

INCH-POUND

MIL-M-38510/663A
27 February 2006

SUPERSEDING
MIL-M-38510/663
30 September 1987

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, HIGH-SPEED CMOS, COUNTERS, MONOLITHIC SILICON

Reactivated after 27 Feb. 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).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	BCD decade counter, asynchronous reset, synchronous load
02	4-bit binary counter, asynchronous reset, synchronous load
03	BCD decade counter, synchronous reset and load
04	4-bit binary counter, synchronous reset and load
05	Synchronous 4-bit binary up/down counter, asynchronous load
06	Synchronous BCD decade up/down counter, asynchronous reset and load
07	Synchronous 4-bit binary up/down counter, asynchronous reset and load
08	Synchronous dual 4-bit decade counter, asynchronous reset
09	Synchronous dual 4-bit binary counter, asynchronous reset
10	Decade counter/divider, 10 decoded outputs, asynchronous reset
11	14-stage ripple-carry binary counter, asynchronous reset
12	7-stage ripple-carry binary counter, asynchronous reset
13	12-stage ripple-carry binary counter, asynchronous reset

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
X	CQCC1-N16	16	Square leadless chip carrier
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
DC V_{CC} or GND current per pin (I_{CC} , I_{GND})	± 50 mA
Storage temperature range (T_{STG})	-65° to +150°C
Maximum power dissipation (P_D)	300 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.All device types:

Supply voltage (V_{CC})	2.0 V dc to 6.0 V dc
Output voltage	0.0 V to V_{CC}
Case operating temperature range (T_C)	-55° to +125°C
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

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

Setup time LOAD before clock (t_{SU}):

Device types 01-04 (LOAD to CLK)	45 ns (minimum)
Device type 05 ($\overline{U/D}$ to CLK)	62 ns (minimum)
Device types 03 and 04 (CLR to CLK)	45 ns (minimum)
Device types 01-04 (ENBLP, ENBLT)	60 ns (minimum)
Device type 05 ($\overline{ENBLG}$ to CLK)	62 ns (minimum)
Device type 10 (CE to CLK)	23 ns (minimum)
Device types 05 (A, B, C, and D to LOAD)	45 ns (minimum)
Device types 06 and 07 (A, B, C, and D to $\overline{LOAD}$)	33 ns (minimum)

Hold time (t_h):

Device types 01-04 (CLK to A, B, C, and D)	15 ns (minimum)
Device types 01-04 (CLK to LOAD)	8 ns (minimum)
Device types 03 and 04 (CLK to CLR)	8 ns (minimum)
Device type 05 (CLK to $\overline{U/D}$)	8 ns (minimum)
Device types 05-07 ($\overline{LOAD}$ to A, B, C, and D)	8 ns (minimum)
Device type 10 (CLK to CE)	23 ns (minimum)
Device type 05 (CLK to $\overline{ENBLG}$)	8 ns (minimum)

Clock pulse width ($t_{p(clock)}$):

Device types 01-04, 10	30 ns (minimum)
Device type 05	38 ns (minimum)
Device type 08	26 ns (minimum)
Device type 09	24 ns (minimum)
Device types 11-13	27 ns (minimum)
Device types 06 and 07	45 ns (minimum)

Reset pulse width ($t_{p(reset)}$):

Device types 01, 02, 10-13	24 ns (minimum)
Device type 06	78 ns (minimum)
Device type 07	39 ns (minimum)
Device types 08 and 09	38 ns (minimum)

Clock enable pulse width ($t_{p(CE)}$):

Device type 10	30 ns (minimum)
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1.4 Recommended operating conditions – Continued.

Load pulse width ($t_{p(\text{load})}$):	
Device types 05 and 07	38 ns (minimum)
Device type 06	78 ns (minimum)
Removal time (t_{REM}) (LOAD, CLR to CLK):	
Device types 01 and 02	38 ns (minimum)
Device type 05	45 ns (minimum)
Device types 06 and 07	33 ns (minimum)
Device type 08	23 ns (minimum)
Device type 09	15 ns (minimum)
Device types 10-13	30 ns (minimum)

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 Terminal connections. The terminal connections shall be as specified on figure 1.

3.3.2 Logic diagram. The logic diagram shall be as specified on figure 2.

3.3.3 Truth tables. The truth tables shall be as specified on figure 3.

3.3.4 Switching time test circuit and waveforms. The switching time test circuit and waveforms shall be as specified on figure 4.

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 herein.

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 40 (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 may be open or connected to $V_{CC}/2$. Resistors R1 are optional on both inputs and open outputs, and required on outputs connected to $V_{CC}/2$. $R1 = 470\Omega$ to 47 k Ω .
 - ii. For static burn-in II, all inputs shall be connected through the R1 resistors to V_{CC} . Outputs may be open or connected to $V_{CC}/2$. Resistors are optional on open outputs, and required on outputs connected to $V_{CC}/2$. $R = 470\Omega$ to 47 k Ω .
 - iii. $V_{CC} = 6.0\text{ V} \pm 0.5\text{ V}$.
 $V_{CC}/2 = V_{CC}/2 \pm 0.5\text{ V}$.

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- (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 of MIL-STD-883.
- i. For dynamic burn-in, all inputs shall be connected through the resistors in parallel to a common CP. Input resistors = 470Ω to $47\text{ k}\Omega \pm 20\%$.
 - ii Output resistors = $1\text{ k}\Omega \pm 5\%$.
 - iii $V_{CC} = 6.0\text{ V} \pm 0.5\text{ V}$.
 - iv $V_{CC}/2 = V_{CC}/2 \pm 0.5\text{ V}$.
 - v CP = CP1, CP2 = CP1/2, CP = 25 kHz to 1 MHz $\pm 50\%$ square wave; duty cycle = $50\% \pm 15\%$; $V_{IH} = 4.5\text{ V}$ minimum to V_{CC} maximum; $V_{IL} = 0.0\text{ V} \pm 0.5\text{ V}$; $t_{THL}, t_{TLH} \leq 500\text{ ns}$.
- 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.

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} 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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ -55°C ≤ T _C ≤ +125°C unless otherwise specified	Device type	V _{CC}	Limits		Unit
					Min	max	
High level output voltage	V _{OH1} <u>2/</u>	V _{IH} = 1.5 V V _{IL} = 0.3 V I _{OH} = -20 μA	All	2.0V	1.95		V
	V _{OH2} <u>2/</u>	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OH} = -20 μA	All	4.5V	4.45		V
	V _{OH3}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OH} = -20 μA	All	6.0V	5.95		V
	V _{OH4} <u>2/</u>	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OH} = -4.0 mA	All	4.5V	3.7		V
	V _{OH5}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OH} = -5.2 mA	All	6.0V	5.2		V
Low level output voltage	V _{OL1} <u>2/</u>	V _{IH} = 1.5 V V _{IL} = 0.3 V I _{OL} = 20 μA	All	2.0V		0.05	V
	V _{OL2} <u>2/</u>	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OL} = 20 μA	All	4.5V		0.05	V
	V _{OL3}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OL} = 20 μA	All	6.0V		0.05	V
	V _{OL4} <u>2/</u>	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OL} = 4.0 mA	All	4.5V		0.4	V
	V _{OL5}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OL} = 5.2 mA	All	6.0V		0.4	V
Positive input clamp voltage	V _{IC+}	I _{IN} = 1 mA T _C = +25°C	All	GND		1.5	V
Negative input clamp voltage	V _{IC-}	I _{IN} = -1 mA T _C = +25°C	All	OPEN		-1.5	V
Input current low	I _{IL}	V _{IN} = GND	All	6.0V		-0.1	μA
Input current high	I _{IH}	V _{IN} = V _{CC}	All	6.0V		0.1	μA
Short circuit output current	I _{OS1} <u>2/</u>	V _O = GND V _I = GND	All	2.0V	-2	-50	mA
	I _{OS2} <u>2/</u>		All	4.5V	-15	-150	
	I _{OS3} <u>2/</u>		All	6.0V	-25	-180	
	I _{OS4}		All	4.0V	-10	-120	
Supply current quiescent	I _{CCH} , I _{CCL}	V _I = 6.0 V, GND	All	6.0V		20	μA
Input capacitance	C _{IN}	T _C = +25°C	01-07			10	pF
Clock, control capacitance	C _C		All			15	pF

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ -55°C ≤ T _C ≤ +125°C unless otherwise specified	Device type	V _{CC}	Limits		Unit		
					Min	max			
Device equivalent capacitance	C _{PD} 2/	No load, T _A = +25°C	01-04	4.5V		90	pF		
			05-07	4.5V		100	pF		
			08,09	4.5V		55	pF		
			10	4.5V		110	pF		
			11,13	4.5V		88	pF		
			12	4.5V		55	pF		
Propagation delay, clock to outputs	t _{PLH1} , t _{PHL1}	C _L = 50 pF ± 10% 3/ 4/	01-04	4.5V	8	48	ns		
CLK to Q			05	4.5V	7	52	ns		
U or D to Q			06,07	4.5V	11	64	ns		
CLK A to QA			08	4.5V	4	34	ns		
CLK A to QC			08	4.5V	9	68	ns		
CLK B to QB			08	4.5V	4	36	ns		
CLK B to QC			08	4.5V	5	49	ns		
CLK B to QD			08	4.5V	4	36	ns		
CLK to QA			09	4.5V	4	32	ns		
CLK to QB			09	4.5V	6	45	ns		
CLK to QC			09	4.5V	8	56	ns		
CLK to QD			09	4.5V	9	73	ns		
Propagation delay, CLK to N – carry out CLK to QN			t _{PHL1} , t _{PLH1}	C _L = 50 pF ± 10% 3/ 4/	10	4.5V	6	54	ns
					11,12,13	4.5V	5	49	ns
							10	98	ns
							15	147	ns
					11,12,13		20	196	ns
	25	245					ns		
	30	294					ns		
	35	343					ns		
	11,13	40			392		ns		
		45			441		ns		
		50			490		ns		
		55			539		ns		
	11	60			588		ns		
		65			637		ns		
11	70	686	ns						
	Propagation delay, clock to carry out	t _{PLH2} , t _{PHL2}	01-04	4.5V	8	50	ns		
05			4.5V	5	35	ns			
06,07			4.5V	4	39	ns			
Propagation delay, CLK to MIN/MAX			t _{PLH3} , t _{PHL3}	05	4.5V	8	60	ns	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions ^{1/} -55°C ≤ T _C ≤ +125°C unless otherwise specified	Device type	V _{CC}	Limits		Unit
					Min	max	
Propagation delay, ENT to RCO	t _{PLH4} , t _{PHL4}	C _L = 50 pF ± 10% ^{3/} ^{4/}	01-04	4.5V	7	46	ns
CE to carry-out			10	4.5V	6	54	ns
ENG to RCO			05	4.5V	6	47	ns
Propagation delay, LOAD to Q	t _{PLH5} , t _{PHL5}		05	4.5V	8	68	ns
Propagation delay, A, B, C, and D to Q	t _{PLH6} , t _{PHL6}		06,07	4.5V	12	68	ns
Propagation delay, U/D to MIN/MAX	t _{PLH7} , t _{PHL7}		05	4.5V	7	56	ns
Propagation delay, U/D to RCO	t _{PLH8} , t _{PHL8}		05	4.5V	6	44	ns
Propagation delay, CLR to Q	t _{PHL9}		05	4.5V	8	54	ns
Propagation delay, CLR to QN	t _{PHL9}		01,02	4.5V	8	53	ns
Propagation delay, CLR to N – carry out	t _{PHL9} , t _{PLH9}		06,07	4.5V	11	62	ns
Propagation delay, CLR to RCO	t _{PHL10}		08,09	4.5V	5	39	ns
Propagation delay, Qn to Qn+1	t _{PHL11} , t _{PLH11}		11,13	4.5V	6	56	ns
Output transition time	t _{TLH} , t _{THL}		12	4.5V	5	49	ns
Maximum frequency test	f _{MAX}		10	4.5V	6	54	ns
		C _L = 50 pF ± 10% 50% duty cycle ^{3/} ^{4/}	01-04, 09	4.5V	21		MHz
			05	4.5V	17		MHz
			06,07	4.5V	14		MHz
			08	4.5V	23		MHz
			10	4.5V	17		MHz
			11-13	4.5V	21		MHz

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

^{2/} Guaranteed but not tested.

