

INCH-POUND

MIL-M-38510/653B
17 January 2006

SUPERSEDING
MIL-M-38510/653A
15 January 1988

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, HIGH-SPEED CMOS,
FLIP-FLOPS, MONOLITHIC SILICON, POSITIVE LOGIC

Reactivated after 17 Jan. 2006 and may be used for new and existing designs and acquisitions.

This specification is approved for use by all Departments
and Agencies of the Department of Defense.

The requirements for acquiring the product herein shall consist of this specification sheet and MIL-PRF 38535.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, high speed CMOS, logic microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided and are reflected in the complete part or identifying number (PIN). For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).

1.2 Part or identifying number (PIN). The PIN is in accordance with MIL-PRF-38535 and as specified herein.

1.2.1 Device types. The device types are as follows:

<u>Device type</u>	<u>Circuit</u>
01	Dual JK flip-flop with clear
02	Dual D positive-edge triggered flip-flop with clear and preset
03	Dual JK negative-edge triggered flip-flop with clear
04	Dual JK positive-edge triggered flip-flop with clear and preset
05	Dual JK negative-edge triggered flip-flop with clear and preset
06	Quad D-type flip-flop with 3-state outputs and clear
07	Hex D-type flip-flop with clear
08	Quad D-type flip-flop with clear
52	Dual D-type positive-edge triggered flip-flop with clear and preset, TTL compatible inputs

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

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

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
C	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	Flat pack
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
2	CQCC1-N20	20	Square leadless chip carrier

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAC, P.O. Box 3990, Columbus, OH 43218-3990, or email CMOS@dsccl.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil/>.

1.3 Absolute maximum ratings.

Supply voltage range (V_{CC})	-0.5 V dc to +7.0 V dc
DC input voltage range (V_{IN})	-0.5 V dc to $V_{CC} + 0.5$ V dc
DC output voltage range (V_{OUT})	-0.5 V dc to $V_{CC} + 0.5$ V dc
Clamp diode current (I_{IK}, I_{OK})	± 20 mA
DC output current per pin (I_{OUT})	± 25 mA (± 35 mA for device type 06)
DC V_{CC} or GND current per pin (I_{CC}, I_{GND})	± 50 mA (± 70 mA for device type 06)
Storage temperature range (T_{STG})	-65°C to +150°C
Maximum power dissipation (P_D):	
Device types 01-05, 07, 08, 52	300 mW
Device type 06	420 mW
Lead temperature (soldering, 10 seconds)	300°C
Thermal resistance, junction to case (θ_{JC})	See MIL-STD-1835
Junction temperature (T_J)	175°C

1.4 Recommended operating conditions.Device types 01 to 08:

Maximum input low voltage (V_{IL})	0.3 V at $V_{CC} = 2.0$ V 0.9 V at $V_{CC} = 4.5$ V 1.2 V at $V_{CC} = 6.0$ V
Minimum input high voltage (V_{IH})	1.5 V at $V_{CC} = 2.0$ V 3.15 V at $V_{CC} = 4.5$ V 4.2 V at $V_{CC} = 6.0$ V
Supply voltage range (V_{CC})	2.0 V dc to 6.0 V dc
Output voltage range (V_{OUT})	0.0 V to V_{CC}
Operating temperature range (T_C)	-55°C to +125°C
Maximum input rise and fall times (t_r, t_f):	
$V_{CC} = 2.0$ V	1000 ns
$V_{CC} = 4.5$ V	500 ns
$V_{CC} = 6.0$ V	400 ns
Width of clock pulse (t_p clock) $V_{CC} = 4.5$ V:	
Device types 01, 03, 04, 06, 07	27 ns minimum
Device types 02, 05	30 ns minimum
Device type 08	24 ns minimum
Width of clear pulse (t_p clear):	
Device types 01, 02, 03, 04, 05, 06	30 ns minimum
Device types 07, 08	24 ns minimum
Width of preset pulse (t_p preset):	
Device types 02, 04, 05	30 ns minimum
Data setup time before clock (t_{setup}):	
Device types 01-08	30 ns minimum
Clear or preset setup time before clock (t_{rem}):	
Device types 01, 03, 04, 05, 07, 08	30 ns minimum
Device type 02	38 ns minimum
Device type 06	27 ns minimum
Hold time (t_{hold}):	
Device types 01-08	8 ns minimum

1.4 Recommended operating conditions – Continued.Device type 52:

Maximum input low voltage (V_{IL})	0.8 V at $V_{CC} = 4.5$ V to 5.5 V
Minimum input high voltage (V_{IH})	2.0 V at $V_{CC} = 4.5$ V to 5.5 V
Supply voltage range (V_{CC})	4.5 V dc to 5.5 V dc
Output voltage range (V_{OUT})	0.0 V dc to V_{CC}
Operating ambient temperature range (T_A)	-55°C to +125°C
Width of clock pulse (t_p clock)	30 ns minimum
Width of clear pulse (t_p clear)	30 ns minimum
Width of preset pulse (t_p preset)	30 ns minimum
Data setup time before clock (t_{setup})	30 ns minimum
t_{rem} setup time before clock (t_{su} clear or t_{su} preset)	38 ns minimum
Hold time (t_{hold})	3 ns minimum
Input rise and fall times (t_r , t_f): $V_{CC} = 4.5$ V	500 ns maximum

2. APPLICABLE DOCUMENTS

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

2.2 Government documents.

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

DEPARTMENT OF DEFENSE SPECIFICATION

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.

MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document 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 Switching test circuit and waveforms. The switching test circuit and waveforms shall be as specified on figure 3.

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

3.3.5 Case outlines. The case outlines shall be as specified in 1.2.3 and MIL-STD-1835.

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. Unless otherwise specified, the electrical performance characteristics are as specified in table I, and apply over the full recommended ambient operating temperature range.

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 38 (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 affect 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 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 method 1015 of MIL-STD-883.
- b. Delete the sequence specified as interim (pre-burn-in) electrical parameters through interim (post-burn-in) electrical parameters of table IA of MIL-PRF-38535 and substitute lines 1 through 7 of table II herein.
- c. Burn-in (method 1015 of MIL-STD-883).

- (1) Unless otherwise specified in the manufacturers QM plan for static tests (test condition A), ambient temperature (T_A) shall be +125°C minimum. Test duration for each static test shall be 24 hours minimum for class S devices and in accordance with table I of method 1015 for class B devices.
 - i. For static burn-in I, all inputs shall be connected to GND. Outputs shall be open or connected to $V_{CC}/2$. Resistors are optional on outputs if open. Resistors are required on inputs and on outputs connected to $V_{CC}/2$. $R = 470\Omega$ to 47 k Ω .
 - ii. For static burn-in II, all inputs shall be connected through a resistor to V_{CC} . Outputs shall be open or connected to $V_{CC}/2$. Resistors are optional on outputs if open. Resistors are required on inputs and on outputs connected to $V_{CC}/2$. $R = 470\Omega$ to 47 k Ω .
- (2) Unless otherwise specified in the manufacturers QM plan for dynamic test (test condition D), ambient temperature shall be +125°C minimum. Test duration shall be in accordance with table I of method 1015.
 - i. For dynamic burn-in, the generator shall be connected to the clock and J – K or D (depending on device type) inputs and reset shall be connected to clock/2. Outputs shall be connected to $V_{CC}/2 + 0.5$ V through the resistors. $R = 680\Omega$ to 1 k Ω for outputs, 470 Ω to 47 k Ω for inputs.
 - ii. CP = 25 kHz to 1 MHz square wave; duty cycle = 50% $\pm$ 15%; $V_{IH} = 4.5$ V to V_{CC} ; $V_{IL} = 0.0$ V $\pm$ 0.5 V; transition time ≤ 0.5 μ s.
 - iii. $V_{CC} = 6.0$ V +0.0 V, -0.5 V. $V_{CC} = 5.5$ V +0.0 V, -0.5 V for device type 52.
- d. Interim and final electrical test parameters shall be as specified in table II.
- e. For class S devices, post dynamic burn-in, or class B devices, post static burn-in, electrical parameter measurements may, at the manufacturer's option, be performed separately or included in the final electrical parameter requirements.

4.2.1 Percent defective allowable (PDA).

- a. The PDA for class S devices shall be 5 percent for static burn-in and 5 percent for dynamic burn-in, based on the exact number of devices submitted to each separate burn-in.
- b. Static burn-in I and II failure shall be cumulative for determining the PDA.
- c. The PDA for class B devices shall be in accordance with MIL-PRF-38535 for static burn-in. Dynamic burn-in is not required.
- d. Those devices whose measured characteristics, after burn-in, exceed the specified delta (Δ) limits or electrical parameter limits specified in table III, subgroup 1, are defective and shall be removed from the lot. The verified failures divided by the total number of devices in the lot initially submitted to burn-in shall be used to determine the percent defective for the lot and the lot shall be accepted or rejected based on the specified PDA.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $T_C = +125^\circ\text{C}$ unless otherwise specified	Device type	V_{CC}	Limits		Unit
					Min	Max	
High-level output voltage	$V_{OH1} \underline{2/}$	$V_{IH} = 1.5 \text{ V}; V_{IL} = 0.3 \text{ V}$ $I_{OH} = -20 \mu\text{A}$	All	2.0 V	1.95		V
	$V_{OH2} \underline{2/}$	$V_{IH} = 3.15 \text{ V}; V_{IL} = 0.9 \text{ V}$ $I_{OH} = -20 \mu\text{A}$	All	4.5 V	4.45		V
	V_{OH3}	$V_{IH} = 4.2 \text{ V}; V_{IL} = 1.2 \text{ V}$ $I_{OH} = -20 \mu\text{A}$	All	6.0 V	5.95		V
	$V_{OH4} \underline{2/}$	$V_{IH} = 3.15 \text{ V}; V_{IL} = 0.9 \text{ V}$ $I_{OH} = -4.0 \text{ mA}$	All	4.5 V	3.7		V
	V_{OH5}	$V_{IH} = 4.2 \text{ V}$ $V_{IL} = 1.2 \text{ V}$	$I_{OH} = -5.2 \text{ mA}$	01,02 03,04 05,07,08	6.0 V	5.2	V
			$I_{OH} = -7.8 \text{ mA}$				
	V_{OH6}	$V_{IH} = 2.0 \text{ V}; V_{IL} = 0.8 \text{ V}$ $I_{OH} = -20 \mu\text{A}$	52	4.5 V	4.40		V
	V_{OH7}	$V_{IH} = 2.0 \text{ V}; V_{IL} = 0.8 \text{ V}$ $I_{OH} = -4.0 \text{ mA}$	52	5.5 V	3.70		V
Low-level output Voltage	$V_{OL1} \underline{2/}$	$V_{IL} = 0.3 \text{ V}; V_{IH} = 1.5 \text{ V}$ $I_{OL} = 20.0 \mu\text{A}$	All	2.0 V		0.05	V
	$V_{OL2} \underline{2/}$	$V_{IL} = 0.9 \text{ V}; V_{IH} = 3.15 \text{ V}$ $I_{OL} = 20.0 \mu\text{A}$	All	4.5 V		0.05	V
	V_{OL3}	$V_{IL} = 1.2 \text{ V}; V_{IH} = 4.2 \text{ V}$ $I_{OL} = 20.0 \mu\text{A}$	All	6.0 V		0.05	V
	$V_{OL4} \underline{2/}$	$V_{IL} = 0.9 \text{ V}; V_{IH} = 3.15 \text{ V}$ $I_{OL} = 4.0 \text{ mA}$	All	4.5 V		0.4	V
	V_{OL5}	$V_{IL} = 1.2 \text{ V}$ $V_{IH} = 4.2 \text{ V}$	$I_{OL} = 5.2 \text{ mA}$	01,02 03,04 05,07,08	6.0 V	0.4	V
			$I_{OL} = 7.8 \text{ mA}$				
	V_{OL6}	$V_{IL} = 0.8 \text{ V}; V_{IH} = 2.0 \text{ V}$ $I_{OL} = 20 \mu\text{A}$	52	4.5 V		0.05	V
	V_{OL7}	$V_{IL} = 0.8 \text{ V}; V_{IH} = 2.0 \text{ V}$ $I_{OL} = 4.0 \text{ mA}$	52	5.5 V		0.4	V
Positive input clamp voltage	V_{IC+}	$I_{IN} = 1 \text{ mA}$ $T_C = +25^\circ\text{C}$	All	GND		1.5	V
Negative input clamp voltage	V_{IC-}	$I_{IN} = -1 \text{ mA}$ $T_C = +25^\circ\text{C}$	All	OPEN		-1.5	V
Input current low	I_{IL}	$V_{IN} = \text{GND}$	01-08	6.0 V		-0.1	μA
			52	5.5 V			
Input current high	I_{IH}	$V_{IN} = V_{CC}$	01-08	6.0 V		0.1	μA
			52	5.5 V			

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/</u> T _C = +125°C unless otherwise specified	Device type	V _{CC}	Limits		Unit
					Min	Max	
Short circuit output current	I _{OS1} <u>2/</u>	V _O = GND V _I = GND	01-05 07,08	2.0 V	-2	-50	mA
			06			-60	
	I _{OS2} <u>2/</u>		01-05 07,08,52	4.5 V	-15	-150	
			06			-165	
	I _{OS3} <u>2/</u>		01-05 07,08	6.0 V	-25	-180	
			06			-210	
	I _{OS4}		01-05 07,08,52	4.0 V	-10	-120	
			06			-135	
I _{OS5} <u>2/</u>	52	5.5 V	-25	-180			
Additional supply current quiescent per input pin (one unit load)	I _{CCA} <u>3/</u>	For all inputs, V _{IL} = 0.4 V and V _{IH} = 2.4 V Test pin at V _{IN} = 2.4 V When not being tested, control pins at V _{IH} = V _{CC} and V _{IL} = GND I _O = 0 μA	52	5.5 V		3.0	mA
Quiescent supply current	I _{CC}	V _{IN} = 6.0 V	01-05 52	6.0 V		15	μA
			06-08			20	
	I _{CCZ}	V _{IN} = 6.0 V	06	6.0 V		10	μA
Three-state output leakage current low	I _{OZL}	V _{OUT} = GND OC = V _{IH} <u>4/</u>	06	6.0 V		-2.0	μA
Three-state output leakage current high	I _{OZH}	V _{OUT} = V _{CC} OC = V _{IH} <u>4/</u>	06	6.0 V		+2.0	μA
Control input capacitance	C _C	T _C = +25°C	All			15	pF
Input capacitance	C _I		All			10	
Three-state output capacitance	C _O		06	6.0 V		20	
Power dissipation capacitance	C _{PD} <u>2/ 5/</u>		01			30	pF
			02-05			35	
			06			29	
			07			38	
			08			65	
		52			30		
Maximum clock frequency	f _{MAX} <u>6/ 7/</u>	C _L = 50 pF ± 10%	01,03 04,06 07	4.5 V	23		MHz
			02,05 52		21		
			08		26		

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/</u> T _C = +125°C unless otherwise specified	Device type	V _{CC}	Limits		Unit		
					Min	Max			
Propagation delay time, low to high level, CLK to Q	t _{PLH1}	C _L = 50 pF ± 10% <u>7/</u> <u>8/</u>	02,04	4.5 V	5	41	ns		
			05,52						
			01-03		5	40			
			06		6	47			
			07		5	42			
			08		4	41			
Propagation delay time, high to low level, CLK to Q	t _{PHL1}		02,04		5	41			
			05,52						
			01-03		5	40			
			06		6	47			
			07		5	42			
			08		4	41			
Propagation delay time, <u>low</u> to high level, CLK or PRE to Q or Q̅	t _{PLH2}		01,05		6	43			
			02		5	54			
			03		6	51			
			04		6	54			
			08		4	43			
			52		5	47			
			Propagation delay time, <u>high</u> to low level, CLK or PRE to Q or Q̅		t _{PHL2}	01,05		6	43
						02		5	54
03	6					51			
04	6					54			
06	5					41			
07	5					42			
08	4					43			
52	5					47			
Enable time to high or low level	t _{PZH} or t _{PZL}		06			5		35	
Disable time to high or low level	t _{PHZ} or t _{PLZ}		06			5		35	
Transition time, low to high level or high to low level	t _{TLH} or t _{THL}		01-05			3		20	
			07,08,52						
		06		2	16				

1/ Complete terminal conditions shall be as specified in table III.

2/ Guaranteed but not tested.

3/ Total supply current = $I_{CC} + I_{CCA}$.

4/ I_{OZL} sets internal D flip-flops to high state.

I_{OZH} sets internal D flip-flops to low state.

5/ Power dissipation capacitance (C_{PD}) per flip-flop.

6/ See the formula for determining maximum frequencies shown in table IA.

7/ Tested at $V_{CC} = 4.5 \text{ V}$ at $+125^\circ\text{C}$ for sample testing and $V_{CC} = 4.5 \text{ V}$ and $+25^\circ\text{C}$ for screening.
Guaranteed at other V_{CC} voltages and temperatures. See tables IA and IB (as appropriate) and the exception in 4.4.1d.

8/ For propagation and transition delay times at $V_{CC} = 2.0 \text{ V}$, increase limit by a factor of 5.

For propagation and transition delay times at $V_{CC} = 6.0 \text{ V}$, decrease limit by a factor of 0.85.

TABLE IA. Calculated f_{MAX} at -55°C / $+25^{\circ}\text{C}$ case temperature.

V_{CC}	T_C	
	$+125^{\circ}\text{C}$	$-55^{\circ}\text{C} / +25^{\circ}\text{C}$
2.0 V	0.2X	0.2Y
4.5 V	$X = 1$	$1.33X = Y$
6.0 V	1.18X	1.18Y

NOTE: Normalized numbers ($+125^{\circ}\text{C} = 1$).
 The 2.0 V and 6.0 V numbers are derived from
 their 4.5 V integer value (rounding off
 according 5/4).

TABLE IB. Calculated dynamic values at $-55^{\circ}\text{C}/+25^{\circ}\text{C}$, case temperature.

V_{CC}	T_C	
	$+125^{\circ}\text{C}$	-55°C or $+25^{\circ}\text{C}$
2.0 V	5	5×0.75
4.5 V	1 $\rightarrow$	$\rightarrow$ 0.75
6.0 V	0.85	0.85×0.75

NOTE: Normalized numbers ($+125^{\circ}\text{C} = 1$).
 The 2.0 V and 6.0 V numbers are derived from their 4.5 V integer value
 (rounding off according 5/4).

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Line no.	MIL-PRF-38535 test requirements	Class S device <u>1/</u>			Class B device <u>1/</u>		
		Ref. par.	Table III subgroups <u>2/</u>	Table IV delta limits <u>3/</u>	Ref. par.	Table III subgroups <u>2/</u>	Table IV delta <u>3/</u>
1	Interim electrical parameters		1			1	
2	Static burn-in I (method 1015)	4.2c 4.5.2	Req'd			Not req'd	
3	Same as line 1		1*	Δ			
4	Static burn-in II (method 1015)	4.2c 4.5.2	Req'd		4.2c 4.5.2	<u>4/</u> req'd	
5	Same as line 1	4.2e	1*	Δ	4.2e	1*	Δ
6	Dynamic burn-in (method 1015)	4.2c 4.5.2	Req'd			Not req'd	
7	Same as line 1	4.2e	1	Δ			
8	Final electrical parameters		* 1, 2, 3, 7, 8, 9			1*, 2, 7, 9 <u>4/</u>	
9	Group A test requirements	4.4.1	1, 2, 3, 4, 7, 8, 9, 10, 11		4.4.1	1, 2, 3, 4, 7, 8, 9, 10, 11	
10	Group B test when using method 5005 QCI option	4.4.2	1, 2, 3, 7, 8, 9, 10, 11	Δ			
11	Group C end-point electrical parameters	4.4.2	1, 2, 3, 7, 8, 9, 10, 11	Δ	4.4.3	1, 2	Δ
12	Group D end-point electrical parameters	4.4.4	1, 2, 3		4.4.4	1, 2	

1/ Blank spaces indicate tests are not applicable.

2/ * indicates PDA applies to subgroup 1 (see 4.2.1).

3/ Δ indicates delta limits shall be required only on table III subgroup 1, where specified, and the delta values shall be computed with reference to the previous interim electrical parameters.

4/ The device manufacturer may, at his option, either complete subgroup 1 electrical parameter measurements, including delta measurements, within 96 hours after burn-in completion (removal of bias); or may complete subgroup 1 electrical measurements without delta measurements within 24 hours after burn-in completion (removal of bias).

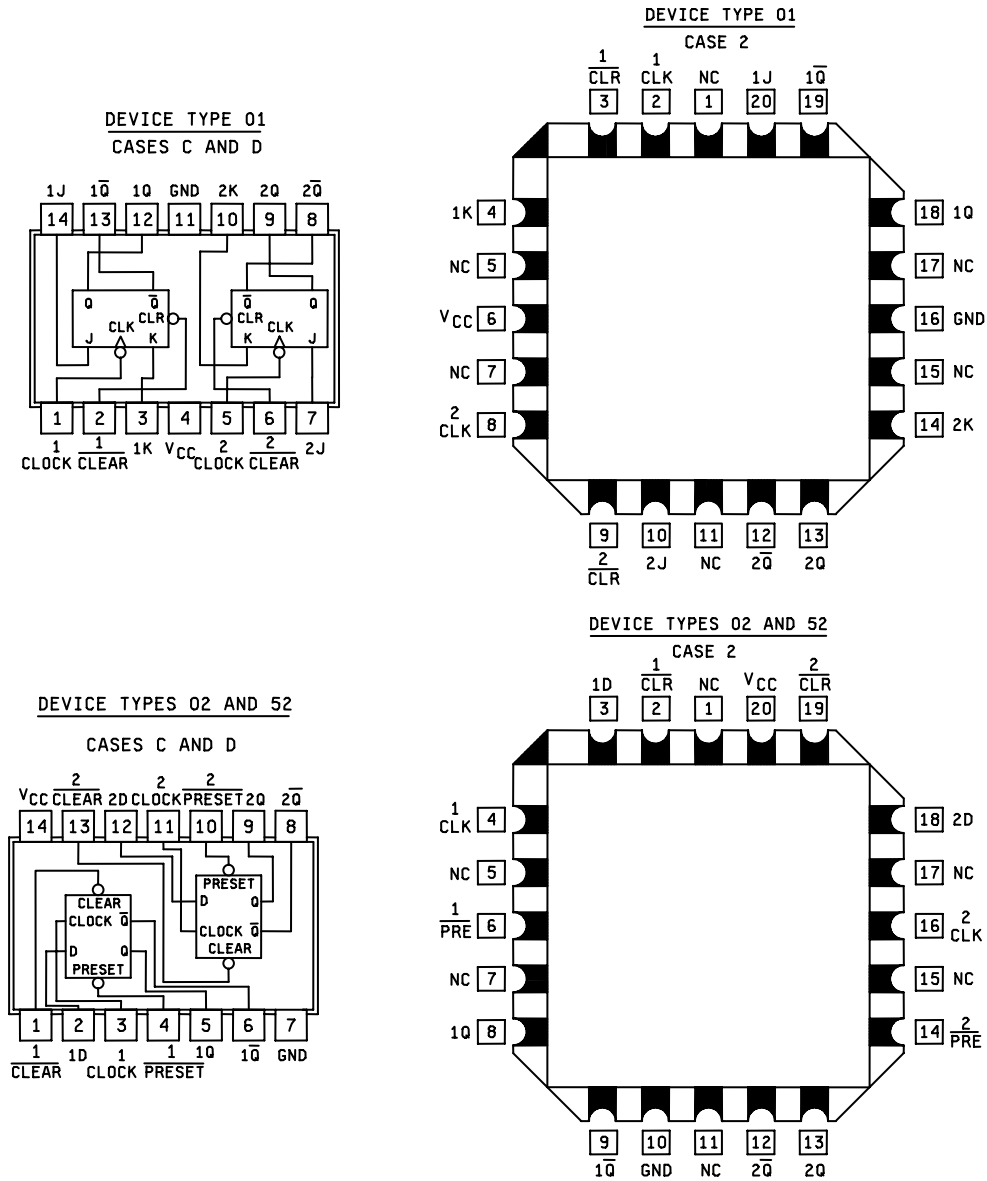


FIGURE 1. Logic diagrams and terminal connections (top views).

