

INCH-POUND

MIL-M-38510/325D  
17 September 2003  
SUPERSEDING  
MIL-M-38510/325C  
24 September 1987

## MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL,  
FLIP-FLOPS, CASCADABLE, 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, bipolar, low-power Schottky TTL, flip-flops, bistable logic microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided for each type and are reflected in the complete part number. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).

1.2 Part number. The part number 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	Octal D flip-flop with clear, cascadable
02	Octal D flip-flop with transparent latch and 3 state outputs non-cascadable
03	Octal D flip-flop with 3 state outputs, cascadable
04	Octal D flip-flop with enable, cascadable

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>
R	GDIP1-T20 or CDIP2-T20	20	Dual-in-line
S	GDFP2-F20 or CDFP3-F20	20	Flat pack
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.

1.3 Absolute maximum ratings.

Supply voltage range .....	-0.5 V dc to 7.0 V dc
Input voltage range .....	-1.5 V dc at -18 mA to 5.5 V dc
Storage temperature range .....	-65°C to +150°C
Maximum power dissipation ( $P_D$ ) <u>1/</u>	
Device type 01 .....	149 mW
Device type 02 and 03 .....	231 mW
Device type 04 .....	176 mW
Lead temperature (soldering, 10 seconds) .....	+300°C
Thermal resistance, junction to case ( $\theta_{JC}$ ):	
Cases R, S, and 2 .....	(See MIL-STD-1835)
Junction temperature ( $T_J$ ) <u>2/</u> .....	+175°C

1.4 Recommended operating conditions.

Supply voltage ( $V_{CC}$ ) .....	4.5 V dc minimum to 5.5 V dc maximum
Minimum high level input voltage ( $V_{IH}$ ) .....	2.0 V dc
Maximum low level input voltage ( $V_{IL}$ ) .....	0.7 V dc
Case operating temperature range ( $T_C$ ) .....	-55°C to +125°C
Normalized fanout (each output) <u>3/</u> .....	10 maximum at low logic level 20 maximum at high logic level
Input setup time, $t_{(setup)}$ :	
Device type 01, 03 .....	20 ns minimum
Device type 02 .....	5 ns minimum
Device type 04	
data .....	20 ns minimum
enable active .....	25 ns minimum
enable inactive .....	10 ns minimum
Input hold time, $t_{(hold)}$ :	
Device type 01, 03, 04 .....	5 ns minimum
Device type 02 .....	20 ns minimum
Input pulse width, $t_p$ :	
Device type 01, 04 (clock) .....	20 ns minimum
Device type 01 (clear) .....	20 ns minimum
Device type 02 (enable) .....	15 ns minimum
Device type 03 (clock) .....	15 ns minimum

1/ Must withstand the added  $P_D$  due to short-circuit test (e.g.,  $I_{OS}$ ).2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions in accordance with MIL-PRF-38535.3/ Device will fanout in both high and low levels to the specified number of data inputs on the same device as that being tested.

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

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

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

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

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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.

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

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$		Device type	Limits		Unit
					Min	Max	
High level output voltage	$V_{OH}$	$V_{IH} = 2.0\text{ V}$ , $V_{CC} = 4.5\text{ V}$	$I_{OH} = -400\ \mu\text{A}$	01, 04	2.5		V
			$I_{OH} = -1\text{ mA}$	02, 03	2.4		
Low level output voltage	$V_{OL}$	$V_{IL} = 0.7\text{ V}$ , $V_{CC} = 4.5\text{ V}$	$I_{OL} = 4\text{ mA}$	01, 04		0.4	V
			$I_{OL} = 12\text{ mA}$	02, 03			
Input clamp voltage	$V_{IC}$	$V_{CC} = 4.5\text{ V}$ , $I_{OL} = -18\text{ mA}$ , $T_C = +25^{\circ}\text{C}$		All		-1.5	V
Low level input current	$I_{IL}$	$V_{CC} = 5.5\text{ V}$ , $V_{IL} = 0.4\text{ V}$	clear	01	-30	-360	$\mu\text{A}$
			clock	01, 04	-30	-400	
				03	0	-400	
			data	01, 04	-100	-400	
				02	0	-400	
			O/C	03	0	-400	
				02, 03	0	-420	
			enable	02		-400	
High level input current all inputs	$I_{IH1}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 2.7\text{ V}$		All		20	$\mu\text{A}$
	$I_{IH2}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 5.5\text{ V}$		All		100	$\mu\text{A}$
Short circuit output current	$I_{OS}$	$V_{CC} = 5.5\text{ V}$ , $V_{IN} = 0\text{ V}$ <sup>1/</sup>		02, 03	-15	-225	mA
				01, 04	-15	-100	
Output current, high level, outputs off	$I_{OZH}$	$V_{CC} = 5.5\text{ V}$ , $V_O = 2.7\text{ V}$		02, 03		20	$\mu\text{A}$
Output current, low level, outputs off	$I_{OZL}$	$V_{CC} = 5.5\text{ V}$ , $V_O = 0.4\text{ V}$		02, 03		-20	$\mu\text{A}$
Supply current	$I_{CC}$	$V_{CC} = 5.5\text{ V}$	$V_{IN} = 5.0\text{ V}$	01		27	mA
				02		40	
			03		42		
			$V_{IN} = \text{GND}$	04		32	
Maximum clock frequency	$f_{MAX}$	$V_{CC} = 4.5\text{ V}$ $C_L = 50\text{ pF} \pm 10\%$	$R_L = 2\text{ k}\Omega \pm 5\%$	01, 04	25		MHz
			$R_L = 110\ \Omega \pm 5\%$	03	26		

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

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T <sub>C</sub> ≤ +125°C	Device type	Limits		Unit
				Min	Max	
To low level clr to Q	t <sub>PHL1</sub>	C <sub>L</sub> = 50 pF ±10%, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 2 kΩ ±5%	01	5	42	ns
To high level clk to Q	t <sub>PLH2</sub>		01	5	42	ns
To low level clk to Q	t <sub>PHL2</sub>		01	5	42	ns
To high level D to Q	t <sub>PLH1</sub>	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 50 pF ±10%, R <sub>L</sub> = 110 Ω ±5%	02	3	24	ns
To low level D to Q	t <sub>PHL1</sub>		02	3	24	ns
To high level G to Q	t <sub>PLH2</sub>		02	3	39	ns
To low level G to Q	t <sub>PHL2</sub>		02	3	39	ns
To high level O/C to Q	t <sub>PZH</sub>		02	3	37	ns
To low level O/C to Q	t <sub>PZL</sub>		02	3	47	ns
To Z from high O/C to Q	t <sub>PHZ</sub>		02	3	35	ns
To Z from low O/C to Q	t <sub>PLZ</sub>		02	3	39	ns
To high level clk to Q	t <sub>PLH2</sub>		03	5	37	ns
To low level clk to Q	t <sub>PHL2</sub>		03	5	37	ns
To high level O/C to Q	t <sub>PZH</sub>		03	3	37	ns
To low level O/C to Q	t <sub>PZL</sub>		03	3	37	ns
To Z from high O/C to Q	t <sub>PHZ</sub>		03	3	37	ns
To Z from low O/C to Q	t <sub>PLZ</sub>		03	3	39	ns
To high level clk to Q	t <sub>PLH2</sub>	C <sub>L</sub> = 50 pF ±10%, R <sub>L</sub> = 2 kΩ ±5%, V <sub>CC</sub> = 5.0 V	04	5	42	ns
To low level clk to Q	t <sub>PHL2</sub>		04	5	42	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
Group B electrical test parameters when using the method 5005 QCI option	1, 2, 3, 7, 8, 9, 10, 11	N/A
Group C end-point electrical parameters	1, 2, 3, 7, 8 9, 10, 11	1, 2, 3
Additional electrical subgroups for group C periodic inspections	N/A	10, 11
Group D end-point electrical parameters	1, 2, 3	1, 2, 3

\*PDA applies to subgroup 1.

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. Subgroups 3 and 4 shall be added to the group C inspection parameters for class B devices and shall consist of the tests, conditions, and limits specified for subgroups 10 and 11 of group A.
- c. 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.

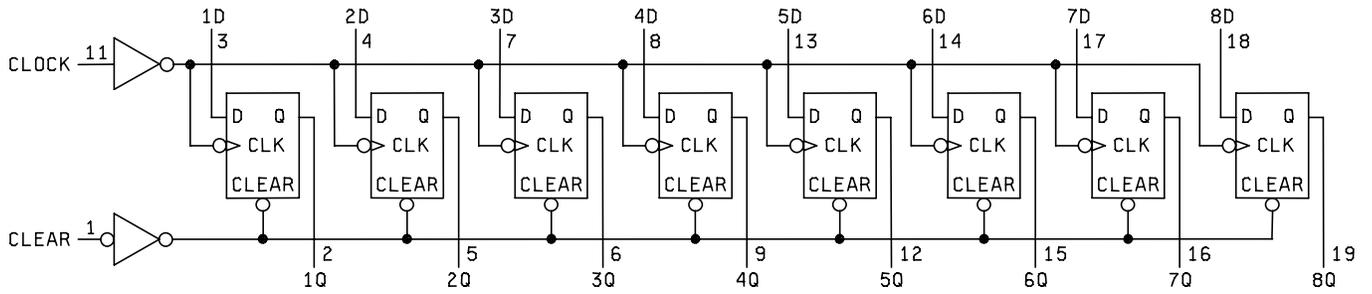
4.5 Methods of inspection. Methods of inspection shall be specified and as follows:

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.

Terminal number	Terminal symbol			
	Device type 01	Device type 02	Device type 03	Device type 04
	Cases R, S, 2			
1	CLEAR	OUTPUT CONTROL	OUTPUT CONTROL	ENABLE $\bar{G}$
2	1Q	1Q	1Q	1Q
3	1D	1D	1D	1D
4	2D	2D	2D	2D
5	2Q	2Q	2Q	2Q
6	3Q	3Q	3Q	3Q
7	3D	3D	3D	3D
8	4D	4D	4D	4D
9	4Q	4Q	4Q	4Q
10	GND	GND	GND	GND
11	CLOCK	ENABLE G	CLOCK	CLOCK
12	5Q	5Q	5Q	5Q
13	5D	5D	5D	5D
14	6D	6D	6D	6D
15	6Q	6Q	6Q	6Q
16	7Q	7Q	7Q	7Q
17	7D	7D	7D	7D
18	8D	8D	8D	8D
19	8Q	8Q	8Q	8Q
20	V <sub>CC</sub>	V <sub>CC</sub>	V <sub>CC</sub>	V <sub>CC</sub>

FIGURE 1. Logic diagrams and terminal connections.

DEVICE TYPE 01



DEVICE TYPE 04

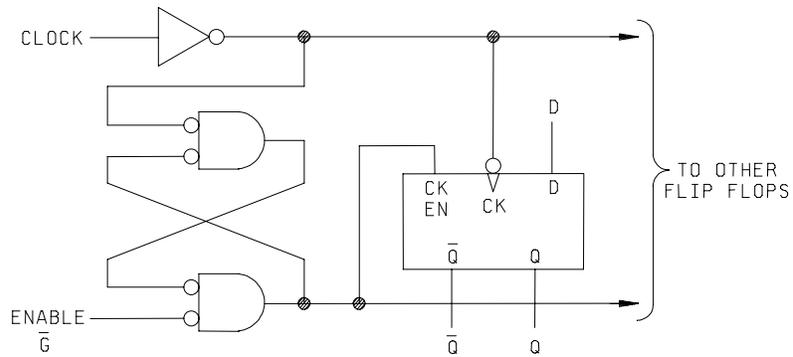


FIGURE 1. Logic diagrams and terminal connections - Continued.