^{3/} Tested at V_{CC} = 4.5 V at +125°C for sample testing and V_{CC} = 4.5 V at +25°C for screening. Guaranteed at other V_{CC} voltages and temperatures, see table IA and IB as appropriate and the exception in 4.4.1d.

^{4/} See the formula for determining switching times and maximum frequencies shown in tables IA and IB, respectively.

TABLE IA. Calculated dynamic figures at $-55^{\circ}\text{C}/+25^{\circ}\text{C}$ ambient temperature.

V_{CC}	$T_A = (^{\circ}\text{C})$	
	+125	-55/+25
2.0 V <u>1/</u>	5.00 X	5.00 Y
4.5 V	X = 1	0.75 X = Y
6.0 V <u>1/</u>	0.85 X	0.85 Y

Normalized numbers
(+125°C equals 1)

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 f_{MAX} figures at $-55^{\circ}\text{C}/+25^{\circ}\text{C}$ ambient temperature.

V_{CC}	$T_A = (^{\circ}\text{C})$	
	+125	-55/+25
2.0 V <u>1/</u>	0.2 X	0.2 Y
4.5 V	X = 1	1.33 X = Y
6.0 V <u>1/</u>	1.18 X	1.18 Y

Normalized numbers
(+125°C equals 1)

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 II. Burn-in and electrical test requirements.

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	req'd <u>4/</u>	
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.

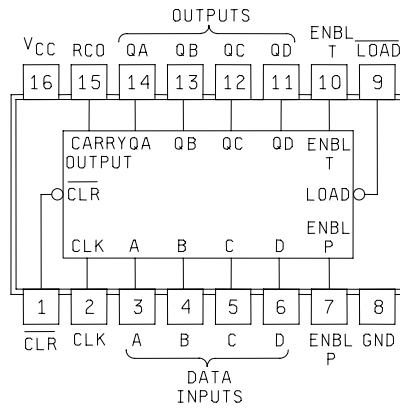
2/ * indicates PDA applies to subgroup 1 (see 4.2.1).

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 measurement without delta measurements within 24 hours after burn-in completion (removal of bias).

MIL-M-38510/663A

DEVICE TYPES 01,02,03 AND 04
CASES E,F AND X



DEVICE TYPES 01,02,03 AND 04
CASE 2

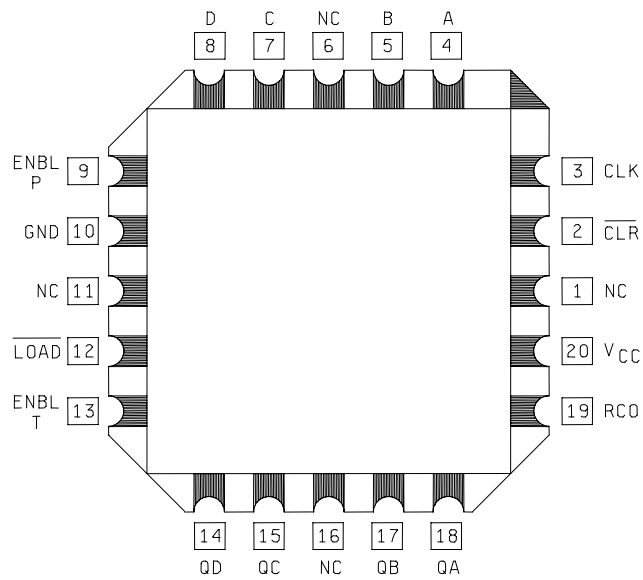


FIGURE 1. Terminal connections.

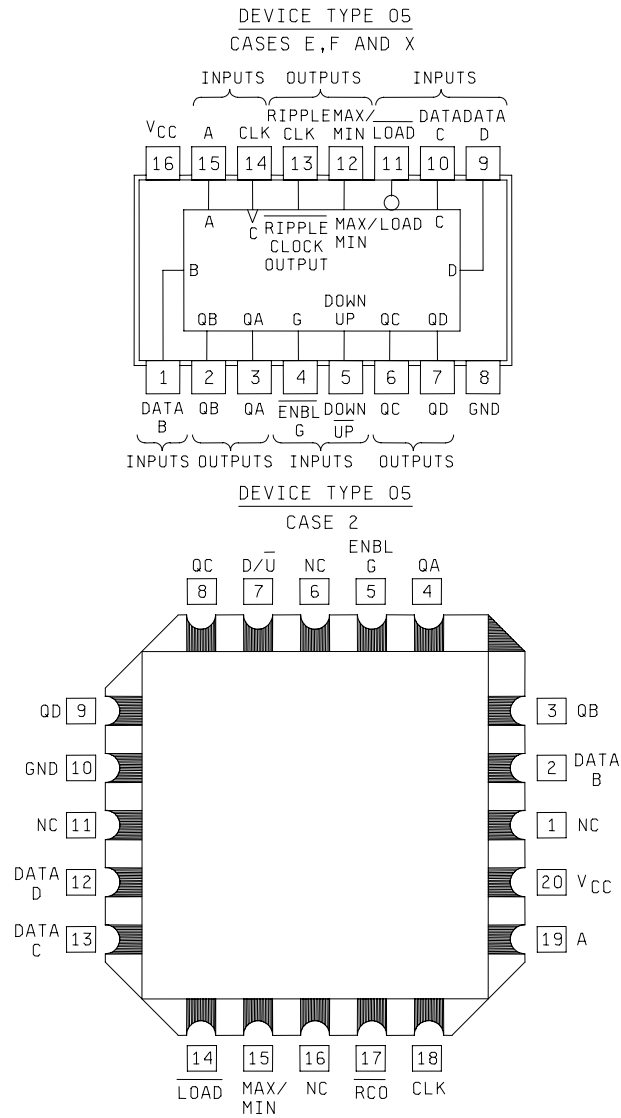


FIGURE 1. Terminal connections - Continued.

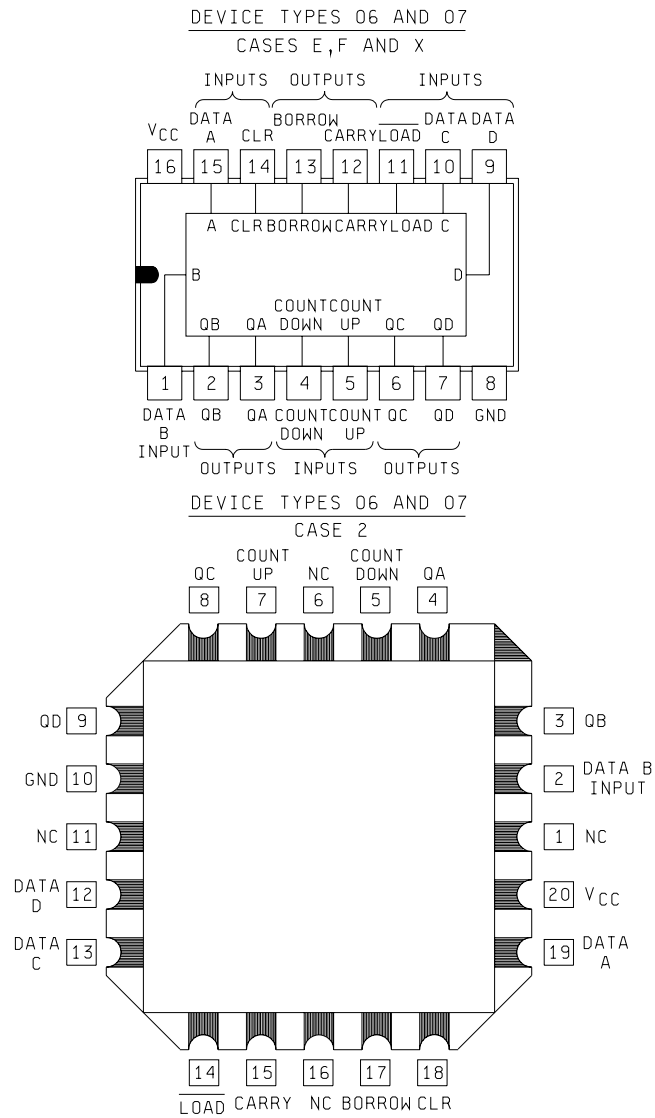


FIGURE 1. Terminal connections - Continued.

MIL-M-38510/663A

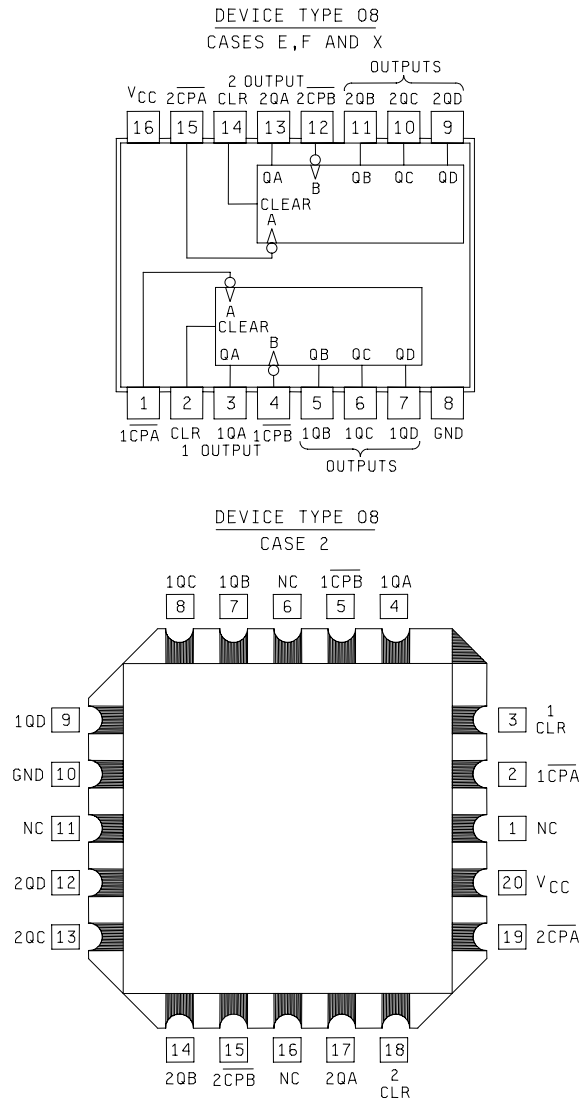


FIGURE 1. Terminal connections - Continued.