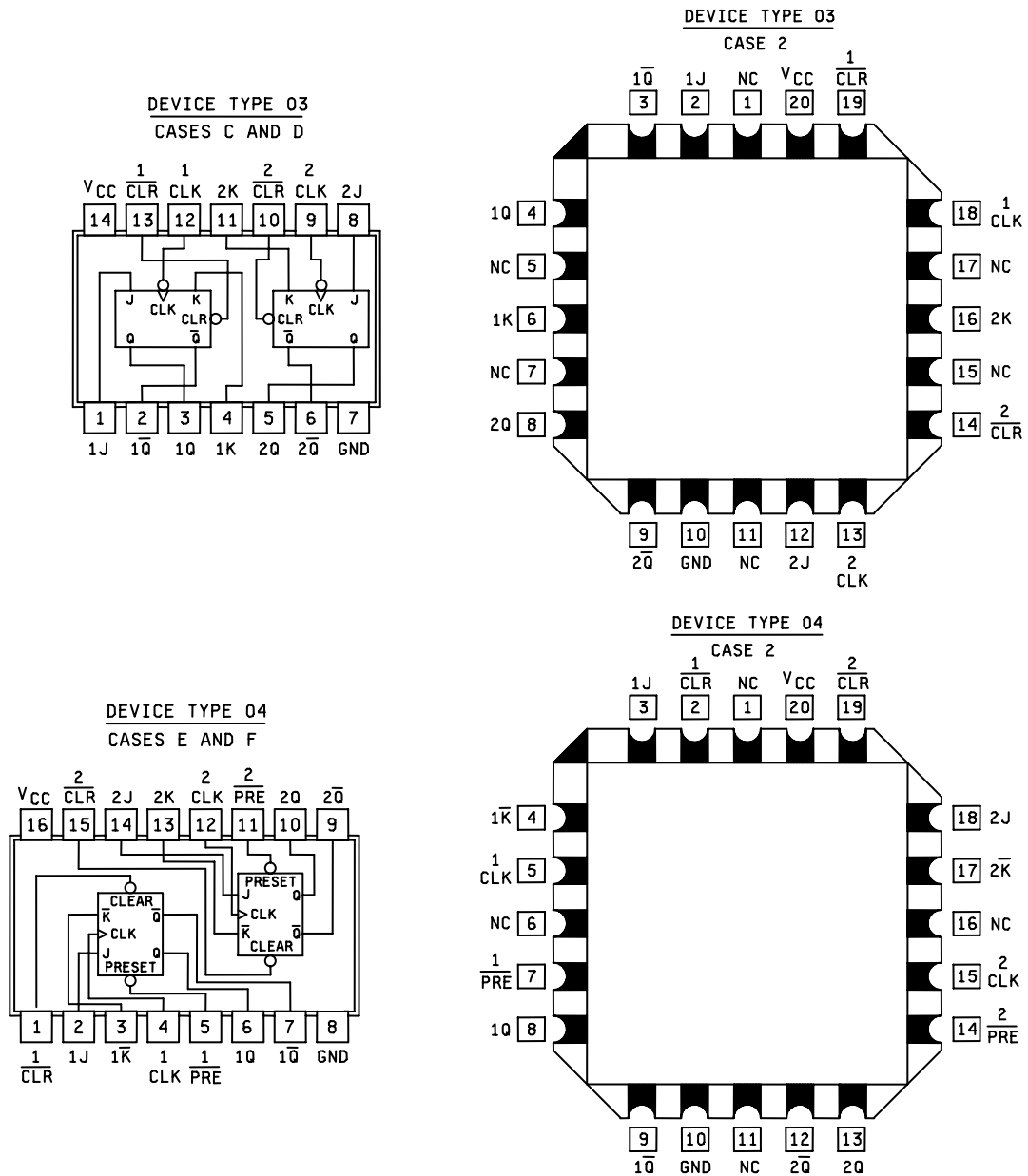


FIGURE 1. Logic diagrams and terminal connections (top views) – Continued.

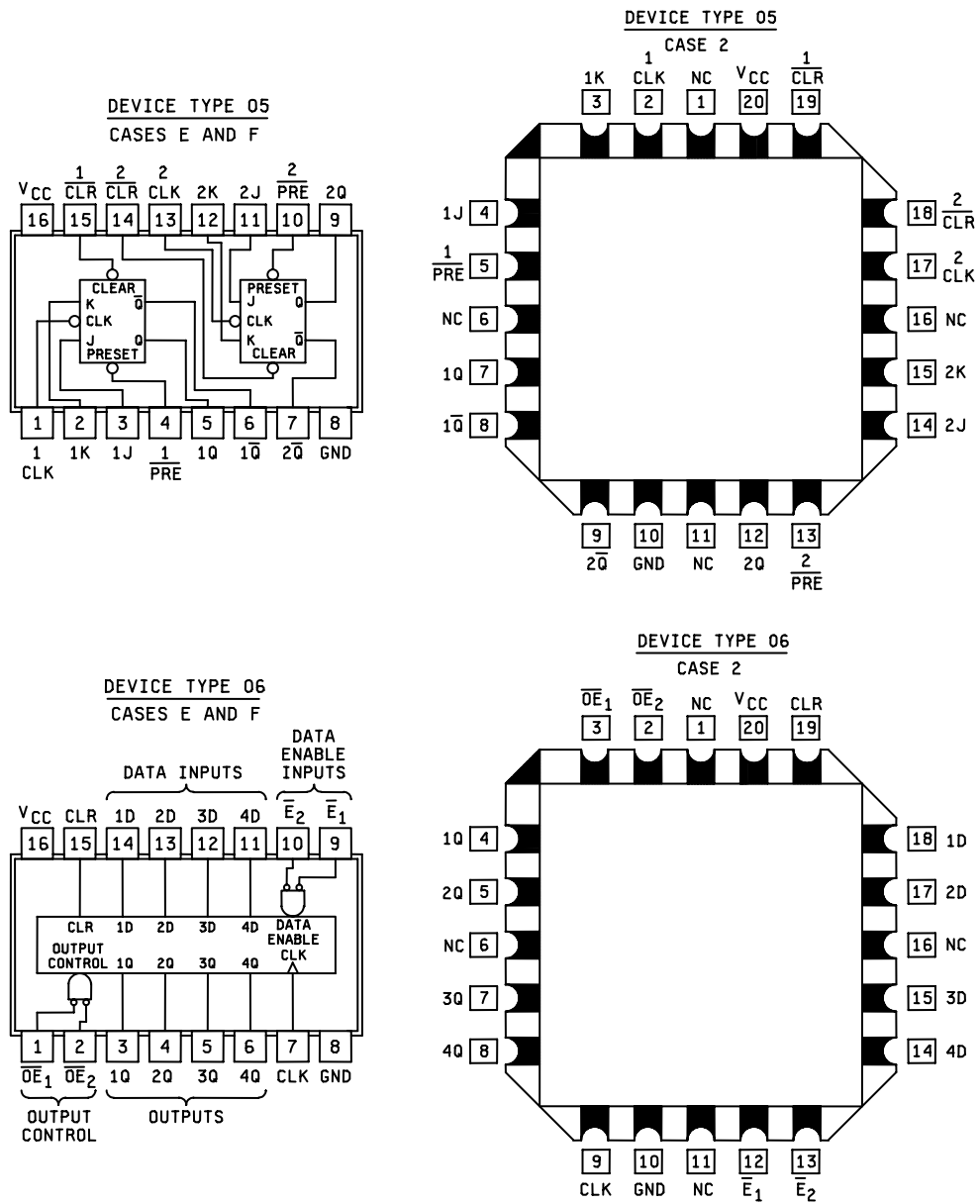


FIGURE 1. Logic diagrams and terminal connections (top views) – Continued.

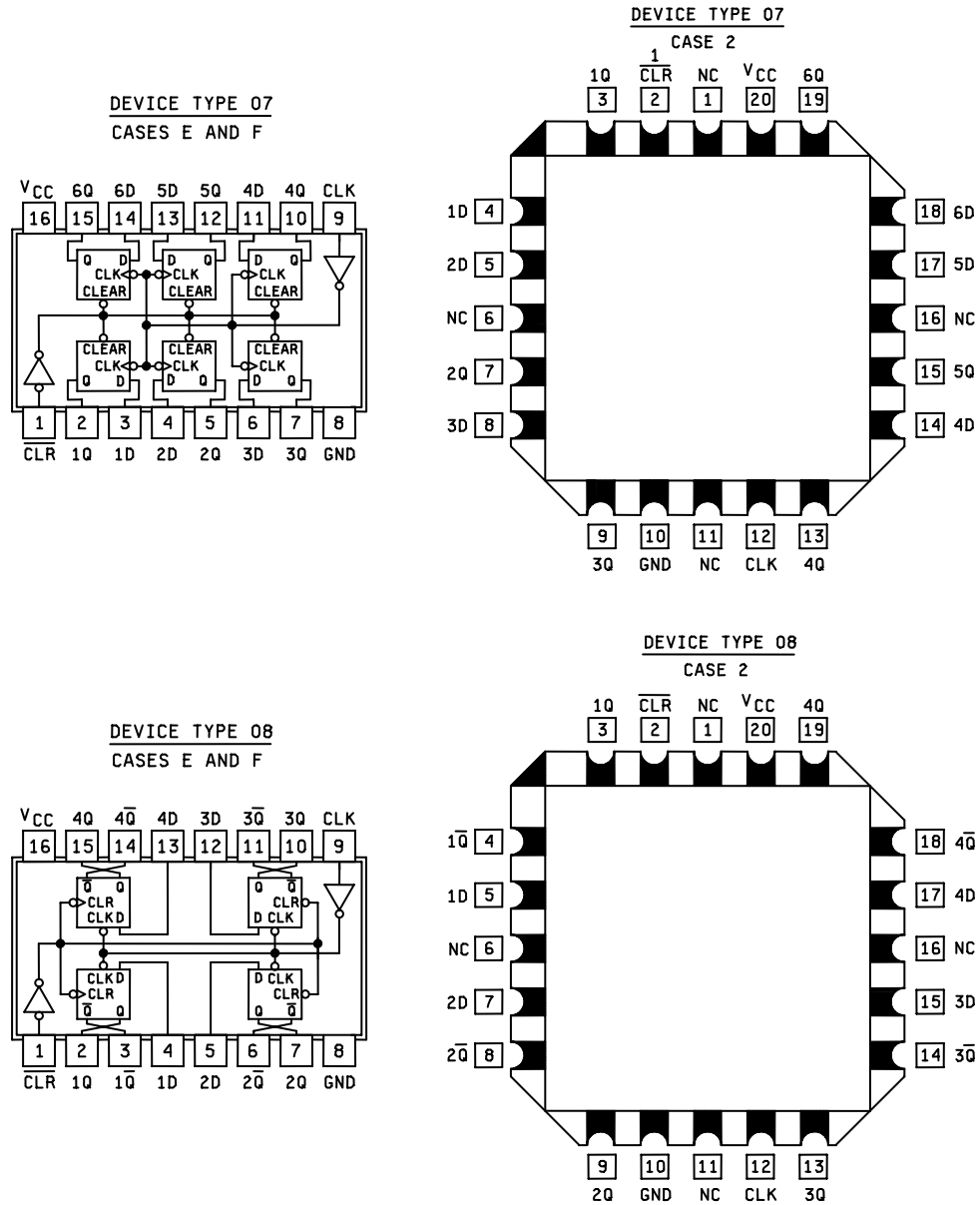


FIGURE 1. Logic diagrams and terminal connections (top views) – Continued.

Device type 01

Inputs				Outputs	
$\overline{\text{CLR}}$	CLK	J	K	Q	$\overline{Q}$
L	X	X	X	L	H
H	↓	L	L	Q0	$\overline{Q0}$
H	↓	H	L	H	L
H	↓	L	H	L	H
H	↓	H	H	Toggle	
H	H	X	X	Q0	$\overline{Q0}$

Device types 02 and 52

Inputs				Outputs	
$\overline{\text{PRE}}$	$\overline{\text{CLR}}$	CLK	D	Q	$\overline{Q}$
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H*	H*
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	X	X	Q0	$\overline{Q0}$

Device type 03

Inputs				Outputs	
$\overline{\text{CLR}}$	CLK	J	K	Q	$\overline{Q}$
L	X	X	X	L	H
H	↓	L	L	Q0	$\overline{Q0}$
H	↓	H	L	H	L
H	↓	L	H	L	H
H	↓	H	H	Toggle	
H	H	X	X	Q0	$\overline{Q0}$

Device type 04

Inputs					Outputs	
$\overline{\text{PRE}}$	$\overline{\text{CLR}}$	CLK	J	$\overline{K}$	Q	$\overline{Q}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	↑	L	L	L	H
H	H	↑	H	L	Toggle	
H	H	↑	L	H	Q0	$\overline{Q0}$
H	H	↑	H	H	H	L
H	H	L	X	X	Q0	$\overline{Q0}$

* = This configuration is nonstable

X = Pins have no effect on output

H = High level voltage

L = Low level voltage

↑ = Low-to-high transition of the clock

↓ = High-to-low transition of the clock

Q0 ($\overline{Q0}$) = The level of Q ($\overline{Q}$) before the indicated steady-state input conditions were established

FIGURE 2. Truth tables.

Device type 05

Inputs					Outputs	
$\overline{\text{PRE}}$	$\overline{\text{CLR}}$	CLK	J	K	Q	$\overline{\text{Q}}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H *	H *
H	H	↓	L	L	Q0	$\overline{\text{Q0}}$
H	H	↓	H	L	H	L
H	H	↓	L	H	L	H
H	H	↓	H	H	Toggle	
H	H	H	X	X	Q0	$\overline{\text{Q0}}$

Device type 06

Inputs		Data enable		Data	Output
CLR	CLK	$\overline{\text{E1}}$	$\overline{\text{E2}}$	D	Q
H	X	X	X	X	L
L	L	X	X	X	Q0
L	↑	H	X	X	Q0
L	↑	X	H	X	Q0
L	↑	L	L	L	L
L	↑	L	L	H	H

For device type 06: When either $\overline{\text{OE1}}$ or $\overline{\text{OE2}}$ (or both) is (are) high, the output is disabled to the high-Z state; however, sequential operation of the flip-flops is not affected.

Device type 07

Inputs			Output
$\overline{\text{CLR}}$	CLK	D	Q
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q0

Device type 08

Inputs			Outputs	
$\overline{\text{CLR}}$	CLK	D	Q	$\overline{\text{Q}}$
L	X	X	L	H
H	↑	H	H	L
H	↑	L	L	H
H	L	X	Q0	$\overline{\text{Q0}}$

* = This configuration is nonstable

X = Pins have no effect on output

H = High level voltage

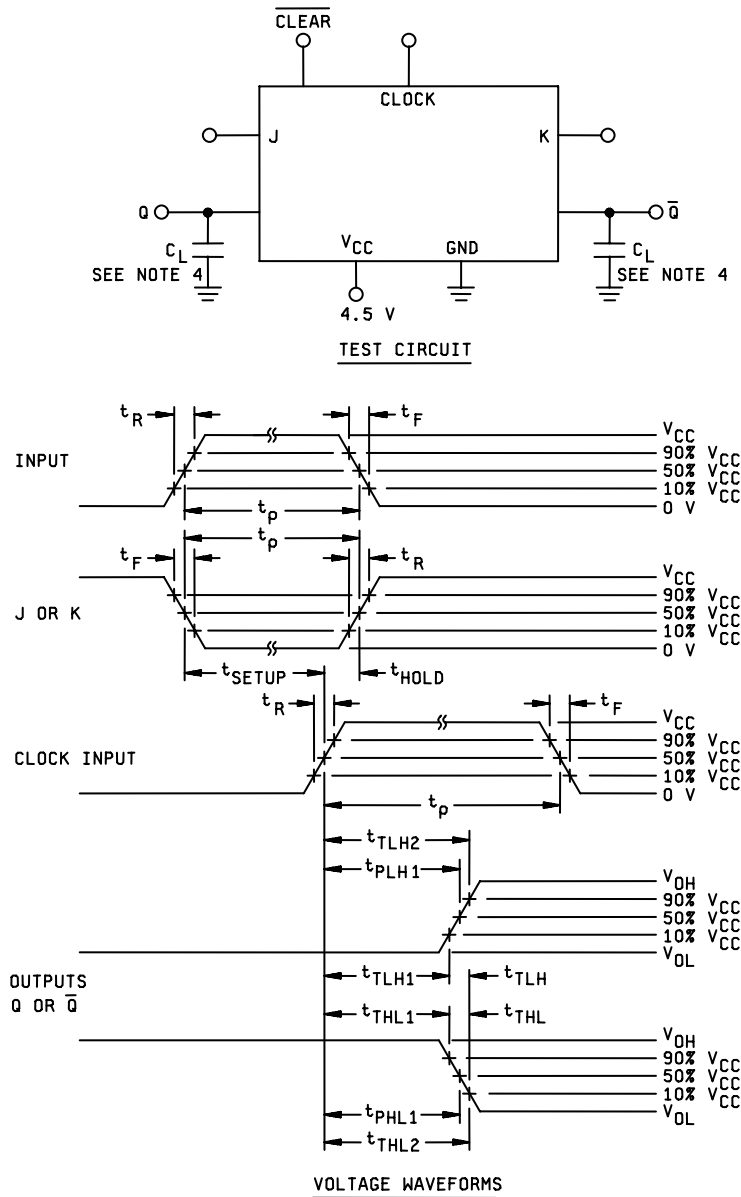
L = Low level voltage

↑ = Low-to-high transition of the clock

↓ = High-to-low transition of the clock

Q0 ($\overline{\text{Q0}}$) = The level of Q ($\overline{\text{Q}}$) before the indicated steady-state input conditions were established

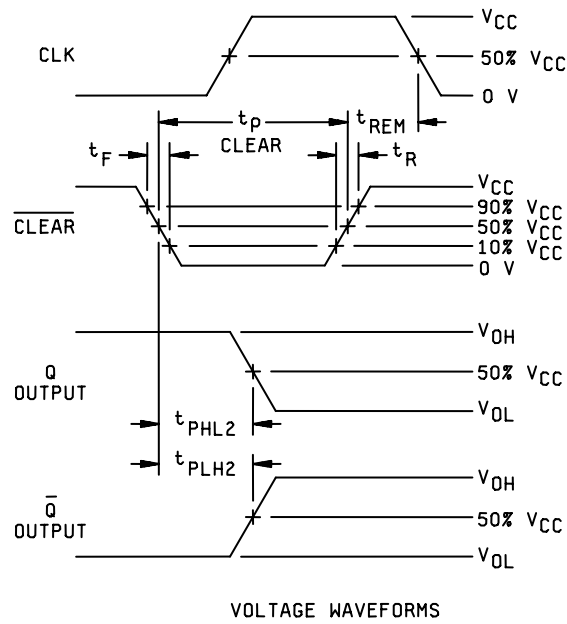
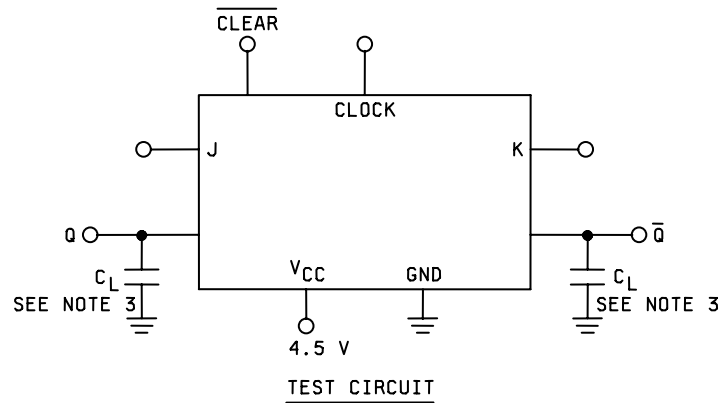
FIGURE 2. Truth tables – Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 27 \text{ ns}$.
2. J or K input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_{\text{setup}} \leq 30 \text{ ns}$; $t_{\text{hold}} \leq 8 \text{ ns}$; $t_p (\text{data}) \leq 38 \text{ ns}$.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 22 \text{ ns}$; $\text{PRR} \geq 23 \text{ MHz}$.
4. $C_L = 50 \text{ pF} \pm 10\%$ (includes test jig and probe capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{\text{TLH}} = t_{\text{TLH2}} - t_{\text{TLH1}}$; $t_{\text{THL}} = t_{\text{THL2}} - t_{\text{THL1}}$.

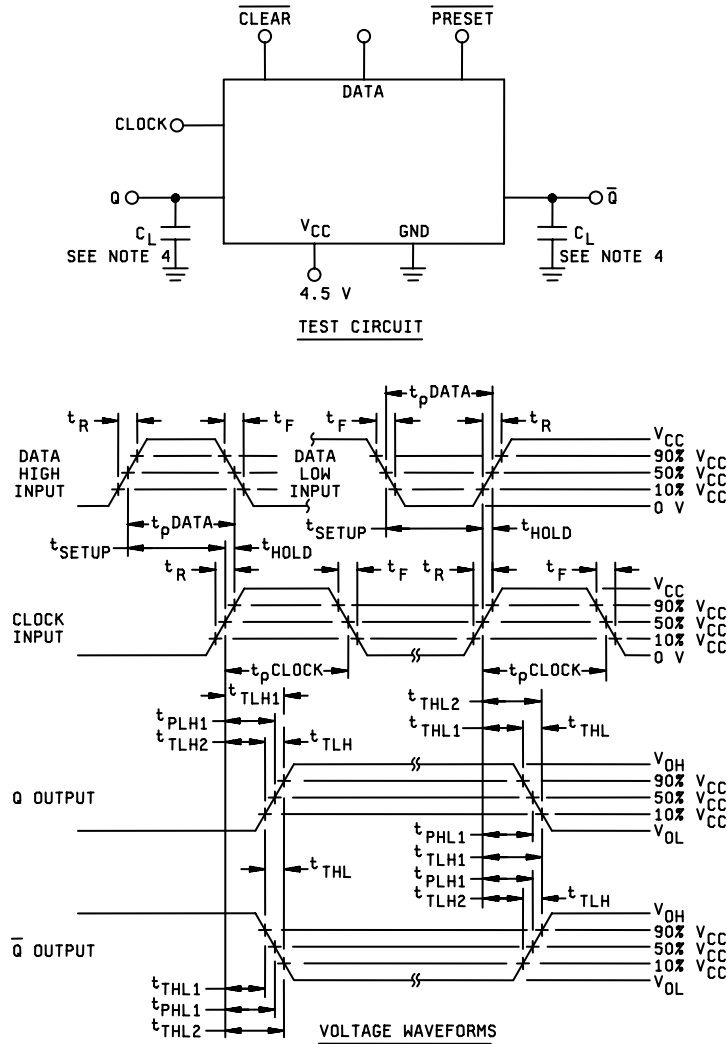
FIGURE 3. Synchronous switching test circuit and waveforms (device type 01).



NOTES:

1. CLEAR pulses dominate regardless of the state of the other inputs.
2. CLEAR input pulse characteristics are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clear}) \leq 30 \text{ ns}$; $t_{\text{REM}} \leq 30 \text{ ns}$.
3. $C_L = 50 \text{ pF} \pm 10 \%$ (includes test jig and probe capacitance).
4. Clock pulse prior to test with inputs biased to place output at the appropriate level for test.
5. Voltage measurements are to be made with respect to the network ground terminal.

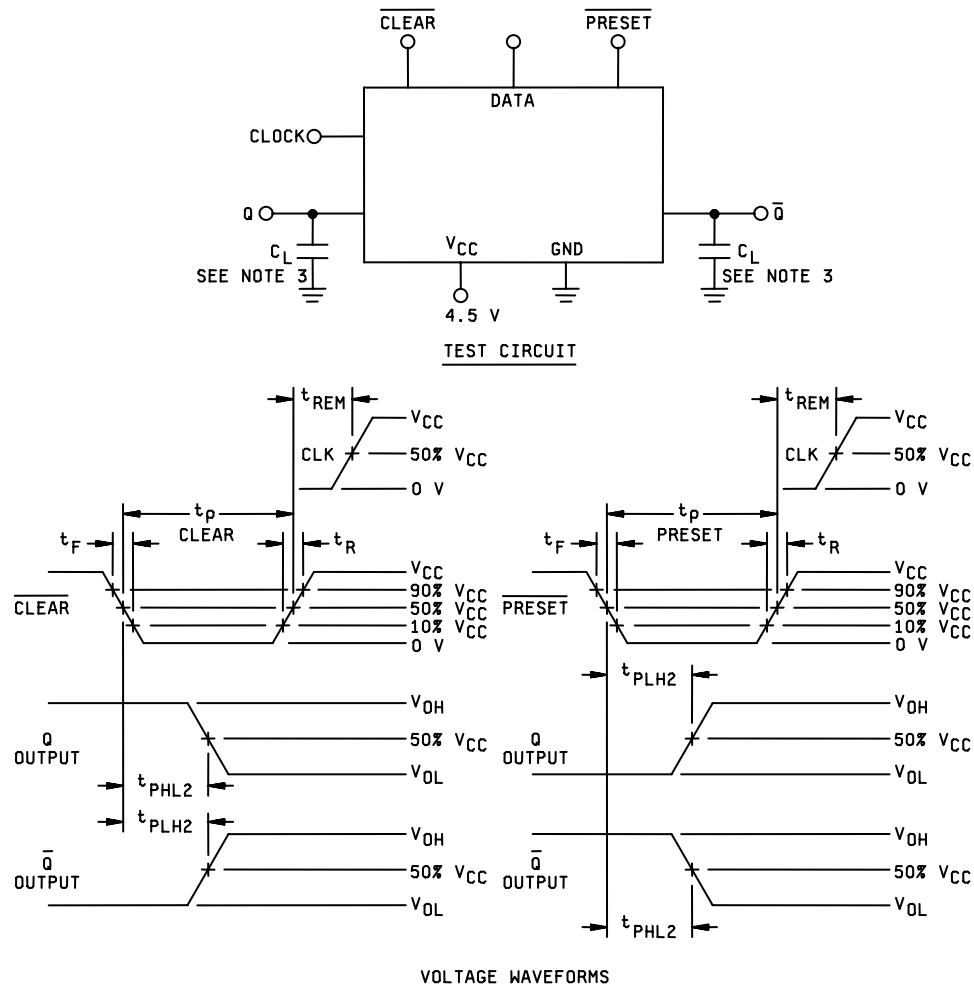
FIGURE 3. CLEAR switching test circuit and waveforms (device type 01) – Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 30 ns.
2. Data input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (data) ≤ 38 ns;
(for device type 52), t_p (data) ≤ 33 ns; $t_{\text{setup}} \leq 30$ ns; $t_{\text{hold}} \leq 8$ ns.
(for device type 52), $t_{\text{hold}} \leq 3$ ns; $\text{PRR} \geq 1$ MHz.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 24 ns; $\text{PRR} \geq 21$ MHz.
4. $C_L = 50$ pF $\pm 10\%$ (including test jig and probe capacitance).
5. Voltage measurements are to be made with respect to network ground terminal. The input signal(s) for HCT device type 52 will be 0 V to 3 V; however, the 50 % V_{CC} measuring point is 1.3 V for input and output.
6. $t_{TLH} = t_{TLH1} - t_{TLH2}$; $t_{THL} = t_{THL2} - t_{THL1}$.