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DEVICE TYPE 02

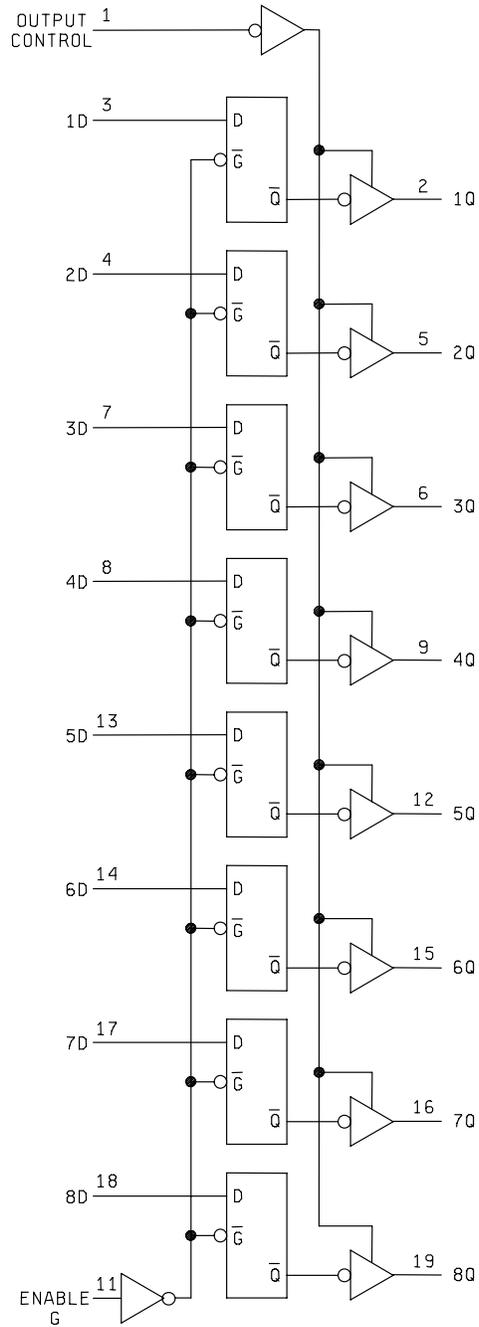


FIGURE 1. Logic diagrams and terminal connections - Continued.

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DEVICE TYPE 03

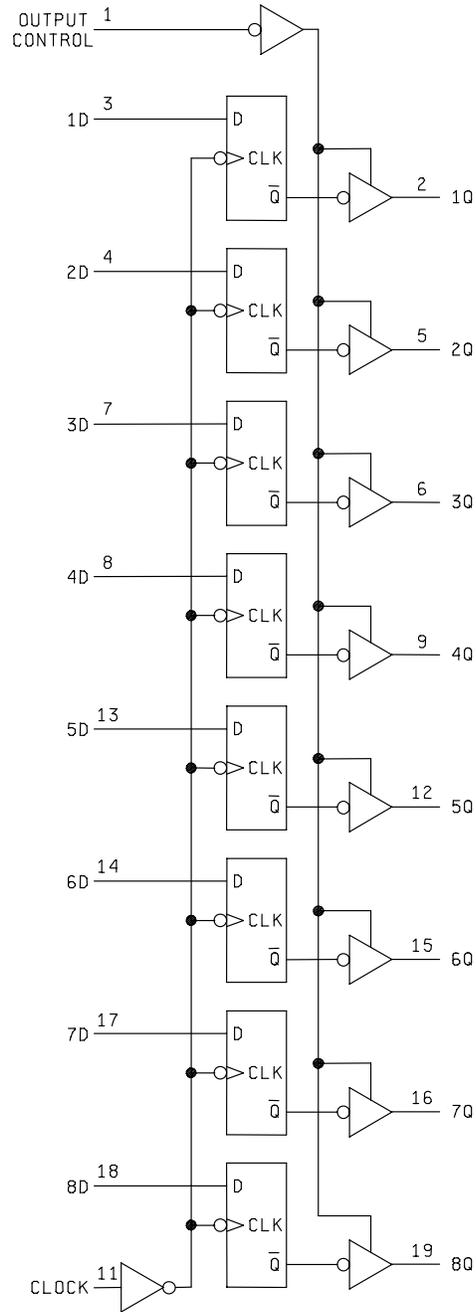


FIGURE 1. Logic diagrams and terminal connections - Continued.

Device type 01

Inputs			Output
Clear	Clock	D	Q
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q <sub>0</sub>

H = high level (steady state)

L = low level (steady state)

X = irrelevant

↑ = transition from low to high level

Q<sub>0</sub> = the level of Q before the indicated input conditions were established

Device type 02

Output control	Enable G	D	Output
L	H	H	H
L	H	L	L
L	L	X	Q <sub>0</sub>
H	X	X	Z

H = high level (steady state)

L = low level (steady state)

X = irrelevant

Q<sub>0</sub> = the level of Q before the indicated input conditions were established

Z = high impedance state

FIGURE 2. Truth tables.

Device type 03

Output control	Clock	D	Output
L	↑	H	H
L	↑	L	L
L	L	X	Q <sub>0</sub>
H	X	X	Z

H = high level (steady state)

L = low level (steady state)

X = irrelevant

↑ = transition from low to high level

Q<sub>0</sub> = the level of Q before the indicated input conditions were established

Z = high impedance state

Device type 04

Inputs			Output
$\bar{G}$	Clock	Data	Q
H	X	X	Q <sub>0</sub>
L	↑	H	H
L	↑	L	L
X	L	X	Q <sub>0</sub>

H = high level (steady state)

L = low level (steady state)

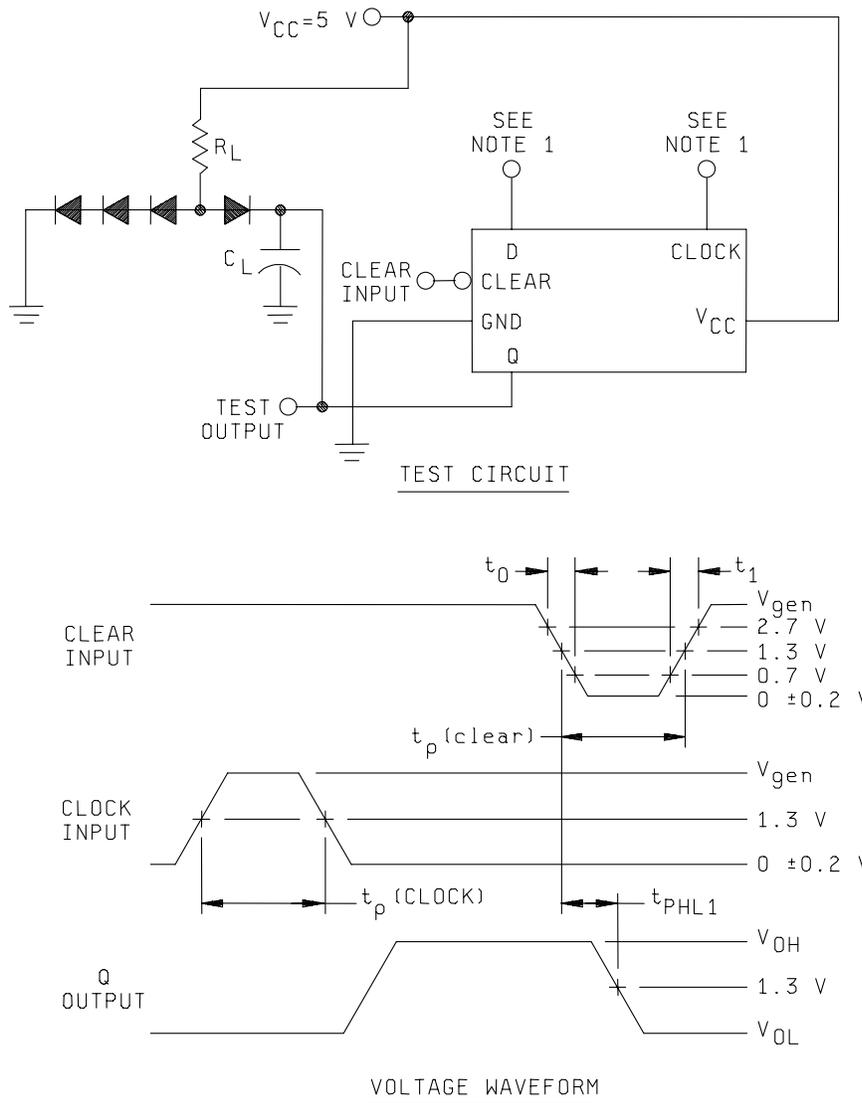
X = irrelevant

↑ = transition from low to high level

Q<sub>0</sub> = the level of Q before the indicated input conditions were established

FIGURE 2. Truth tables - Continued.

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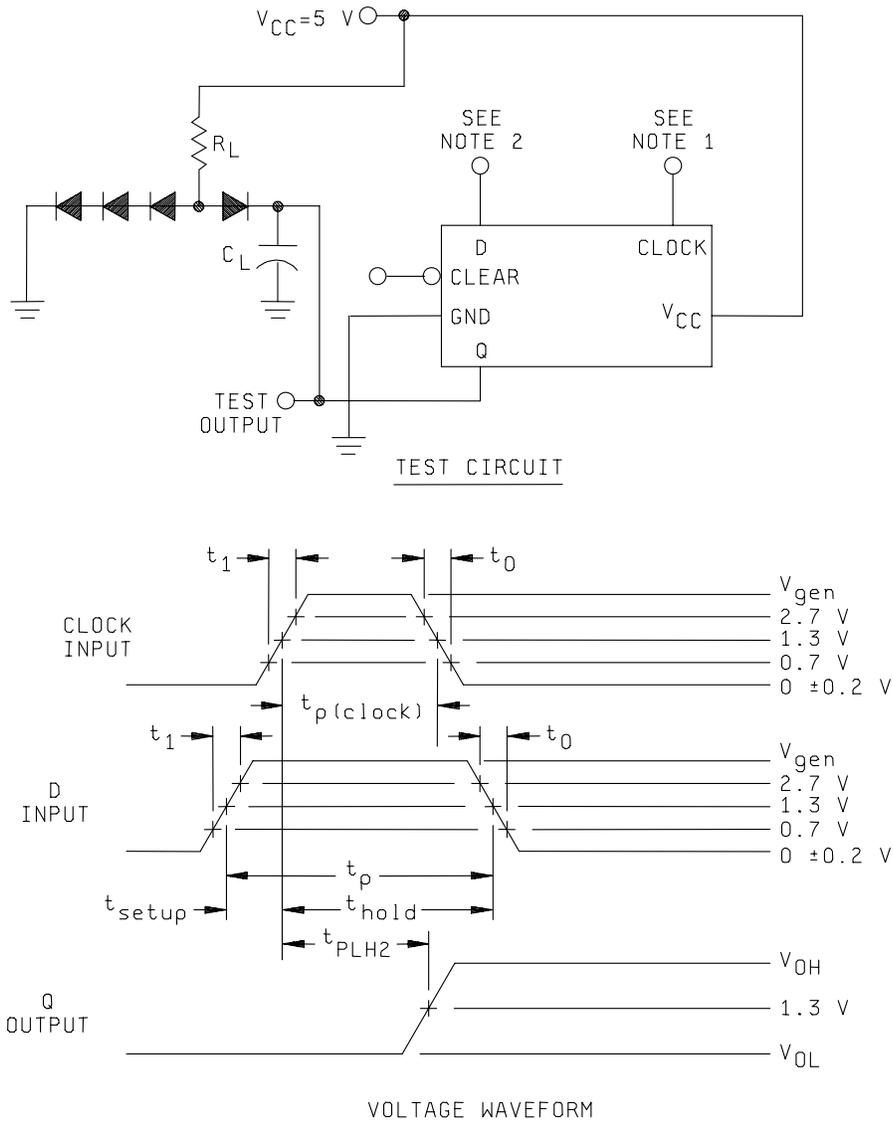


NOTES:

1. Clear input dominates regardless of the state of clock or D inputs.
2. All diodes are 1N3064 or equivalent.
3. Clear input pulse characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_0 \leq 6$  ns,  $t_1 \leq 15$  ns,  $t_{p(clear)} = 20$  ns minimum and  $PRR \leq 1$  MHz.
4.  $C_L = 50$  pF  $\pm 10\%$  (including probe and jig capacitance).
5.  $R_L = 2$  k $\Omega$   $\pm 5$  percent.
6. Clock input pulse characteristics:  $t_{p(clock)} \geq 20$  ns,  $V_{GEN} = 3.0 \pm 0.2$  V,  $PRR \leq 1$  MHz.

FIGURE 3. Asynchronous switching test circuit for device type 01.