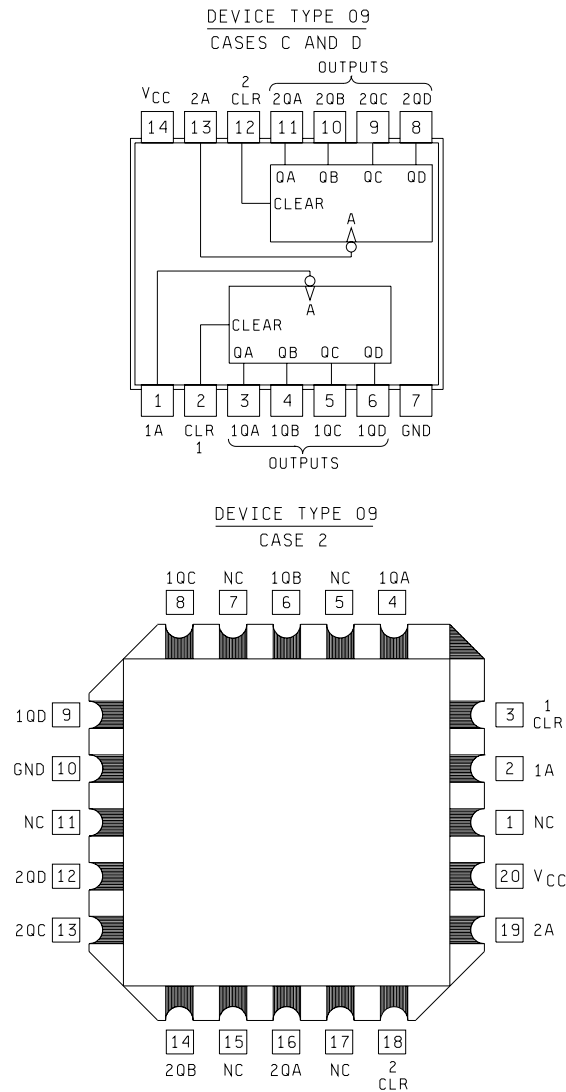


FIGURE 1. Terminal connections - Continued.

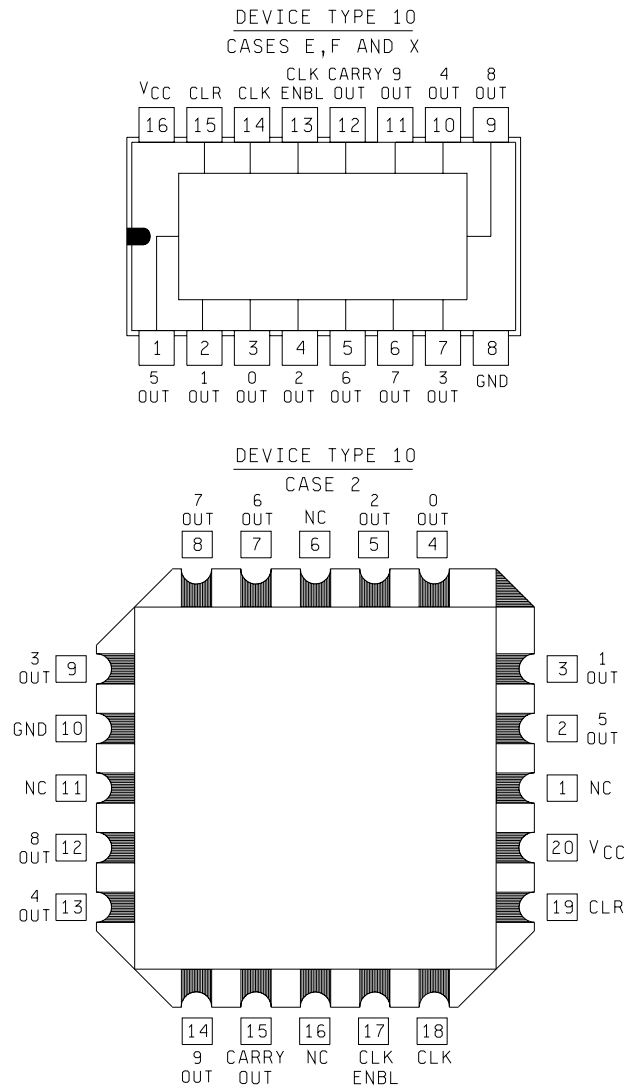


FIGURE 1. Terminal connections - Continued.

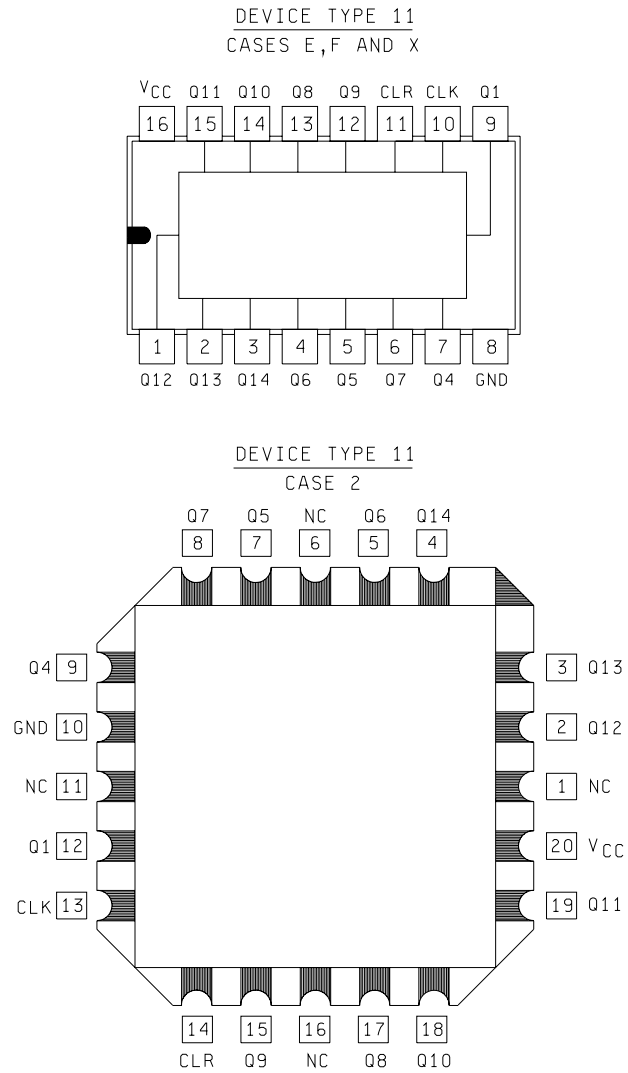


FIGURE 1. Terminal connections - Continued.

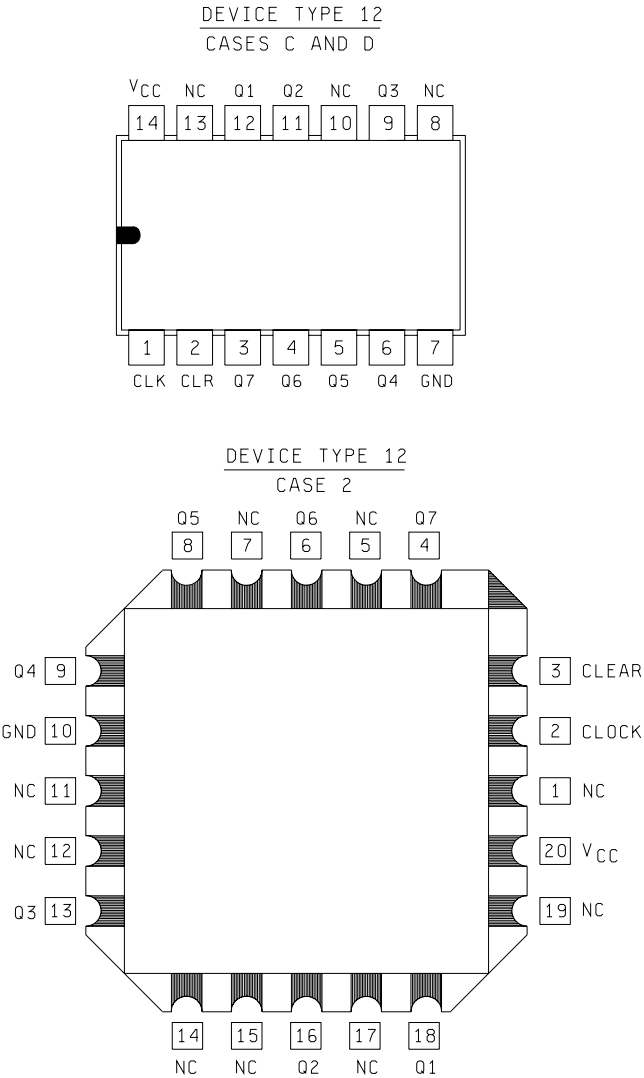


FIGURE 1. Terminal connections - Continued.

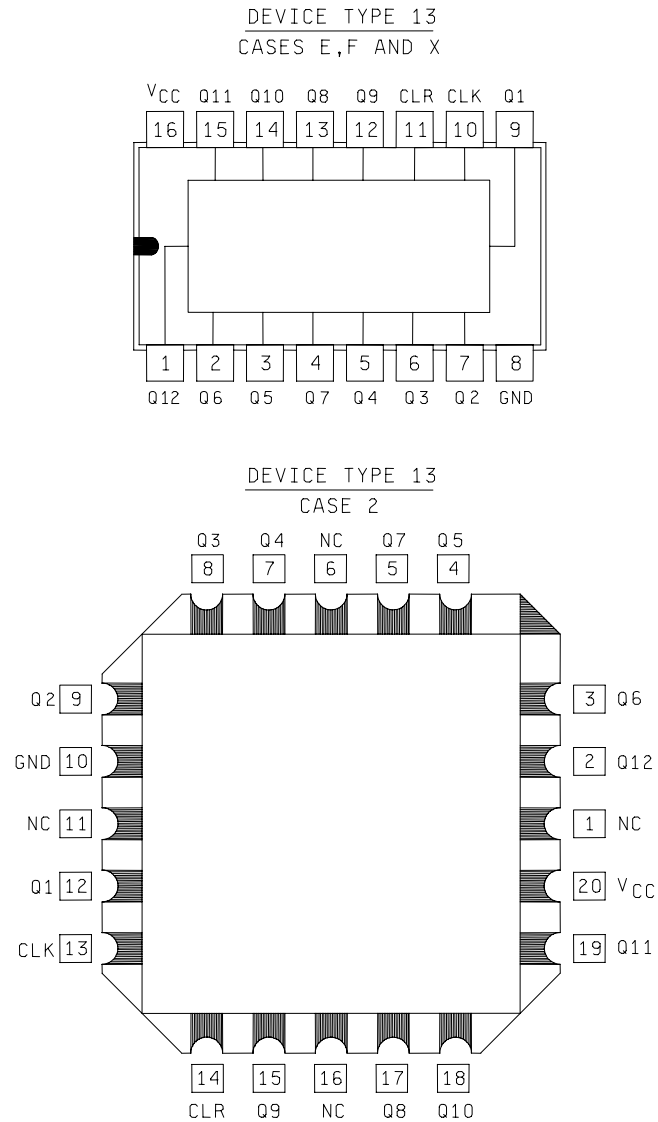


FIGURE 1. Terminal connections - Continued.