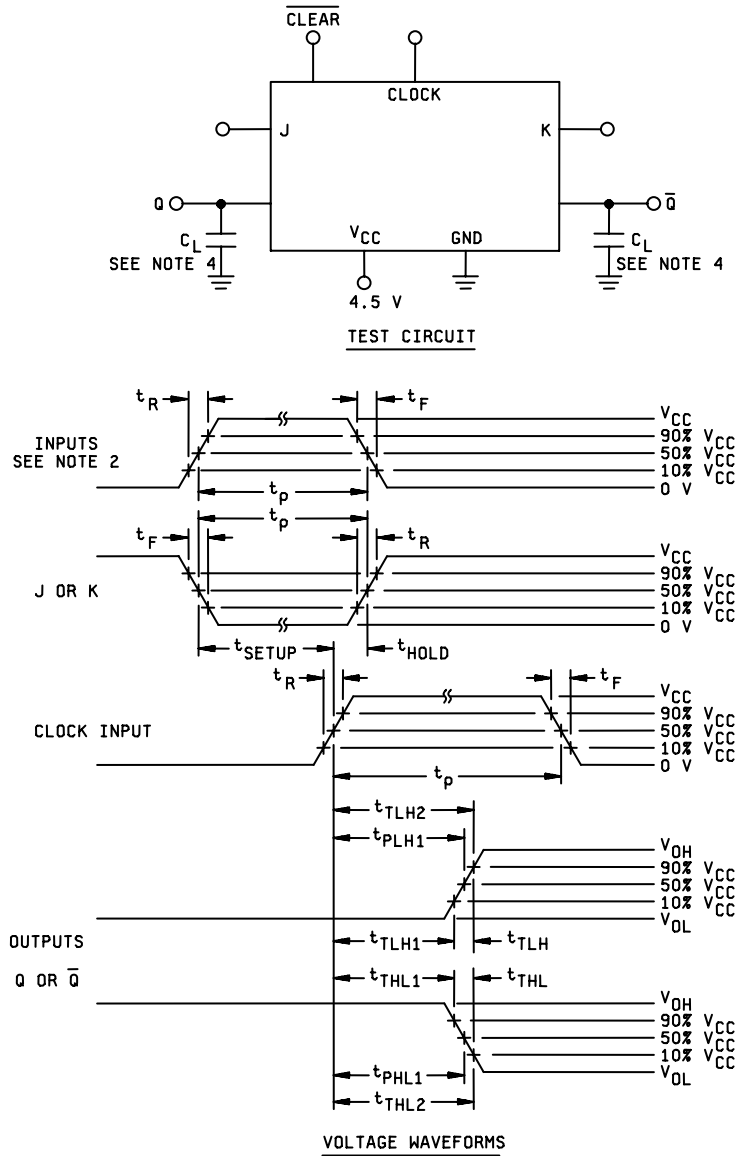
FIGURE 3. Synchronous switching test circuit and waveforms (device types 02 and 52) - Continued.



NOTES:

1. CLEAR and PRESET pulses are active low and dominate regardless of the state of the clock and data inputs.
2. CLEAR or PRESET input pulse characteristics are as follows:
 $t_r = t_f \leq 6 \text{ ns}$; $t_p(\text{CLEAR}) = t_p(\text{PRESET}) \leq 30 \text{ ns}$; $t_{\text{REM}} \leq 38 \text{ ns}$.
3. $C_L = 50 \text{ pF} \pm 10\%$ (including test jig and probe capacitance).
4. While testing the CLEAR input at a logic "0" level, PRESET will have a logic "1" level applied. While testing the PRESET input at a logic level "0", CLEAR will have a logic "1" applied.
5. Voltage measurements are to be made with respect to the network ground terminal. The input signal(s) for HCT device type 52 will be 0 V to 3 V; however, the 50 % measurements point is 1.3 V for inputs and outputs.

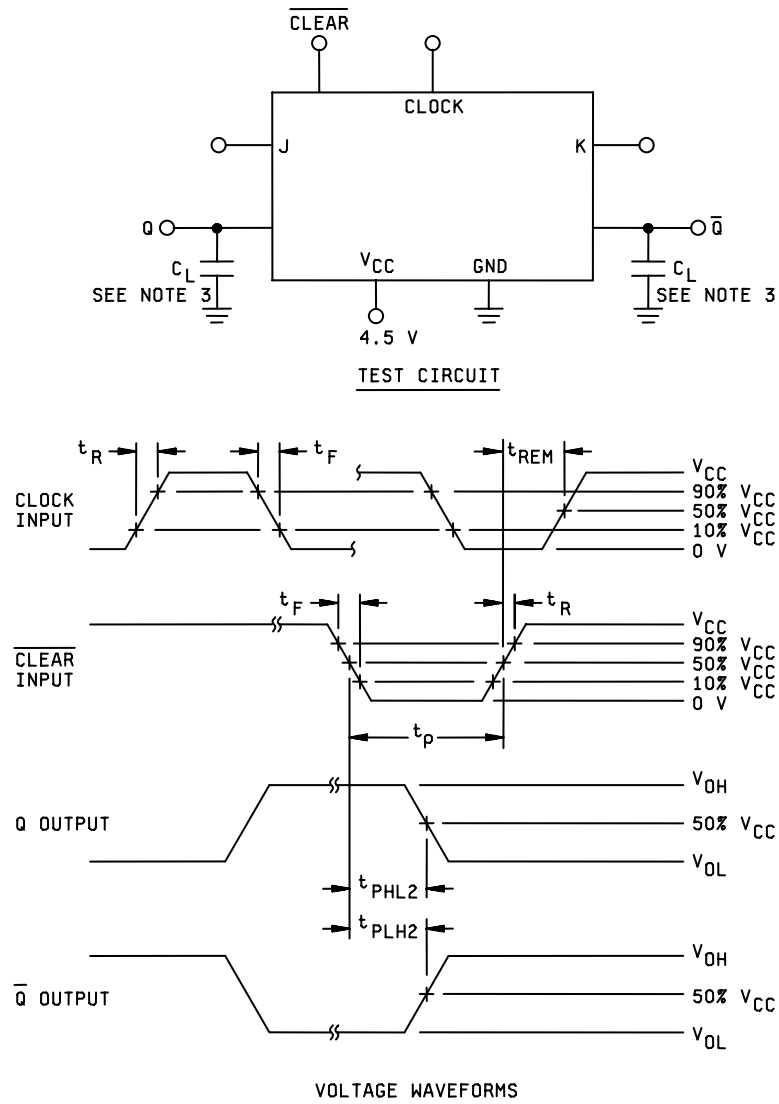
FIGURE 3. CLEAR switching test circuit and waveforms (device types 02 and 52) - Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 27 ns.
2. J or K input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (J or K) ≤ 38 ns; $t_{hold} \leq 8$ ns; $t_{setup} \leq 30$ ns; $PRR \geq 1$ MHz.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 22 ns; $PRR \geq 23$ MHz.
4. $C_L = 50$ pF $\pm 10\%$ (including test jig and probe capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{TLH} = t_{TLH2} - t_{TLH1}$; $t_{THL} = t_{THL2} - t_{THL1}$.

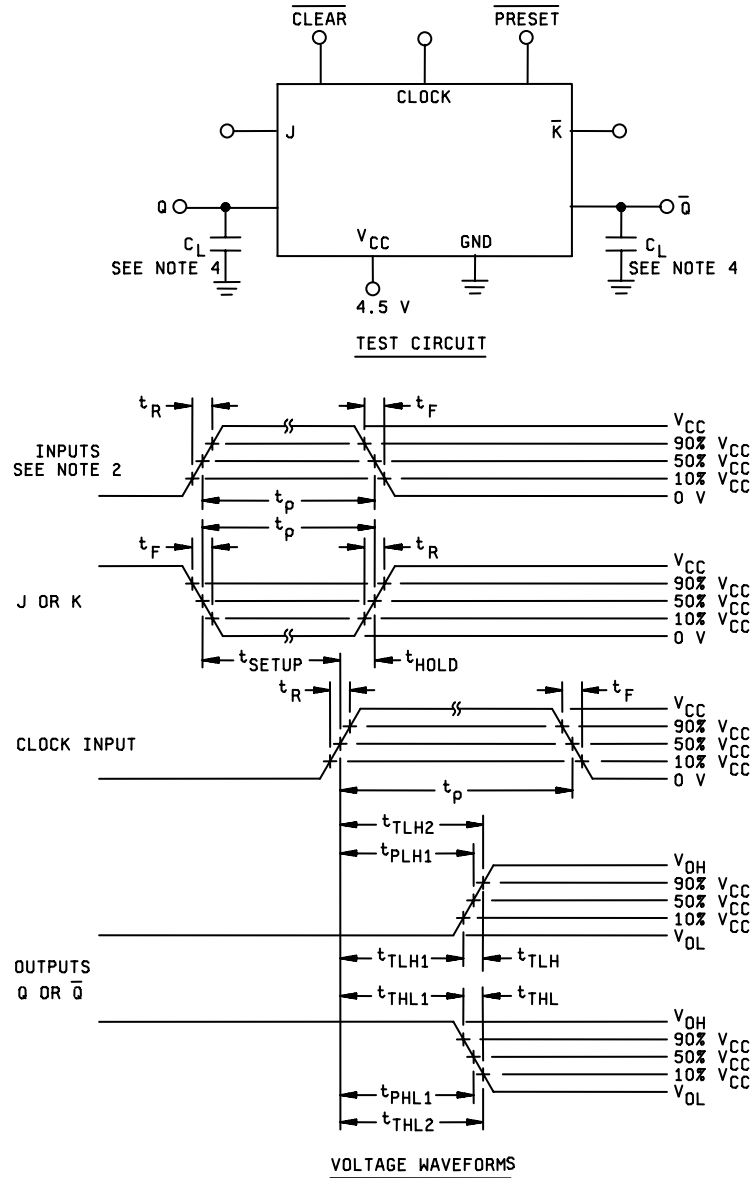
FIGURE 3. Synchronous switching test circuit and waveforms (device type 03) - Continued.



NOTES:

1. CLEAR pulses dominate regardless of the state of the other inputs.
2. CLEAR input pulse characteristics are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{CLEAR}) \leq 30 \text{ ns}$; $t_{\text{REM}} \leq 30 \text{ ns}$.
3. $C_L = 50 \text{ pF} \pm 10\%$ (including test jig and probe capacitance).
4. Clock pulse prior to test with inputs biased to place the output at the appropriate level for test.
5. Voltage measurements are to be made with respect to the network ground terminal.

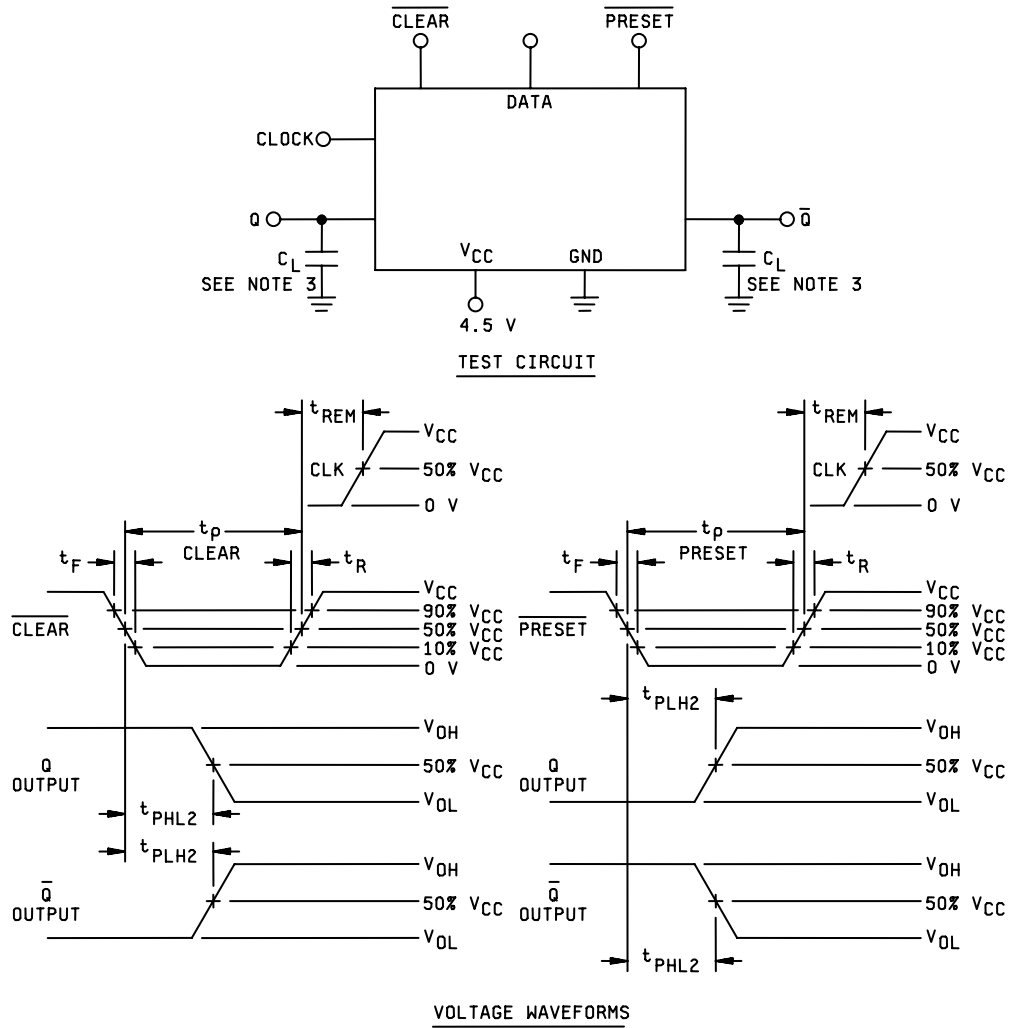
FIGURE 3. CLEAR switching test circuit and waveforms (device type 03) - Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 27 ns.
2. J or K input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (J or K) ≤ 38 ns; $t_{hold} \leq 8$ ns; $t_{setup} \leq 30$ ns.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 22 ns; $PRR \geq 23$ MHz.
4. $C_L = 50$ pF $\pm 10\%$ (including jig and probe capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{TLH} = t_{TLH2} - t_{TLH1}$; $t_{THL} = t_{THL2} - t_{THL1}$.

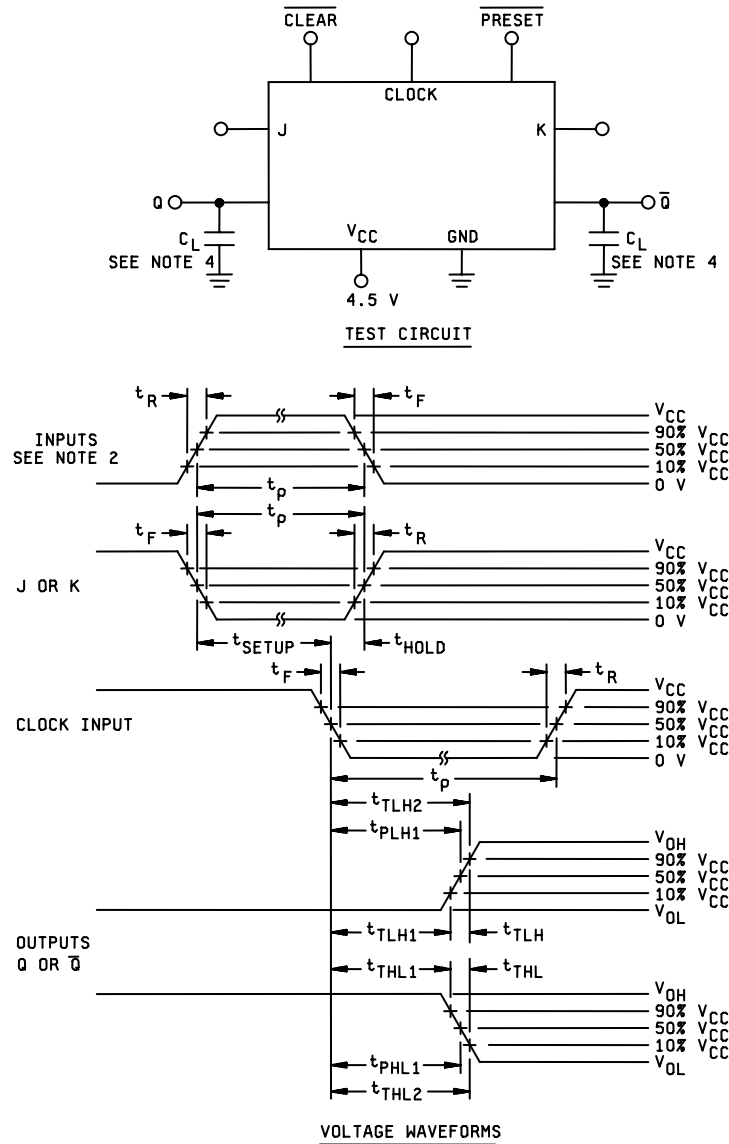
FIGURE 3. Synchronous switching test circuit and waveforms (device type 04) - Continued.



NOTES:

1. $\overline{\text{CLEAR}}$ and $\overline{\text{PRESET}}$ pulses are active low and dominate regardless of the state of the other inputs.
2. $\overline{\text{CLEAR}}$ and $\overline{\text{PRESET}}$ input pulse characteristics are as follows: $t_r = t_f \leq 6 \text{ ns}$;
 $t_p(\overline{\text{CLEAR}}) = t_p(\overline{\text{PRESET}}) \leq 30 \text{ ns}$; $t_{REM} \leq 30 \text{ ns}$.
3. $C_L = 50 \text{ pF} \pm 10\%$ (including test jig and probe capacitance).
4. May be pulsed prior to test with inputs biased to place output at the appropriate level for test.
5. Voltage measurements are to be made with respect to the network ground terminal.

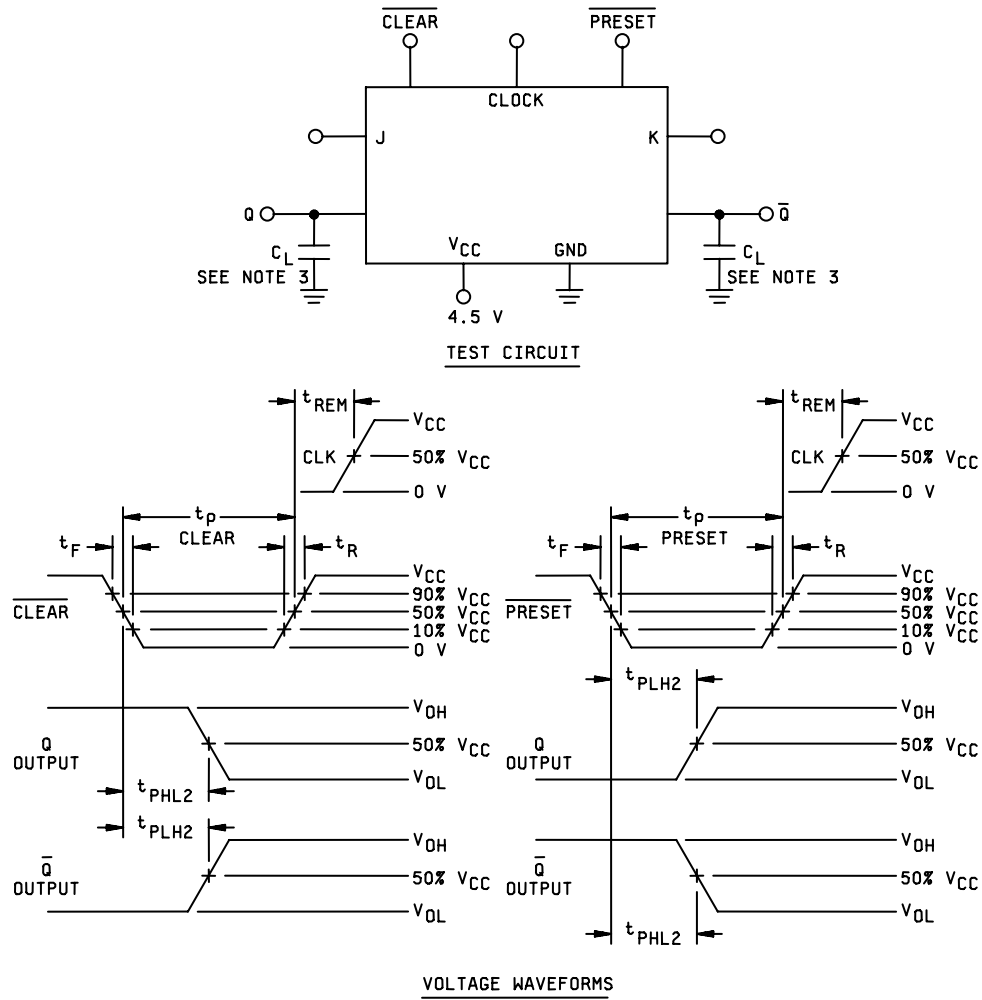
FIGURE 3. $\overline{\text{CLEAR}}$ and $\overline{\text{PRESET}}$ switching test circuit and waveforms (device type 04) - Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 30 \text{ ns}$.
2. J or K input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{J or K}) \leq 38 \text{ ns}$; $t_{\text{hold}} \leq 8 \text{ ns}$; $t_{\text{setup}} \leq 30 \text{ ns}$.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 24 \text{ ns}$; $\text{PRR} \geq 21 \text{ MHz}$.
4. $C_L = 50 \text{ pF} \pm 10\%$ (including test jig and probe capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{\text{TLH}} = t_{\text{TLH2}} - t_{\text{TLH1}}$; $t_{\text{THL}} = t_{\text{THL2}} - t_{\text{THL1}}$.

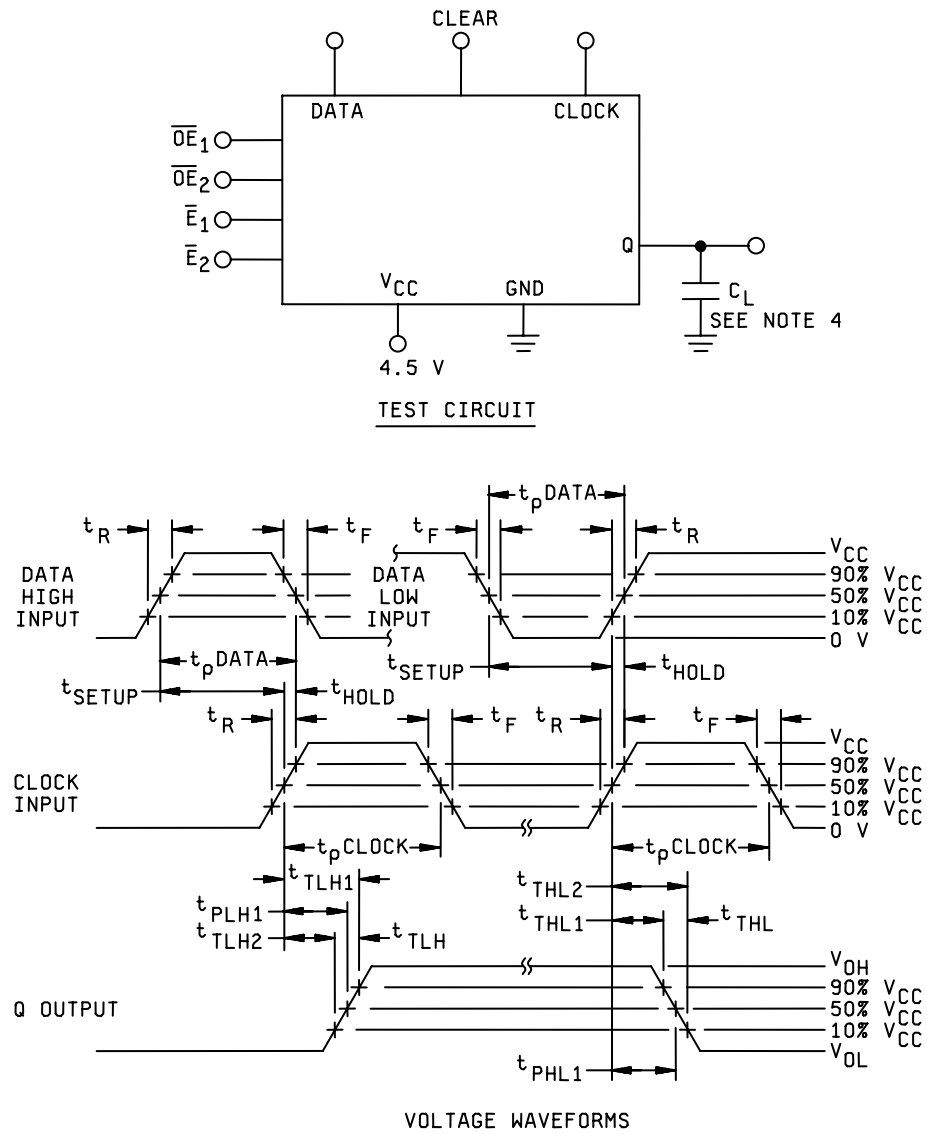
FIGURE 3. Synchronous switching test circuit and waveforms (device type 05) - Continued.



NOTES:

1. CLEAR and PRESET pulses are active low and dominate regardless of the state of the other inputs.
2. CLEAR and PRESET input pulse characteristics are as follows: $t_r = t_f \leq 6$ ns; t_p (CLEAR) = t_p (PRESET) ≤ 30 ns; $t_{REM} \leq 30$ ns.
3. $C_L = 50$ pF ± 10 % (including test jig and probe capacitance).
4. May be pulsed prior to test with inputs biased to place output at the appropriate level for test.
5. Voltage measurements are to be made with respect to the network ground terminal.