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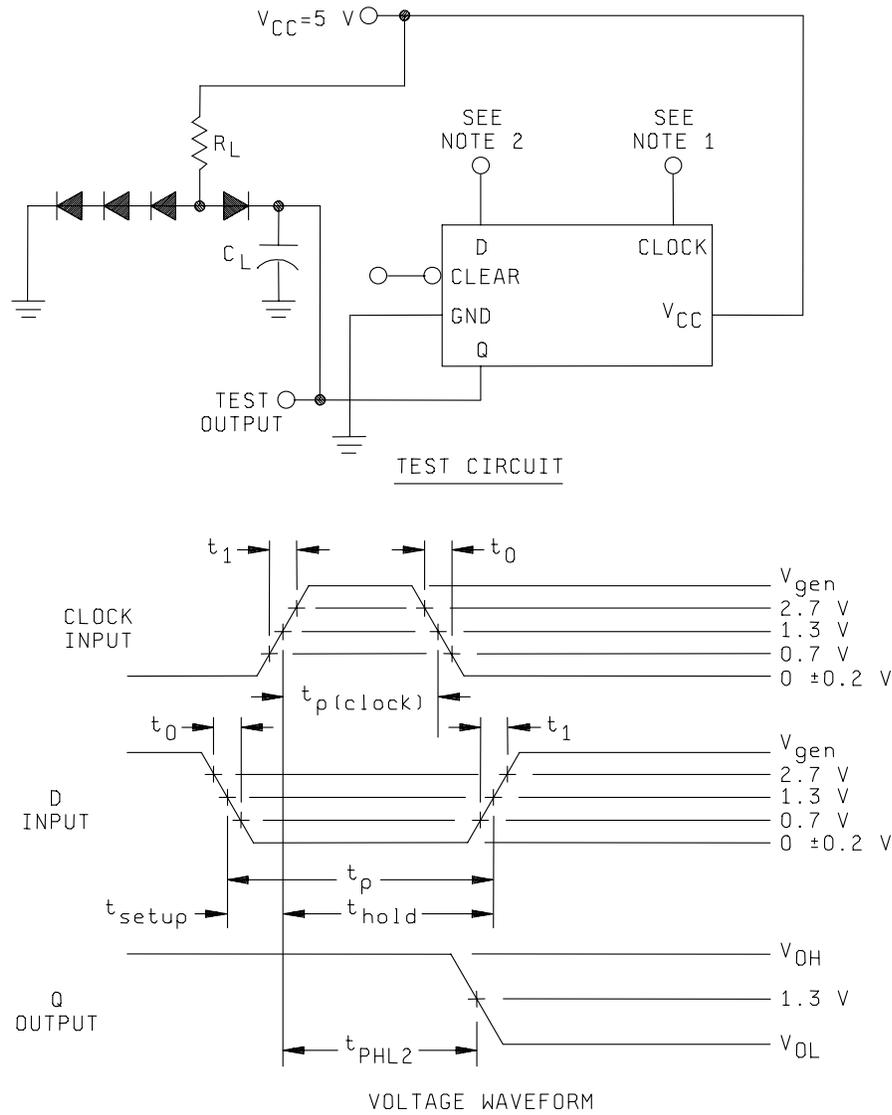


NOTES:

1. Clock input pulse has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_1 \leq 15$  ns,  $t_0 \leq 6$  ns,  $t_{p(clock)} \geq 30$  ns,  $PRR \leq 1$  MHz. When testing  $f_{MAX}$ ,  $PRR =$  see table III, and  $t_0 = t_1 \leq 6$  ns.
2. D input has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_1 \leq 15$  ns,  $t_0 \leq 6$  ns,  $t_{setup} = 20$  ns,  $t_{hold} = 5$  ns,  $t_p = 25$  ns, and  $PRR$  is 50 percent of the clock  $PRR$ . For  $f_{MAX}$ ,  $t_0 = t_1 \leq 6$  ns.
3. All diodes are 1N3064 or equivalent.
4.  $C_L = 50$  pF  $\pm 10\%$  (including probe and jig capacitance).
5.  $R_L = 2$  k $\Omega$   $\pm 5$  percent.

FIGURE 3. Synchronous switching test circuit (high level data) for device types 01 and 04 - Continued.

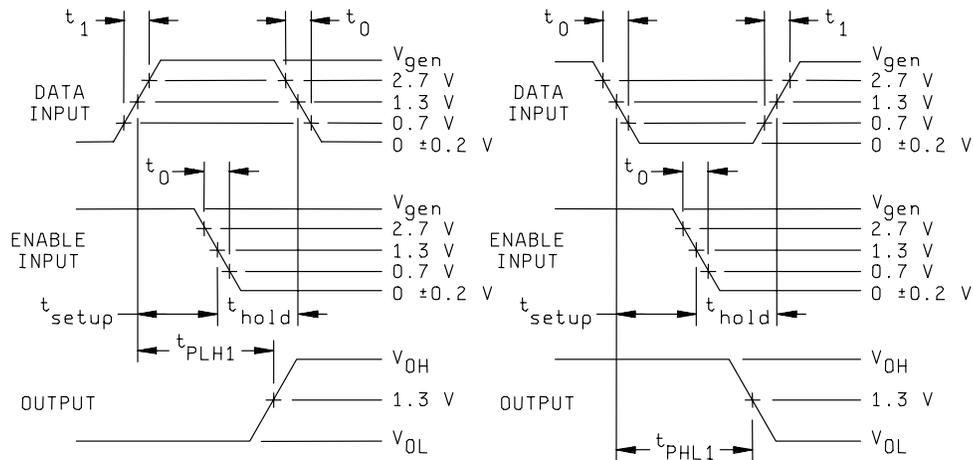
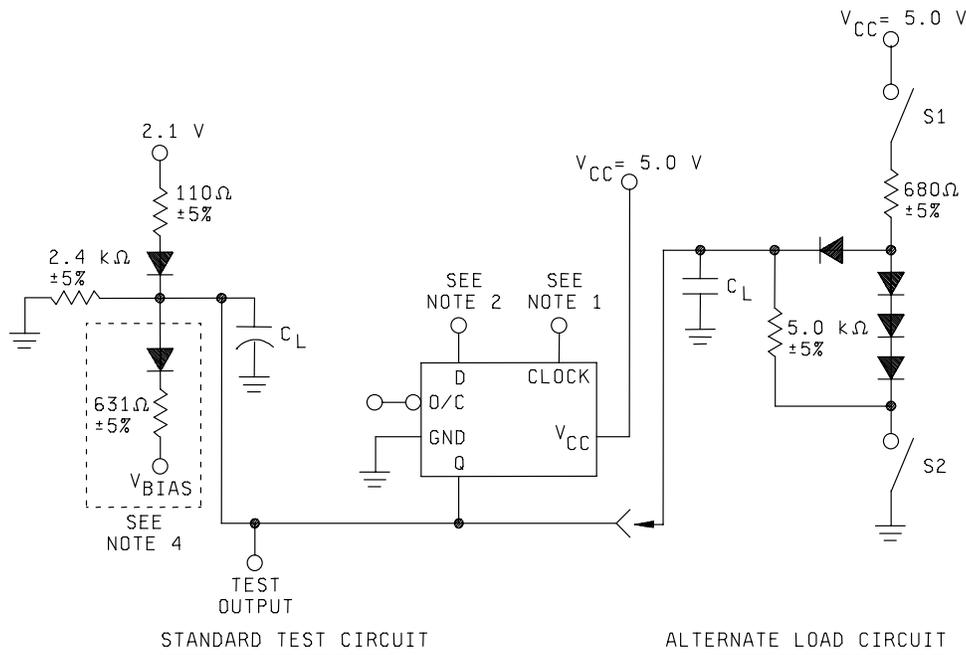
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NOTES:

1. Clock input pulse has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_1 \leq 15$  ns,  $t_0 \leq 6$  ns,  $t_{p(\text{clock})} = 30$  ns, and  $PRR \leq 1$  MHz.
2. D input has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_1 \leq 15$  ns,  $t_0 \leq 6$  ns,  $t_{setup} = 20$  ns,  $t_{hold} = 5$  ns,  $t_p = 25$  ns, and  $PRR$  is 50 percent of the clock  $PRR$ .
3. All diodes are 1N3064 or equivalent.
4.  $C_L = 50$  pF  $\pm 10\%$  (including probe and jig capacitance).
5.  $R_L = 2$  k $\Omega$   $\pm 5$  percent.

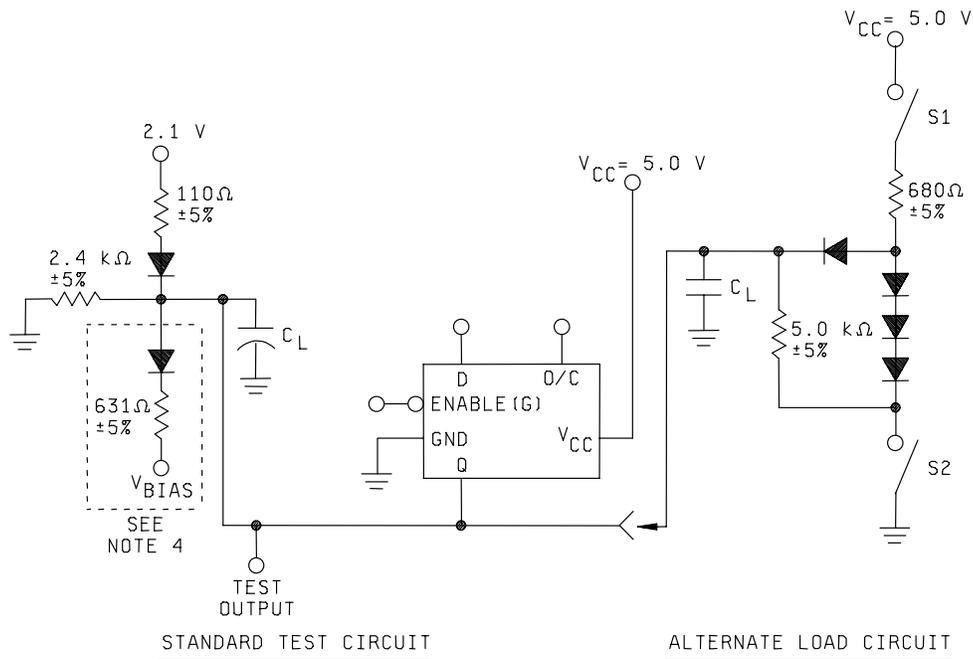
FIGURE 3. Synchronous switching test circuit (low level data) for device types 01 and 04 - Continued.



NOTES:

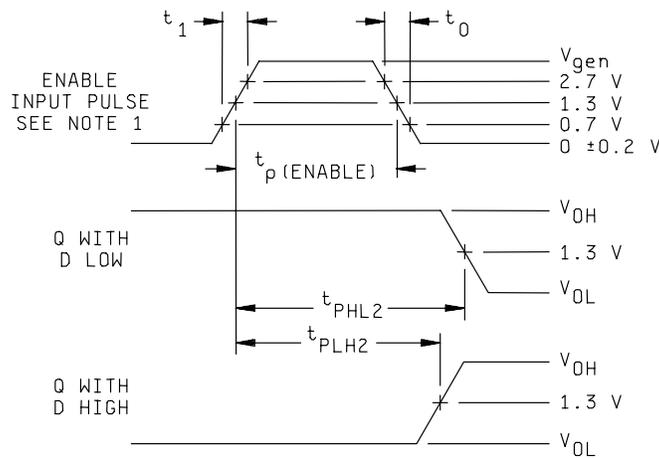
1. Enable pulse has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_0 \leq 6$  ns.
2. D input pulse has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_1 \leq 15$  ns,  $t_0 \leq 6$  ns,  $t_{setup} = 5$  ns,  $t_{hold} = 20$  ns,  $t_p = 25$  ns
3. All diodes are 1N3064 or equivalent.
4. The diode and resistor shown within the dotted area are optional. When the diode and resistor are used,  $V_{BIAS}$  shall be 5.5 V for all tests except for  $t_{PHZ}$ ; for  $t_{PHZ}$  tests,  $V_{BIAS}$  shall be -0.6 V.
5.  $C_L = 50$  pF  $\pm 10\%$  (including probe and jig capacitance).
6. Switches S1 and S2 are closed for  $t_{PLH1}$  and  $t_{PHL1}$ , when using the alternate load circuit.

FIGURE 3. Switching test circuit ( $t_{PLH1}$ ,  $t_{PHL1}$ ) for device type 02 - Continued.