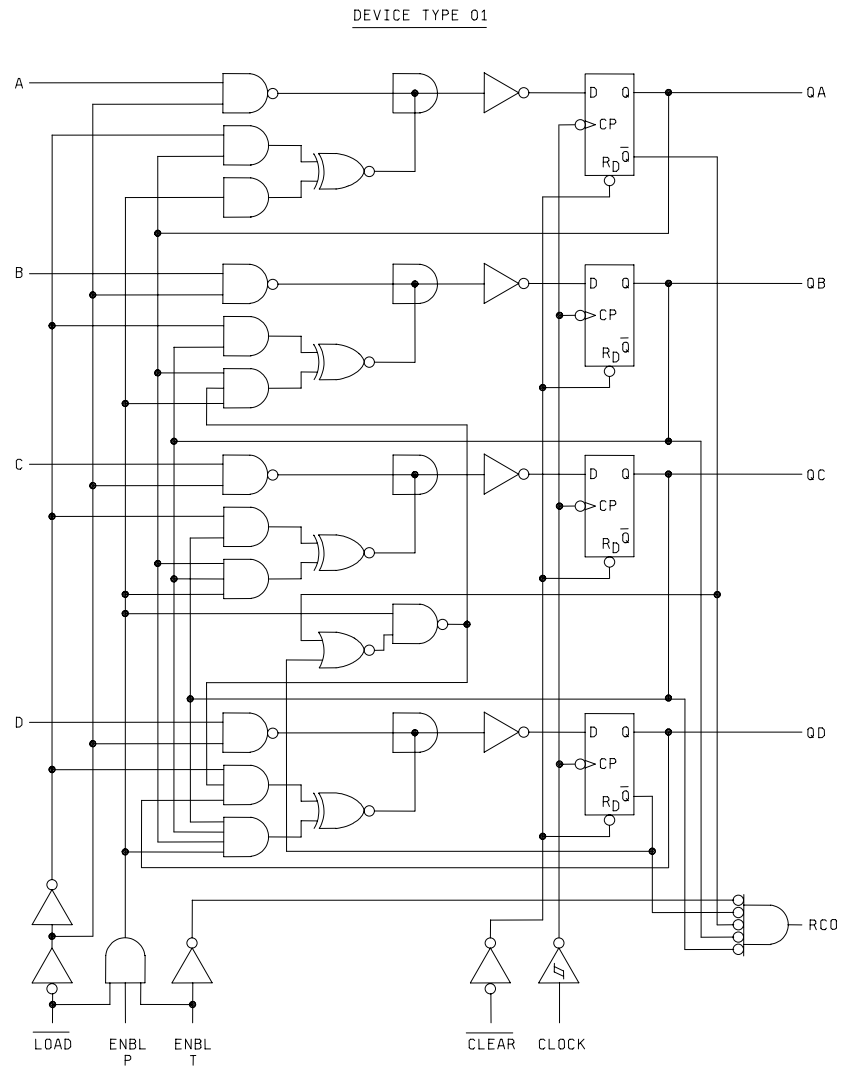
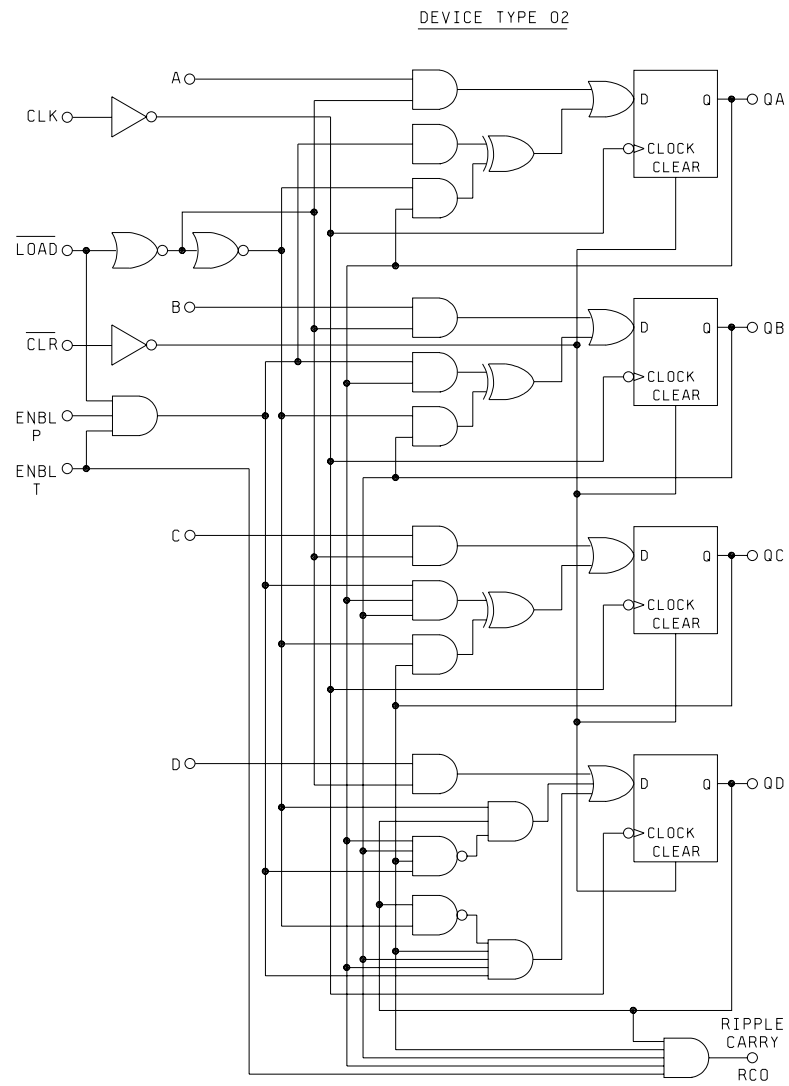


FIGURE 2. Logic diagrams.

FIGURE 2. Logic diagrams – Continued.

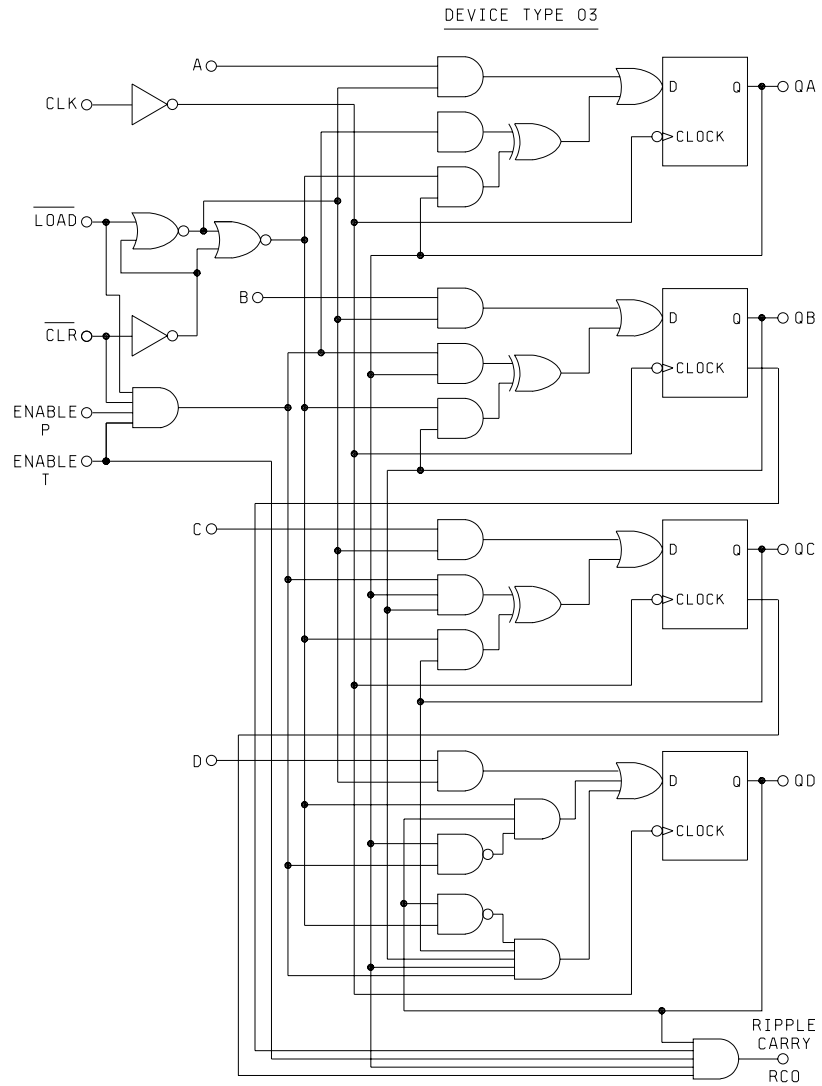
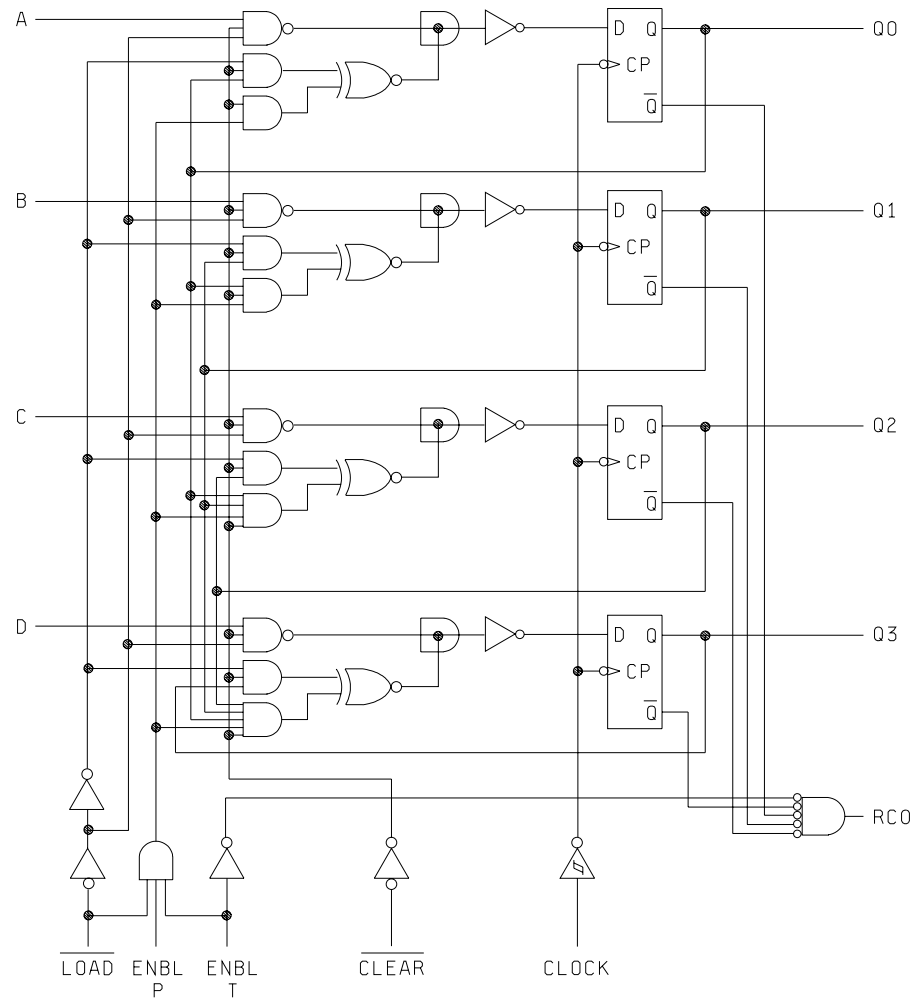