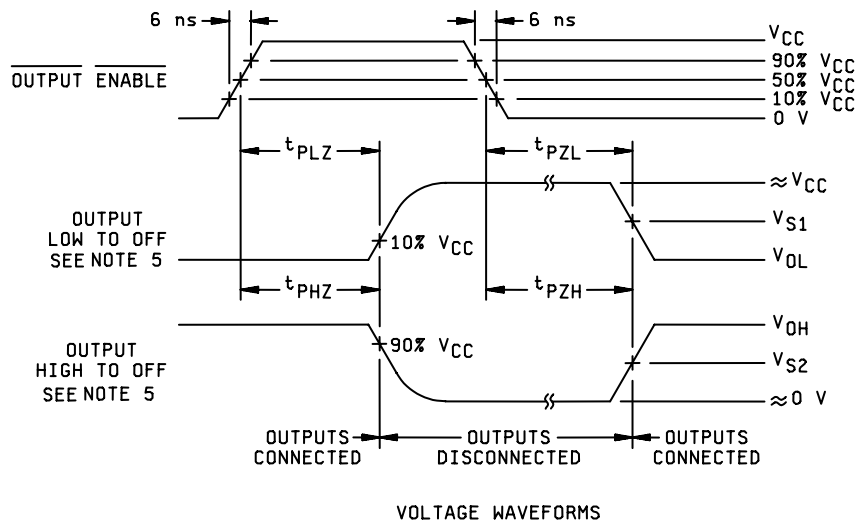
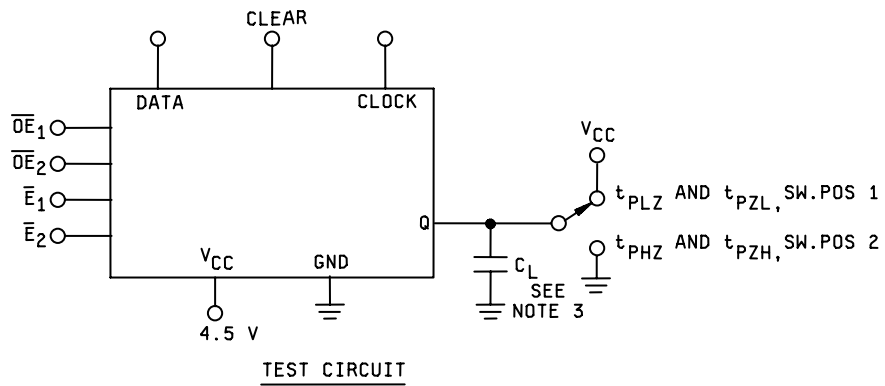
FIGURE 3. CLEAR and PRESET switching test circuit and waveforms (device type 05) - Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 27 ns.
2. Data input pulse characteristics: $t_r = t_f \leq 6$ ns; t_p (data) ≤ 38 ns; $t_{setup} \leq 30$ ns; $t_{hold} \leq 8$ ns; PRR ≥ 1 MHz.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns; t_p (clock) ≤ 22 ns; PRR ≥ 23 MHz.
4. $C_L = 50$ pF ± 10 % (including test jig and probe capacitance).
5. $t_{TLH} = t_{TLH1} - t_{TLH2}$; $t_{THL} = t_{THL2} - t_{THL1}$.
6. Voltage measurements are to be made with respect to network ground terminal.

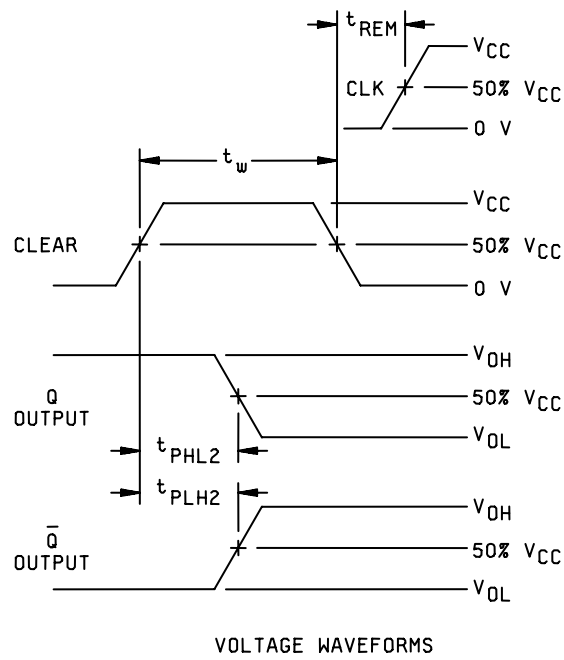
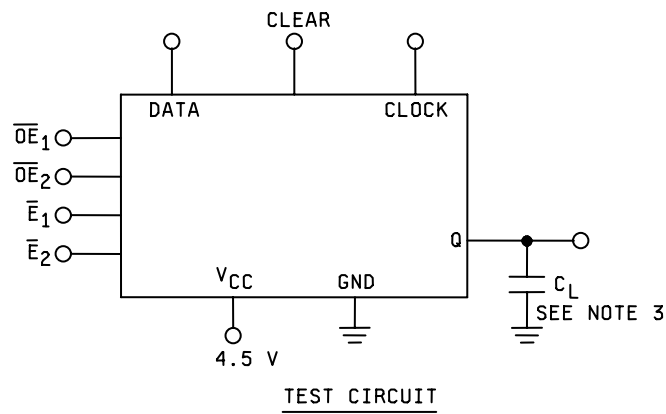
FIGURE 3. Synchronous switching test circuit and waveforms (device type 06) - Continued.



NOTES:

1. $\overline{\text{OE1}}$ and $\overline{\text{OE2}}$ pulses are active low and one or both must be active to enable the outputs.
2. $\overline{\text{OE1}}$ and $\overline{\text{OE2}}$ input pulse characteristics are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_{p\text{OE1}} = t_{p\text{OE2}} \geq 200 \text{ ns}$.
3. $C_L = 50 \text{ pF} \pm 10 \%$ (including test jig and probe capacitance).
4. $\overline{\text{OE1}}$ or $\overline{\text{OE2}}$ does not affect the sequential operation of the flip-flop.
5. For t_{PHZ} and t_{PZH} , a $1 \text{ k}\Omega$ resistor is connected between the output and the GND terminal. For t_{PZL} and t_{PLZ} , a $1 \text{ k}\Omega$ resistor is connected between the output and the V_{CC} terminal. $V_{S1} = V_{OL} + 0.1 \text{ V}$ ($V_{OH} - V_{OL}$). $V_{S2} = V_{OH} - 0.1 \text{ V}$ ($V_{OH} - V_{OL}$).

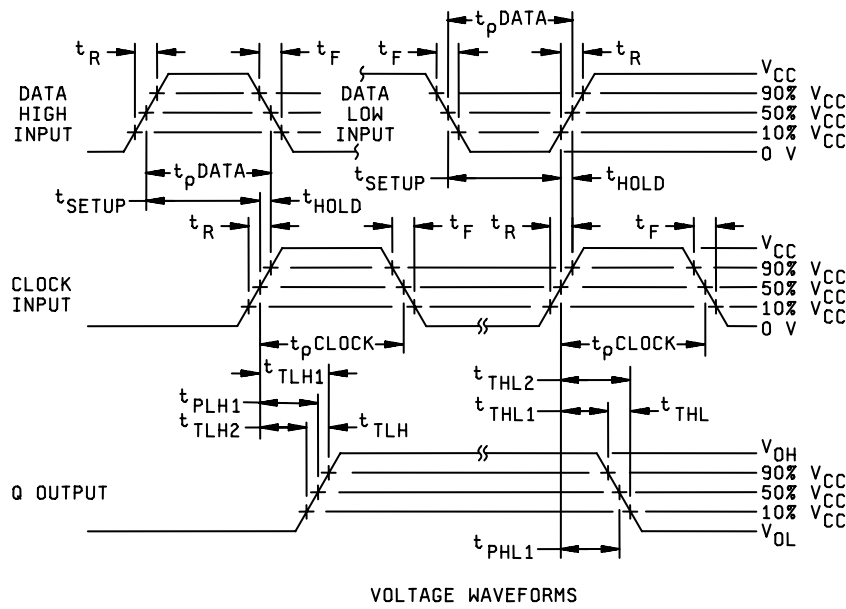
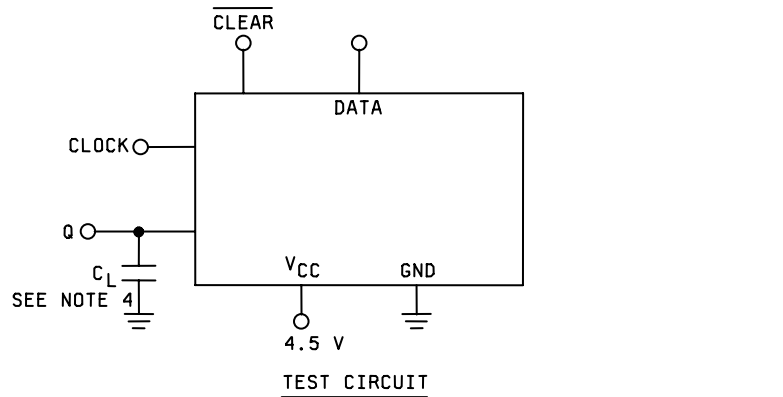
FIGURE 3. Three-state switching test circuit and waveforms (device type 06) - Continued.



NOTES:

1. CLEAR pulses are active high and dominate regardless of the state of the clock and data inputs.
2. CLEAR input pulse characteristics are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{CLEAR}) \leq 30 \text{ ns}$; $t_{\text{REM}} \leq 27 \text{ ns}$.
3. $C_L = 50 \text{ pF} \pm 10 \%$ (including test jig and probe capacitance).
4. Clock pulse prior to test with inputs biased to place output at the appropriate level for test.
5. Voltage measurements are to be made with respect to the network ground terminal.

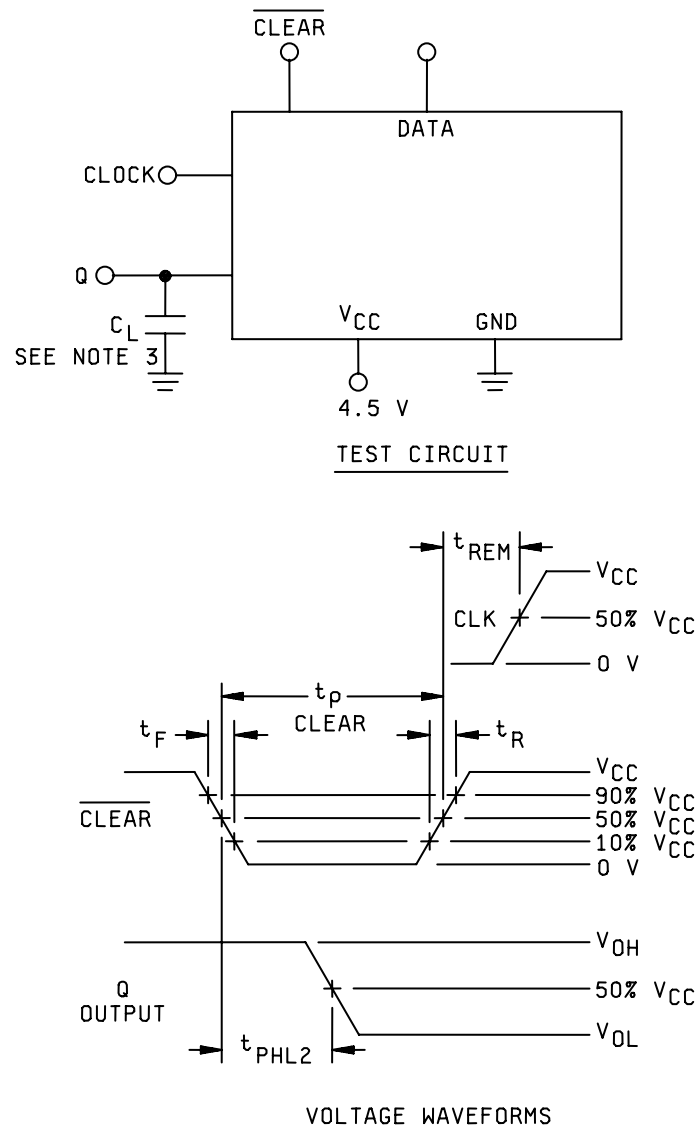
FIGURE 3. CLEAR switching test circuit and waveforms (device type 06) - Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 27 \text{ ns}$.
2. Data input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{data}) \leq 38 \text{ ns}$; $t_{\text{setup}} \leq 30 \text{ ns}$; $t_{\text{hold}} \leq 8 \text{ ns}$.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 22 \text{ ns}$; $\text{PRR} \geq 23 \text{ MHz}$.
4. $C_L = 50 \text{ pF} \pm 10 \%$ (including test jig and probe capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{\text{TLH}} = t_{\text{TLH1}} - t_{\text{TLH2}}$; $t_{\text{THL}} = t_{\text{THL2}} - t_{\text{THL1}}$.

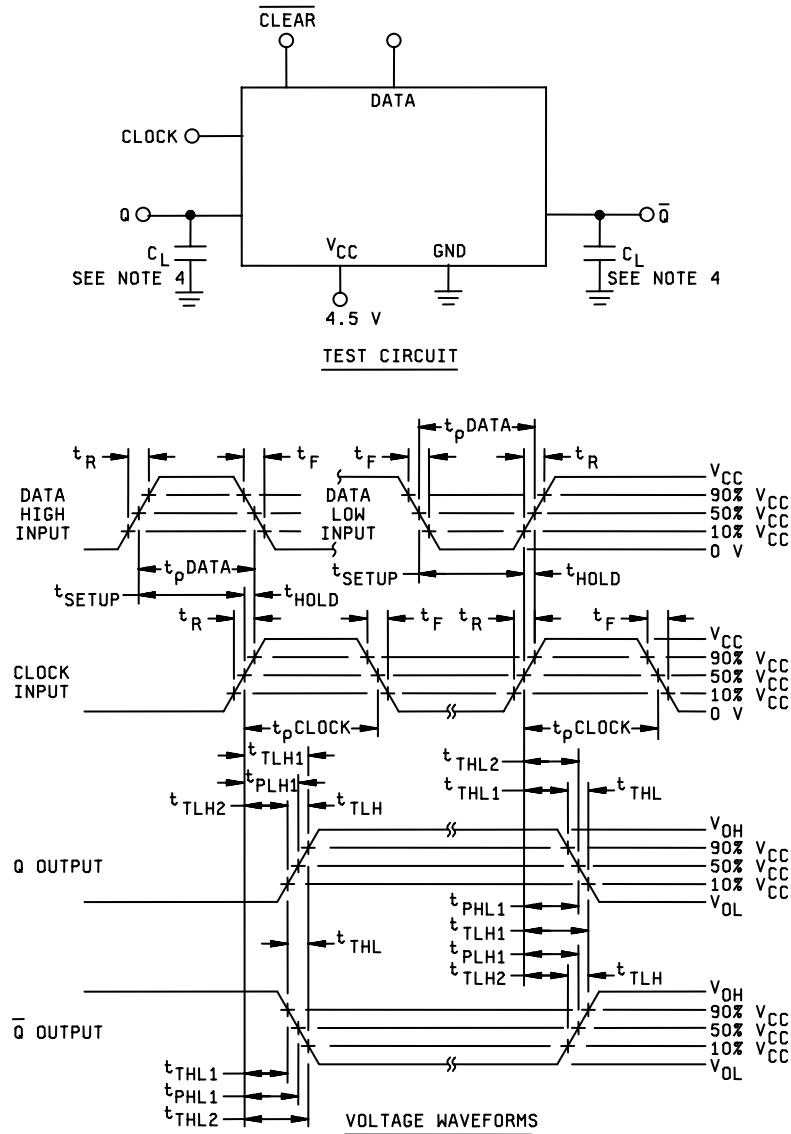
FIGURE 3. Synchronous switching test circuit and waveforms (device type 07) - Continued.



NOTES:

1. $\overline{\text{CLEAR}}$ pulses are active low and dominate regardless of the state of the clock and data inputs.
2. $\overline{\text{CLEAR}}$ input pulse characteristics are as follows: $t_r = t_f \leq 6\text{ ns}$; $t_p(\overline{\text{CLEAR}}) \leq 24\text{ ns}$; $t_{REM} \leq 30\text{ ns}$.
3. $C_L = 50\text{ pF} \pm 10\%$ (including test jig and probe capacitance).
4. Clock pulse prior to test with inputs biased to place the output at the appropriate level for test.
5. Voltage measurements are to be made with respect to the network ground terminal.

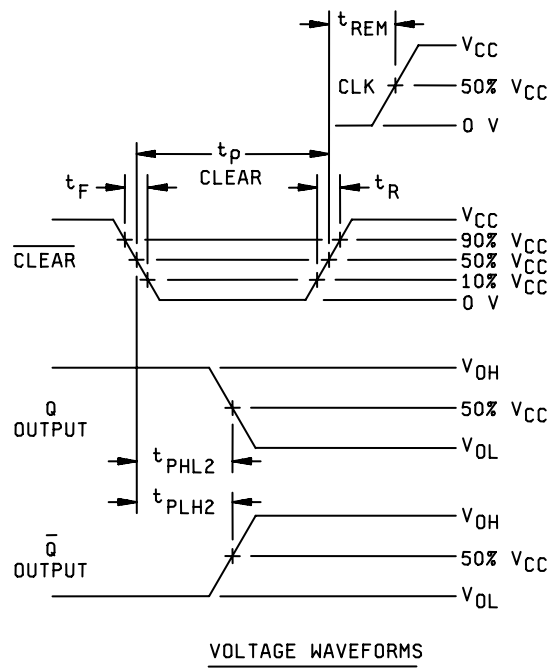
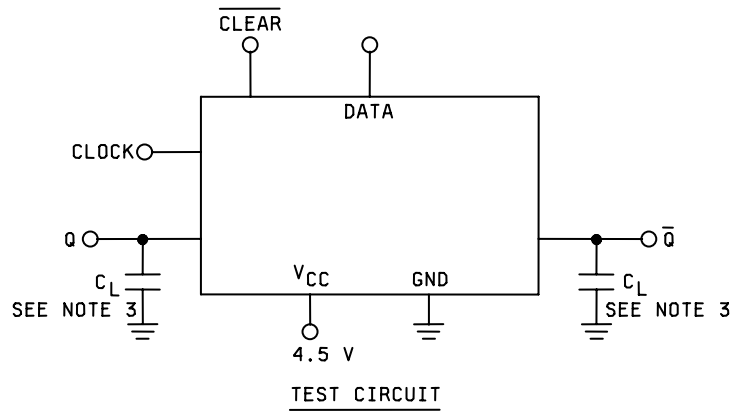
FIGURE 3. $\overline{\text{CLEAR}}$ switching test circuit and waveforms (device type 07) - Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 24 \text{ ns}$.
2. Data input pulse characteristics: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{data}) \leq 38 \text{ ns}$; $t_{\text{setup}} \leq 30 \text{ ns}$; $t_{\text{hold}} \leq 8 \text{ ns}$.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p (\text{clock}) \leq 19 \text{ ns}$; $\text{PRR} \geq 26 \text{ MHz}$.
4. $C_L = 50 \text{ pF} \pm 10\%$ (including test jig and probe capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{\text{TLH}} = t_{\text{TLH1}} - t_{\text{TLH2}}$; $t_{\text{THL}} = t_{\text{THL2}} - t_{\text{THL1}}$.

FIGURE 3. Synchronous switching test circuit and waveforms (device type 08) - Continued.



NOTES:

1. CLEAR pulses are active low and dominate regardless of the state of the clock and data inputs.
2. CLEAR input pulse characteristics are as follows: $t_r = t_f \leq 6 \text{ ns}$; $t_p(\text{CLEAR}) \leq 24 \text{ ns}$; $t_{\text{REM}} \leq 30 \text{ ns}$.
3. $C_L = 50 \text{ pF} \pm 10 \%$ (including test jig and probe capacitance).
4. Clock pulse prior to test with inputs biased to place the output at the appropriate level for test.
5. Voltage measurements are to be made with respect to the network ground terminal.

FIGURE 3. CLEAR switching test circuit and waveforms (device type 08) - Continued.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Case 2 Cases C,D Test no.	Terminal conditions 1/														Measured terminal	Test limits						Unit	
			2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Min	Max	Min	Max		
V _{IC} (pos) 1/		1 2 3 4 5 6 7 8	1mA	1mA	1mA	GND " " " " " "	1mA	1mA	1mA				1/ " " " " "				1CLK 1CLR 1K 2CLK 2CLR 2J 2K 1J	1/ " " " " " " "	1.5 " " " " " "						V " " " " " "
V _{IC} (neg) 1/		9 10 11 12 13 14 15 16	-1mA	-1mA	-1mA	1/ " " " " " "	-1mA	-1mA	-1mA				GND " " " " "			-1mA	1CLK 1CLR 1K 2CLK 2CLR 2J 2K 1J		-1.5 " " " " " "						" " " " " "
I _{CC}	3005	17 18	6.0V 2/	GND 6.0V	6.0V GND	6.0V 6.0V	6.0V 2/	GND 6.0V	6.0V 6.0V			6.0V GND	" "			6.0V 6.0V	V _{CC} V _{CC}		0.15 0.15		15 15			μA μA	
V _{OH3}	3006	19 20 21 22 23 24	1.2V 2/ 2/	1.2V 4.2V 4.2V	1.2V 1.2V 4.2V	6.0V " " " "	1.2V 4.2V 2/	1.2V 4.2V 2/	1.2V 4.2V 1.2V	-20μA -20μA -20μA		1.2V 1.2V 4.2V	" " "	-20μA -20μA	-20μA	1.2V 4.2V 1.2V	1Q 2Q 1Q 2Q 2Q	5.95 " " " "		5.95 " " "		5.95 " " "		V " " " "	
V _{OH5}	3006	25-30	Same terminal conditions as specified above for V _{OH3} except I _{OH} = -5.2 mA														5.48		5.2		5.48		"		
V _{OL3}	3007	31 32 33 34 35 36	1.2V 2/ 2/	1.2V 4.2V 4.2V	1.2V 1.2V 4.2V	6.0V " " " "	1.2V 4.2V 2/	1.2V 4.2V 2/	1.2V 4.2V 1.2V		20μA 20μA	1.2V 1.2V 4.2V	" " "	20μA 20μA	20μA	1.2V 4.2V 1.2V	1Q 2Q 1Q 2Q 2Q		0.05 " " "		0.05 " "		0.05 " "		" " "
V _{OL5}	3007	37-42	Same terminal conditions as specified above for V _{OL3} except I _{OL} = 5.2 mA															0.26		0.4		0.26	"		
I _{OS4}	3011	43 44 45 46	3/ 3/	4.0V 4.0V	GND 4.0V	4.0V 4.0V		3/ 3/	4.0V 4.0V	4.0V GND		GND 4.0V	GND "	GND "	GND	4.0V GND	1Q 1Q 2Q 2Q	-10 " " "	-120 " " "	-10 " " "	-120 " " "	-10 " " "	-120 " " "	mA " " "	

See footnotes at end of table.

TABLE III. Group A inspection for device type 01 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases C,D Test no.	Terminal conditions 1/														Measured terminal	Test limits						Unit	
			2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Min	Max	Min	Max		
I _{IH}	3010	47 48 49 50 51 52 53 54	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V				GND				1CLK 1CLR 1K 2CLK 2CLR 2J 2K 1J		.05		0.1			μA	
I _{IL}	3009	55 56 57 58 59 60 61 62	GND	GND	GND		GND	GND	GND								1CLK 1CLR 1K 2CLK 2CLR 2J 2K 1J		-.05		-0.1				
																		Subgroup 4 T _C = +25°C							
																		Min	Max						
C _i	3012	63 64 65 66 67 68 69 70	4/	4/	4/	GND						GND					1CLK 1CLR 1K 2CLK 2CLR 2J 2K 1J		10					pF	
																		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C			
																		Min	Max	Min	Max	Min	Max		
Truth table tests 6/ 7/	3014	71 72 73 74 75 76 77 78 79 80	A B A A A B A A B A	B B B A A A A A A A	B B B B B B B B B B	4.5V " " " " " " " " " "	A B A A B A B A A A	B B A A A A A A A A	A A A B B B B A A A	H H H H H H H H L H	L L L L L L L L L H	B B B B B B B B B B	GND " " " " " " " " " "	L L L L L L L L H H	H H H H H H H H L L	A A A B B B A A A A	All outputs " " " " " " " " " "	5/ " " " " " " " " " "	5/ " " " " " " " " " "	5/ " " " " " " " " " "	5/ " " " " " " " " " "	5/ " " " " " " " " " "			

See footnotes at end of table.