STANDARD TEST CIRCUIT

ALTERNATE LOAD CIRCUIT



NOTES:

1. Enable input pulse characteristics for  $t_{PLH2}$  and  $t_{PHL2}$ :  $V_{gen} = 3.0 \pm 0.2 \text{ V}$ ,  $t_0 \leq 6 \text{ ns}$ ,  $t_1 \leq 15 \text{ ns}$ ,  $t_{(enable)} = 15 \text{ ns}$ , and  $\text{PRR} \leq 1 \text{ MHz}$ .
2. All diodes are 1N3064 or equivalent.
3.  $C_L = 50 \text{ pF} \pm 10\%$  (including probe and jig capacitance).
4. The diode and resistor shown within the dotted area are optional. When the diode and resistor are used,  $V_{BIAS}$  shall be 5.5 V for all tests except for  $t_{PHZ}$ ; for  $t_{PHZ}$  tests,  $V_{BIAS}$  shall be -0.6 V.
5. Switches S1 and S2 are closed for  $t_{PLH2}$  and  $t_{PHL2}$ , when using the alternate load circuit.

FIGURE 3. Switching test circuit ( $t_{PLH1}$ ,  $t_{PHL1}$ ) for device type 02 - Continued.

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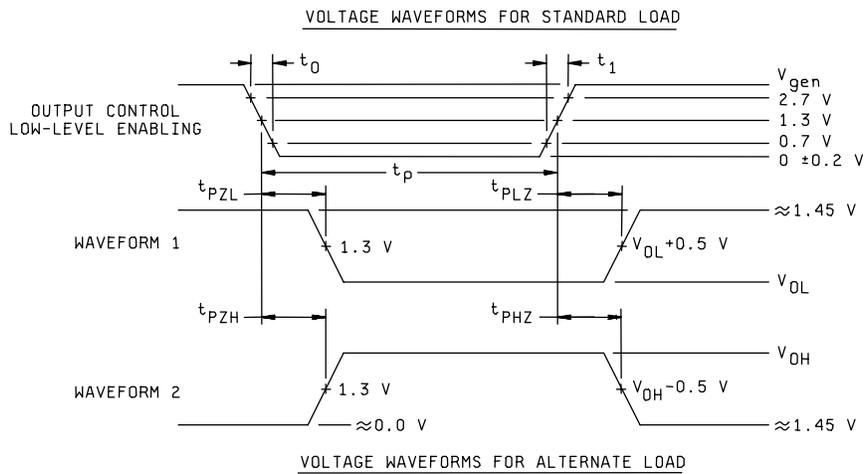
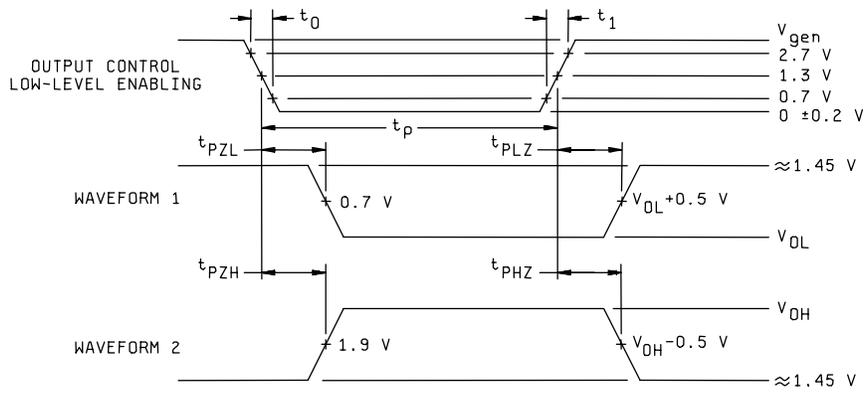
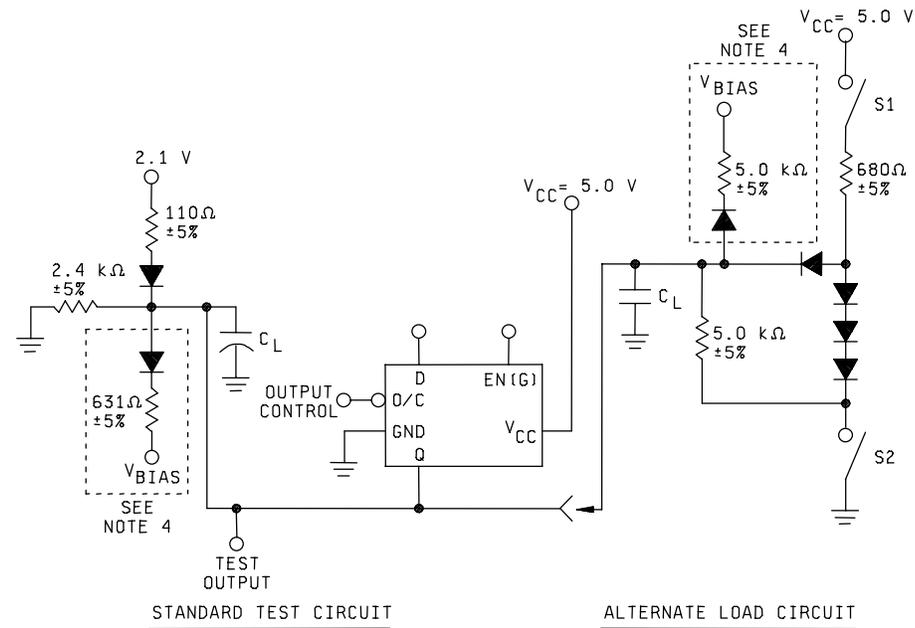


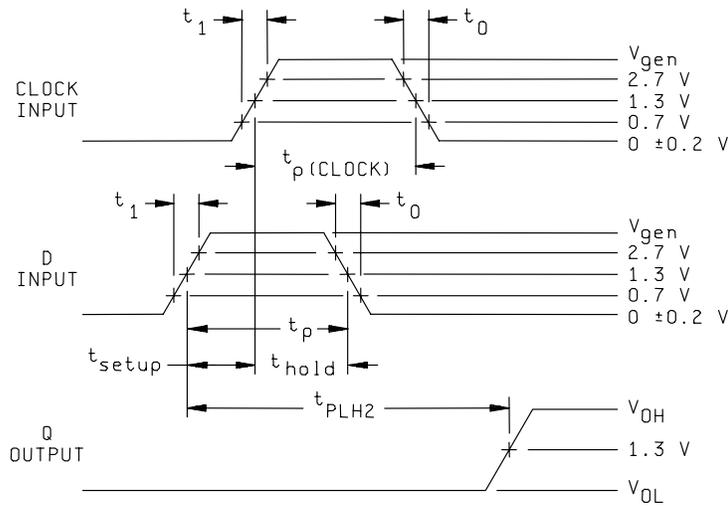
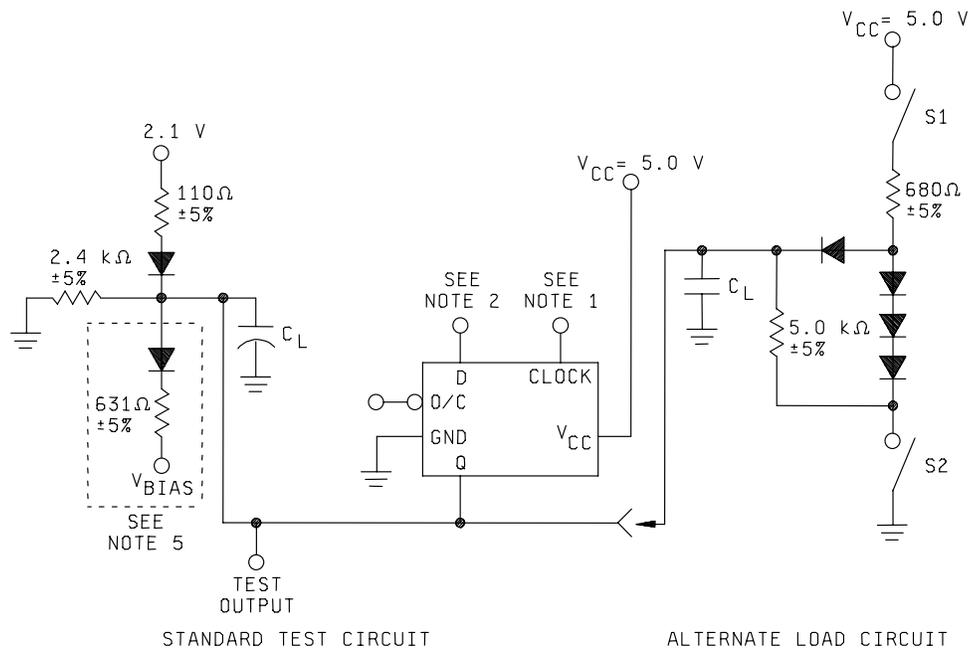
FIGURE 3. Three state switching test circuit and waveforms for device type 02 - Continued.

## NOTES:

1. All diodes are 1N3064 or equivalent.
2. Output control input pulse characteristics:  $V_{gen} = 3.0 \pm 0.2 \text{ V}$ ,  $t_i \leq 15 \text{ ns}$ ,  $t_o \leq 6 \text{ ns}$ ,  $t_{P(input)} \geq 200 \text{ ns}$ , and  $PRR \leq 1 \text{ MHz}$ .
3. For the standard test circuit,  $C_L = 50 \text{ pF} \pm 10\%$ . For the alternate load circuit,  $C_L = 50 \text{ pF} \pm 10\%$  for  $t_{PZL}$  and  $t_{PZH}$  and  $C_L = 15 \text{ pF}$  minimum for  $t_{PLZ}$  and  $t_{PHZ}$ . All capacitive load values include jig and probe capacitance.
4. The diodes and resistors shown within the dotted area are optional. When the diodes and resistors are used,  $V_{BIAS}$  shall be 5.5 V for all tests except for  $t_{PHZ}$ ; for  $t_{PHZ}$  tests,  $V_{BIAS}$  shall be -0.6 V.
5. When using the alternate load circuit, the appropriate switch positions for the three state tests are listed in the table below.

Test	S1	S2
$t_{PZL}$	Closed	Open
$t_{PLZ}$	Closed	Closed
$t_{PZH}$	Open	Closed
$t_{PHZ}$	Closed	Closed

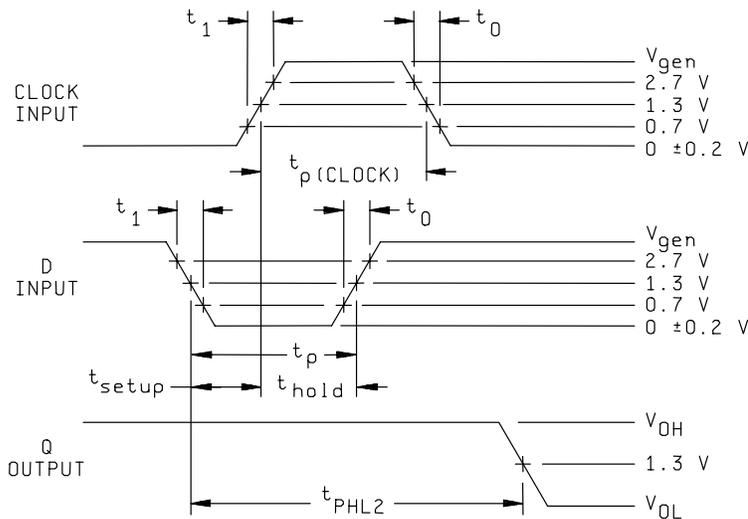
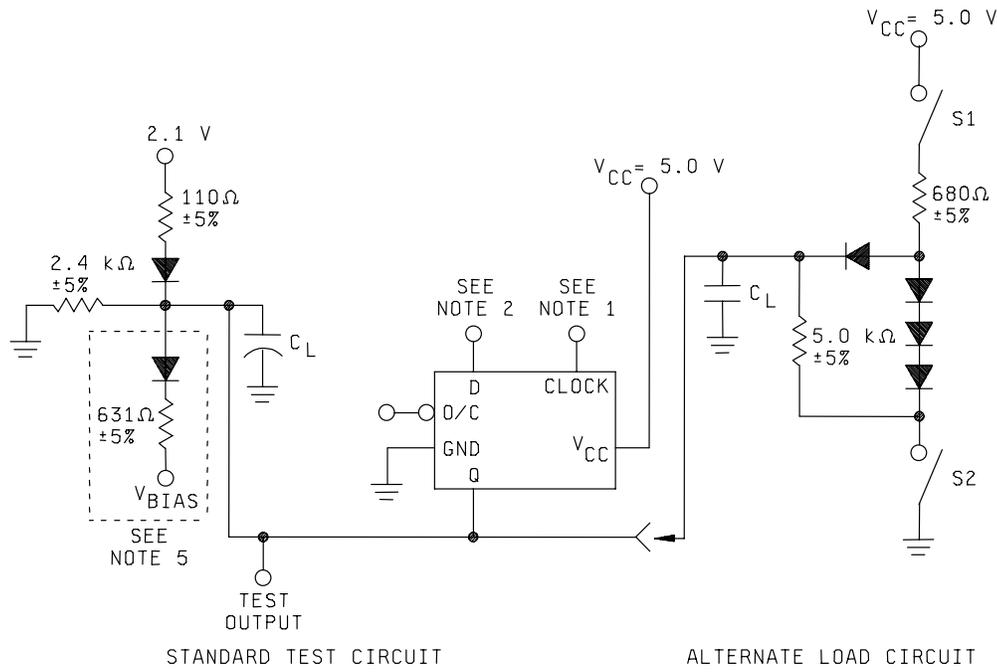
FIGURE 3. Three state switching test circuit and waveforms for device type 02 - Continued.