FIGURE 2. Logic diagrams – Continued.

DEVICE TYPE 04

FIGURE 2. Logic diagrams – Continued.

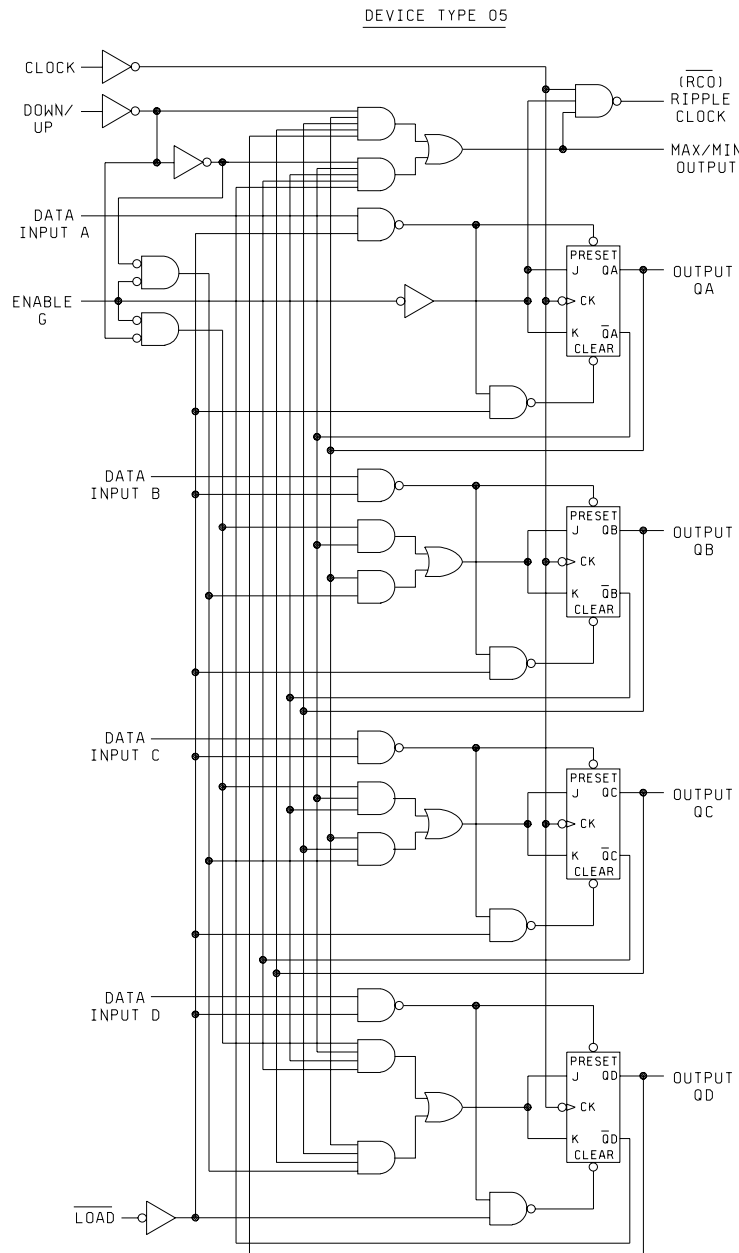


FIGURE 2. Logic diagrams – Continued.

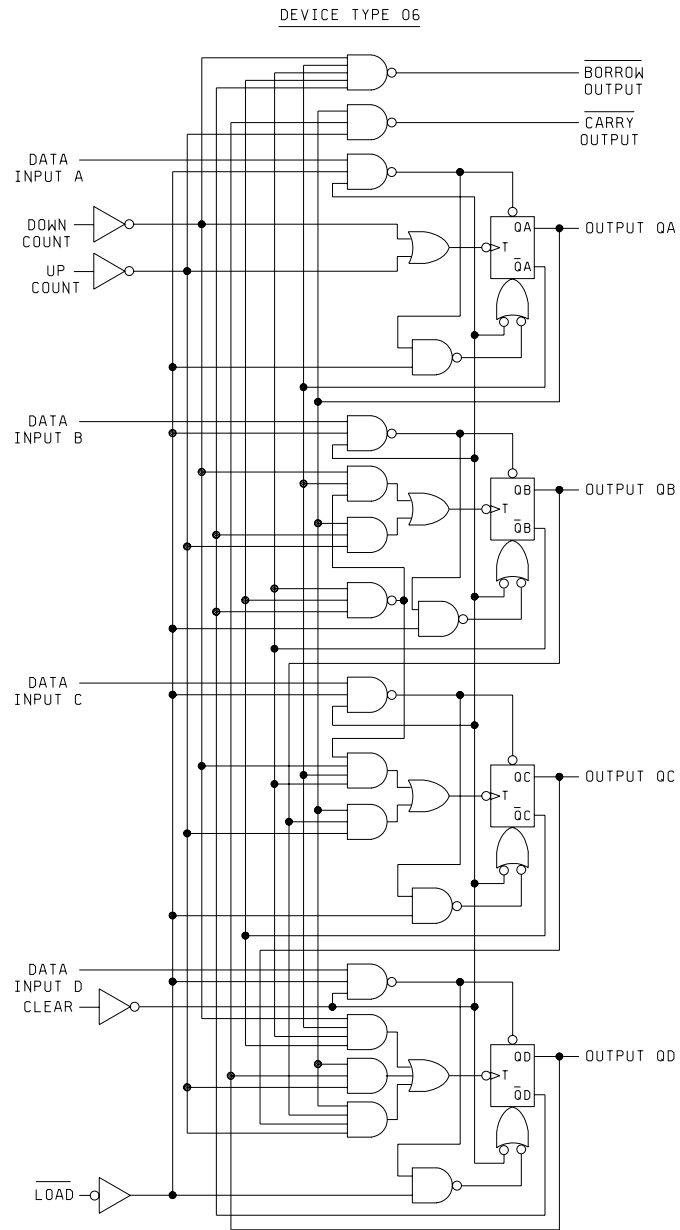


FIGURE 2. Logic diagrams – Continued.