TABLE III. Group A inspection for device type 01 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions <u>1/</u>														Measured terminal	Test limits						Unit
		2	3	4	6	8	9	10	12	13	14	16	18	19	20	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
		Cases C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Min	Max	Min	Max	
		Test no.	1CLK	<u>1CLR</u>	1K	V _{CC}	2CLK	<u>2CLR</u>	2J	<u>2Q</u>	2Q	2K	GND	1Q	<u>1Q</u>	1J								
Truth table tests <u>6/ 7/</u>	3014	81	A	A	A	4.5V	A	A	A	L	H	A	GND	H	L	A	All outputs	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	
		82	A	A	A	"	A	A	B	L	H	A	"	H	L	B		A	"	"	"	"	"	"
		83	B	A	A	"	B	A	B	H	L	A	"	L	H	B		B	"	"	"	"	"	"
		84	A	A	A	"	A	A	B	H	L	A	"	L	H	B		B	"	"	"	"	"	"
		85	A	A	A	"	A	A	A	H	L	A	"	L	H	A		A	"	"	"	"	"	"
		86	B	A	A	"	B	A	A	L	H	A	"	H	L	A		A	"	"	"	"	"	"
		87	A	A	A	"	A	A	A	L	H	A	"	H	L	A		A	"	"	"	"	"	"
		88	B	A	A	"	B	A	A	H	L	A	"	L	H	A		A	"	"	"	"	"	"
		89	A	A	A	"	A	A	A	H	L	A	"	L	H	A		A	"	"	"	"	"	"
																	Test limits 8/							
																	Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C			
																	Min	Max	Min	Max	Min	Max		
f _{MAX} <u>7/ 9/</u>	(Fig. 3)	90 91 92 93	IN IN	4.5V 4.5V	4.5V 4.5V	" "	IN IN	4.5V 4.5V	4.5V 4.5V	OUT OUT	OUT OUT	4.5V 4.5V	GND "	OUT "	OUT "	4.5V 4.5V	<u>1Q</u> <u>1Q</u> <u>2Q</u> <u>2Q</u>	31 " " "	 	23 " " "	 	31 " " "	 	MHz " " "
t _{PHL1} <u>7/</u>	3003 (Fig. 3)	94 95 96 97	IN IN	4.5V 4.5V	GND IN	" "	IN IN	4.5V 4.5V	IN GND	OUT OUT	OUT OUT	4.5V GND	" "	OUT "	OUT "	IN GND	1CLK to <u>1Q</u> 1CLK to <u>1Q</u> 2CLK to <u>2Q</u> 2CLK to <u>2Q</u>	5 " " "	30 " " "	5 " " "	40 " " "	5 " " "	30 " " "	ns " " "
t _{PLH1} <u>7/</u>	3003 (Fig. 3)	98 99 100 101	IN IN	4.5V 4.5V	4.5V IN	" "	IN IN	4.5V 4.5V	IN 4.5V	OUT OUT	OUT OUT	4.5V IN	" "	OUT "	OUT "	IN 4.5V	1CLK to <u>1Q</u> 1CLK to <u>1Q</u> 2CLK to <u>2Q</u> 2CLK to <u>2Q</u>	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "
t _{PHL2} <u>7/</u>	3003 (Fig. 3)	102 103	<u>10/</u>	IN	GND	"	<u>10/</u>	IN	4.5V	OUT	OUT	GND	"	OUT		4.5V	<u>1CLR</u> to 1Q <u>2CLR</u> to <u>2Q</u>	6 "	32 "	6 "	43 "	6 "	32 "	" "
t _{PLH2} <u>7/</u>	3003 (Fig. 3)	104 105	<u>10/</u>	IN	GND	"	<u>10/</u>	IN	4.5V	OUT		GND	"		OUT	4.5V	<u>1CLR</u> to <u>1Q</u> <u>2CLR</u> to <u>2Q</u>	" "	" "	" "	" "	" "	" "	" "
t _{THL} <u>7/</u>	3004 (Fig. 3)	106 107 108 109	IN IN	4.5V 4.5V	4.5V GND	" "	IN IN	4.5V 4.5V	4.5V GND	OUT OUT	OUT OUT	GND 4.5V	" "	OUT "	OUT "	GND 4.5V	<u>1Q</u> <u>1Q</u> <u>2Q</u> <u>2Q</u>	3 " " "	15 " " "	3 "	20 "	3 "	15 "	" " " "
t _{TLH} <u>7/</u>	3004 (Fig. 3)	110 111 112 113	IN IN	4.5V 4.5V	4.5V GND	" "	IN IN	4.5V 4.5V	GND 4.5V	OUT OUT	OUT OUT	4.5V GND	" "	OUT "	OUT "	GND 4.5V	<u>1Q</u> <u>1Q</u> <u>2Q</u> <u>2Q</u>	" " " "	" " " "	" "	" "	" "	" "	" " " "

See footnotes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/														Measured terminal	Test limits						Unit
		2	3	4	6	8	9	10	12	13	14	16	18	19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
		Cases C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Min	Max	Min	Max	
		Test no.	1CLR	1D	1CLK	1PRE	1Q	1Q	GND	2Q	2Q	2PRE	2CLK	2D	2CLR	V _{CC}								
V _{IC} (pos) 1/		1 2 3 4 5 6 7 8	1mA	1mA	1mA	1mA			1/				1mA	1mA		GND	1CLR 1D 1CLK 1PRE 2PRE 2CLK 2D 2CLR	1/	1.5					V
V _{IC} (neg) 1/		9 10 11 12 13 14 15 16	-1mA	-1mA	-1mA	-1mA			GND				-1mA	-1mA		1/	1CLR 1D 1CLK 1PRE 2PRE 2CLK 2D 2CLR		-1.5					
I _{CC}	3005	17 18	6.0V GND	GND GND	GND GND	GND 6.0V						GND 6.0V	GND GND	GND GND	6.0V GND	6.0V	V _{CC} V _{CC}		0.15 0.15		15 15			μA μA
V _{OH3}	3006	19 20 21 22 23 24 25 26	4.2V 1.2V	1.2V 1.2V	1.2V 1.2V	1.2V 4.2V	-20μA	-20μA		-20μA	-20μA	4.2V 1.2V	1.2V 1.2V	1.2V 1.2V	1.2V 4.2V		1Q 1Q 2Q 2Q 1Q 1Q 2Q 2Q	5.95		5.95		5.95		V
V _{OH5}	3006	27-34	Same terminal conditions as specified above for V _{OH3} except I _{OH} = -5.2 mA.														5.48		5.2		5.48			
V _{OL3}	3007	35 36 37 38 39 40 41 42	4.2V 1.2V	1.2V 1.2V	1.2V 1.2V	1.2V 4.2V	20μA	20μA	GND		20μA	20μA	4.2V 1.2V	1.2V 1.2V	1.2V 4.2V	6.0V	1Q 1Q 2Q 2Q 1Q 1Q 2Q 2Q		0.05		0.05		0.05	
V _{OL5}	3007	43-50	Same terminal conditions as specified above for V _{OL3} except I _{OL} = 5.2 mA.															0.26		0.4		0.26		
I _{OS4}	3011	51 52 53 54	4.0V GND	GND GND	GND GND	GND 4.0V	GND	GND	GND		GND	GND	GND GND	GND GND	GND 4.0V	4.0V	1Q 1Q 2Q 2Q	-10	-120	-10	-120	-10	-120	mA

See footnotes at end of table.

TABLE III. Group A inspection for device type 02 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/														Measured terminal	Test limits						Unit	
		2	3	4	6	8	9	10	12	13	14	16	18	19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C					
		Cases C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Min	Max	Min	Max		
		Test no.	1CLR	1D	1CLK	1PRE	1Q	1Q̄	GND	2Q̄	2Q	2PRE	2CLK	2D	2CLR	V _{CC}									
I _{IH}	3010	55	6.0V	6.0V	6.0V	6.0V			GND							6.0V	1CLR		.05		0.1			μA	
		56																							
		57																							
		58																							
		59													6.0V										
		60														6.0V									
		61															6.0V								
		62																6.0V							
I _{IL}	3009	63	GND	GND	GND	GND											1CLR		-.05		-0.1				
		64																							
		65																							
		66																							
		67													GND										
		68													GND										
		69														GND									
		70															GND								
																	Subgroup 4 T _C = +25°C								
																	Min	Max							
C _i	3012	71	4/	4/	4/	4/				GND							1CLR		10					pF	
		72																							
		73																							
		74																							
		75													4/										
		76														4/									
		77															4/								
		78																4/							
																	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
																	Min	Max	Min	Max	Min	Max			
Truth table tests 6/ 7/	3014	79	B	A	B	A	L	H	GND	H	L	A	B	A	B	4.5V	All outputs	5/	5/	5/	5/	5/	5/		
		80	B	A	A	A	L	H		H	L	A	A	A	B										
		81	B	A	B	A	L	H		H	L	A	B	A	B										
		82	A	A	B	A	L	H		H	L	A	B	B	A	A									
		83	A	A	B	B	H	L		L	H	B	B	B	A	A									
		84	A	B	B	B	H	L		L	H	B	B	B	B	A									
		85	A	B	A	B	H	L		L	H	B	A	B	B	A									
		86	A	B	B	B	H	L		L	H	B	B	B	B	A									
		87	A	B	B	B	H	L		L	H	A	B	B	B	A									
		88	A	B	A	A	L	H		H	L	A	A	B	B	A									

See footnotes at end of table.

TABLE III. Group A inspection for device type 02 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/														Measured terminal	Test limits						Unit
		2	3	4	6	8	9	10	12	13	14	16	18	19	20	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
		Cases C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
		Test no.	1CLR	1D	1CLK	1PRE	1Q	1Q	GND	2Q	2Q	2PRE	2CLK	2D	2CLR	V _{CC}		Min	Max	Min	Max	Min	Max	
Truth table tests 6/ 7/	3014	89 90 91	A A A	B A A	B B A	A A A	L L H	H H L	GND " "	H H L	L L H	A A A	B B A	B A A	A A A	4.5V " "	All outputs "	5/ " "	5/ " "	5/ " "	5/ " "	5/ " "	5/ " "	
																		Test limits 8/						
																		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C		
																		Min	Max	Min	Max	Min	Max	
f _{MAX} 7/ 9/	(Fig. 3)	92 93 94 95	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	GND " "	OUT " "	OUT "	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	4.5V " "	1Q 1Q 2Q 2Q	28 " " "		21 " " "		28 " " "		MHz
t _{PHL1} 7/	3003 (Fig. 3)	96 97 98 99	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	" " "	OUT " "	OUT "	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	" " "	1CLK to 1Q 2CLK to 2Q 1CLK to 1Q 2CLK to 2Q	5 " " "	31 " " "	5 " " "	41 " " "	5 " " "	31 " " "	ns
t _{PLH1} 7/	3003 (Fig. 3)	100 101 102 103	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	" " "	OUT " "	OUT "	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	" " "	1CLK to 1Q 2CLK to 2Q 1CLK to 1Q 2CLK to 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	"
t _{PHL2} 7/	3003 (Fig. 3)	104 105 106 107	IN 4.5V	GND GND	GND GND	4.5V IN	OUT	OUT	" " "	OUT " "	OUT "	4.5V IN	GND GND	GND GND	IN 4.5V	" " "	1CLR to 1Q 1PRE to 1Q 2CLR to 2Q 2PRE to 2Q	" " " "	41 " " "	" " " "	54 " " "	" " " "	41 " " "	"
t _{PLH2} 7/	3003 (Fig. 3)	108 109 110 111	IN 4.5V	GND GND	GND GND	4.5V IN	OUT	OUT	" " "	OUT " "	OUT "	4.5V IN	GND GND	GND GND	IN 4.5V	" " "	1CLR to 1Q 1PRE to 1Q 2CLR to 2Q 2PRE to 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	"
t _{THL} 7/	3004 (Fig. 3)	112 113 114 115	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	" " "	OUT " "	OUT "	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	" " "	1Q 2Q 1Q 2Q	3 " " "	15 " " "	3 " " "	20 " " "	3 " " "	15 " " "	"
t _{TLH} 7/	3004 (Fig. 3)	116 117 118 119	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	" " "	OUT " "	OUT "	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	" " "	1Q 2Q 1Q 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions $\frac{1}{2}$														Measured terminal	Test limits						Unit
		Cases C,D	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T _C = +25°C	Subgroup 2 T _C = +125°C	Subgroup 3 T _C = -55°C				
		Test no.	1J	$\overline{1Q}$	1Q	1K	2Q	$\overline{2Q}$	GND	2J	2CLK	$\overline{2CLR}$	2K	1CLK	$\overline{1CLR}$	V _{CC}		Min	Max	Min	Max	Min	Max	
V _{IC} (pos) $\frac{1}{2}$		1 2 3 4 5 6 7 8	1mA			1mA			$\frac{1}{2}$ " " " " " "	1mA	1mA	1mA	1mA	1mA	GND " " " " " "	1J 1K 2J 2CLK 2CLR 2K 1CLK 1CLR	$\frac{1}{2}$ " " " " " " "	1.5 " " " " " "						V " " " " " "
V _{IC} (neg) $\frac{1}{2}$		9 10 11 12 13 14 15 16	-1mA			-1mA			GND " " " " " "	-1mA	-1mA	-1mA	-1mA	-1mA	$\frac{1}{2}$ " " " " " "	1J 1K 2J 2CLK 2CLR 2K 1CLK 1CLR		-1.5 " " " " " "						" " " " " "
I _{CC}	3005	17 18	6.0V 6.0V			6.0V GND			" "	6.0V 6.0V	6.0V $\frac{2}{2}$	GND 6.0V	6.0V GND	6.0V $\frac{2}{2}$	GND 6.0V	6.0V V _{CC} V _{CC}	V _{CC} V _{CC}		0.15 0.15		15 15			μA μA
V _{OH3}	3006	19 20 21 22 23 24	1.2V 4.2V 1.2V	-20μA -20μA	-20μA	1.2V 4.2V	-20μA -20μA	-20μA	" " " " "	1.2V 4.2V 1.2V	1.2V $\frac{2}{2}$	1.2V 4.2V	1.2V 4.2V	1.2V $\frac{2}{2}$	1.2V 4.2V	" " " " "	$\frac{1Q}{2Q}$ 1Q 1Q 2Q 2Q	5.95 " " " "		5.95 " " " "		5.95 " " " "		V " " " "
V _{OH5}	3006	25-30	Same terminal conditions as specified above for V _{OH3} except I _{OH} = -5.2 mA.															5.48		5.2		5.48		"
V _{OL3}	3007	31 32 33 34 35 36	1.2V 4.2V 1.2V	20μA 20μA	20μA	1.2V 4.2V	20μA 20μA	GND " " " "	" " " "	1.2V 4.2V 1.2V	1.2V $\frac{2}{2}$	1.2V 4.2V	1.2V 4.2V	1.2V $\frac{2}{2}$	1.2V 4.2V	6.0V " " "	1Q 2Q 1Q 2Q 2Q		0.05 " " " "		0.05 " " " "		0.05 " " " "	" " " "
V _{OL5}	3007	37-42	Same terminal conditions as specified above for V _{OL3} except I _{OL} = 5.2 mA.																0.26		0.4		0.26	"
I _{OS4}	3011	43 44 45 46	4.0V GND	GND	GND	GND 4.0V	GND	GND "	" "	4.0V GND	$\frac{3}{3}$ $\frac{3}{3}$	4.0V 4.0V	GND 4.0V	$\frac{3}{3}$ "	4.0V "	4.0V "	$\frac{1Q}{1Q}$ 2Q 2Q	-10 " " "	-120 " " "	-10 " " "	-120 " " "	-10 " " "	-120 " " "	mA " " "

See footnotes at end of table.

TABLE III. Group A inspection for device type 03 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases C,D Test no.	Terminal conditions 1/														Measured terminal	Test limits						Unit		
			2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Min	Max	Min	Max			
I _{IH}	3010	47	6.0V			6.0V			GND							6.0V	1J		.05		0.1			μA		
		48							"	6.0V	6.0V					"	1K		"		"			"		
		49							"			6.0V				"	2J		"		"			"		
		50							"				6.0V			"	2CLK		"		"			"		
		51							"					6.0V		"	2CLR		"		"			"		
		52							"						6.0V	"	2K		"		"			"		
		53							"							"	1CLK		"		"			"		
		54							"						6.0V	"	1CLR		"		"			"		
I _{IL}	3009	55	GND			GND			"							"	1J		-.05		-0.1			"		
		56							"	GND						"	1K		"		"			"		
		57							"		GND					"	2J		"		"			"		
		58							"			GND				"	2CLK		"		"			"		
		59							"				GND			"	2CLR		"		"			"		
		60							"					GND		"	2K		"		"			"		
		61							"							"	1CLK		"		"			"		
		62							"						GND	"	1CLR		"		"			"		
																			Subgroup 4 T _C = +25°C							
																			Min	Max						
C _i	3012	63	4/			4/			GND							GND	1J		10					pF		
		64							"	4/						"	1K		"					"		
		65							"		4/					"	2J		"					"		
		66							"			4/				"	2CLK		"					"		
		67							"				4/			"	2CLR		"					"		
		68							"					4/		"	2K		"					"		
		69							"						4/	"	1CLK		"					"		
		70							"						4/	"	1CLR		"					"		
																	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C					
																	Min	Max	Min	Max	Min	Max				
Truth table tests 6/ 7/	3014	71	A	H	L	B	L	H	GND	A	A	B	B	A	B	4.5V	All outputs	5/	5/	5/	5/	5/	5/			
		72	A	H	L	B	L	H	"	A	B	B	B	B	B	"	"	"	"	"	"	"	"			
		73	A	H	L	B	L	H	"	A	A	B	B	A	B	"	"	"	"	"	"	"	"			
		74	A	H	L	B	L	H	"	A	A	A	B	A	A	"	"	"	"	"	"	"	"			
		75	B	H	L	B	L	H	"	B	A	A	B	A	A	"	"	"	"	"	"	"	"			
		76	B	H	L	B	L	H	"	B	B	A	B	B	A	"	"	"	"	"	"	"	"			
		77	B	H	L	B	L	H	"	B	A	A	B	A	A	"	"	"	"	"	"	"	"			
		78	A	H	L	B	L	H	"	A	A	A	B	A	A	"	"	"	"	"	"	"	"			
		79	A	L	H	B	H	L	"	A	B	A	B	B	A	"	"	"	"	"	"	"	"			
		80	A	L	H	B	H	L	"	A	A	A	B	A	A	"	"	"	"	"	"	"	"			

See footnotes at end of table.

TABLE III. Group A inspection for device type 03 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/															Measured terminal	Test limits						Unit
			2	3	4	6	8	9	10	12	13	14	16	18	19	20	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
		Cases C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Min		Max	Min	Max	Min	Max		
		Test no.	1J	1Q	1Q	1K	2Q	2Q	GND	2J	2CLK	2CLR	2K	1CLK	1CLR	V _{CC}									
Truth table tests 6/ 7/	3014	81	A	L	H	A	H	L	GND	A	A	A	A	A	A	A	4.5V	All outputs	5/	5/	5/	5/	5/	5/	
		82	B	L	H	A	H	L	"	B	A	A	A	A	A	"	"		"	"	"	"	"		
		83	B	H	L	A	L	H	"	B	B	A	A	B	A	"	"		"	"	"	"	"		
		84	B	H	L	A	L	H	"	B	A	A	A	A	A	"	"		"	"	"	"	"		
		85	A	H	L	A	L	H	"	A	A	A	A	A	A	"	"		"	"	"	"	"		
		86	A	L	H	A	H	L	"	A	B	A	A	B	A	"	"		"	"	"	"	"		
		87	A	L	H	A	H	L	"	A	A	A	A	A	A	"	"		"	"	"	"	"		
		88	A	H	L	A	L	H	"	A	B	A	A	B	A	"	"		"	"	"	"	"		
		89	A	H	L	A	L	H	"	A	A	A	A	A	A	"	"		"	"	"	"	"		
																		Test limits 8/							
																		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C			
																		Min	Max	Min	Max	Min	Max		
f _{MAX} 7/ 9/	(Fig. 3)	90 91 92 93	4.5V 4.5V	OUT	OUT	4.5V 4.5V	OUT	OUT	GND " "	4.5V 4.5V	IN IN	4.5V 4.5V	4.5V 4.5V	IN IN	4.5V 4.5V	4.5V "	1Q 1Q 2Q 2Q	31 " " "		23 " " "		31 " " "		MHz	
t _{PHL1} 7/	3003 (Fig. 3)	94 95 96 97	IN GND	OUT	OUT	GND IN	OUT	OUT	" " "	GND IN	IN IN	4.5V 4.5V	IN GND	IN IN	4.5V 4.5V	"	1CLK to 1Q 1CLK to 1Q 2CLK to 2Q 2CLK to 2Q	5 " " "	30 " " "	5 " " "	40 " " "	5 " " "	30 " " "	ns	
t _{PLH1} 7/	3003 (Fig. 3)	98 99 100 101	IN 4.5V	OUT	OUT	4.5V IN	OUT	OUT	" " "	4.5V IN	IN IN	4.5V 4.5V	IN 4.5V	IN IN	4.5V 4.5V	"	1CLK to 1Q 1CLK to 1Q 2CLK to 2Q 2CLK to 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	"	
t _{PHL2} 7/	3003 (Fig. 3)	102 103	4.5V		OUT	GND	OUT		" "	4.5V	10/	IN	GND	10/	IN	"	1CLR to 1Q 2CLR to 2Q	6 "	27 "	6 "	36 "	6 "	27 "	"	
t _{PLH2} 7/	3003 (Fig. 3)	104 105	4.5V	OUT		GND		OUT	" "	4.5V	10/	IN	GND	10/	IN	"	1CLR to 1Q 2CLR to 2Q	" "	" "	" "	" "	" "	" "	"	
t _{THL} 7/	3004 (Fig. 3)	106 107 108 109	4.5V GND	OUT	OUT	GND 4.5V	OUT	OUT	" " "	GND 4.5V	IN IN	4.5V 4.5V	GND	IN IN	4.5V 4.5V	"	1Q 1Q 2Q 2Q	3 " " "	15 " " "	3 " " "	20 " " "	3 " " "	15 " " "	"	
t _{TLH} 7/	3004 (Fig. 3)	110 111 112 113	GND 4.5V	OUT	OUT	4.5V GND	OUT	OUT	" " "	4.5V GND	IN IN	4.5V 4.5V	GND	IN IN	4.5V 4.5V	"	1Q 1Q 2Q 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit			
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C					
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max				
V _{IC} (pos) 1/		1	1mA	1mA	1mA	1mA	1mA				1/							GND	1CLR	1/	1.5					V			
		2																											
		3																											
		4																											
		5																											
		6																											
		7																											
		8																											
		9																											
		10																											
V _{IC} (neg) 1/		11	-1mA	-1mA	-1mA	-1mA	-1mA				GND							1/	1CLR		-1.5								
		12																											
		13																											
		14																											
		15																											
		16																											
		17																											
		18																											
		19																											
		20																											
I _{CC}	3005	21	GND	6.0V	6.0V	GND	6.0V						6.0V	GND	6.0V	6.0V	GND	6.0V	V _{CC}		0.15		15			μA			
V _{OH3}	3006	22	6.0V	6.0V	6.0V	GND	GND							GND	GND	6.0V	6.0V	6.0V		V _{CC}		0.15		15			μA		
		23	4.2V	1.2V	1.2V	1.2V	1.2V	1.2V	-20μA											1Q	5.95		5.95		5.95		V		
		24	1.2V	4.2V	4.2V	1.2V	4.2V	4.2V		-20μA					4.2V	1.2V	4.2V	4.2V	1.2V										
		25													1.2V	1.2V	1.2V	4.2V											
		26													1.2V	1.2V	1.2V	4.2V											
		27	4.2V	4.2V	4.2V	2/	4.2V	-20μA							4.2V	1.2V	4.2V	4.2V											
		28	4.2V	1.2V	1.2V	2/	4.2V		-20μA						4.2V	2/	1.2V	1.2V	4.2V										
		29													2/	4.2V	4.2V	4.2V											
		30													2/	4.2V	4.2V	4.2V											
		V _{OH5}	3006	31	4.2V	1.2V	1.2V	1.2V	1.2V	4.2V	-5.2mA											1Q	5.48		5.2		5.48		
32	1.2V			4.2V	4.2V	1.2V	4.2V	4.2V		-5.2mA					4.2V	1.2V	4.2V	4.2V	1.2V										
33															1.2V	1.2V	1.2V	4.2V											
34															1.2V	1.2V	1.2V	4.2V											
35	4.2V			4.2V	4.2V	2/	4.2V	-5.2mA							4.2V	1.2V	4.2V	4.2V											
36	4.2V			1.2V	1.2V	2/	4.2V		-5.2mA						4.2V	2/	1.2V	1.2V	4.2V										
37															2/	4.2V	4.2V	4.2V											
38															2/	4.2V	4.2V	4.2V											
V _{OL3}	3007			39	1.2V	4.2V	4.2V	1.2V	4.2V	20μA												1Q		0.05		0.05		0.05	
				40	4.2V	1.2V	1.2V	1.2V	1.2V		20μA						1.2V	1.2V	1.2V	1.2V	4.2V								
		41													1.2V	1.2V	1.2V	4.2V											
		42													1.2V	1.2V	1.2V	4.2V											
		43	4.2V	1.2V	1.2V	2/	4.2V	20μA							4.2V	1.2V	4.2V	4.2V											
		44	4.2V	4.2V	4.2V	2/	4.2V		20μA						4.2V	2/	1.2V	1.2V	4.2V										
		45																		1Q		0.05		0.05		0.05			
		46																		1Q									
																				2Q									
																				2Q									

See footnotes at end of table.

TABLE III. Group A inspection for device type 04 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases E,F Test no.	Terminal conditions 1/																	Measured terminal	Test limits						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Min		Max	Min	Max	Min	Max		
V _{OL5}	3007	47	1CLR	1J	1K	1CLK	1PRE	1Q	1Q	GND	2Q	2Q	2PRE	2CLK	2K	2J	2CLR	V _{CC}	6.0V	1Q		0.26		0.4		0.26	V
		48	4.2V	1.2V	1.2V	1.2V	1.2V	5.2mA	5.2mA	"	5.2mA	5.2mA	1.2V	1.2V	1.2V	1.2V	4.2V	"	1Q	"	"	"	"	"	"	"	
		49								"			4.2V	1.2V	4.2V	4.2V	1.2V	"	2Q	"	"	"	"	"	"	"	
		50								"								"	2Q	"	"	"	"	"	"	"	
		51	4.2V	1.2V	1.2V	2/	4.2V	5.2mA	5.2mA	"								"	1Q	"	"	"	"	"	"	"	
		52	4.2V	4.2V	4.2V	2/	4.2V		5.2mA	"	5.2mA	5.2mA	4.2V	2/	4.2V	4.2V	4.2V	"	1Q	"	"	"	"	"	"	"	
		53								"								"	2Q	"	"	"	"	"	"	"	
		54								"								"	2Q	"	"	"	"	"	"	"	
I _{OS4}	3011	55	4.0 V	GND	GND	GND	GND	GND		"								4.0V	1Q	-10	-120	-10	-120	-10	-120	mA	
		56	GND	GND	GND	GND	4.0V		GND	"			4.0V	GND	GND	GND	GND	"	1Q	"	"	"	"	"	"	"	
		57								"	GND							"	2Q	"	"	"	"	"	"	"	
		58								"		GND	GND	GND	GND	GND	4.0V	"	2Q	"	"	"	"	"	"	"	
I _{IH}	3010	59	6.0V							"								6.0V	1CLR		50		100			nA	
		60		6.0V						"								"	1J	"	"	"	"	"	"	"	
		61			6.0V					"								"	1K	"	"	"	"	"	"	"	
		62				6.0V				"								"	1CLK	"	"	"	"	"	"	"	
		63					6.0V			"								"	1PRE	"	"	"	"	"	"	"	
		64								"			6.0V					"	2PRE	"	"	"	"	"	"	"	
		65								"				6.0V				"	2CLK	"	"	"	"	"	"	"	
		66								"					6.0V			"	2K	"	"	"	"	"	"	"	
I _{IL}	3009	67								"								"	2J	"	"	"	"	"	"	"	
		68								"								"	2CLR	"	"	"	"	"	"	"	
		69	GND							"								"	1CLR		-50		-100			"	
		70		GND						"								"	1J	"	"	"	"	"	"	"	
		71			GND					"								"	1K	"	"	"	"	"	"	"	
		72				GND				"								"	1CLK	"	"	"	"	"	"	"	
		73					GND			"								"	1PRE	"	"	"	"	"	"	"	
		74								"			GND					"	2PRE	"	"	"	"	"	"	"	
C _i	3012	75								"								"	2CLK	"	"	"	"	"	"	"	
		76								"								"	2K	"	"	"	"	"	"	"	
		77								"								"	2J	"	"	"	"	"	"	"	
		78								"								"	2CLR	"	"	"	"	"	"	"	
		79	4/							GND								GND	1CLR							pF	
		80		4/						"								"	1J	"	10					"	
		81			4/					"								"	1K	"	"	"	"	"	"	"	
		82				4/				"								"	1CLK	"	"	"	"	"	"	"	
C _i	3012	83					4/			"								"	1PRE	"	"	"	"	"	"	"	
		84								"			4/					"	2PRE	"	"	"	"	"	"	"	
		85								"				4/				"	2CLK	"	"	"	"	"	"	"	
		86								"					4/			"	2K	"	"	"	"	"	"	"	
		87								"						4/		"	2J	"	"	"	"	"	"	"	
		88								"							4/	"	2CLR	"	"	"	"	"	"	"	
																		Subgroup 4 T _C = +25°C									
																		Min	Max								

See footnotes at end of table.