NOTES:

1. Clock input pulse has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_i \leq 15$  ns,  $t_o \leq 6$  ns,  $t_{p(\text{clock})} = 15$  ns,  $PRR \leq 1$  MHz. When testing  $f_{MAX}$ ,  $PRR =$  see table III, and  $t_o = t_i \leq 6$  ns.
2. D input has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_i \leq 15$  ns,  $t_o \leq 6$  ns,  $t_{setup} = 20$  ns,  $t_{hold} = 5$  ns,  $t_p = 25$  ns, and  $PRR$  is 50 percent of the clock  $PRR$ . For  $f_{MAX}$ ,  $t_o = t_i \leq 6$  ns.
3. All diodes are 1N3064 or equivalent.
4.  $C_L = 50$  pF  $\pm 10\%$  (including probe and jig capacitance).
5. The diode and resistor shown within the dotted area are optional. When the diode and resistor are used,  $V_{BIAS}$  shall be 5.5 V for all tests except for  $t_{PHZ}$ ; for  $t_{PHZ}$  tests,  $V_{BIAS}$  shall be -0.6 V.
6. Switches S1 and S2 are closed for  $t_{PHL2}$ , when using the alternate load circuit.

FIGURE 3. Synchronous switching test circuit (high level data) for device type 03 - Continued.



NOTES:

1. Clock input pulse has the following characteristics:  $V_{gen} = 3.0 \pm 0.2 \text{ V}$ ,  $t_1 \leq 15 \text{ ns}$ ,  $t_0 \leq 6 \text{ ns}$ ,  $t_{p(\text{clock})} = 15 \text{ ns}$  and  $\text{PRR} \leq 1 \text{ MHz}$ .
2. D input has the following characteristics:  $V_{gen} = 3.0 \pm 0.2 \text{ V}$ ,  $t_1 \leq 15 \text{ ns}$ ,  $t_0 \leq 6 \text{ ns}$ ,  $t_{\text{setup}} = 20 \text{ ns}$ ,  $t_{\text{hold}} = 5 \text{ ns}$ ,  $t_p = 25 \text{ ns}$ , and  $\text{PRR}$  is 50 percent of the clock  $\text{PRR}$ .
3. All diodes are 1N3064 or equivalent.
4.  $C_L = 50 \text{ pF} \pm 10\%$  (including probe and jig capacitance).
5. The diode and resistor shown within the dotted area are optional. When the diode and resistor are used,  $V_{BIAS}$  shall be 5.5 V for all tests except for  $t_{PHZ}$ ; for  $t_{PHZ}$  tests,  $V_{BIAS}$  shall be -0.6 V.
6. Switches S1 and S2 are closed for  $t_{PHL2}$ , when using the alternate load circuit.

FIGURE 3. Synchronous switching test circuit (low level data) for device type 03 - Continued.

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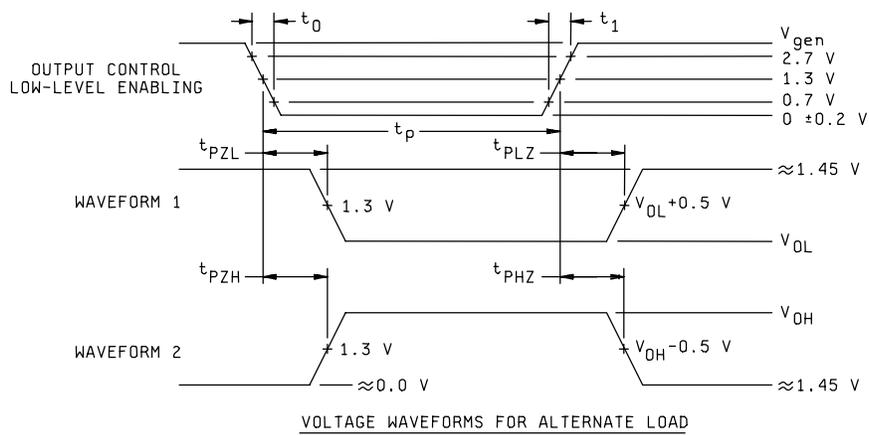
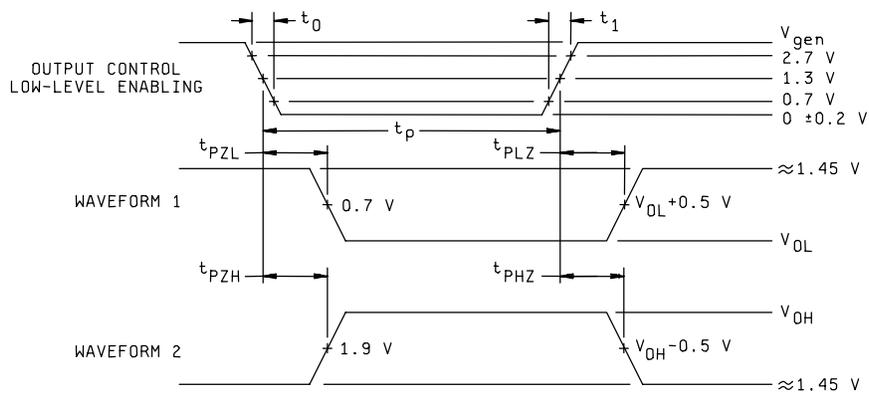
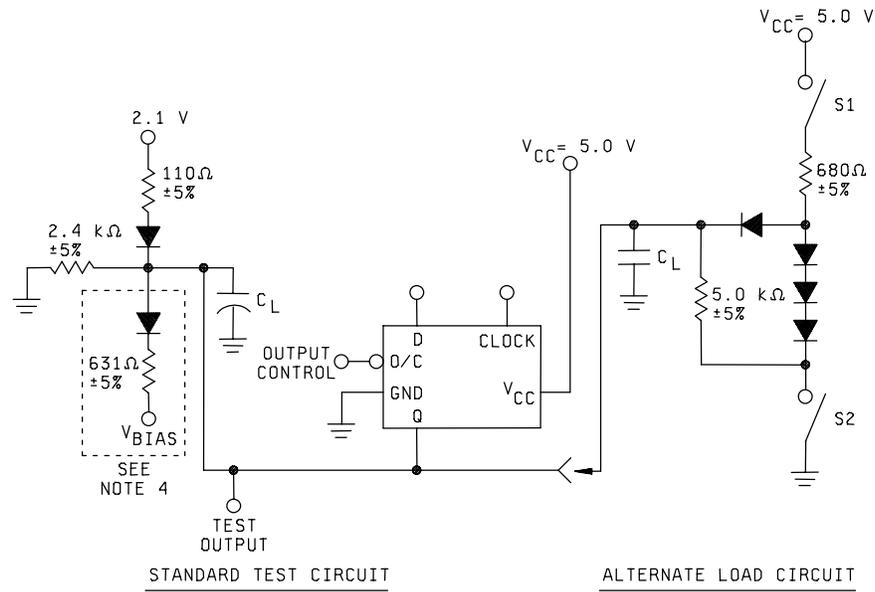


FIGURE 3. Three state switching test circuits and waveforms for device type 03 - Continued.

## NOTES:

1. O/C input pulse characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_i \leq 15$  ns,  $t_o \leq 6$  ns,  $t_{P(input)} \geq 200$  ns, and  $PRR \leq 1$  MHz.
2. All diodes are 1N3064 or equivalent.
3. For the standard test circuit,  $C_L = 50$  pF  $\pm 10\%$ . For the alternate load circuit,  $C_L = 50$  pF  $\pm 10\%$  for  $t_{PZL}$  and  $t_{PZH}$  and  $C_L = 15$  pF minimum for  $t_{PLZ}$  and  $t_{PHZ}$ . All capacitive load values include jig and probe capacitance.
4. The diodes and resistors shown within the dotted area are optional. When the diodes and resistors are used,  $V_{BIAS}$  shall be 5.5 V for all tests except for  $t_{PHZ}$ ; for  $t_{PHZ}$  tests,  $V_{BIAS}$  shall be -0.6 V.
5. When using the alternate load circuit, the appropriate switch positions for the three state tests are listed in the table below.

Test	S1	S2
$t_{PZL}$	Closed	Open
$t_{PLZ}$	Closed	Closed
$t_{PZH}$	Open	Closed
$t_{PHZ}$	Closed	Closed

FIGURE 3. Three state switching test circuits and waveforms for device type 03 - Continued.

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

Subgroup	Symbol	MIL-STD-883 method	Cases R, S, 2 Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Measured terminal	Test limits		Unit												
				CLR	1Q	1D	2D	2Q	3Q	3D	4D	4Q	GND	CLK	5Q	6D	6Q	7Q	7D	8D	8Q	V <sub>cc</sub>	Min		Max														
1 Tc = 25°C	V <sub>OH</sub>	3006	1	2.0 V	-4 mA	2.0 V	2.0 V	-4 mA	-4 mA	2.0 V														1Q	2.5		V												
			2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2Q	"	"	"												
			3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3Q	"	"	"											
			4	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4Q	"	"	"										
			5	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5Q	"	"	"									
			6	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6Q	"	"	"								
			7	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7Q	"	"	"							
			8	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8Q	"	"	"							
	V <sub>OL</sub>	3007	9	"	4 mA	0.7 V	0.7 V	4 mA																1Q		0.4	"												
			10	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
			11	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"							
			12	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
			13	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
			14	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"					
			15	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"					
			16	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
			17	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
			18	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
	V <sub>IC</sub>		25	-18 mA		-18 mA	-18 mA																	CLR		-1.5	"												
			26	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
			27	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
			28	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			29	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			30	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			31	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			32	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			33	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			34	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	I <sub>IL</sub>	3009	35	0.4 V		0.4 V	0.4 V																	CLR	2/	2/	µA												
			36	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
			37	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			38	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			39	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			40	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			41	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			42	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			43	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			44	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	I <sub>IH1</sub>	3010	45	2.7 V		2.7 V	2.7 V																	CLR	20	"													
			46	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			47	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			48	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			49	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			50	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			51	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			52	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			53	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			54	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

See footnotes at end of device type 01.