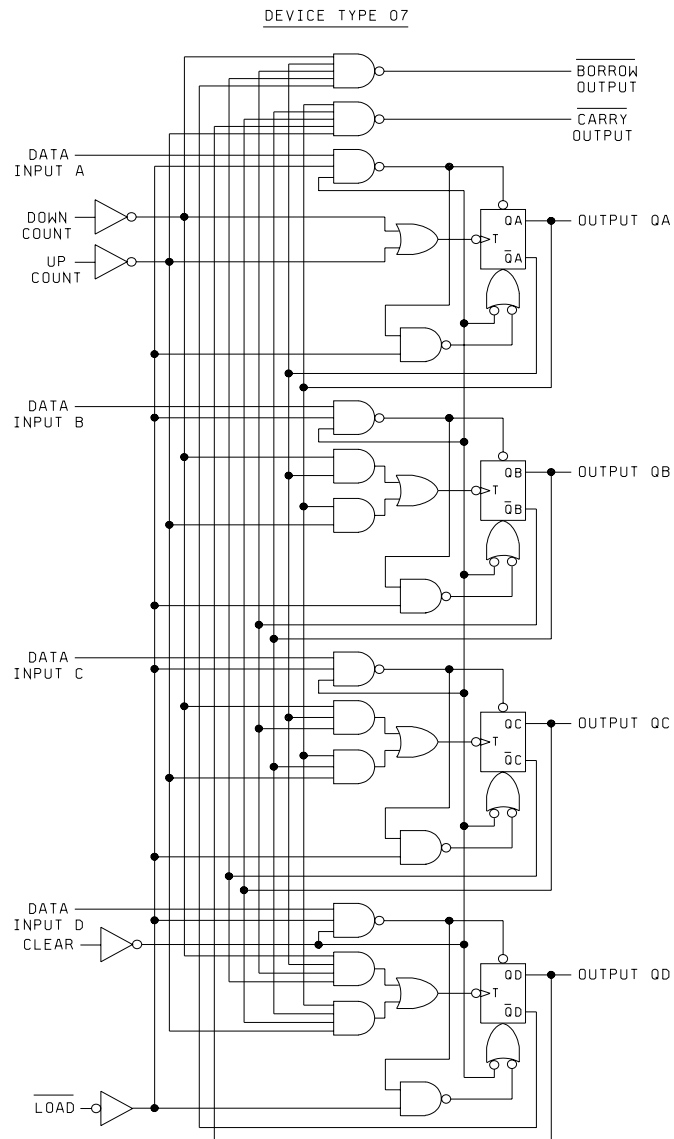
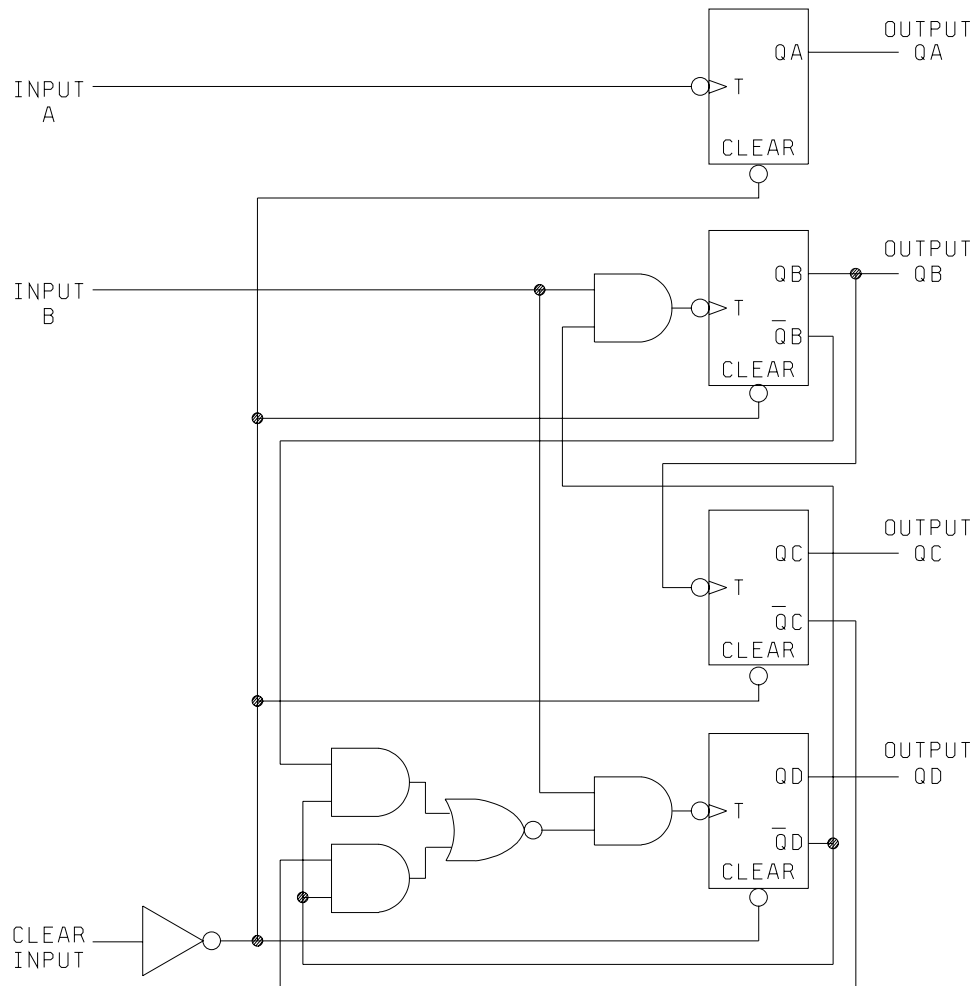
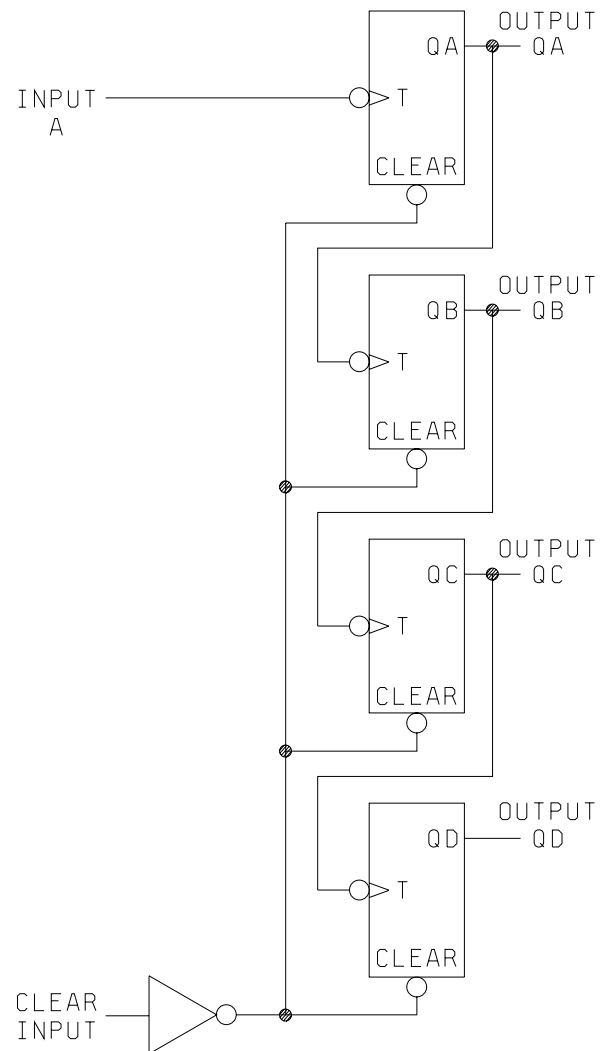
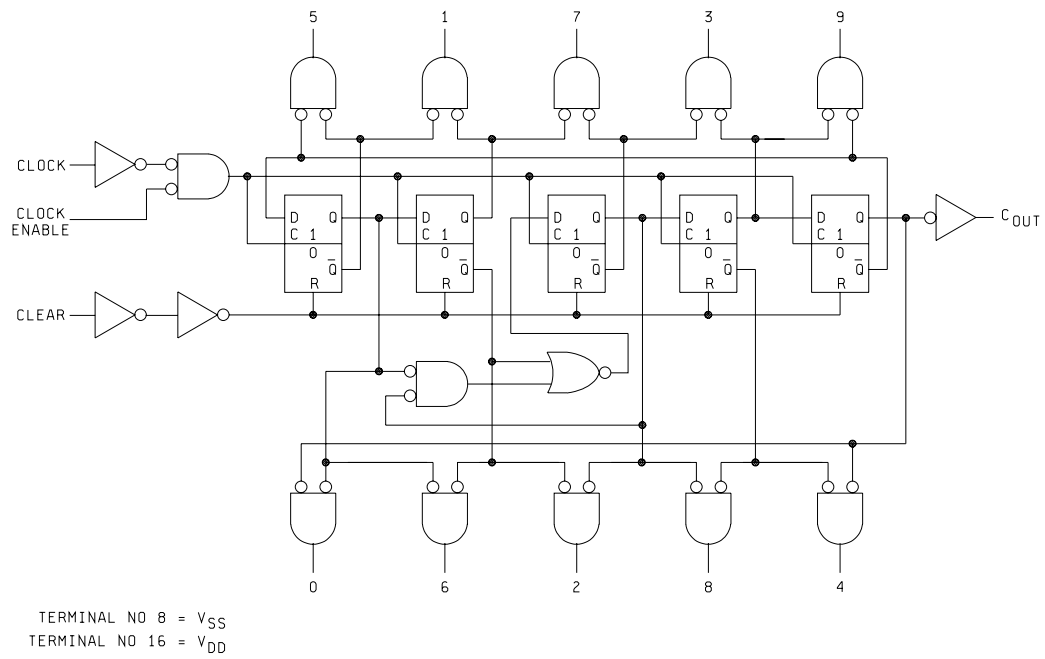


FIGURE 2. Logic diagrams – Continued.

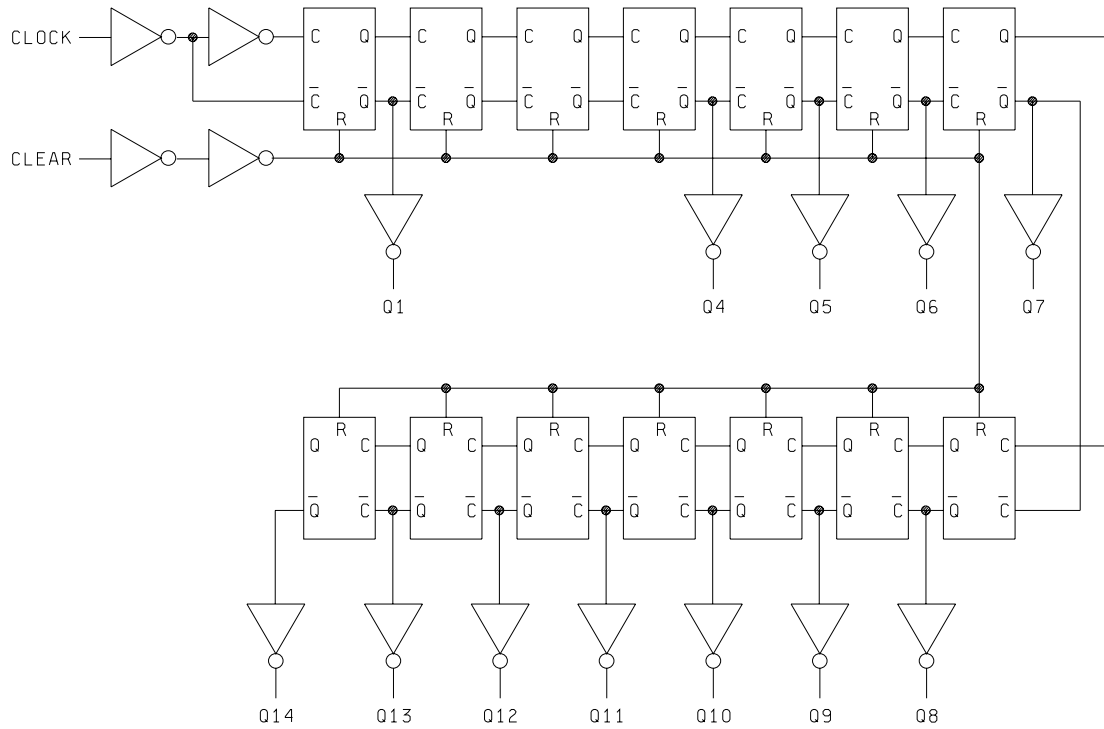
DEVICE TYPE 08FIGURE 2. Logic diagrams – Continued.

DEVICE TYPE 09FIGURE 2. Logic diagrams – Continued.

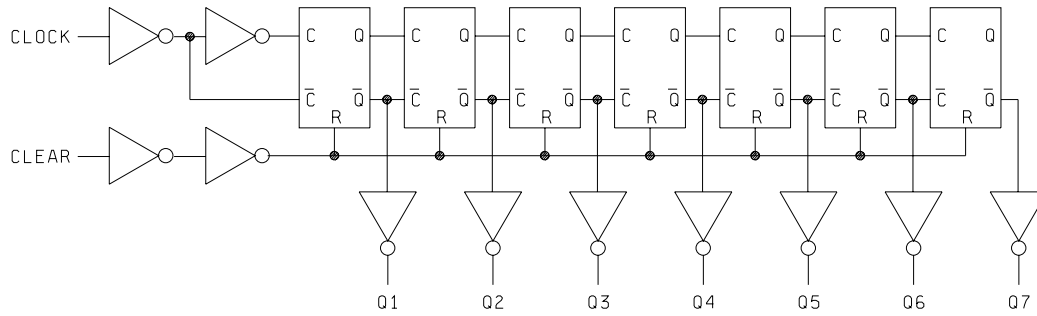
DEVICE TYPE 10

FIGURE 2. Logic diagrams – Continued.

DEVICE TYPE 11

FIGURE 2. Logic diagrams – Continued.