TABLE III. Group A inspection for device type 04 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
		Cases E,F																		Min	Max	Min	Max	Min	Max	
		Test no.	1CLR	1J	1K	1CLK	1PRE	1Q	1Q	GND	2Q	2Q	2PRE	2CLK	2K	2J	2CLR	V _{CC}								
Truth table tests 6/ 7/	3014	89	B	A	A	B	A	L	H	GND	H	L	A	B	A	A	B	4.5V	All outputs	5/	5/	5/	5/	5/	5/	
		90	B	A	A	B	A	L	H	"	H	L	A	B	A	A	B	"		"	"	"	"	"		
		91	B	A	A	B	A	L	H	"	H	L	A	B	A	A	B	"		"	"	"	"	"	"	
		92	A	A	A	B	B	L	H	"	H	L	A	B	A	A	A	"		"	"	"	"	"	"	
		93	A	A	A	B	B	H	L	"	L	H	B	B	A	A	A	"		"	"	"	"	"	"	
		94	A	B	A	B	B	H	L	"	L	H	B	B	A	B	A	"		"	"	"	"	"	"	
		95	A	B	B	B	B	H	L	"	L	H	B	B	B	B	A	"		"	"	"	"	"	"	
		96	A	B	B	B	B	H	L	"	L	H	B	A	B	B	A	"		"	"	"	"	"	"	
		97	A	B	B	B	B	H	L	"	L	H	B	B	B	B	A	"		"	"	"	"	"	"	
		98	A	B	B	B	A	H	L	"	L	H	A	B	B	B	A	"		"	"	"	"	"	"	
		99	A	B	B	A	A	L	H	"	H	L	A	A	B	B	A	"		"	"	"	"	"	"	
		100	A	B	B	B	A	L	H	"	H	L	A	B	B	B	A	"		"	"	"	"	"	"	
		101	A	B	A	B	A	L	H	"	H	L	A	B	A	B	A	"		"	"	"	"	"	"	
		102	A	B	A	A	A	L	H	"	H	L	A	A	A	B	A	"		"	"	"	"	"	"	
		103	A	B	A	B	A	L	H	"	H	L	A	B	A	B	A	"		"	"	"	"	"	"	
		104	A	A	A	B	A	L	H	"	H	L	A	B	A	A	A	"		"	"	"	"	"	"	
		105	A	A	A	A	A	H	L	"	L	H	A	A	A	A	A	"		"	"	"	"	"	"	
		106	A	A	A	B	A	H	L	"	L	H	A	B	A	A	A	"		"	"	"	"	"	"	
		107	A	A	B	B	A	H	L	"	L	H	A	B	B	A	A	"		"	"	"	"	"	"	
		108	A	A	B	A	A	L	H	"	H	L	A	A	B	A	A	"		"	"	"	"	"	"	
		109	A	A	B	B	A	A	L	H	"	H	L	A	B	B	A	A		"	"	"	"	"	"	
		110	A	A	B	A	A	H	L	"	L	H	A	A	B	A	A	"		"	"	"	"	"	"	
		111	A	A	B	B	A	H	L	"	L	H	A	B	B	A	A	"		"	"	"	"	"	"	
		112	B	A	B	B	A	L	H	"	H	L	A	B	B	A	B	"		"	"	"	"	"	"	
																		Test limits 8/								
																		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C				
																		Min	Max	Min	Max	Min	Max			
f _{MAX}	(Fig. 3)	113	4.5V	4.5V	GND	IN	4.5V	OUT	OUT	GND	"	OUT	OUT	4.5V	IN	GND	4.5V	4.5V	4.5V	1Q	31		23		31	MHz
		114	4.5V	4.5V	GND	IN	4.5V			"	OUT		4.5V	IN	GND	4.5V	4.5V	"	1Q	"	"	"	"	"	"	
		115								"		OUT						"	2Q	"	"	"	"	"	"	
		116								"			4.5V	IN	GND	4.5V	4.5V	"	2Q	"	"	"	"	"	"	
t _{PHL1}	3003 (Fig. 3)	117	4.5V	IN	GND	IN	4.5V	OUT	OUT	"	"	OUT	4.5V	IN	4.5V	IN	4.5V	"	1CLK to 1Q	5	31	5	41	5	31	ns
		118	4.5V	4.5V	IN	IN	4.5V			"	OUT		4.5V	IN	4.5V	IN	4.5V	"	1CLK to 1Q	"	"	"	"	"	"	
		119								"	OUT							"	2CLK to 2Q	"	"	"	"	"	"	
		120								"		OUT						"	2CLK to 2Q	"	"	"	"	"	"	
t _{PLH1}	3003 (Fig. 3)	121	4.5V	IN	4.5V	IN	4.5V	OUT	OUT	"	"	OUT	4.5V	IN	GND	GND	4.5V	"	1CLK to 1Q	"	"	"	"	"	"	
		122	4.5V	GND	IN	IN	4.5V			"	OUT		4.5V	IN	GND	GND	4.5V	"	1CLK to 1Q	"	"	"	"	"	"	
		123								"	OUT							"	2CLK to 2Q	"	"	"	"	"	"	
		124								"		OUT	4.5V	IN	GND	GND	4.5V	"	2CLK to 2Q	"	"	"	"	"	"	
t _{PHL2}	3003 (Fig. 3)	125	IN	4.5V	GND	GND	4.5V	OUT	OUT	"	"	OUT						"	1CLR to 1Q	6	41	6	54	6	41	"
		126	4.5V	4.5V	GND	GND	IN			"	OUT		IN	GND	GND	4.5V	4.5V	"	1PRE to 1Q	"	"	"	"	"	"	
		127								"		OUT						"	2PRE to 2Q	"	"	"	"	"	"	
		128								"		OUT	4.5V	GND	GND	4.5V	IN	"	2CLR to 2Q	"	"	"	"	"	"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 04 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits 8/						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C		
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16								
		Test no.	1CLR	1J	1K	1CLK	1PRE	1Q	1Q	GND	2Q	2Q	2PRE	2CLK	2K	2J	2CLR	V _{CC}		Min	Max	Min	Max	Min	Max	
t_{PLH2} <u>Z/</u>	3003 (Fig. 3)	129	4.5V	4.5V	GND	GND	IN	OUT		GND							4.5V	1PRE to 1Q 1CLR to 1Q 2CLR to 2Q 2PRE to 2Q	6	41	6	54	6	41	ns	
		130	IN	4.5V			4.5V		OUT			4.5V	GND	GND	4.5V	IN										
		131									OUT															
		132																								
t_{THL} <u>Z/</u>	3004 (Fig. 3)	133	4.5V	IN	GND	IN	4.5V	OUT										1Q 1Q 2Q 2Q	3	15	3	20	3	15		
		134	4.5V	4.5V	IN	IN	4.5V		OUT			4.5V	IN	4.5V	IN	4.5V										
		135									OUT															
		136																								
t_{TLH} <u>Z/</u>	3004 (Fig. 3)	137	4.5V	IN	4.5V	IN	4.5V	OUT										1Q 1Q 2Q 2Q								
		138	4.5V	GND	IN	IN	4.5V		OUT			4.5V	IN	GND	IN	4.5V										
		139									OUT															
		140																								

See footnotes at end of table.

TABLE III. Group A inspection for device type 05.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions <u>1/</u>																Measured terminal	Test limits						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
		Test no.	1CLK	1K	1J	1PRE	1Q	1Q	2Q	GND	2Q	2PRE	2J	2K	2CLK	2CLR	1CLR	V _{CC}								
V _{IC} (pos) <u>1/</u>		1 2 3 4 5 6 7 8 9 10	1mA	1mA	1mA	1mA				<u>1/</u>								GND	1CLK 1K 1J 1PRE 2PRE 2J 2K 2CLK 2CLR 1CLR	<u>1/</u> 1.5						V
V _{IC} (neg) <u>1/</u>		11 12 13 14 15 16 17 18 19 20	-1mA	-1mA	-1mA	-1mA				GND								1/	1CLK 1K 1J 1PRE 2PRE 2J 2K 2CLK 2CLR 1CLR	-1.5						
I _{CC}	3005	21 22	6.0V 6.0V	6.0V 6.0V	6.0V 6.0V	GND 6.0V						GND 6.0V	6.0V 6.0V	6.0V 6.0V	6.0V 6.0V	6.0V GND	6.0V GND	6.0V V _{CC}		0.15 0.15		15 15				μA μA
V _{OH3}	3006	23 24 25 26 27 28 29 30	1.2V 1.2V	1.2V 1.2V	4.2V 4.2V	1.2V 4.2V	-20μA	-20μA			-20μA	1.2V 4.2V	4.2V 4.2V	1.2V 1.2V	1.2V 1.2V	4.2V 1.2V	4.2V 4.2V	4.2V 4.2V	1Q 1Q 2Q 2Q 1Q 1Q 2Q 2Q	5.95		5.95		5.95		V
V _{OH5}	3006	31 32 33 34 35 36 37 38	1.2V 1.2V	1.2V 1.2V	4.2V 4.2V	1.2V 4.2V	-5.2mA	-5.2mA			-5.2mA	1.2V 4.2V	4.2V 4.2V	1.2V 1.2V	1.2V 1.2V	4.2V 1.2V	4.2V 4.2V	4.2V 4.2V	1Q 1Q 2Q 2Q 1Q 1Q 2Q 2Q	5.48		5.2		5.48		

See footnotes at end of table.

TABLE III. Group A inspection for device type 05 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases E,F Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
V _{OL3}	3007	39	1CLK	1K	1J	1PRE	1Q	1Q	2Q	GND	2Q	2PRE	2J	2K	2CLK	2CLR	1CLR	V _{CC}	1Q		0.05		0.05		0.05	V
		40	1.2V	4.2V	1.2V	1.2V	20μA	20μA		"							1.2V	4.2V	1Q		"		"		"	
		41	1.2V	4.2V	1.2V	1.2V				"	20μA	4.2V	1.2V	4.2V	1.2V	1.2V	4.2V	"	2Q		"		"		"	
		42								"		1.2V	1.2V	4.2V	1.2V	4.2V	"	"	2Q		"		"		"	
		43	2/	4.2V	1.2V	4.2V	20μA	20μA		"							4.2V	"	1Q		"		"		"	
		44	2/	1.2V	4.2V	4.2V		20μA		"	20μA	4.2V	1.2V	4.2V	2/	4.2V	4.2V	"	1Q		"		"		"	
		45								"		4.2V	1.2V	4.2V	2/	4.2V	"	"	2Q		"		"		"	
		46						20μA		"		4.2V	4.2V	1.2V	2/	4.2V	"	"	2Q		"		"		"	
V _{OL5}	3007	47	1.2V	4.2V	1.2V	4.2V	5.2mA	5.2mA		"							1.2V	"	1Q		0.26		0.4		0.26	"
		48	1.2V	4.2V	1.2V	1.2V		5.2mA		"	5.2mA	4.2V	1.2V	4.2V	1.2V	1.2V	4.2V	"	1Q		"		"		"	
		49								"		1.2V	1.2V	4.2V	1.2V	4.2V	"	2Q		"		"		"		
		50								"							4.2V	"	2Q		"		"		"	
		51	2/	4.2V	1.2V	4.2V	5.2mA	5.2mA		"		1.2V	1.2V	4.2V	1.2V	4.2V	4.2V	"	1Q		"		"		"	
		52	2/	1.2V	4.2V	4.2V		5.2mA		"	5.2mA	4.2V	1.2V	4.2V	2/	4.2V	4.2V	"	1Q		"		"		"	
		53								"		4.2V	1.2V	4.2V	2/	4.2V	"	"	2Q		"		"		"	
		54						5.2mA		"		4.2V	4.2V	1.2V	2/	4.2V	"	"	2Q		"		"		"	
I _{OS4}	3011	55	GND	GND	GND	GND	GND			"							4.0V	4.0V	1Q	-10	-120	-10	-120	-10	-120	mA
		56	GND	GND	GND	4.0V		GND		"							GND	"	1Q	"	"	"	"	"	"	
		57								"	GND	GND	GND	GND	GND	4.0V	GND	"	2Q	"	"	"	"	"	"	
		58						GND		"		4.0V	GND	GND	GND	GND	"	"	2Q	"	"	"	"	"	"	
I _{IH}	3010	59	6.0V							"							6.0V	1CLK		50		100			nA	
		60		6.0V						"							"	1K		"		"			"	
		61			6.0V					"							"	1J		"		"			"	
		62				6.0V				"							"	1PRE		"		"			"	
		63								"		6.0V					"	2PRE		"		"			"	
		64								"			6.0V				"	2J		"		"			"	
		65								"				6.0V			"	2K		"		"			"	
		66								"					6.0V		"	2CLK		"		"			"	
I _{IL}	3009	67								"						6.0V	"	2CLR		"		"			"	
		68								"							6.0V	1CLR		"		"			"	
		69	GND							"							"	1CLK		-50		-100			nA	
		70		GND						"							"	1K		"		"			"	
		71								"							"	1J		"		"			"	
		72								"							"	1PRE		"		"			"	
		73								"		GND					"	2PRE		"		"			"	
		74								"			GND				"	2J		"		"			"	
		75								"				GND			"	2K		"		"			"	
		76								"					GND		"	2CLK		"		"			"	
		77								"						GND	"	2CLR		"		"			"	
		78								"						GND	"	1CLR		"		"			"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 05 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit
		Cases E,F	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 4 T _C = +25°C						
		Test no.	1CLK	1K	1J	1PRE	1Q	1Q	2Q	GND	2Q	2PRE	2J	2K	2CLK	2CLR	1CLR	V _{CC}		Min	Max					
C ₁	3012	79 80 81 82 83 84 85 86 87 88	4/ 	4/ 	4/ 	4/ 	 	 	 	GND " " " " " " " " "	 	 	 	 	 	 	 	GND " " " " " " " " "	1CLK 1K 1J 1PRE 2PRE 2J 2K 2CLK 2CLR 1CLR	 	10 " " " " " " " "	 	 	 	 	pF " " " " " " " "
																			Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C			
																			Min	Max	Min	Max	Min	Max		
Truth table tests 6/ 7/	3014	89	A	B	A	A	L	H	H	GND	L	A	A	A	B	B	B	6.0V	All outputs	5/	5/	5/	5/	5/	5/	
		90	B	B	A	A	L	H	H	"	L	A	A	A	B	B	B	"	"	"	"	"	"	"	"	
		91	A	B	A	A	L	H	H	"	L	A	A	A	B	B	B	"	"	"	"	"	"	"	"	
		92	A	A	A	A	L	H	H	"	L	A	A	A	A	A	A	"	"	"	"	"	"	"	"	
		93	A	A	A	A	L	L	H	"	L	A	A	A	A	A	A	"	"	"	"	"	"	"	"	
		94	A	A	A	B	A	L	H	"	L	A	A	A	B	A	A	"	"	"	"	"	"	"	"	
		95	A	A	A	B	B	H	L	"	H	B	B	A	A	A	A	"	"	"	"	"	"	"	"	
		96	B	A	A	B	B	H	L	"	H	B	B	A	A	A	A	"	"	"	"	"	"	"	"	
		97	A	A	A	B	B	H	L	"	H	B	B	A	A	A	A	"	"	"	"	"	"	"	"	
		98	A	A	A	B	A	H	L	"	L	A	B	B	A	A	A	"	"	"	"	"	"	"	"	
		99	A	B	B	B	A	H	L	"	L	A	B	B	B	A	A	"	"	"	"	"	"	"	"	
		100	B	B	B	B	A	H	L	"	L	A	B	B	B	B	A	"	"	"	"	"	"	"	"	
		101	A	B	B	B	A	H	L	"	L	A	B	B	B	A	A	"	"	"	"	"	"	"	"	
		102	A	B	B	B	A	L	H	"	L	A	A	B	B	B	A	"	"	"	"	"	"	"	"	
		103	A	B	B	B	A	L	H	"	L	A	A	B	B	B	A	"	"	"	"	"	"	"	"	
		104	B	B	B	B	A	L	H	"	L	A	A	B	B	B	A	"	"	"	"	"	"	"	"	
		105	A	B	B	B	A	L	H	"	L	A	A	B	B	B	A	"	"	"	"	"	"	"	"	
		106	A	B	A	A	A	L	H	"	L	A	A	A	B	B	A	"	"	"	"	"	"	"	"	
		107	B	B	B	A	A	H	L	"	L	A	A	A	B	B	A	"	"	"	"	"	"	"	"	
		108	A	B	A	A	A	H	L	"	L	A	A	A	B	A	A	"	"	"	"	"	"	"	"	
109	A	A	A	A	A	H	L	"	L	A	A	A	A	A	A	"	"	"	"	"	"	"	"			
110	A	A	A	B	A	H	L	"	L	A	B	A	A	A	A	"	"	"	"	"	"	"	"			
111	B	A	A	B	A	L	H	"	L	A	A	B	A	B	A	"	"	"	"	"	"	"	"			
112	A	A	A	A	A	L	H	"	L	A	A	B	A	A	A	"	"	"	"	"	"	"	"			
113	A	A	A	A	A	L	H	"	L	A	A	A	A	A	A	"	"	"	"	"	"	"	"			
114	B	A	A	A	A	H	L	"	L	A	A	A	A	B	A	"	"	"	"	"	"	"	"			
115	A	A	A	A	A	H	L	"	L	A	A	A	A	A	A	"	"	"	"	"	"	"	"			
116	B	A	A	A	A	L	H	"	L	A	A	A	A	B	A	"	"	"	"	"	"	"	"			
117	A	A	A	A	A	L	H	"	L	A	A	A	A	A	A	"	"	"	"	"	"	"	"			
118	A	A	A	A	A	L	H	"	L	A	A	A	A	A	A	"	"	"	"	"	"	"	"			

See footnotes at end of table.

TABLE III. Group A inspection for device type 05 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits 8/						Unit
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C				
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
		Test no.	1CLK	1K	1J	1PRE	1Q	1Q	2Q	GND	2Q	2PRE	2J	2K	2CLK	2CLR	1CLR	V _{CC}								
f _{MAX} Z/ 9/	(Fig. 3)	119 120 121 122	IN IN	4.5V 4.5V	4.5V 4.5V	4.5V 4.5V	OUT		OUT		GND						4.5V 4.5V	4.5V	1Q 1Q 2Q 2Q	28		21		28		MHz
t _{PHL1} Z/	3003 (Fig. 3)	123 124 125 126	IN IN	4.5V IN	IN 4.5V	4.5V 4.5V	OUT		OUT								4.5V 4.5V		1CLK to 1Q 1CLK to 1Q 2CLK to 2Q 2CLK to 2Q	5	31	5	41	5	31	ns
t _{PLH1} Z/	3003 (Fig. 3)	127 128 129 130	IN IN	GND IN	IN GND	4.5V 4.5V	OUT		OUT								4.5V 4.5V		1CLK to 1Q 1CLK to 1Q 2CLK to 2Q 2CLK to 2Q							
t _{PHL2} Z/	3003 (Fig. 3)	131 132 133 134	GND GND	4.5V 4.5V	4.5V 4.5V	4.5V IN	OUT		OUT								IN 4.5V		1CLR to 1Q 1PRE to 1Q 2CLR to 2Q 2PRE to 2Q	6	32	6	43	6	32	
t _{PLH2} Z/	3003 (Fig. 3)	135 136 137 138	GND GND	4.5V 4.5V	4.5V 4.5V	IN 4.5V	OUT		OUT								4.5V IN		1PRE to 1Q 1CLR to 1Q 2PRE to 2Q 2CLR to 2Q							
t _{THL} Z/	3004 (Fig. 3)	139 140 141 142	IN IN	4.5V IN	IN 4.5V	4.5V 4.5V	OUT		OUT								4.5V 4.5V		1Q 1Q 2Q 2Q	3	15	3	20	3	15	
t _{TLH} Z/	3004 (Fig. 3)	143 144 145 146	IN IN	GND IN	IN GND	4.5V 4.5V	OUT		OUT								4.5V 4.5V		1Q 1Q 2Q 2Q							

See footnotes at end of table.

TABLE III. Group A inspection for device type 06.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
V _{IC} (pos) 1/		Test no.	OE1	OE2	1Q	2Q	3Q	4Q	CLK	GND	E1	E2	4D	3D	2D	1D	CLR	V _{CC}		Min	Max	Min	Max	Min	Max	
	1	1mA								1/								GND	OE1	1/	1.5				V	
	2		1mA																OE2							
	3								1mA										CLK							
	4										1mA								E1							
	5											1mA							E2							
	6												1mA						4D							
	7													1mA					3D							
	8														1mA				2D							
	9															1mA			1D							
10																1mA		CLR								
V _{IC} (neg) 1/		11	-1mA							GND								1/	OE1		-1.5					
	12			-1mA															OE2							
	13							-1mA											CLK							
	14										-1mA								E1							
	15											-1mA							E2							
	16												-1mA						4D							
	17													-1mA					3D							
	18														-1mA				2D							
	19															-1mA			1D							
	20																-1mA		CLR							
I _{CC}	3005	21	GND	GND					2/		GND	GND	6.0V	6.0V	6.0V	6.0V	GND	6.0V	V _{CC}		0.2		20		μA	
I _{CCZ}		22	GND	GND					GND								6.0V				0.2		20			
V _{OH3}	3006	24	1.2V	1.2V	-20μA	-20μA			2/		1.2V	1.2V	1.2V	1.2V	1.2V	4.2V	1.2V		1Q	5.95		5.95		5.95	V	
		25												1.2V	4.2V	1.2V			2Q							
		26												1.2V	1.2V				3Q							
		27											4.2V	1.2V	1.2V				4Q							
V _{OH5}	3006	28			-7.8mA								1.2V	1.2V	1.2V	4.2V			1Q	5.48		5.2		5.48		
		29				-7.8mA							1.2V	4.2V	1.2V	1.2V			2Q							
		30					-7.8mA							4.2V	1.2V	1.2V			3Q							
		31						-7.8mA					4.2V	1.2V	1.2V	1.2V			4Q							
V _{OL3}	3007	32			20μA				1.2V					4.2V	4.2V	4.2V	4.2V		1Q		0.05		0.05		0.05	
		33				20μA													2Q							
		34					20μA												3Q							
		35						20μA											4Q							
		36			20μA				2/										1Q							
		37				20μA									1.2V	4.2V			2Q							
		38					20μA							1.2V	4.2V				3Q							
		39					20μA						1.2V	4.2V	4.2V				4Q							

See footnotes at end of table.