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

Subgroup	Symbol	MIL-STD-883 R, S, 2 Cases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Measured		Test limits		Unit		
																							terminal	terminal	Min	Max			
9 T <sub>c</sub> = 25°C	t <sub>PHZ</sub>	3003 Fig 3	104	CLR 4.5 V	1Q	OUT	2Q	OUT	3Q	OUT	4D	4Q	GND	CLK	5Q	5D	6D	6Q	7Q	7D	8D	8Q	V <sub>cc</sub> 5.0 V	CLK to 1Q	5	32	ns		
			105	"	"	IN	OUT	IN	OUT	IN	OUT	IN	OUT	"	"	"	"	"	"	"	"	"	"	CLK to 2Q	"	"	"	"	
			106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 3Q	"	"	"	"
			107	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 4Q	"	"	"	"
			108	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 5Q	"	"	"	"
			109	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 6Q	"	"	"	"
			110	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 7Q	"	"	"	"
			111	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 8Q	"	"	"	"
			112	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 1Q	"	"	"	"
			113	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 2Q	"	"	"	"
			114	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 3Q	"	"	"	"
115	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 4Q	"	"	"	"			
116	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 5Q	"	"	"	"			
117	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 6Q	"	"	"	"			
118	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 7Q	"	"	"	"			
119	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to 8Q	"	"	"	"			
10	f <sub>MAX</sub>	Same tests and terminal conditions as subgroup 9 except T <sub>c</sub> = +125°C.																							25		MHz		
T <sub>c</sub> = 125°C	t <sub>FHL1</sub>																								5	42	ns		
	t <sub>FLH2</sub>																								"	"	"		
11	t <sub>PHZ</sub>	Same tests, terminal conditions, and limits as subgroup 10 except T <sub>c</sub> = -55°C.																							"	"	"		
T <sub>c</sub> = -55°C																									"	"	"		



2/ I<sub>L</sub> limits in  $\mu$ A are as follows:

Parameter	Circuit				
	A	F	B	D	E
Clear	-120/-360	-105/-345	-30/-300	-120/-360	-120/-360
Clock	-120/-360	-160/-400	-30/-300	-160/-400	-120/-360
Data	-100/-340	-160/-400	-120/-360	-100/-340	-120/-360



4/ Input voltages shown are: A = 3.0 volts minimum and B = 0.0 V or GND.

5/ Tests shall be performed in sequence, attributes data only.

6/ Outputs: H > 1.5 V, L < 1.5 V.

7/ f<sub>MAX</sub>, minimum limit specified is the frequency of the input pulse. The output frequency shall be one half of the input frequency.



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

Subgroup	Symbol	MIL-STD-883 method	Cases R, S, 2 Test no.	Terminal conditions																Test limits		Unit									
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19	20	Measured terminal	Min	Max				
1	$I_{OS}$	3011	57	O/C	1Q	1D	2D	2Q	3Q	3D	4D	4Q	GND	G	5Q	5D	6D	6Q	7Q	7D	8D	8Q	1Q	5.5 V	-30	-130	mA				
			58	"	"	"	4.5 V	GND	4.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2Q	"	2/	2/	"			
			59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			65	3005	4.5 V	"	2.7 V	2.0 V	"	"	"	"	"	"	"	4.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			67	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			68	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			69	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			70	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
71	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
72	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
73	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
76	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
77	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
79	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
81	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
2	Same tests, terminal conditions, and limits as subgroup 1, except $T_C = +125^\circ\text{C}$ and $V_{IC}$ tests are omitted.																														
3	Same tests, terminal conditions, and limits as subgroup 1, except $T_C = -55^\circ\text{C}$ and $V_{IC}$ tests are omitted.																														
7 3/4	Truth table tests	3014	82	B	H	A	A	H	H	A	A	A	H	GND	A	H	A	H	H	H	A	A	H	5.0 V	"	"	"	"			
			83	"	L	B	B	L	B	B	L	B	B	L	"	A	L	L	L	L	L	B	B	"	"	"	"	"	"		
			84	"	"	B	B	"	B	B	"	B	B	"	"	B	B	"	B	"	B	B	B	"	"	"	"	"	"	"	
			85	"	"	A	A	"	A	A	"	A	A	"	"	A	A	"	A	"	A	A	A	"	"	"	"	"	"	"	
			86	"	"	H	H	"	H	H	"	H	H	"	"	H	H	"	H	"	H	H	H	"	"	"	"	"	"	"	
			87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			88	"	"	"	B	B	"	"	"	B	B	"	"	B	B	"	B	"	B	B	B	"	"	"	"	"	"	"	
			89	3003	GND	OUT	IN	IN	OUT	OUT	OUT	IN	IN	IN	OUT	GND	IN	IN	IN	IN	IN	IN	IN	IN	5.0 V	1D to 1Q	3	18	ns		
			90	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D to 2Q	"	"	"		
			91	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3D to 3Q	"	"	"	
			92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4D to 4Q	"	"	"	
			93	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5D to 5Q	"	"	"	
			94	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6D to 6Q	"	"	"	
			95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7D to 7Q	"	"	"	
96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D to 8Q	"	"	"				
97	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D to 1Q	"	"	"				
98	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D to 2Q	"	"	"				
99	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3D to 3Q	"	"	"				
100	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4D to 4Q	"	"	"				
101	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5D to 5Q	"	"	"				
102	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6D to 6Q	"	"	"				
103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7D to 7Q	"	"	"				
104	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D to 8Q	"	"	"				

See footnotes at end of device type 02.

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

Subgroup	Symbol	MIL-STD-883 method	Cases R, S, 2 Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Measured terminal	Test limits		Unit					
				O/C	1Q	1D	2D	2Q	3Q	3D	4D	4Q	GND	G	5Q	5D	6D	6Q	7Q	7D	8D	8Q	V <sub>cc</sub>		Min	Max						
9 T <sub>c</sub> = 25°C	t <sub>PHZ</sub>	3003 Fig 3	105	GND	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	OUT	4.5 V	OUT	GND	IN										G to 1Q	3	30	ns				
			106	"	"	"	"	OUT	4.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 2Q	"	"	"	"			
			107	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 3Q	"	"	"	"		
			108	"	"	"	"	"	"	"	"	"	4.5 V	OUT	"	"	"	"	"	"	"	"	"	"	"	"	G to 4Q	"	"	"	"	
			109	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	"	"	"	"	G to 5Q	"	"	"	"	
			110	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4.5 V	OUT	"	"	"	"	"	"	G to 6Q	"	"	"	"	
			111	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	4.5 V	"	"	"	"	"	G to 7Q	"	"	"	"	
			112	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	4.5 V	"	"	"	"	G to 8Q	"	"	"	"
			113	"	"	"	OUT	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 1Q	"	"	"	"	
			114	"	"	"	"	"	GND	OUT	OUT	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 2Q	"	"	"	"	
			115	"	"	"	"	"	"	"	OUT	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 3Q	"	"	"	"	
			116	"	"	"	"	"	"	"	"	GND	OUT	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 4Q	"	"	"	"	
117	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	GND	"	"	"	"	"	"	"	G to 5Q	"	"	"	"				
118	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 6Q	"	"	"	"				
119	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 7Q	"	"	"	"				
120	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G to 8Q	"	"	"	"				
121	IN	OUT	4.5 V	"	"	"	"	OUT	"	"	"	"	"	4.5 V	"	"	"	"	"	"	"	"	"	O/C to 1Q	"	28	"	"				
122	"	"	"	"	"	"	"	OUT	4.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 2Q	"	"	"	"				
123	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 3Q	"	"	"	"				
124	"	"	"	"	"	"	"	"	"	4.5 V	OUT	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 4Q	"	"	"	"				
125	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	4.5 V	"	"	"	"	"	"	"	O/C to 5Q	"	"	"	"				
126	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 6Q	"	"	"	"				
127	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 7Q	"	"	"	"				
128	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 8Q	"	"	"	"				
129	"	"	"	"	OUT	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 1Q	"	36	"	"				
130	"	"	"	"	"	GND	"	OUT	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 2Q	"	"	"	"				
131	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 3Q	"	"	"	"				
132	"	"	"	"	"	"	"	"	"	GND	OUT	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 4Q	"	"	"	"				
133	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	"	"	"	O/C to 5Q	"	"	"	"				
134	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 6Q	"	"	"	"				
135	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 7Q	"	"	"	"				
136	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 8Q	"	"	"	"				
137	"	"	"	"	OUT	4.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 1Q	"	31	"	"				
138	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 2Q	"	"	"	"				
139	"	"	"	"	"	"	"	OUT	4.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 3Q	"	"	"	"				
140	"	"	"	"	"	"	"	"	"	"	4.5 V	OUT	"	"	"	"	"	"	"	"	"	"	"	O/C to 4Q	"	"	"	"				
141	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 5Q	"	"	"	"				
142	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	4.5 V	"	"	"	"	"	"	"	O/C to 6Q	"	"	"	"				
143	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 7Q	"	"	"	"				
144	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 8Q	"	"	"	"				
145	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 1Q	"	30	"	"				
146	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 2Q	"	"	"	"				
147	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 3Q	"	"	"	"				
148	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 4Q	"	"	"	"				
149	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	"	"	"	O/C to 5Q	"	"	"	"				
150	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"	O/C to 6Q	"	"	"	"				
151	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	O/C to 7Q	"	"	"	"				
152	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C to 8Q	"	"	"	"				

See footnotes at end of device type 02.

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

Subgroup	Symbol	MIL-STD-883 method	Cases R, S, 2 Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Measured terminal	Test limits		Unit
				O/C	1Q	1D	2D	2Q	3Q	3D	4D	4Q	GND	G	5Q	5D	6D	6Q	7Q	7D	8D	8Q	V <sub>CC</sub>		Min	Max	
10	t <sub>PH1</sub> t <sub>PHL1</sub> t <sub>PLH2</sub> t <sub>PHL2</sub> t <sub>PHZ</sub> t <sub>PZH</sub> t <sub>PHZ</sub> t <sub>PZH</sub>	883																							3	24	ns
			Same tests and terminal conditions as subgroup 9 except T <sub>c</sub> = +125°C.																								
11			Same tests and terminal conditions as subgroup 10 except T <sub>c</sub> = -55°C.																								

1/ I<sub>L</sub> limits in  $\mu$ A are as follows:

Parameter	Circuit					
	A	B	F	C	D	E
O/C	-10/-200	-1/-100	-400 max	-180/-420	-400 max	0/-400
G	-400 max	-1/-100	-400 max	-160/-400	-400 max	0/-400
D	-120/-360	-1/-100	-105/-345	-160/-400	-120/-360	-120/-360

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2/ For circuits C and D, I<sub>os</sub> limits shall be -15/-100 mA. For circuit E, I<sub>os</sub> limits shall be -40/-225 mA.

3/ A = 3.0 V minimum. B = 0.0 V or GND.

4/ Tests shall be performed in sequence, attributes data only.

5/ Output voltages shall be:

H > 1.5 V  
L < 1.5 V

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

Subgroup	Symbol	MIL-STD-883 method	Cases R, S, 2 Test no.	Terminal conditions (pins not designated may be high $\geq 2.0$ V; low $\leq 0.7$ V; or open).													Measured terminal	Test limits		Unit												
				1	2	3	4	5	6	7	8	9	10	11	12	13		14	15		16	17	18	19	20	Min	Max					
1 Tc = 25°C	V <sub>OH</sub>	3006	1	O/C	1Q	-1 mA	2.0 V	2D	2Q	2Q	3Q	3Q	4D	4Q	GND	CLK	5Q	5Q	6D	6Q	7Q	7D	8D	8Q	V <sub>CC</sub>	1Q	2.4		V			
			2	"	"	"	"	"	2.0 V	-1 mA	"	"	"	2.0 V	"	"	"	"	"	"	"	"	"	"	"	"	2Q	"	"	"	"	
			3	"	"	"	"	"	"	"	"	"	"	2.0 V	"	"	"	"	"	"	"	"	"	"	"	"	3Q	"	"	"	"	
			4	"	"	"	"	"	"	"	"	"	"	2.0 V	-1 mA	"	"	"	"	"	"	"	"	"	"	"	"	4Q	"	"	"	"
			5	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	-1 mA	2.0 V	"	"	"	"	"	"	"	5Q	"	"	"	"
			6	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2.0 V	-1 mA	"	"	"	"	"	6Q	"	"	"	"
			7	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	-1 mA	2.0 V	"	"	"	7Q	"	"	"	"
			8	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2.0 V	-1 mA	"	8Q	"	"	"	"
			9	"	3007	9	"	12 mA	0.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1Q	"	0.4	"	"
			10	"	"	10	"	"	"	0.7 V	12 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2Q	"	"	"	"
			11	"	"	11	"	"	"	"	"	12 mA	0.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3Q	"	"	"	"
			12	"	"	12	"	"	"	"	"	"	0.7 V	12 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	4Q	"	"	"	"
			13	"	"	13	"	"	"	"	"	"	"	12 mA	0.7 V	"	"	"	"	"	"	"	"	"	"	"	"	5Q	"	"	"	"
			14	"	"	14	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	0.7 V	12 mA	"	"	"	"	6Q	"	"	"	"
			15	"	"	15	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	12 mA	0.7 V	"	"	7Q	"	"	"	"
			16	"	"	16	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	0.7 V	12 mA	"	8Q	"	"	"	"
17	"	"	17	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C	"	-1.5	"	"			
18	"	"	18	"	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"			
19	"	"	19	"	"	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D	"	"	"	"			
20	"	"	20	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"			
21	"	"	21	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"			
22	"	"	22	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G	"	"	"	"			
23	"	"	23	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5D	"	"	"	"			
24	"	"	24	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6D	"	"	"	"			
25	"	"	25	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7D	"	"	"	"			
26	"	"	26	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D	"	"	"	"			
27	"	3009	27	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C	"	2/	2/	"	μA		
28	"	"	28	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"			
29	"	"	29	"	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D	"	"	"	"			
30	"	"	30	"	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"			
31	"	"	31	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"			
32	"	"	32	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G	"	"	"	"			
33	"	"	33	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5D	"	"	"	"			
34	"	"	34	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6D	"	"	"	"			
35	"	"	35	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7D	"	"	"	"			
36	"	"	36	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D	"	"	"	"			
37	"	3010	37	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C	"	20	"	"			
38	"	"	38	"	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"			
39	"	"	39	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"			
40	"	"	40	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"			
41	"	"	41	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G	"	"	"	"			
42	"	"	42	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5D	"	"	"	"			
43	"	"	43	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6D	"	"	"	"			
44	"	"	44	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7D	"	"	"	"			
45	"	"	45	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D	"	"	"	"			
46	"	"	46	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	O/C	"	100	"	"			
47	"	"	47	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"			
48	"	"	48	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D	"	"	"	"			
49	"	"	49	"	"	"	"	"	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"			
50	"	"	50	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"			
51	"	"	51	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G	"	"	"	"			
52	"	"	52	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5D	"	"	"	"			
53	"	"	53	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6D	"	"	"	"			
54	"	"	54	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7D	"	"	"	"			
55	"	"	55	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D	"	"	"	"			
56	"	"	56	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V; low  $\leq 0.7$  V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases R, S, 2 Test no.	Terminal conditions																Measured terminal		Test limits		Unit																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Min	Max																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
1	$I_{OS}$	3011	57	O/C	1Q	1D	2D	2Q	3Q	3D	4D	4Q	GND	CLK	5Q	5D	6D	6Q	7Q	7D	8D	8Q	1Q	2Q	3Q	4Q	5Q	6Q	7Q	8Q	9Q	10Q	11Q	12Q	13Q	14Q	15Q	16Q	17Q	18Q	19Q	20Q	21Q	22Q	23Q	24Q	25Q	26Q	27Q	28Q	29Q	30Q	31Q	32Q	33Q	34Q	35Q	36Q	37Q	38Q	39Q	40Q	41Q	42Q	43Q	44Q	45Q	46Q	47Q	48Q	49Q	50Q	51Q	52Q	53Q	54Q	55Q	56Q	57Q	58Q	59Q	60Q	61Q	62Q	63Q	64Q	65Q	66Q	67Q	68Q	69Q	70Q	71Q	72Q	73Q	74Q	75Q	76Q	77Q	78Q	79Q	80Q	81Q	82Q	83Q	84Q	85Q	86Q	87Q	88Q	89Q	90Q	91Q	92Q	93Q	94Q	95Q	96Q	97Q	98Q	99Q	100Q	101Q	102Q	103Q	104Q	105Q	106Q	107Q	108Q	109Q	110Q	111Q	112Q	113Q	114Q	115Q	116Q	117Q	118Q	119Q	120Q	121Q	122Q	123Q	124Q	125Q	126Q	127Q	128Q	129Q	130Q	131Q	132Q	133Q	134Q	135Q	136Q	137Q	138Q	139Q	140Q	141Q	142Q	143Q	144Q	145Q	146Q	147Q	148Q	149Q	150Q	151Q	152Q	153Q	154Q	155Q	156Q	157Q	158Q	159Q	160Q	161Q	162Q	163Q	164Q	165Q	166Q	167Q	168Q	169Q	170Q	171Q	172Q	173Q	174Q	175Q	176Q	177Q	178Q	179Q	180Q	181Q	182Q	183Q	184Q	185Q	186Q	187Q	188Q	189Q	190Q	191Q	192Q	193Q	194Q	195Q	196Q	197Q	198Q	199Q	200Q	201Q	202Q	203Q	204Q	205Q	206Q	207Q	208Q	209Q	210Q	211Q	212Q	213Q	214Q	215Q	216Q	217Q	218Q	219Q	220Q	221Q	222Q	223Q	224Q	225Q	226Q	227Q	228Q	229Q	230Q	231Q	232Q	233Q	234Q	235Q	236Q	237Q	238Q	239Q	240Q	241Q	242Q	243Q	244Q	245Q	246Q	247Q	248Q	249Q	250Q	251Q	252Q	253Q	254Q	255Q	256Q	257Q	258Q	259Q	260Q	261Q	262Q	263Q	264Q	265Q	266Q	267Q	268Q	269Q	270Q	271Q	272Q	273Q	274Q	275Q	276Q	277Q	278Q	279Q	280Q	281Q	282Q	283Q	284Q	285Q	286Q	287Q	288Q	289Q	290Q	291Q	292Q	293Q	294Q	295Q	296Q	297Q	298Q	299Q	300Q	301Q	302Q	303Q	304Q	305Q	306Q	307Q	308Q	309Q	310Q	311Q	312Q	313Q	314Q	315Q	316Q	317Q	318Q	319Q	320Q	321Q	322Q	323Q	324Q	325Q	326Q	327Q	328Q	329Q	330Q	331Q	332Q	333Q	334Q	335Q	336Q	337Q	338Q	339Q	340Q	341Q	342Q	343Q	344Q	345Q	346Q	347Q	348Q	349Q	350Q	351Q	352Q	353Q	354Q	355Q	356Q	357Q	358Q	359Q	360Q	361Q	362Q	363Q	364Q	365Q	366Q	367Q	368Q	369Q	370Q	371Q	372Q	373Q	374Q	375Q	376Q	377Q	378Q	379Q	380Q	381Q	382Q	383Q	384Q	385Q	386Q	387Q	388Q	389Q	390Q	391Q	392Q	393Q	394Q	395Q	396Q	397Q	398Q	399Q	400Q	401Q	402Q	403Q	404Q	405Q	406Q	407Q	408Q	409Q	410Q	411Q	412Q	413Q	414Q	415Q	416Q	417Q	418Q	419Q	420Q	421Q	422Q	423Q	424Q	425Q	426Q	427Q	428Q	429Q	430Q	431Q	432Q	433Q	434Q	435Q	436Q	437Q	438Q	439Q	440Q	441Q	442Q	443Q	444Q	445Q	446Q	447Q	448Q	449Q	450Q	451Q	452Q	453Q	454Q	455Q	456Q	457Q	458Q	459Q	460Q	461Q	462Q	463Q	464Q	465Q	466Q	467Q	468Q	469Q	470Q	471Q	472Q	473Q	474Q	475Q	476Q	477Q	478Q	479Q	480Q	481Q	482Q	483Q	484Q	485Q	486Q	487Q	488Q	489Q	490Q	491Q	492Q	493Q	494Q	495Q	496Q	497Q	498Q	499Q	500Q	501Q	502Q	503Q	504Q	505Q	506Q	507Q	508Q	509Q	510Q	511Q	512Q	513Q	514Q	515Q	516Q	517Q	518Q	519Q	520Q	521Q	522Q	523Q	524Q	525Q	526Q	527Q	528Q	529Q	530Q	531Q	532Q	533Q	534Q	535Q	536Q	537Q	538Q	539Q	540Q	541Q	542Q	543Q	544Q	545Q	546Q	547Q	548Q	549Q	550Q	551Q	552Q	553Q	554Q	555Q	556Q	557Q	558Q	559Q	560Q	561Q	562Q	563Q	564Q	565Q	566Q	567Q	568Q	569Q	570Q	571Q	572Q	573Q	574Q	575Q	576Q	577Q	578Q	579Q	580Q	581Q	582Q	583Q	584Q	585Q	586Q	587Q	588Q	589Q	590Q	591Q	592Q	593Q	594Q	595Q	596Q	597Q	598Q	599Q	600Q	601Q	602Q	603Q	604Q	605Q	606Q	607Q	608Q	609Q	610Q	611Q	612Q	613Q	614Q	615Q	616Q	617Q	618Q	619Q	620Q	621Q	622Q	623Q	624Q	625Q	626Q	627Q	628Q	629Q	630Q	631Q	632Q	633Q	634Q	635Q	636Q	637Q	638Q	639Q	640Q	641Q	642Q	643Q	644Q	645Q	646Q	647Q	648Q	649Q	650Q	651Q	652Q	653Q	654Q	655Q	656Q	657Q	658Q	659Q	660Q	661Q	662Q	663Q	664Q	665Q	666Q	667Q	668Q	669Q	670Q	671Q	672Q	673Q	674Q	675Q	676Q	677Q	678Q	679Q	680Q	681Q	682Q	683Q	684Q	685Q	686Q	687Q	688Q	689Q	690Q	691Q	692Q	693Q	694Q	695Q	696Q	697Q	698Q	699Q	700Q	701Q	702Q	703Q	704Q	705Q	706Q	707Q	708Q	709Q	710Q	711Q	712Q	713Q	714Q	715Q	716Q	717Q	718Q	719Q	720Q	721Q	722Q	723Q	724Q	725Q	726Q	727Q	728Q	729Q	730Q	731Q	732Q	733Q	734Q	735Q	736Q	737Q	738Q	739Q	740Q	741Q	742Q	743Q	744Q	745Q	746Q	747Q	748Q	749Q	750Q	751Q	752Q	753Q	754Q	755Q	756Q	757Q	758Q	759Q	760Q	761Q	762Q	763Q	764Q	765Q	766Q	767Q	768Q	769Q	770Q	771Q	772Q	773Q	774Q	775Q	776Q	777Q	778Q	779Q	780Q	781Q	782Q	783Q	784Q	785Q	786Q	787Q	788Q	789Q	790Q	791Q	792Q	793Q	794Q	795Q	796Q	797Q	798Q	799Q	800Q	801Q	802Q	803Q	804Q	805Q	806Q	807Q	808Q	809Q	810Q	811Q	812Q	813Q	814Q	815Q	816Q	817Q	818Q	819Q	820Q	821Q	822Q	823Q	824Q	825Q	826Q	827Q	828Q	829Q	830Q	831Q	832Q	833Q	834Q	835Q	836Q	837Q	838Q	839Q	840Q	841Q	842Q	843Q	844Q	845Q	846Q	847Q	848Q	849Q	850Q	851Q	852Q	853Q	854Q	855Q	856Q	857Q	858Q	859Q	860Q	861Q	862Q	863Q	864Q	865Q	866Q	867Q	868Q	869Q	870Q	871Q	872Q	873Q	874Q	875Q	876Q	877Q	878Q	879Q	880Q	881Q	882Q	883Q	884Q	885Q	886Q	887Q	888Q	889Q	890Q	891Q	892Q	893Q	894Q	895Q	896Q	897Q	898Q	899Q	900Q	901Q	902Q	903Q	904Q	905Q	906Q	907Q	908Q	909Q	910Q	911Q	912Q	913Q	914Q	915Q	916Q	917Q	918Q	919Q	920Q	921Q	922Q	923Q	924Q	925Q	926Q	927Q	928Q	929Q	930Q	931Q	932Q	933Q	934Q	935Q	936Q	937Q	938Q	939Q	940Q	941Q	942Q	943Q	944Q	945Q	946Q	947Q	948Q	949Q	950Q	951Q	952Q	953Q	954Q	955Q	956Q	957Q	958Q	959Q	960Q	961Q	962Q	963Q	964Q	965Q	966Q	967Q	968Q	969Q	970Q	971Q	972Q	973Q	974Q	975Q	976Q	977Q	978Q	979Q	980Q	981Q	982Q	983Q	984Q	985Q	986Q	987Q	988Q	989Q	990Q	991Q	992Q	993Q	994Q	995Q	996Q	997Q	998Q	999Q	1000Q	1001Q	1002Q	1003Q	1004Q	1005Q	1006Q	1007Q	1008Q	1009Q	1010Q	1011Q	1012Q	1013Q	1014Q	1015Q	1016Q	1017Q	1018Q	1019Q	1020Q	1021Q	1022Q	1023Q	1024Q	1025Q	1026Q	1027Q	1028Q	1029Q	1030Q	1031Q	1032Q	1033Q	1034Q	1035Q	1036Q	1037Q	1038Q	1039Q	1040Q	1041Q	1042Q	1043Q	1044Q	1045Q	1046Q	1047Q	1048Q	1049Q	1050Q	1051Q	1052Q	1053Q	1054Q	1055Q	1056Q	1057Q	1058Q	1059Q	1060Q	1061Q	1062Q	1063Q	1064Q	1065Q	1066Q	1067Q	1068Q	1069Q	1070Q	1071Q	1072Q	1073Q	1074Q	1075Q	1076Q	1077Q	1078Q	1079Q	1080Q	1081Q	1082Q	1083Q	1084Q	1085Q	1086Q	1087Q	1088Q	1089Q	1090Q	1091Q	1092Q	1093Q	1094Q	1095Q	1096Q	1097Q	1098Q	1099Q	1100Q	1101Q	1102Q	1103Q	1104Q	1105Q	1106Q	1107Q	1108Q	1109Q	1110Q	1111Q	1112Q	1113Q	1114Q	1115Q	1116Q	1117Q	1118Q	1119Q	1120Q	1121Q	1122Q	1123Q	1124Q	1125Q	1126Q	1127Q	1128Q	1129Q	1130Q	1131Q	1132Q	1133Q	1134Q	1135Q	1136Q	1137Q	1138Q	1139Q	1140Q	1141Q	1142Q	1143Q	1144Q	1145Q	1146Q	1147Q	1148Q	1149Q	1150Q	1151Q	1152Q	1153Q	1154Q	1155Q	1156Q	1157Q	1158Q	1159Q	1160Q	1161Q	1162Q	1163Q	1164Q	1165Q	1166Q	1167Q	11





TABLE III. Group A inspection for device type 04.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V; low  $\leq 0.7$  V; or open).