DEVICE TYPE 12



DEVICE TYPE 13

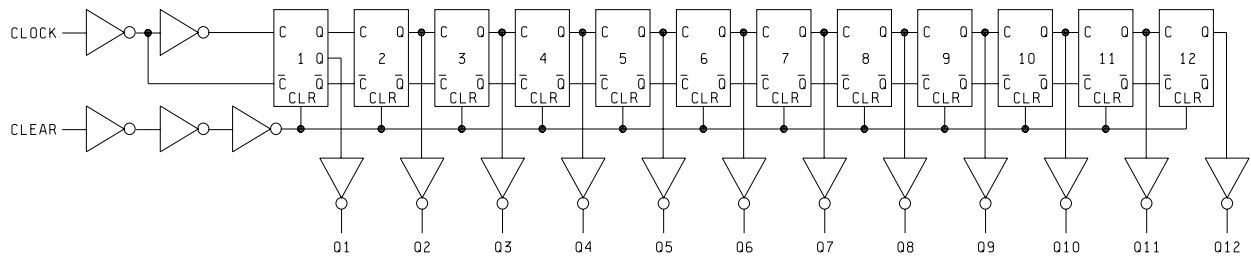


FIGURE 2. Logic diagrams – Continued.

Device type 01

Synchronous truth table

Inputs at time t_n									Outputs at time $t_n + 1$				
CLOCK	ENABLE P	ENABLE T	LOAD	A	B	C	D	CLEAR	QA	QB	QC	QD	RCO
CP	L	X	H	X	X	X	X	H	NC	NC	NC	NC	NC
CP	X	L	H	X	X	X	X	H	NC	NC	NC	NC	L
CP	H	H	H	X	X	X	X	H	Previous count plus 1 (See note 1)				H if count = 9 L if count < 9
CP	X	H	L	X	X	X	X	H	A	B	C	D	H if count = 9 L if count < 9
CP	X	L	L	X	X	X	X	H	A	B	C	D	L
X	X	X	X	X	X	X	X	L	L	L	L	L	L

Device type 01

Asynchronous truth table

Inputs at time t_n									Outputs at time $t_n + 1$				
CLOCK	ENABLE P	ENABLE T	LOAD	A	B	C	D	CLEAR	QA	QB	QC	QD	RCO
X	X	X	X	X	X	X	X	L	L	L	L	L	L

H = High level voltage
L = Low level voltage
X = Irrelevant

FIGURE 3. Truth tables.

Device type 01

Up count sequence table

QA (LBS)	QB	QC	QD (MSB)
L	L	L	L
H	L	L	L
L	H	L	L
H	H	L	L
L	L	H	L
H	L	H	L
L	H	H	L
H	H	H	L
L	L	L	H
H	L	L	H

NOTES:

1. See up count sequence table.
2. L = V_{IL} for inputs, V_{OL} for outputs.
3. H = V_{IH} for inputs, V_{OH} for outputs.
4. X = V_{IH} or V_{IL} .
5. CP = Clock pulse.
6. NC = No change.

FIGURE 3. Truth tables – Continued.

Device type 02

Synchronous truth table

Inputs at time t_n									Outputs at time t_n+1				
CLOCK	ENABLE P	ENABLE T	$\overline{\text{LOAD}}$	A	B	C	D	$\overline{\text{CLEAR}}$	QA	QB	QC	QD	$\overline{\text{RCO}}$
CP	L	X	H	X	X	X	X	H	NC	NC	NC	NC	NC
CP	X	L	H	X	X	X	X	H	NC	NC	NC	NC	L
CP	H	H	H	X	X	X	X	H	Previous count plus 1 (See note 1)				H if count = 15 L if count < 15
CP	X	H	L	X	X	X	X	H	A	B	C	D	H if count = 15 L if count < 15
CP	X	L	L	X	X	X	X	H	A	B	C	D	L
X	X	X	X	X	X	X	X	L	L	L	L	L	L

Device type 02

Asynchronous truth table

Inputs at time t_n									Outputs at time t_n+1				
CLOCK	ENABLE P	ENABLE T	$\overline{\text{LOAD}}$	A	B	C	D	$\overline{\text{CLEAR}}$	QA	QB	QC	QD	$\overline{\text{RCO}}$
X	L	X	X	X	X	X	X	L	L	L	L	L	L

H = High level voltage
 L = Low level voltage
 X = Irrelevant

FIGURE 3. Truth tables – Continued.

Device type 02

Up count sequence table

QA (LBS)	QB	QC	QD (MSB)
L	L	L	L
H	L	L	L
L	H	L	L
H	H	L	L
L	L	H	L
H	L	H	L
L	H	H	L
H	H	H	L
L	L	L	H
H	L	L	H
L	H	L	H
H	H	L	H
L	L	H	H
H	L	H	H
L	H	H	H
H	H	H	H

NOTES:

1. See up count sequence table.
2. L = V_{IL} for inputs, V_{OL} for output.
3. H = V_{IH} for inputs, V_{OH} for outputs.
4. X = V_{IH} or V_{IL} .
5. CP = Clock pulse.
6. NC = No change.

FIGURE 3. Truth tables – Continued.

Device type 03

Synchronous truth table

Inputs at time t_n									Outputs at time t_{n+1}				
CLOCK	ENABLE P	ENABLE T	$\overline{\text{LOAD}}$	A	B	C	D	$\overline{\text{CLEAR}}$	QA	QB	QC	QD	$\overline{\text{RCO}}$
CP	L	X	H	X	X	X	X	H	NC	NC	NC	NC	NC
CP	X	L	H	X	X	X	X	H	NC	NC	NC	NC	L
CP	H	H	H	X	X	X	X	H	Previous count plus 1 (See note 1)				H if count = 9 L if count < 9
CP	X	H	L	X	X	X	X	H	A	B	C	D	H if count = 9 L if count < 9
CP	X	L	L	X	X	X	X	H	A	B	C	D	L
CP	X	X	X	X	X	X	X	L	L	L	L	L	L

Up count sequence table

QA (LBS)	QB	QC	QD (MSB)
L	L	L	L
H	L	L	L
L	H	L	L
H	H	L	L
L	L	H	L
H	L	H	L
L	H	H	L
H	H	H	L
L	L	L	H
H	L	L	H

NOTES:

1. See up count sequence table.
2. L = V_{IL} for inputs, V_{OL} for output.
3. H = V_{IH} for inputs, V_{OH} for outputs.
4. X = V_{IH} or V_{IL} .
5. CP = Clock pulse.
6. NC = No change.

FIGURE 3. Truth tables – Continued.

Device type 04

Synchronous truth table

Inputs at time t_n									Outputs at time t_{n+1}				
CLOCK	ENABLE P	ENABLE T	$\overline{\text{LOAD}}$	A	B	C	D	$\overline{\text{CLEAR}}$	QA	QB	QC	QD	$\overline{\text{RCO}}$
CP	L	X	H	X	X	X	X	H	NC	NC	NC	NC	NC
CP	X	L	H	X	X	X	X	H	NC	NC	NC	NC	L
CP	H	H	H	X	X	X	X	H	Previous count plus 1 (See note 1)				H if count = 15 L if count < 15
CP	X	H	L	X	X	X	X	H	A	B	C	D	H if count = 15 L if count < 15
CP	X	L	L	X	X	X	X	H	A	B	C	D	L
CP	X	X	X	X	X	X	X	L	L	L	L	L	L

FIGURE 3. Truth tables – Continued.

Device type 04

Up count sequence table

QA (LBS)	QB	QC	QD (MSB)
L	L	L	L
H	L	L	L
L	H	L	L
H	H	L	L
L	L	H	L
H	L	H	L
L	H	H	L
H	H	H	L
L	L	L	H
H	L	L	H
L	H	L	H
H	H	L	H
L	L	H	H
H	L	H	H
L	H	H	H
H	H	H	H

NOTES:

1. See up count sequence table.
2. L = V_{IL} for inputs, V_{OL} for output.
3. H = V_{IH} for inputs, V_{OH} for outputs.
4. X = V_{IH} or V_{IL} .
5. CP = Clock pulse.
6. NC = No change.

FIGURE 3. Truth tables – Continued.

Device type 05

Mode select table

Inputs				Mode
LOAD	$\overline{\text{ENABLE G}}$	$\overline{\text{U/D}}$	CLK	
H	L	L	$\uparrow$	Count up
H	L	H	$\uparrow$	Count down
L	X	X	X	Preset (Asynchronous)
H	H	X	X	No change (Hold)

Ripple carry truth table

Inputs		Outputs	
$\overline{\text{ENABLE G}}$	CLOCK	Max/Min	$\overline{\text{RCO}}$
L	$\downarrow$	H	$\downarrow$
H	X	X	H
X	X	L	H

H = High level voltage

L = Low level voltage

X = Irrelevant

 $\uparrow$ = Low-to-high clock transition $\downarrow$ = Negative-going clock pulse

NOTE: The up count and down count sequence for device type 05 is identical as that for device type 07.

FIGURE 3. Truth tables – Continued.

Device type 06

Inputs at time t_n								Outputs at time $t_n + 1$					
Count up	Count down	LOAD	A	B	C	D	CLEAR	QA	QB	QC	QD	CARRY	BORROW
H	H	H	X	X	X	X	L	NC	NC	NC	NC	H	H
X	X	X	X	X	X	X	H	L	L	L	L	H	H
X	X	L	X	X	X	X	L	A	B	C	D	H	H
P	H	H	X	X	X	X	L	Previous count plus 1 (See note 1)				H	H
H	P	H	X	X	X	X	L	Previous count minus 1 (See note 2)				H	H
N	H	H	X	X	X	X	L	NC	NC	NC	NC	N if count = 9 H if count $\neq$ 9	
H	N	H	X	X	X	X	L	NC	NC	NC	NC		N if count = 9 H if count $\neq$ 9

NOTES:

1. See up count sequence table.
2. See down count sequence table.
3. L = V_{IL} for inputs, V_{OL} for outputs.
4. H = V_{IH} for inputs, V_{OH} for outputs.
5. X = V_{IH} or V_{IL} .
6. NC = No change.
7. NA = Not applicable.
8. P = Positive-going pulse.
9. N = Negative-going pulse.

FIGURE 3. Truth tables – Continued.

Device type 06

Up count sequence table

QA (LSB)	QB	QC	QD	$\overline{\text{CARRY}}$
L	L	L	L	H
H	L	L	L	H
L	H	L	L	H
H	H	L	L	H
L	L	H	L	H
H	L	H	L	H
L	H	H	L	H
H	H	H	L	H
L	L	L	H	H
H	L	L	H	L

Down count sequence table

QA (LSB)	QB	QC	QD (MSB)	$\overline{\text{BORROW}}$
H	L	L	H	H
L	L	L	H	H
H	H	H	L	H
L	H	H	L	H
H	L	H	L	H
L	L	H	L	H
H	H	L	L	H
L	H	L	L	H
H	L	L	L	H
L	L	L	L	L

FIGURE 3. Truth tables – Continued.