TABLE III. Group A inspection for device type 06 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
		Test no.	OE1	OE2	1Q	2Q	3Q	4Q	CLK	GND	E1	E2	4D	3D	2D	1D	CLR	V _{CC}								
V _{OL5}	3007	40	1.2V	1.2V	7.8mA	7.8mA	7.8mA	7.8mA	1.2V	GND	1.2V	1.2V	4.2V	4.2V	4.2V	4.2V	4.2V	6.0V	1Q		0.26		0.4		0.26	V
		41	"	"								"	"	"	"	"	"	"	"	"	"	2Q		"		"
		42	"	"					"	"	"	"	"	"	"	"	"	"	"	3Q		"		"		"
		43	"	"					"	"	"	"	"	"	"	"	"	"	"	4Q		"		"		"
		44	"	"	7.8mA	7.8mA	7.8mA	7.8mA	2/	"	"	"	"	"	"	1.2V	1.2V	"	1Q		"		"		"	
		45	"	"							"	"	"	"	"	"	1.2V	4.2V	"	"	2Q		"		"	
		46	"	"			7.8mA	7.8mA	1	"	"	"	"	"	1.2V	4.2V	"	"	3Q		"		"		"	
		47	"	"					7.8mA	"	"	"	"	"	1.2V	4.2V	"	"	4Q		"		"		"	
I _{OS4}	3011	48	GND	GND	GND	GND	GND	GND	"	"	GND	GND	4.0V	4.0V	4.0V	4.0V	GND	4.0V	1Q	-10	-135	-10	-135	-10	-135	mA
		49	"	"						"	"	"	"	"	"	"	"	"	"	"	2Q	"	"	"	"	"
		50	"	"			"	"	"	"	"	"	"	"	"	"	"	"	3Q	"	"	"	"	"	"	
		51	"	"			GND	"	"	"	"	"	"	"	"	"	"	"	4Q	"	"	"	"	"	"	
I _{OZH}		52	1.2V	11/	6.0V	6.0V	6.0V	6.0V	"	"	4.2V	4.2V					1.2V	6.0V	1Q		0.2		2.0			μA
		53	"	"						"	"	"					"	"	"	"	"	"	"	"	2Q	
		54	"	"					"	"	"	"	"	"	"	"	"	"	"	3Q		"		"		"
		55	"	"			6.0V	"	"	"	"	"	"	"	"	"	"	"	4Q		"		"		"	
I _{OZL}		56	11/	1.2V	GND	GND	GND	GND	"	"	"	"					"	"	1Q		-0.2		-2.0			"
		57	"	"						"	"	"					"	"	"	"	"	"	"	"	2Q	
		58	"	"					"	"	"	"	"	"	"	"	"	"	"	3Q		"		"		"
		59	"	"			GND	"	"	"	"	"	"	"	"	"	"	"	"	4Q		"		"		"
I _{IH}	3010	60	6.0V	6.0V					6.0V	"	"	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	"	OE1		50		100			nA
		61								"	"							"	"	"	"	"	"	"	"	"
		62							"	"	"	"	6.0V	6.0V	6.0V	6.0V	6.0V	"	CLK		"		"		"	
		63						"	"	"	"	"						"	"	"	"	"	"	E1		"
		64							"	"	"	"						"	E2		"		"		"	
		65							"	"	"	"						"	4D		"		"		"	
		66							"	"	"	"						"	3D		"		"		"	
		67							"	"	"	"						"	2D		"		"		"	
		68							"	"	"	"						"	1D		"		"		"	
		69							"	"	"	"						"	CLR		"		"		"	
I _{IL}	3009	70	GND	GND					GND	"	"	GND	GND	GND	GND	GND	GND	"	OE1		-50		-100			"
		71								"	"							"	"	"						"
		72							"	"	"	"	GND	GND	GND	GND	GND	"	CLK		"		"		"	
		73						"	"	"	"	"						"	"	"	"	"	"	E1		"
		74							"	"	"	"						"	E2		"		"		"	
		75							"	"	"	"						"	4D		"		"		"	
		76							"	"	"	"						"	3D		"		"		"	
		77							"	"	"	"						"	2D		"		"		"	
		78							"	"	"	"						"	1D		"		"		"	
		79							"	"	"	"						"	CLR		"		"		"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 06 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 4 T _C = +25°C									
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Min	Max							
		Test no.	OE1	OE2	1Q	2Q	3Q	4Q	CLK	GND	E1	E2	4D	3D	2D	1D	CLR	V _{CC}									
C _i	3012	80	4/	4/						GND								GND	OE1		10				pF		
		81								"								"	OE2		"				"		
		82							4/	"	4/							"	CLK		"				"		
		83								"		4/						"	E1		"				"		
		84								"		4/		4/				"	E2		"				"		
		85								"			4/					"	4D		"				"		
		86								"				4/		4/		"	3D		"				"		
		87								"					4/		4/		"	2D		"			"		
		88								"							4/		"	1D		"			"		
		89								"								4/	"	CLR		"			"		
C _o	3012	90	GND	6.0V	4/					"	6.0V	6.0V					GND	6.0V	1Q		20				"		
		91	GND	6.0V		4/				"	"	"					"	"	2Q		"				"		
		92	6.0V	GND			4/			"	"	"					"	"	3Q		"				"		
		93	6.0V	GND				4/		"	"	"					"	"	4Q		"				"		
																			Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
																			Min	Max	Min	Max	Min	Max			
Truth table tests 6/ 7/	3014	94	B	B	L	L	L	L	B	GND	B	B	B	A	A	A	A	A	4.5V	All outputs	5/	5/	5/	5/	5/	5/	
		95	B	B	L	L	L	L	B	"	B	B	B	A	A	A	A	A	"	"	"	"	"	"	"		
		96	B	B	H	H	H	H	A	"	B	B	B	A	A	A	A	B	"	"	"	"	"	"	"		
		97	B	B	H	H	H	H	B	"	B	B	B	A	A	A	A	B	"	"	"	"	"	"	"		
		98	B	B	H	H	H	H	B	"	B	B	B	B	B	B	B	B	"	"	"	"	"	"	"		
		99	B	B	H	H	H	H	B	"	A	B	B	B	B	B	B	B	"	"	"	"	"	"	"		
		100	B	B	H	H	H	H	A	"	A	B	B	B	B	B	B	B	"	"	"	"	"	"	"		
		101	B	B	H	H	H	H	B	"	A	B	B	B	B	B	B	B	"	"	"	"	"	"	"		
		102	B	B	H	H	H	H	B	"	A	A	A	B	B	B	B	B	"	"	"	"	"	"	"		
		103	B	B	H	H	H	H	A	"	A	A	A	B	B	B	B	B	"	"	"	"	"	"	"		
		104	B	B	H	H	H	H	B	"	A	A	A	B	B	B	B	B	"	"	"	"	"	"	"		
		105	B	B	H	H	H	H	B	"	B	A	A	B	B	B	B	B	"	"	"	"	"	"	"		
		106	B	B	H	H	H	H	A	"	B	A	B	B	B	B	B	B	"	"	"	"	"	"	"		
		107	B	B	H	H	H	H	B	"	B	A	B	B	B	B	B	B	"	"	"	"	"	"	"		
		108	B	B	H	H	H	H	B	"	B	B	B	B	B	B	B	B	"	"	"	"	"	"	"		
		109	B	B	L	L	L	L	A	"	B	B	B	B	B	B	B	B	"	"	"	"	"	"	"		
		110	B	B	L	L	L	L	B	"	B	B	B	B	B	B	B	B	"	"	"	"	"	"	"		
		111	B	B	L	L	L	L	B	"	B	B	B	A	A	B	B	B	"	"	"	"	"	"	"		
		112	B	B	L	L	L	L	B	"	A	B	A	A	A	A	B	B	"	"	"	"	"	"	"		
		113	B	B	L	L	L	L	A	"	A	B	A	A	A	A	A	B	"	"	"	"	"	"	"		
		114	B	B	L	L	L	L	B	"	A	B	A	A	A	A	B	B	"	"	"	"	"	"	"		
		115	B	B	L	L	L	L	B	"	A	A	A	A	A	A	B	B	"	"	"	"	"	"	"		
116	B	B	L	L	L	L	A	"	A	A	A	A	A	A	B	B	"	"	"	"	"	"	"				
117	B	B	L	L	L	L	B	"	A	A	A	A	A	A	A	B	"	"	"	"	"	"	"				
118	B	B	L	L	L	L	B	"	B	A	A	A	A	A	A	B	"	"	"	"	"	"	"				
119	B	B	L	L	L	L	A	"	B	A	A	A	A	A	A	B	"	"	"	"	"	"	"				
120	B	B	L	L	L	L	B	"	B	A	A	A	A	A	A	B	"	"	"	"	"	"	"				
121	B	B	L	L	L	L	B	"	B	B	A	A	A	A	A	B	"	"	"	"	"	"	"				
122	B	B	L	L	L	L	B	"	B	B	B	A	A	A	A	B	"	"	"	"	"	"	"				

See footnotes at end of table.

TABLE III. Group A inspection for device type 06 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits 8/						Unit	
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C					
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			16	Min	Max	Min	Max	Min		Max
		Test no.	OE1	OE2	1Q	2Q	3Q	4Q	CLK	GND	GND	GND	4D	3D	2D	1D	CLR			V _{CC}							
t _{MAX} 6/ 9/	(Fig. 3)	123 124 125 126	GND " " "	GND " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	IN " " "	GND " " "	GND " " "	GND " " "	IN " " "	IN " " "	IN " " "	GND " " "	4.5V " " "	1Q 2Q 3Q 4Q	31 " " "	 " " "	23 " " "	 " " "	31 " " "	 " " "	MHz		
t _{PHL1} Z/	3003 (Fig. 3)	127 128 129 130	" " " "	" " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	" " " "	" " " "	" " " "	" " " "	IN " " "	IN " " "	IN " " "	" " " "	" " " "	CLK to 1Q CLK to 2Q CLK to 3Q CLK to 4Q	6 " " "	35 " " "	6 " " "	47 " " "	6 " " "	35 " " "	ns		
t _{PLH1} Z/	3003 (Fig. 3)	131 132 133 134	" " " "	" " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	" " " "	" " " "	" " " "	" " " "	IN " " "	IN " " "	IN " " "	" " " "	" " " "	CLK to 1Q CLK to 2Q CLK to 3Q CLK to 4Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "		
t _{PHL2} Z/	3003 (Fig. 3)	135 136 137 138	" " " "	" " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	10/ " " "	" " " "	" " " "	" " " "	4.5V " " "	4.5V " " "	4.5V " " "	4.5V " " "	IN " " "	CLR to 1Q CLR to 2Q CLR to 3Q CLR to 4Q	5 " " "	31 " " "	5 " " "	41 " " "	5 " " "	31 " " "	"		
t _{PHZ} Z/	3003 (Fig. 3)	139 140 141 142 143 144 145 146	IN " " " " " " "	GND " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	10/ " " "	GND " " "	GND " " "	GND " " "	4.5V " " "	4.5V " " "	4.5V " " "	4.5V " " "	GND " " "	4.5V " " "	OE1 to 1Q OE1 to 2Q OE1 to 3Q OE1 to 4Q OE2 to 1Q OE2 to 2Q OE2 to 3Q OE2 to 4Q	5 " " " " " " " "	26 " " " " " " " "	5 " " " " " " " "	35 " " " " " " " "	5 " " " " " " " "	26 " " " " " " " "	ns	
t _{PLZ} Z/	3003 (Fig. 3)	147 148 149 150 151 152 153 154	IN " " " " " " "	GND " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	GND " " "	" " " "	" " " "	" " " "	4.5V " " "	4.5V " " "	4.5V " " "	4.5V " " "	10/ " " "	" " " "	OE1 to 1Q OE1 to 2Q OE1 to 3Q OE1 to 4Q OE2 to 1Q OE2 to 2Q OE2 to 3Q OE2 to 4Q	" " " " " " " "	26 " " " " " " "	" " " " " " " "	35 " " " " " " "	" " " " " " " "	26 " " " " " " "	"	
t _{PZH} Z/	3003 (Fig. 3)	155 156 157 158 159 160 161 162	IN " " " " " " "	GND " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	10/ " " "	" " " "	" " " "	" " " "	4.5V " " "	4.5V " " "	4.5V " " "	4.5V " " "	GND " " "	" " " "	OE1 to 1Q OE1 to 2Q OE1 to 3Q OE1 to 4Q OE2 to 1Q OE2 to 2Q OE2 to 3Q OE2 to 4Q	" " " " " " " "	" " " " " " " "	" " " " " " " "	" " " " " " " "	" " " " " " " "	" " " " " " " "		

See footnotes at end of table.

TABLE III. Group A inspection for device type 06 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions <u>1/</u>																	Measured terminal	Test limits <u>8/</u>						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C	Subgroup 11 T _C = -55°C					
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Min		Max	Min	Max	Min	Max		
Test no.	<u>OE1</u>	<u>OE2</u>	1Q	2Q	3Q	4Q	CLK	GND	<u>E1</u>	<u>E2</u>	4D	3D	2D	1D	CLR	V _{CC}											
t _{PZL} <u>7/</u>	3003 (Fig. 3)	163 164 165 166 167 168 169 170	IN " " " GND " " "	GND " " " IN " " "	OUT " " " OUT " OUT "	OUT " " " " " OUT "	OUT " " " " " " " "	GND " " " " " " " "	GND " " " " " " " "	GND " " " " " " " "	GND " " " " " " " "	4.5V " " " 4.5V " 4.5V "	4.5V " " " 4.5V " 4.5V "	4.5V " " " 4.5V " 4.5V "	4.5V " " " 4.5V " 4.5V "	10/ " " " " " " "	4.5V " " " " " " "	OE1 to 1Q OE1 to 2Q OE1 to 3Q OE1 to 4Q OE2 to 1Q OE2 to 2Q OE2 to 3Q OE2 to 4Q	5 " " " " " " "	26 " " " " " " "	5 " " " " " " "	35 " " " " " " "	5 " " " " " " "	26 " " " " " " "	ns " " " " " " "		
t _{THL} <u>7/</u>	3004 (Fig. 3)	171 172 173 174	" " " "	GND " " "	OUT " " "	OUT " " "	OUT " " "	" " " "	10/ " " "	" " " "	" " " "	" " " "	4.5V " " "	4.5V " " "	4.5V " " "	IN " " "	" " " "	1Q 2Q 3Q 4Q	2 " " "	12 " " "	2 " " "	16 " " "	2 " " "	12 " " "	" " " "		
t _{TLH} <u>7/</u>	3004 (Fig. 3)	175 176 177 178	" " " "	" " " "	OUT " " "	OUT " " "	OUT " " "	IN " " "	" " " "	" " " "	" " " "	" " " "	4.5V " " "	4.5V " " "	4.5V " " "	10/ " " "	" " " "	1Q 2Q 3Q 4Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "		

See footnotes at end of table.

TABLE III. Group A inspection for device type 07.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		Cases E,F	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max		
			Test no.	CLR	1Q	1D	2D	2Q	3D	3Q	GND	CLK	4Q	4D	5Q	5D	6D	6Q		V _{CC}							
V _{IC} (pos) 1/		1	1mA			1mA				1/								GND	CLR	1/	1.5					V	
		2								"								"	1D	"	"					"	
		3					1mA			"								"	2D	"	"					"	
		4							1mA	"								"	3D	"	"					"	
		5								"	1mA							"	CLK	"	"					"	
		6								"			1mA					"	4D	"	"					"	
		7								"					1mA			"	5D	"	"					"	
		8								"						1mA		"	6D	"	"					"	
V _{IC} (neg) 1/		9	-1mA			-1mA				GND								1/	CLR		-1.5					"	
		10								"								"	1D		"					"	
		11								"								"	2D		"					"	
		12							-1mA	"								"	3D		"					"	
		13								"	-1mA							"	CLK		"					"	
		14								"			-1mA					"	4D		"					"	
		15								"					-1mA			"	5D		"					"	
		16								"						-1mA		"	6D		"					"	
I _{CC}	3005	17	GND			6.0V	6.0V			6.0V			6.0V		6.0V	6.0V		6.0V	V _{CC}		0.2		20			μA	
		18	6.0V			6.0V	6.0V			6.0V			6.0V		6.0V	6.0V		6.0V	V _{CC}		0.2		20				
V _{OH3}	3006	19	4.2V	-20μA	4.2V					"	"							"	1Q	5.95		5.95		5.95		V	
		20	"			4.2V		-20μA			"	"						"	2Q	"		"		"		"	
		21	"						4.2V	-20μA	"	"						"	3Q	"		"		"		"	
		22	"								"	"	-20μA	4.2V				"	4Q	"		"		"		"	
		23	"								"	"			-20μA	4.2V			"	5Q	"		"		"		"
		24	"								"	"				4.2V	-20μA		"	6Q	"		"		"		"
V _{OH5}	3006	25	"	-5.2mA	4.2V					"	"							"	1Q	5.48		5.2		5.48		"	
		26	"				4.2V	-5.2mA			"	"						"	2Q	"		"		"		"	
		27	"						4.2V	-5.2mA	"	"						"	3Q	"		"		"		"	
		28	"								"	"	-5.2mA	4.2V				"	4Q	"		"		"		"	
		29	"								"	"			-5.2mA	4.2V			"	5Q	"		"		"		"
		30	"								"	"				4.2V	-5.2mA		"	6Q	"		"		"		"
V _{OL3}	3007	31	1.2V	20μA						"	"							"	1Q		0.05		0.05		0.05	"	
		32	"					20μA			"	"						"	2Q		"		"		"	"	
		33	"							20μA	"	"						"	3Q		"		"		"	"	
		34	"								"	"	20μA					"	4Q		"		"		"	"	
		35	"								"	"			20μA			"	5Q		"		"		"	"	
		36	"								"	"						"	6Q		"		"		"	"	
		37	4.2V	20μA	1.2V						"	2/						20μA	"	1Q		"		"		"	"
		38	"			1.2V					"	"							"	2Q		"		"		"	"
		39	"				20μA				"	"							"	3Q		"		"		"	"
		40	"						1.2V	20μA	"	"							"	4Q		"		"		"	"
		41	"								"	"	20μA	1.2V					"	5Q		"		"		"	"
		42	"								"	"				1.2V	20μA		"	6Q		"		"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 07 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases E,F Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit		
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max			
V _{OL5}	3007	43	1.2V	5.2mA				1.2V		GND								6.0V	1Q		0.26		0.4		0.26	V		
		44	"				5.2mA	"		"								"	2Q		"		"		"	"		
		45	"					"	5.2mA	"								"	3Q		"		"		"	"		
		46	"					"		"								"	4Q		"		"		"	"		
		47	"					"		"								"	5Q		"		"		"	"		
		48	"					"		"				5.2mA				"	6Q		"		"		"	"		
		49	4.2V	5.2mA	1.2V			4.2V		"	2/						5.2mA	"	1Q		"		"		"	"		
		50	"			1.2V		5.2mA	4.2V		"	"						"	2Q		"		"		"	"		
		51	"						1.2V		"							"	3Q		"		"		"	"		
		52	"						4.2V		"			5.2mA	1.2V			"	4Q		"		"		"	"		
		53	"						"		"				5.2mA	1.2V			5Q		"		"		"	"		
		54	"						"		"						1.2V	5.2mA	6Q		"		"		"	"		
I _{OS4}	3011	55	4.0V	GND	4.0V	4.0V		4.0V		"	"		4.0V		4.0V	4.0V		4.0V	1Q	-10	-120	-10	-120	-10	-120	mA		
		56	"		"	"		"		"	"		"		"	"		"	2Q	"	"	"	"	"	"	"		
		57	"		"	"		"		GND	"	"		"		"	"		3Q	"	"	"	"	"	"	"		
		58	"		"	"		"		"	"		GND	"		"	"		4Q	"	"	"	"	"	"	"		
		59	"		"	"		"		"	"		"		GND	"	"		5Q	"	"	"	"	"	"	"		
		60	"		"	"		"		"	"		"		"	"		GND	6Q	"	"	"	"	"	"	"		
I _{IH}	3010	61	6.0V		6.0V					"								6.0V	CLR		50		100			nA		
		62	"		"	6.0V				"								"	1D		"		"		"	"		
		63	"		"			6.0V		"								"	2D		"		"		"	"		
		64	"		"					"								"	3D		"		"		"	"		
		65	"		"					"	6.0V							"	CLK		"		"		"	"		
		66	"		"					"			6.0V					"	4D		"		"		"	"		
		67	"		"					"				6.0V				"	5D		"		"		"	"		
		68	"		"					"						6.0V		"	6D		"		"		"	"		
I _{IL}	3009	69	GND		GND					"								"	CLR		-50		-100			"		
		70	"		"	GND				"								"	1D		"		"		"	"		
		71	"		"					"								"	2D		"		"		"	"		
		72	"		"			GND		"								"	3D		"		"		"	"		
		73	"		"					"								"	CLK		"		"		"	"		
		74	"		"					"			GND					"	4D		"		"		"	"		
		75	"		"					"				GND				"	5D		"		"		"	"		
		76	"		"					"					GND			"	6D		"		"		"	"		
																					Subgroup 4 T _C = +25°C							
																					Min	Max						
C _i	3012	77	4/		4/					GND								GND	CLR		10					pF		
		78	"		"					"								"	1D		"		"		"	"		
		79	"		"					"								"	2D		"		"		"	"		
		80	"		"				4/		"							"	3D		"		"		"	"		
		81	"		"					"	4/							"	CLK		"		"		"	"		
		82	"		"					"			4/					"	4D		"		"		"	"		
		83	"		"					"					4/			"	5D		"		"		"	"		
		84	"		"					"						4/			"	6D		"		"		"	"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 07 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases E,F	Terminal conditions 1/																Measured terminal	Test limits						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
			Test no.	CL _R	1Q	1D	2D	2Q	3D	3Q	GND	CLK	4Q	4D	5Q	5D	6D	6Q		V _{CC}	Min	Max	Min	Max	Min	
Truth table tests 6/ 7/	3014	85	B	L	A	A	L	A	L	GND	B	L	A	L	A	A	L	4.5V	All outputs	5/	5/	5/	5/	5/	5/	
		86	A	L	A	A	L	A	L	"	B	L	A	L	A	A	L	"		"	"	"	"	"		
		87	A	H	A	A	H	A	H	"	A	H	A	H	A	A	H	"		"	"	"	"	"		
		88	A	H	A	A	H	A	H	"	B	H	A	H	A	A	H	"		"	"	"	"	"		
		89	A	H	B	B	H	B	H	"	B	H	B	H	B	B	H	"		"	"	"	"	"		
		90	A	L	B	B	L	B	L	"	A	L	B	L	B	B	L	"		"	"	"	"	"		
																			Test limits 8/							
																			Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C			
																			Min	Max	Min	Max	Min	Max		
f _{MAX}	(Fig. 3)	91	4.5V	OUT	IN	IN	OUT	IN	OUT	GND	IN							4.5V	1Q	31		23		31		MHz
9/		92	"							"	"							"	2Q	"		"		"		"
		93	"							"	"							"	3Q	"		"		"		"
		94	"							"	"	OUT	IN	OUT	IN			"	4Q	"		"		"		"
		95	"							"	"							"	5Q	"		"		"		"
		96	"							"	"							"	6Q	"		"		"		"
t _{PHL1}	3003 (Fig. 3)	97	"	OUT	IN	IN	OUT	IN	OUT	"	"						"	CLK to 1Q	5	31	5	42	5	31	ns	
7/		98	"							"	"							"	CLK to 2Q	"	"	"	"	"	"	"
		99	"							"	"							"	CLK to 3Q	"	"	"	"	"	"	"
		100	"							"	"	OUT	IN	OUT	IN			"	CLK to 4Q	"	"	"	"	"	"	"
		101	"							"	"							"	CLK to 5Q	"	"	"	"	"	"	"
		102	"							"	"							"	CLK to 6Q	"	"	"	"	"	"	"
t _{PLH1}	3003 (Fig. 3)	103	"	OUT	IN	IN	OUT	IN	OUT	"	"						"	CLK to 1Q	"	"	"	"	"	"	"	
7/		104	"							"	"							"	CLK to 2Q	"	"	"	"	"	"	"
		105	"							"	"							"	CLK to 3Q	"	"	"	"	"	"	"
		106	"							"	"	OUT	IN	OUT	IN			"	CLK to 4Q	"	"	"	"	"	"	"
		107	"							"	"							"	CLK to 5Q	"	"	"	"	"	"	"
		108	"							"	"							"	CLK to 6Q	"	"	"	"	"	"	"
t _{PHL2}	3003 (Fig. 3)	109	IN	OUT	4.5V	4.5V	OUT	4.5V	OUT	"	10/						"	CL _R to 1Q	"	"	"	"	"	"	"	
7/		110	"							"	"							"	CL _R to 2Q	"	"	"	"	"	"	"
		111	"							"	"							"	CL _R to 3Q	"	"	"	"	"	"	"
		112	"							"	"	OUT	4.5V	OUT	4.5V			"	CL _R to 4Q	"	"	"	"	"	"	"
		113	"							"	"							"	CL _R to 5Q	"	"	"	"	"	"	"
		114	"							"	"							"	CL _R to 6Q	"	"	"	"	"	"	"
t _{THL}	3004 (Fig. 3)	115	4.5V	OUT	IN	IN	OUT	IN	OUT	"	IN						"	1Q	3	15	3	20	3	15	"	
7/		116	"							"	"							"	2Q	"	"	"	"	"	"	"
		117	"							"	"							"	3Q	"	"	"	"	"	"	"
		118	"							"	"	OUT	IN	OUT	IN			"	4Q	"	"	"	"	"	"	"
		119	"							"	"							"	5Q	"	"	"	"	"	"	"
		120	"							"	"							"	6Q	"	"	"	"	"	"	"
t _{TLH}	3004 (Fig. 3)	121	"	OUT	IN	IN	OUT	IN	OUT	"	"						"	1Q	"	"	"	"	"	"	"	
7/		122	"							"	"							"	2Q	"	"	"	"	"	"	"
		123	"							"	"							"	3Q	"	"	"	"	"	"	"
		124	"							"	"	OUT	IN	OUT	IN			"	4Q	"	"	"	"	"	"	"
		125	"							"	"							"	5Q	"	"	"	"	"	"	"
		126	"							"	"							"	6Q	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 08.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
		Test no.	CLR	1Q	1Q̄	1D	2D	2Q̄	2Q	GND	CLK	3Q	3Q̄	3D	4D	4Q̄	4Q	V _{CC}								
V _{IC} (pos) 1/		1	1mA			1mA					1/							GND	CLR	1/	1.5				V	
		2					1mA				"							"	1D	"	"			"		
		3					1mA				"							"	2D	"	"			"		
		4									"	1mA						"	CLK	"	"			"		
		5									"			1mA				"	3D	"	"			"		
		6									"				1mA	1mA			"	4D	"	"			"	
V _{IC} (neg) 1/		7	-1mA			-1mA				GND								1/	CLR		-1.5				"	
		8					-1mA			"								"	1D	"	"			"		
		9					-1mA			"								"	2D	"	"			"		
		10								"	-1mA							"	CLK	"	"			"		
		11								"				-1mA				"	3D	"	"			"		
		12								"					-1mA	-1mA			"	4D	"	"			"	
I _{CC}	3005	13	GND			6.0V	6.0V			"	GND			6.0V	6.0V			6.0V	V _{CC}		0.2		20		μA	
		14	6.0V			6.0V	6.0V			"	2/			6.0V	6.0V			6.0V	V _{CC}		0.2		20		μA	
V _{OH3}	3006	15	1.2V		-20μA			-20μA			"							"	1Q	5.95		5.95		5.95	V	
		16	"								"			-20μA				"	2Q	"	"		"	"		
		17	"								"							"	3Q	"	"		"	"		
		18	"								"						-20μA	"	4Q	"	"		"	"		
		19	4.2V	-20μA		4.2V					"	2/							"	1Q	"	"		"	"	
		20	"			4.2V					"	"							"	2Q	"	"		"	"	
		21	"				4.2V				"	"							"	3Q	"	"		"	"	
		22	"						-20μA		"	"		-20μA	4.2V				"	4Q	"	"		"	"	
		23	"			-20μA	1.2V				"	"			4.2V			-20μA	"	1Q̄	"	"		"	"	
		24	"				1.2V				"	"							"	2Q̄	"	"		"	"	
		25	"					1.2V	-20μA		"	"			-20μA	1.2V			"	3Q̄	"	"		"	"	
		26	"								"	"				1.2V	-20μA		"	4Q̄	"	"		"	"	
V _{OH5}	3006	27	1.2V		-5.2mA			-5.2mA			"							"	1Q	5.48		5.2		5.48	"	
		28	"								"							"	2Q	"	"		"	"		
		29	"								"			-5.2mA				"	3Q	"	"		"	"		
		30	"								"						-5.2mA	"	4Q	"	"		"	"		
		31	4.2V	-5.2mA		4.2V					"	2/							"	1Q	"	"		"	"	
		32	"				4.2V				"	"							"	2Q	"	"		"	"	
		33	"					4.2V			"	"							"	3Q	"	"		"	"	
		34	"							-5.2mA	"	"		-5.2mA	4.2V				"	4Q	"	"		"	"	
		35	"			-5.2mA	1.2V				"	"			4.2V			-5.2mA	"	1Q̄	"	"		"	"	
		36	"					1.2V	-5.2mA		"	"							"	2Q̄	"	"		"	"	
		37	"								"	"			-5.2mA	1.2V			"	3Q̄	"	"		"	"	
		38	"								"	"				1.2V	-5.2mA		"	4Q̄	"	"		"	"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 08 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
		Test no.	CL _R	1Q	1Q̄	1D	2D	2Q̄	2Q	GND	CLK	3Q	3Q̄	3D	4D	4Q̄	4Q	V _{CC}								
V _{OL3}	3007	39	1.2V	20μA					20μA	GND								6.0V	1Q		0.05		0.05		0.05	V
		40	"						"	"		20μA						"	2Q		"		"		"	"
		41	"						"	"								"	3Q		"		"		"	"
		42	"						"	"								"	4Q		"		"		"	"
		43	4.2V		20μA	4.2V		20μA	"	2/							20μA	"	1Q		"		"		"	"
		44	"				4.2V		"	"								"	2Q		"		"		"	"
		45	"					4.2V		"	"		20μA	4.2V				"	3Q		"		"		"	"
		46	"						"	"					4.2V	20μA		"	4Q		"		"		"	"
		47	"	20μA		1.2V			"	"								"	1Q		"		"		"	"
		48	"				1.2V		20μA	"				1.2V				"	2Q		"		"		"	"
		49	"						"	"		20μA			1.2V			"	3Q		"		"		"	"
		50	"						"	"							20μA	"	4Q		"		"		"	"
V _{OL5}	3007	51	1.2V	5.2mA					5.2mA	"								"	1Q		0.26		0.4		0.26	"
		52	"						"	"		5.2mA						"	2Q		"		"		"	"
		53	"						"	"								"	3Q		"		"		"	"
		54	"						"	"								"	4Q		"		"		"	"
		55	4.2V		5.2mA	4.2V		5.2mA	"	2/							5.2mA	"	1Q		"		"		"	"
		56	"				4.2V		"	"								"	2Q		"		"		"	"
		57	"					5.2mA	"	"			5.2mA	4.2V				"	3Q		"		"		"	"
		58	"						"	"					4.2V	5.2mA		"	4Q		"		"		"	"
		59	"	5.2mA		1.2V			"	"								"	1Q		"		"		"	"
		60	"				1.2V		5.2mA	"				1.2V				"	2Q		"		"		"	"
		61	"						"	"								"	3Q		"		"		"	"
		62	"						"	"							5.2mA	"	4Q		"		"		"	"
I _{OS4}	3011	63	4.0V	GND		4.0V				"	3/							4.0V	1Q	-10	-120	-10	-120	-10	-120	mA
		64	"		GND	GND			GND	"	"							"	1Q	"	"	"	"	"	"	"
		65	"				4.0V		GND	"	"							"	2Q	"	"	"	"	"	"	"
		66	"				GND			"	"							"	3Q	"	"	"	"	"	"	"
		67	"							"	"			GND				"	4Q	"	"	"	"	"	"	"
		68	"							"	"				GND			"	3Q	"	"	"	"	"	"	"
		69	"							"	"					4.0V		"	4Q	"	"	"	"	"	"	"
		70	"							"	"					GND		"	4Q	"	"	"	"	"	"	"
I _{IH}	3010	71	6.0V						"	"								6.0V	CL _R		50		100			nA
		72				6.0V			"	"								"	1D		"		"		"	"
		73					6.0V		"	"								"	2D		"		"		"	"
		74							"	"	6.0V							"	CLK		"		"		"	"
		75							"	"								"	3D		"		"		"	"
		76							"	"					6.0V			"	4D		"		"		"	"
I _{IL}	3009	77	GND						"	"								"	CL _R		-50		-100			"
		78				GND			"	"								"	1D		"		"		"	"
		79					GND		"	"								"	2D		"		"		"	"
		80							"	"								"	CLK		"		"		"	"
		81							"	"				GND				"	3D		"		"		"	"
		82							"	"					GND			"	4D		"		"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 08 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits						Unit					
		Cases E,F	1	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19		20	Subgroup 4 T _C = +25°C										
		Test no.	CL _R	1Q	1Q̄	1D	2D	2Q̄	2Q	GND	CLK	3Q	3Q̄	3D	4D	4Q̄	4Q	V _{CC}		Min	Max										
C _I	3012	83 84 85 86 87 88	4/			4/		4/		GND " " "									GND " " "	CL _R 1D 2D CLK 3D 4D		10 " " "					pF " " "				
																				Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C							
																				Min	Max	Min	Max	Min	Max						
Truth table tests 6/ 7/	3014	89 90 91 92 93 94 95 96 97 98 99 100	B B B A A B A A A A A	L L L L H L L L H L L L	H H H H L L H L L L L L	A A A A A A A A A A B B	A A A A A A A A A A B B	H H H H L H H H L L L H	L L L L H H L L H H H L	GND " " " " " " " " " " " "	B A B B A B B A A B B A	L L L L H H L L L L L L	H H H A A A A A A A A A	A A A A A A A A A A A B	A A A A A A A A A A A B	H H H H L H L L L L L H	L L L L H H L L L L L L	4.5V " " " " " " " " " " "	All outputs " " " " " " " " " " "	5/ " " " " " " " " " " "	5/ " " " " " " " " " " "	5/ " " " " " " " " " " "	5/ " " " " " " " " " " "	5/ " " " " " " " " " " "							
																						Test limits 8/									
																						Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C					
																						Min	Max	Min	Max	Min	Max				
		f _{MAX}	(Fig. 3)	101 102 103 104 105 106 107 108	4.5V " " " " " " "	OUT " " " " " "	OUT " " " " " "	IN IN " " " "	IN " " " " " "	OUT " " " " " "	OUT " " " " " "	GND " " " " " "	IN " " " " " "	OUT " " " " " "	OUT " " " " " "	IN " " " " " "	IN " " " " " "	OUT " " " " " "	OUT " " " " " "	4.5V " " " " " "	1Q 1Q̄ 2Q 2Q̄ 3Q 3Q̄ 4Q 4Q̄	35 " " " " " "		26 " " " " " "		35 " " " " " "		MHz " " " " " "			
		t _{PHL1} Z/	3003 (Fig. 3)	109 110 111 112 113 114 115 116	" " " " " " "	OUT " " " " " "	IN " " " " " "	IN " " " " " "	OUT " " " " " "	OUT " " " " " "	OUT " " " " " "	" " " " " "	" " " " " "	OUT " " " " " "	OUT " " " " " "	IN " " " " " "	IN " " " " " "	OUT " " " " " "	OUT " " " " " "	" " " " " "	CLK to 1Q CLK to 2Q CLK to 3Q CLK to 4Q CLK to 1Q̄ CLK to 2Q̄ CLK to 3Q̄ CLK to 4Q̄	4 " " " " "	31 " " " " "	4 " " " " "	41 " " " " "	4 " " " " "	31 " " " " "	ns " " " " "			