Subgroup	Symbol	MIL-STD-883 method	Cases R, S, 2 Test no.	Terminal conditions (pins not designated may be high $\geq 2.0$ V; low $\leq 0.7$ V; or open)																Test limits		Unit						
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19	20	Measured terminal	Min	Max	
1 Tc = 25°C	V <sub>OH</sub>	3006	1	G	1Q	2D	2Q	3Q	3D	4D	4Q	GND	CLK	5Q	5D	6D	6Q	7Q	7D	8D	8Q	V <sub>CC</sub>	1Q	2.4		V		
			2	"	"	2.0 V	-4 mA	"	"	-4 mA	2.0 V	"	"	"	"	"	"	"	"	"	"	"	"	2Q	"	"	"	"
			3	"	"	"	"	"	"	"	2.0 V	"	"	"	"	"	"	"	"	"	"	"	"	3Q	"	"	"	"
			4	"	"	"	"	"	"	"	2.0 V	-4 mA	"	"	"	"	"	"	"	"	"	"	"	4Q	"	"	"	"
			5	"	"	"	"	"	"	"	"	"	"	"	-4 mA	2.0 V	"	"	"	"	"	"	"	5Q	"	"	"	"
			6	"	"	"	"	"	"	"	"	"	"	"	"	"	2.0 V	-4 mA	"	"	"	"	"	6Q	"	"	"	"
			7	"	"	"	"	"	"	"	"	"	"	"	"	"	"	-4 mA	2.0 V	"	"	"	"	7Q	"	"	"	"
			8	"	"	"	"	"	"	"	"	"	0.7 V	"	"	"	"	"	"	2.0 V	-4 mA	"	"	8Q	"	"	"	"
	V <sub>OL</sub>	3007	9	"	"	4 mA	0.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1Q	"	"	0.4	"	
			10	"	"	"	0.7 V	4 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2Q	"	"	"	"
			11	"	"	"	"	4 mA	0.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3Q	"	"	"	"
			12	"	"	"	"	"	"	0.7 V	4 mA	"	"	"	"	"	"	"	"	"	"	"	"	4Q	"	"	"	"
			13	"	"	"	"	"	"	"	"	4 mA	0.7 V	"	"	"	"	"	"	"	"	"	"	5Q	"	"	"	"
			14	"	"	"	"	"	"	"	"	"	"	0.7 V	4 mA	"	"	"	"	"	"	"	"	6Q	"	"	"	"
			15	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4 mA	0.7 V	"	"	"	7Q	"	"	"	"
			16	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	0.7 V	4 mA	"	8Q	"	"	"	"
V <sub>IC</sub>	3009	17	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G	"	"	-1.5	"		
		18	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"	
		19	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D	"	"	"	"	
		20	"	"	"	"	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"	
		21	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"	
		22	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	"	"	"	"	"	"	CLK	"	"	"	"	
		23	"	"	"	"	"	"	"	"	"	"	"	"	-18 mA	"	"	"	"	"	"	"	5D	"	"	"	"	
		24	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6D	"	"	"	"	
		25	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7D	"	"	"	"	
		26	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D	"	"	"	"	
I <sub>IL</sub>	3010	27	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G	"	"	2/	2/		
		28	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"	
		29	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D	"	"	"	"	
		30	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"	
		31	"	"	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"	
		32	"	"	"	"	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	CLK	"	"	"	"	
		33	"	"	"	"	"	"	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	5D	"	"	"	"	
		34	"	"	"	"	"	"	"	"	"	"	"	"	0.4 V	"	"	"	"	"	"	"	6D	"	"	"	"	
		35	"	"	"	"	"	"	"	"	"	"	"	"	"	0.4 V	"	"	"	"	"	"	7D	"	"	"	"	
		36	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	0.4 V	"	"	8D	"	"	"	"	
		37	"	2.7 V	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	"	"	"	0.4 V	"	G	"	"	"	20	
		38	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"	
I <sub>IH2</sub>	3010	39	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"		
		40	"	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"	
		41	"	"	"	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	"	"	"	"	CLK	"	"	"	"	
		42	"	"	"	"	"	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	"	"	5D	"	"	"	"	
		43	"	"	"	"	"	"	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	"	6D	"	"	"	"	
		44	"	"	"	"	"	"	"	"	"	"	"	2.7 V	"	"	"	"	"	"	"	"	7D	"	"	"	"	
		45	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D	"	"	"	"	
		46	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	G	"	"	"	100	
		47	"	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	"	"	"	
		48	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2D	"	"	"	"	
I <sub>IH1</sub>	3010	49	"	"	"	"	"	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	3D	"	"	"	"		
		50	"	"	"	"	"	"	5.5 V	"	"	"	"	"	"	"	"	"	"	"	"	"	4D	"	"	"	"	
		51	"	"	"	"	"	"	"	"	"	"	5.5 V	"	"	"	"	"	"	"	"	"	CLK	"	"	"	"	
		52	"	"	"	"	"	"	"	"	"	"	"	"	5.5 V	"	"	"	"	"	"	"	5D	"	"	"	"	
		53	"	"	"	"	"	"	"	"	"	"	"	"	"	5.5 V	"	"	"	"	"	"	6D	"	"	"	"	
		54	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5.5 V	"	"	"	"	"	7D	"	"	"	"	
		55	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8D	"	"	"	"	
		56	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	

See footnotes at end of device type 04.

TABLE III. Group A inspection for device type 04 - Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V; low  $\leq 0.7$  V; or open).

Subgroup	Symbol	MIL-STD-883 R, S, 2 Test no.	Cases	Terminal conditions																	Test limits		Unit											
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	Measured terminal	Min	Max							
1	$I_{cc}$	3011	57	0.7 V	G	1Q	1D	2D	2Q	3Q	3D	4D	4Q	GND	CLK	5Q	5D	6D	6Q	7Q	7D	8D	8Q	$V_{cc}$	5.5 V	1Q	-15	-100	mA					
			58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2Q	"	"	"				
			59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3Q	"	"	"				
			60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	4Q	"	"	"			
			61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5Q	"	"	"		
			62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	6Q	"	"	"		
			63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	7Q	"	"	"		
64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	8Q	"	"	"					
2	$I_{cc}$	3005	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	$V_{cc}$	4.5 V	GND	"	"	32					
3	Same tests, terminal conditions, and limits as subgroup 1, except $T_c = +125^\circ\text{C}$ and $V_{IC}$ tests are omitted.																																	
3	Same tests, terminal conditions, and limits as subgroup 1, except $T_c = -55^\circ\text{C}$ and $V_{IC}$ tests are omitted.																																	
7 4/5	Truth table tests	3014	66	B	X 6/	B	B	B	X 6/	X 6/	B	B	B	L	X 6/	B	B	B	X 6/	X 6/	B	B	B	X 6/	5.0 V	Z/								
			67	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
			68	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			69	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			70	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			71	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			72	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			73	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			76	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			77	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			79	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
81	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"				
8	Same tests and terminal conditions as subgroup 7, except $T_c = +125^\circ\text{C}$ and $-55^\circ\text{C}$ .																																	
9	$f_{max}$	3003 Fig 3	83	GND	OUT	IN	IN	OUT	OUT	OUT	IN	IN	OUT	GND	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	5.0 V	CLK to Q	30		MHz					
			84	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
			85	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			88	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			89	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			90	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
			91	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
93	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
94	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
97	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
98	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		

See footnotes at end of device type 04.

TABLE III. Group A inspection for device type 04 - Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V; low  $\leq 0.7$  V; or open).

Subgroup	Symbol	MIL-STD-883 R, S, 2 Test no.	Cases	Terminal conditions (pins not designated may be high $\geq 2.0$ V; low $\leq 0.7$ V; or open).													Test limits		Unit												
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20	Measured terminal	Min	Max				
9	$t_{PHL2}$ Tc = 25°C	3003 method See Fig 3	99	GND	G	1Q	1D	2D	2Q	3Q	3D	4D	4Q	GND	5Q	5D	6D	6Q	7Q	7D	8D	8Q	V <sub>CC</sub>	5	32	ns					
			100	"	"	"	IN	OUT	OUT	OUT	IN	IN	OUT	"	"	"	"	"	"	"	"	"	"	"	"		"	ns			
			101	"	"	"	"	"	"	"	"	IN	OUT	"	"	"	"	"	"	"	"	"	"	"	"		"		ns		
			102	"	"	"	"	"	"	"	"	"	IN	OUT	"	"	"	"	"	"	"	"	"	"	"		"			ns	
			103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"				ns
			104	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"				
105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	ns						
106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		ns					
10	$f_{max}$	Same tests and terminal conditions as subgroup 9 except Tc = +125°C.																							25			MHZ			
	$t_{PHZ}$	Same tests and terminal conditions as subgroup 9 except Tc = +125°C.																							5		ns				
11	$t_{PHL2}$	Same tests and terminal conditions as subgroup 10 except Tc = -55°C.																							5		ns				

1/  - - 2.5 V minimum/5.5 V maximum.

2/ I<sub>L</sub> limits in  $\mu$ A are as follows:

Parameter	Circuit			
	A	F	B	D
Enable	-120/-360	-105/-345	-30/-300	-120/-360
Clock	-120/-360	-160/-400	-30/-300	-160/-400
Data	-100/-340	-160/400	-120/-360	-100/-340

3/  - - 2.5 V min/5.5 V max.

4/ A = 3.0 V minimum. B = 0.0 V or GND.

5/ Tests shall be performed in sequence, attributes data only.

6/ X = Indeterminate output voltage.

7/ Output shall be: H > 1.5 V, L < 1.5 V

8/ f<sub>max</sub>, minimum limit specified is the frequency of the input pulse. The output frequency shall be one half of the input frequency.

## 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.
- i. Requirements for "JAN" marking.

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

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

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

GND ..... Ground zero voltage potential  
 $V_{IN}$  ..... Voltage level at an input terminal  
 $f_{MAX}$  ..... Maximum clock frequency

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	54LS273
02	54LS373
03	54LS374
04	54LS377

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	Circuit					
	A	B	C	D	F	E
	Texas Instruments	Signetics Corp.	National Semiconductor	Raytheon Co.	Motorola Inc.	Fairchild Semiconductor
01	X	X		X	X	X
02	X		X	X	X	
03	X	X	X	X		
04	X	X		X	X	

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

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

Preparing activity:  
 DLA - CC  
 (Project 5962-1972)

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-38510/325D

2. DOCUMENT DATE (YYYYMMDD)  
2003-09-17

### 3. DOCUMENT TITLE

MICROCIRCUITS, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL, FLIP-FLOPS, CASCADABLE,  
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

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:  
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