	C	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	DATA IN	ENBL	CLR	V _{cc}		Min	Max			
9	$T_C = 25^{\circ}\text{C}$	3003 Fig 5	179	GND	IN	GND			OUT		GND					GND	IN	4.5 V	5.0 V	ENBL to Q2	3	29	ns		
			180	"	"	"					"						4.5 V	"	"	"	ENBL to Q2	"	"	"	
			181	"	"	"					"						GND	"	"	"	ENBL to Q2	"	"	"	
			182	"	GND	IN					"	OUT					GND	"	"	"	"	ENBL to Q4	"	"	"
			183	"	"	"					"	"					4.5 V	"	"	"	"	ENBL to Q4	"	"	"
			184	"	"	"					"	"					GND	"	"	"	"	ENBL to Q4	"	"	"
			185	IN	"	GND	OUT				"						GND	"	"	"	"	ENBL to Q0	"	"	"
			186	"	"	"	"				"						4.5 V	"	"	"	"	ENBL to Q0	"	"	"
			187	"	"	"	"				"						GND	"	"	"	"	ENBL to Q0	"	"	"
			188	4.5 V	IN	4.5 V					"		"	OUT			GND	"	"	"	"	ENBL to Q5	"	"	"
			189	"	"	"	"				"		"	"			4.5 V	"	"	"	"	ENBL to Q5	"	"	"
			190	"	"	"	"				"		"	"			GND	"	"	"	"	ENBL to Q5	"	"	"
			191	"	4.5 V	IN					OUT		"				GND	"	"	"	"	ENBL to Q3	"	"	"
			192	"	"	"	"				"		"				4.5 V	"	"	"	"	ENBL to Q3	"	"	"
			193	"	"	"	"				"		"				GND	"	"	"	"	ENBL to Q3	"	"	"
10	$T_C = 125^{\circ}\text{C}$	Same tests and terminal conditions as for subgroup 9, except $T_C = +125^{\circ}\text{C}$ and test limits as shown																							
$T_C = 125^{\circ}\text{C}$	$t_{PH1.1}$																								
	t_{PH2}																								
	t_{PH2}																								
	t_{PH3}																								
	t_{PH3}																								
11	$T_C = 125^{\circ}\text{C}$	t_{PH4}																							
		t_{PH4}																							
		t_{PH4}																							

- 1/ Apply a 3V/0V/3V momentary pulse 500 ns minimum prior to measurements.
2/ A = 2.4 V, B = 0.4 V.
3/ H ≥ 1.5 V, L ≤ 1.5 V.
4/ I_{IL} limits are as follows:

Symbol	Min/max limits (mA)
Circuit B, C Device 03	Circuit A Device 05
I_{L1}	-12/-36
Test 21	-0.005/-0.72
Test 21	-0.005/-0.20

5/ See note 6 of figure 5.

6/ Apply  4.5 v momentary pulse prior to each test.

5. PACKAGING

5.1 Packaging requirements. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department of Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

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

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. Complete part number (see 1.2).
- c. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- d. Requirements for certificate of compliance, if applicable.
- e. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.
- f. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.
- g. Requirements for product assurance options.
- h. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements should not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
- j. Requirements for "JAN" marking.

6.3 Superseding information. The requirements of MIL-M-38510 have been superseded to take advantage of the available Qualified Manufacturer Listing (QML) system provided by MIL-PRF-38535. Previous references to MIL-M-38510 in this document have been replaced by appropriate references to MIL-PRF-38535. All technical requirements now consist of this specification and MIL-PRF-38535. The MIL-M-38510 specification sheet number and PIN have been retained to avoid adversely impacting existing government logistics systems and contractor's parts lists.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, 3990 E. Broad Street, Columbus, Ohio 43123-1199.

MIL-M-38510/316E

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535, MIL-HDBK-1331, and as follows:

GND	Ground zero voltage potential.
I _{IN}	Current flowing into an input terminal.
V _{IN}	Voltage level at an input terminal.
V _{SUH}	Setup high
V _{SUL}	Setup low

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

6.7 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

Military device type	Generic-industry type
01	54LS75
02	54LS279
03	54LS259
04	54LS375
05	54LS259B

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

TABLE IV. Manufacturer's designator.

Device type	CIRCUITS				
	A	B	C	D	E
	Texas Instruments	Motorola Inc.	Fairchild Co.	Signetics Corp.	National Semiconductor
01	X	X		X	X
02	X	X	X	X	X
03	X	X	X		X
04	X	X	X	X	
05	X				

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

Custodians:

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

Preparing activity:

DLA - CC

(Project 5962-1965)

Review activities:

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

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-M-38510/316E

2. DOCUMENT DATE (YYYYMMDD)
2003-07-14

3. DOCUMENT TITLE

MICROCIRCUITS, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL, CASCADABLE LATCHES, MONOLITHIC SILICON

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First Middle Initial)*

b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*
(1) Commercial
(2) DSN
(If applicable)

7. DATE SUBMITTED
(YYYYMMDD)

8. PREPARING ACTIVITY

a. NAME
Defense Supply Center, Columbus

b. TELEPHONE *(Include Area Code)*
(1) Commercial 614-692-0536 (2) DSN 850-0536

c. ADDRESS *(Include Zip Code)*
DSCC-VA
P. O. Box 3990
Columbus, Ohio 43216-5000

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