See footnotes at end of table.

TABLE III. Group A inspection for device type 08 – Continued.

Symbol	MIL-STD-883 method	Case 2	Terminal conditions 1/																Measured terminal	Test limits 8/						Unit
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C		
		Cases E,F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16								
		Test no.	CL $\overline{\text{R}}$	1Q	1 $\overline{\text{Q}}$	1D	2D	2 $\overline{\text{Q}}$	2Q	GND	CLK	3Q	3 $\overline{\text{Q}}$	3D	4D	4 $\overline{\text{Q}}$	4Q	V _{CC}		Min	Max	Min	Max	Min	Max	
t _{PLH1} Z/	3003 (Fig. 3)	117 118 119 120 121 122 123 124	4.5V " " " " " " "	OUT " " " OUT " " "	IN " " " IN " " "	IN " " " IN " " "	IN " " " OUT " " "	OUT " " " " " " "	GND " " " " " " "	IN " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	4.5V " " " " " " "	CLK to 1Q CLK to 2Q CLK to 3Q CLK to 4Q CLK to 1 $\overline{\text{Q}}$ CLK to 2 $\overline{\text{Q}}$ CLK to 3 $\overline{\text{Q}}$ CLK to 4 $\overline{\text{Q}}$	4 " " " " " " "	31 " " " " " " "	4 " " " " " " "	41 " " " " " " "	4 " " " " " " "	31 " " " " " " "	ns " " " " " " "		
t _{PHL2} Z/	3003 (Fig. 3)	125 126 127 128	IN " " "	OUT " " "	4.5V " " "	4.5V " " "	OUT " " "	OUT " " "	10/ " " "	OUT " " "	4.5V " " "	4.5V " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	CL $\overline{\text{R}}$ to 1Q CL $\overline{\text{R}}$ to 2Q CL $\overline{\text{R}}$ to 3Q CL $\overline{\text{R}}$ to 4Q	32 " " "	43 " " "	32 " " "	32 " " "	32 " " "	32 " " "			
t _{PLH2} Z/	3003 (Fig. 3)	129 130 131 132	IN " " "	OUT " " "	4.5V " " "	4.5V " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	OUT " " "	CL $\overline{\text{R}}$ to 1 $\overline{\text{Q}}$ CL $\overline{\text{R}}$ to 2 $\overline{\text{Q}}$ CL $\overline{\text{R}}$ to 3 $\overline{\text{Q}}$ CL $\overline{\text{R}}$ to 4 $\overline{\text{Q}}$	32 " " "	43 " " "	32 " " "	32 " " "	32 " " "	32 " " "			
t _{THL} Z/	3004 (Fig. 3)	133 134 135 136 137 138 139 140	4.5V " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	GND " " " " " " "	IN " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	4.5V " " " " " " "	1Q 2Q 3Q 4Q 1 $\overline{\text{Q}}$ 2 $\overline{\text{Q}}$ 3 $\overline{\text{Q}}$ 4 $\overline{\text{Q}}$	3 " " " " " " "	15 " " " " " " "	3 " " " " " " "	20 " " " " " " "	3 " " " " " " "	15 " " " " " " "	ns " " " " " " "	
t _{TLH} Z/	3004 (Fig. 3)	141 142 143 144 145 146 147 148	IN " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	1Q 2Q 3Q 4Q 1 $\overline{\text{Q}}$ 2 $\overline{\text{Q}}$ 3 $\overline{\text{Q}}$ 4 $\overline{\text{Q}}$	3 " " " " " " "	15 " " " " " " "	3 " " " " " " "	20 " " " " " " "	3 " " " " " " "	15 " " " " " " "	ns " " " " " " "		

See footnotes at end of table.

TABLE III. Group A inspection for device type 52.

Symbol	MIL-STD-883 method	Case 2 Cases C,D Test no.	Terminal conditions 1/														Measured terminal	Test limits						Unit	
			2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Min	Max	Min	Max		
V _{IC} (pos) 1/		1 2 3 4 5 6 7 8	1mA	1mA	1mA	1mA			1/					1mA	1mA	1mA	GND	1CLR 1D 1CLK 1PRE 2PRE 2CLK 2D 2CLR	1/	1.5					V
V _{IC} (neg) 1/		9 10 11 12 13 14 15 16	-1mA	-1mA	-1mA	-1mA			GND				-1mA	-1mA	-1mA	-1mA	1/	1CLR 1D 1CLK 1PRE 2PRE 2CLK 2D 2CLR		-1.5					
I _{CC}	3005	17 18	5.5V GND	GND GND	GND GND	GND 5.5V						GND 5.5V	GND GND	GND GND	5.5V GND	5.5V	V _{CC}		0.15 0.15		15 15				μA μA
I _{CCA}		219 220 221 222 223 224 225 226	2.4V 0.4V	0.4V 2.4V	0.4V 0.4V	0.4V 0.4V						0.4V	0.4V	0.4V	0.4V				3.0		3.0		3.0		mA
V _{OH6}	3006	23 24 25 26 27 28 29 30	2.0V 0.8V	0.8V 0.8V	0.8V 0.8V	0.8V 2.0V	-20μA	-20μA		-20μA	-20μA	2.0V 0.8V	0.8V 0.8V	0.8V 0.8V	0.8V 2.0V	4.5V	1Q 1Q 2Q 2Q	4.40		4.40		4.40			V
V _{OH7}	3006	31-38	Same terminal conditions as specified above for V _{OH6} except I _{OH} = -4.0 mA, V _{CC} = 5.5 V.															3.98		3.70		3.98			
V _{OL6}	3007	39 40 41 42 43 44 45 46	2.0V 0.8V	0.8V 0.8V	0.8V 0.8V	0.8V 2.0V	20μA	20μA	GND		20μA	2.0V 0.8V	0.8V 0.8V	0.8V 0.8V	0.8V 2.0V	4.5V	1Q 1Q 2Q 2Q		0.05		0.05		0.05		
			2.0V 2.0V	2.0V 0.8V	2/2/	2.0V 2.0V	20μA	20μA			20μA	2.0V 2.0V	2/2/	0.8V 2.0V	2.0V 2.0V		1Q 1Q 2Q 2Q								

See footnotes at end of table.

TABLE III. Group A inspection for device type 52 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases C,D Test no.	Terminal conditions 1/															Measured terminal	Test limits						Unit
			2	3	4	6	8	9	10	12	13	14	16	18	19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			1CLR	1D	1CLK	1PRE	1Q	1Q	GND	2Q	2Q	2PRE	2CLK	2D	2CLR	V _{CC}	Min		Max	Min	Max	Min	Max		
V _{OL7}	3007	47-54	Same terminal conditions as specified above for V _{OL6} except I _{OL} = 4.0 mA, V _{CC} = 5.5 V.																0.26		0.4		0.26	V	
I _{OS4}	3011	55 56 57 58	4.0V GND	GND GND	GND GND	GND 4.0V	GND	GND	GND	GND	GND	4.0V GND	GND GND	GND GND	GND 4.0V	4.0V	1Q 1Q 2Q 2Q	-10 " " "	-120 " " "	-10 " " "	-120 " " "	-10 " " "	-120 " " "	mA	
I _{IH}	3010	59 60 61 62 63 64 65 66	6.0V	6.0V	6.0V	6.0V			" " " "			6.0V	6.0V	6.0V	6.0V	5.5V " " " " " " "	1CLR 1D 1CLK 1PRE 2PRE 2CLK 2D 2CLR		.05 " " " " " "		0.1 " " " " " "			μA	
I _{IL}	3009	67 68 69 70 71 72 73 74	GND	GND	GND	GND			" " " " " " "			GND	GND	GND	GND	" " " " " " "	1CLR 1D 1CLK 1PRE 2PRE 2CLK 2D 2CLR		-.05 " " " " " "		-0.1 " " " " " "			"	
																	Subgroup 4 T _C = +25°C								
																	Min	Max							
C _i	3012	75 76 77 78 79 80 81 82	4/ 4/ 4/ 4/ 4/ 4/ 4/	4/ 4/ 4/ 4/ 4/ 4/ 4/	4/ 4/ 4/ 4/ 4/ 4/ 4/	4/ 4/ 4/ 4/ 4/ 4/ 4/			GND " " " " " "			4/ 4/ 4/ 4/ 4/ 4/ 4/	4/ 4/ 4/ 4/ 4/ 4/ 4/	4/ 4/ 4/ 4/ 4/ 4/ 4/	4.5V " " " " " "	GND " " " " " "	1CLR 1D 1CLK 1PRE 2PRE 2CLK 2D 2CLR		10 " " " " " "					pF	
																	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
																	Min	Max	Min	Max	Min	Max			
Truth table tests 6/ 7/	3014	83 84 85 86	B B B A	A A A A	B A B B	A A A A	L L L L	H H H H	GND " " "	H H H H	L L L L	A A A A	B A B A	A A A A	B B B A	4.5V " " "	All outputs " " "	5/ " " "	5/ " " "	5/ " " "	5/ " " "	5/ " " "	5/ " " "		

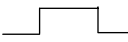
See footnotes at end of table.

TABLE III. Group A inspection for device type 52 – Continued.

Symbol	MIL-STD-883 method	Case 2 Cases C,D Test no.	Terminal conditions 1/														Measured terminal	Test limits						Unit
			2	3	4	6	8	9	10	12	13	14	16	18	19	20		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14								
			1CLR	1D	1CLK	1PRE	1Q	1Q	GND	2Q	2Q	2PRE	2CLK	2D	2CLR	V _{CC}		Min	Max	Min	Max	Min	Max	
Truth table tests 6/ 7/	3014	87	A	A	B	B	H	L	GND	L	H	B	B	A	A	4.5V	All outputs	5/	5/	5/	5/	5/	5/	
		88	A	B	B	B	H	L	"	L	H	B	B	A	A	"		"	"	"	"	"		
		89	A	B	A	B	H	L	"	L	H	B	A	B	A	"		"	"	"	"	"		
		90	A	B	B	B	H	L	"	L	H	B	B	B	A	"		"	"	"	"	"		
		91	A	B	B	A	H	L	"	L	H	A	B	B	A	"		"	"	"	"	"		
		92	A	B	A	A	L	H	"	H	L	A	A	B	A	"		"	"	"	"	"		
		93	A	B	B	A	L	H	"	H	L	A	B	B	A	"		"	"	"	"	"		
		94	A	A	B	A	L	H	"	H	L	A	B	A	A	"		"	"	"	"	"		
		95	A	A	A	A	H	L	"	L	H	A	A	A	A	"		"	"	"	"	"		
																	Test limits 8/							
																	Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C			
																	Min	Max	Min	Max	Min	Max		
f _{MAX} 7/ 9/	(Fig. 3)	96 97 98 99	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	GND " "	OUT	OUT	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	4.5V "	1Q 1Q 2Q 2Q	28 " "		21 " "		28 " "		MHz " "
t _{PHL1} 7/	3003 (Fig. 3)	100 101 102 103	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	" " "	OUT	OUT	4.5V 4.5V 4.5V	IN IN IN	IN IN IN	4.5V 4.5V 4.5V	" " "	1CLK to 1Q 2CLK to 2Q 1CLK to 1Q 2CLK to 2Q	5 " " "	31 " " "	5 " " "	41 " " "	5 " " "	31 " " "	ns " " "
t _{PLH1} 7/	3003 (Fig. 3)	104 105 106 107	4.5V 4.5V	IN IN	IN IN	4.5V 4.5V	OUT	OUT	" " "	OUT	OUT	4.5V 4.5V 4.5V	IN IN IN	IN IN IN	4.5V 4.5V 4.5V	" " "	1CLK to 1Q 2CLK to 2Q 1CLK to 1Q 2CLK to 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	ns " " "
t _{PHL2} 7/	3003 (Fig. 3)	108 109 110 111	IN 4.5V	GND GND	GND GND	4.5V IN	OUT	OUT	" " "	OUT	OUT	4.5V IN	GND GND	GND GND	IN 4.5V	" " "	1CLR to 1Q 1PRE to 1Q 2CLR to 2Q 2PRE to 2Q	" " " "	35 " " "	" " " "	47 " " "	" " " "	35 " " "	ns " " "
t _{PLH2} 7/	3003 (Fig. 3)	112 113 114 115	IN 4.5V	GND GND	GND GND	4.5V IN	OUT	OUT	" " "	OUT	OUT	4.5V IN	GND GND	GND GND	IN 4.5V	" " "	1CLR to 1Q 1PRE to 1Q 2CLR to 2Q 2PRE to 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	ns " " "
t _{THL} 7/	3004 (Fig. 3)	116 117 118 119	IN 4.5V	GND GND	GND GND	4.5V IN	OUT	OUT	" " "	OUT	OUT	4.5V IN	GND GND	GND GND	IN 4.5V	" " "	1Q 1Q 2Q 2Q	3 " " "	15 " " "	3 " " "	20 " " "	3 " " "	15 " " "	ns " " "
t _{TLH} 7/	3004 (Fig. 3)	120 121 122 123	4.5V IN	GND GND	GND GND	IN 4.5V	OUT	OUT	" " "	OUT	OUT	4.5V IN	GND GND	GND GND	IN 4.5V	" " "	1Q 1Q 2Q 2Q	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	ns " " "

See footnotes on next page.

TABLE III. Group A inspection – Continued.

- 1/ Pins not designated may be high level logic, low level logic, or open. Exceptions are as follows:
 - a. $V_{IC}(\text{pos})$ tests, the GND terminal shall be open. For test equipment that does not allow GND pin to be open during test, a minimum limit of 0.4 V applies.
 - b. $V_{IC}(\text{neg})$ tests, the V_{CC} terminal shall be open.
 - c. I_{IC} tests, the output terminals shall be open.
- 2/ Apply one clock pulse prior to test as follows: $\begin{matrix} 6.0 \text{ V} \\ 0.0 \text{ V} \end{matrix}$  or $\begin{matrix} 6.0 \text{ V} \\ 0.0 \text{ V} \end{matrix}$  as appropriate.
- 3/ Apply one clock pulse prior to test as follows: $\begin{matrix} 4.0 \text{ V} \\ 0.0 \text{ V} \end{matrix}$  or $\begin{matrix} 4.0 \text{ V} \\ 0.0 \text{ V} \end{matrix}$  as appropriate.
- 4/ See 4.4.1c.
- 5/ $A = 3.7 \text{ V}$, $B = 0.4 \text{ V}$ for all device types (except 52 where $A = 2.4 \text{ V}$); $H > 2.5 \text{ V}$, $L < 2.5 \text{ V}$.
- 6/ Only a summary of attributes data is required.
- 7/ Apply input test parameters such that t_{SU} , t_{hold} , t_{rem} , and t_w values are not greater than the recommended operating minimums (see 1.4).
Preset outputs to required state if necessary prior to test.
- 8/ See 4.4.1d.
- 9/ The f_{MAX} , minimum limit specified, is the frequency of the clock input. The data input is $f_{MAX}/2$
- 10/ Apply one clock pulse prior to test as follows: $\begin{matrix} 4.5 \text{ V} \\ 0.0 \text{ V} \end{matrix}$  or $\begin{matrix} 4.5 \text{ V} \\ 0.0 \text{ V} \end{matrix}$  as appropriate.
- 11/ Three-state output conditions are required.

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 performed in accordance with table II herein.
- b. Subgroups 5 and 6 shall be omitted.
- c. Subgroup 4 (C_{IN} , C_O , and C_C measurements) shall be measured only for initial qualification and after process or design changes that may affect input capacitance. Capacitance shall be measured between the designated terminal and GND at a frequency of 1 MHz.
- d. Subgroups 9 and 11 shall be measured only for initial qualification and after process or design changes which may affect dynamic performance.

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

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

- a. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 1 of group C inspection and shall consist of tests specified in table IV 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 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. Unless otherwise specified, all voltages given are referenced to the microcircuit GND terminal. Currents given are conventional current and positive when flowing into the referenced terminal.

4.5.2 Burn-in and life test cool down procedures. When the burn-in and life tests are completed and prior to removal of bias voltages, the devices under test (DUT) shall be cooled to within 10°C of their power stable condition at room temperature; then, electrical parameter end-point measurements shall be performed.

TABLE IV. Delta limits at 25°C.

Parameter ^{1/}	Device types	
	All	
I_{CC}		± 30 nA

^{1/} The above parameters shall be recorded before and after the required burn-in and life tests to determine deltas (Δ).

4.5.3 Quiescent supply current (I_{CC} test). When performing quiescent supply current measurements (I_{CC}), the meter shall be placed so that all currents flow through the meter.

5. PACKAGING

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

6. NOTES

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

6.1 Intended use. Microcircuits conforming to this specification are intended for 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. PIN and compliance identifier, if applicable (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.
- j. Packaging requirements (see 5.1).

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 contractors 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, P.O. Box 3990, Columbus, Ohio 43218-3990.

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:

T_C	Case temperature.
C_{IN}	Input terminal-to-GND capacitance.
GND	Ground zero voltage potential.
I_{CC}	Quiescent supply current.
T_A	Free air temperature.
V_{CC}	Positive supply voltage.
C_{PD}	Power dissipation capacitance.

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 S for National Aeronautics and Space Administration or class B for Department of Defense (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 Data reporting. When specified in the purchase order or contract, a copy of the following data, as applicable, will be supplied.

- Attributes data for all screening tests (see 4.2) and variables data for all static burn-in, dynamic burn-in, and steady-state life tests (see 3.6).
- A copy of each radiograph.
- The technology conformance inspection (TCI) data (see 4.4).
- Parameter distribution data on parameters evaluated during burn-in (see 3.6).
- Final electrical parameters data (see 4.2d).

6.8 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-35810 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	54HC73
02	54HC74
03	54HC107
04	54HC109
05	54HC112
06	54HC173
07	54HC174
08	54HC175
52	54HCT74

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

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

Preparing activity:
DLA - CC

(Project 5962-2005-020)

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

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at <http://assist.daps.dla.mil>.