Device type 07

Inputs at time t_n								Outputs at time $t_n + 1$					
Count up	Count down	LOAD	A	B	C	D	CLEAR	QA	QB	QC	QD	CARRY	BORROW
H	H	H	X	X	X	X	L	NC	NC	NC	NC	H	H
X	X	X	X	X	X	X	H	L	L	L	L	H	H
X	X	L	X	X	X	X	L	A	B	C	D	H	H
P	H	H	X	X	X	X	L	Previous count plus 1 (See note 1)				H	H
H	P	H	X	X	X	X	L	Previous count minus 1 (See note 2)				H	H
N	H	H	X	X	X	X	L	NC	NC	NC	NC	N if count = 15 H if count $\neq$ 15	
H	N	H	X	X	X	X	L	NC	NC	NC	NC		N if count = 0 H if count $\neq$ 0

NOTES:

1. See up count sequence table.
2. See down count sequence table.
3. L = V_{IL} for inputs, V_{OL} for outputs.
4. H = V_{IH} for inputs, V_{OH} for outputs.
5. X = V_{IH} or V_{IL} .
6. NC = No change.
7. NA = Not applicable.
8. P = Positive-going pulse.
9. N = Negative-going pulse.

FIGURE 3. Truth tables – Continued.

Device type 07

Up count sequence table

QA (LSB)	QB	QC	QD	$\overline{\text{CARRY}}$
L	L	L	L	H
H	L	L	L	H
L	H	L	L	H
H	H	L	L	H
L	L	H	L	H
H	L	H	L	H
L	H	H	L	H
H	H	H	L	H
L	L	L	H	H
H	L	L	H	H
L	H	L	H	H
H	H	L	H	H
L	L	H	H	H
H	L	H	H	H
L	H	H	H	H
H	H	H	H	L

Down count sequence table

QA (LSB)	QB	QC	QD (MSB)	$\overline{\text{BORROW}}$
H	H	H	H	H
L	H	H	H	H
H	L	H	H	H
L	L	H	H	H
H	H	L	H	H
L	H	L	H	H
H	L	L	H	H
L	L	L	H	H
H	H	H	L	H
L	H	H	L	H
H	L	H	L	H
L	L	H	L	H
H	H	L	L	H
L	H	L	L	H
H	L	L	L	H
L	L	L	L	L

FIGURE 3. Truth tables – Continued.

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Device type 08

BCD count sequence
(See note 1)

Count	Outputs			
	QD	QC	QB	QA
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H

Bi-quinary (5-2)
(See note 2)

Count	Outputs			
	QA	QD	QC	QB
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	H	L	L	L
6	H	L	L	H
7	H	L	H	L
8	H	L	H	H
9	H	H	L	L

NOTES:

1. Output QA is connected to input B for BCD count.
2. Output QD is connected to input A for bi-quinary count.

Device type 09

Count sequence

Count	Outputs			
	QD	QC	QB	QA
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H
10	H	L	H	L
11	H	L	H	H
12	H	H	L	L
13	H	H	L	H
14	H	H	H	L
15	H	H	H	H

FIGURE 3. Truth tables – Continued.

Device type 10

Input				Outputs			
CLOCK	CLOCK ENABLE	CLEAR	Dn-1	Qn	Nn	“On	
			On chip				
X	H	L	X	Qn-1	Nn-1	“On-1	(No change)
X	X	H	X	L	L	H	
↓	X	L	X	Qn-1	Nn-1	“On-1	(No change)
↑	L	L	L	L	N-1n-1	“9n-1	
↑	L	L	H	H	N-1n-1	“9n-1	

Device type 11

CLOCK	CLEAR	Output state
↑	L	No change
↓	L	Advance to next state
X	H	All outputs are low

Device type 12

CLOCK	CLEAR	Output state
↑	L	No change
↓	L	Advance to next state
X	H	All outputs are low

Device type 13

CLOCK	CLEAR	Output state
↑	L	No change
↓	L	Advance to next stage
X	H	All outputs are low

H = High level voltage (steady-state)

L = Low level voltage (steady-state)

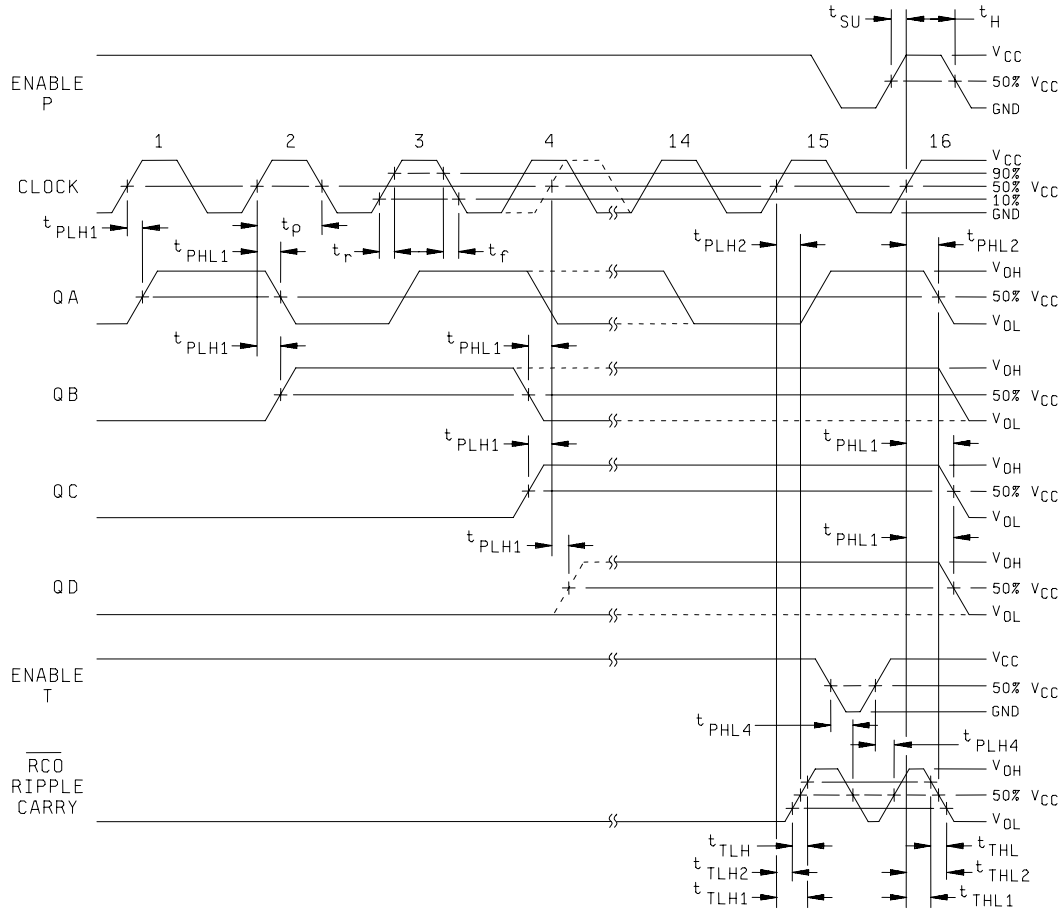
X = Irrelevant

↑ = Low-to-high clock transition

↓ = High-to-low clock transition

FIGURE 3. Truth tables – Continued.

DEVICE TYPES 02 AND 04
SYNCHRONOUS

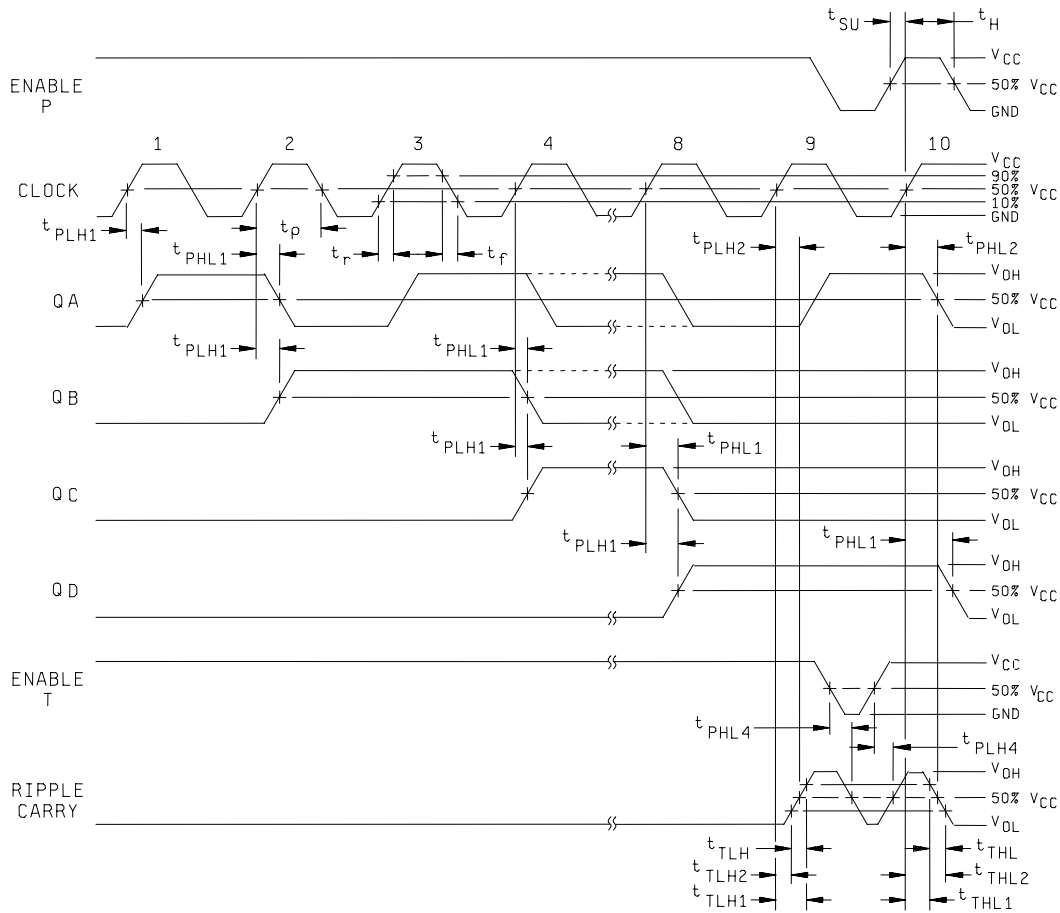


NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 30 ns.
2. ENABLE input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (ENABLE T) = t_p (ENABLE P) ≤ 68 ns, $t_{SETUP} \leq 60$ ns, $t_{HOLD} \leq 8$ ns.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 30 ns, $PRR \geq 21$ MHz.
4. $C_L = 50$ pF ± 10 percent (including probe and jig capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{TLH} = t_{TLH1} - t_{TLH2}$, $t_{THL} = t_{THL2} - t_{THL1}$.

FIGURE 4. Switching time test circuits and waveforms.

DEVICE TYPES 01 AND 03
SYNCHRONOUS

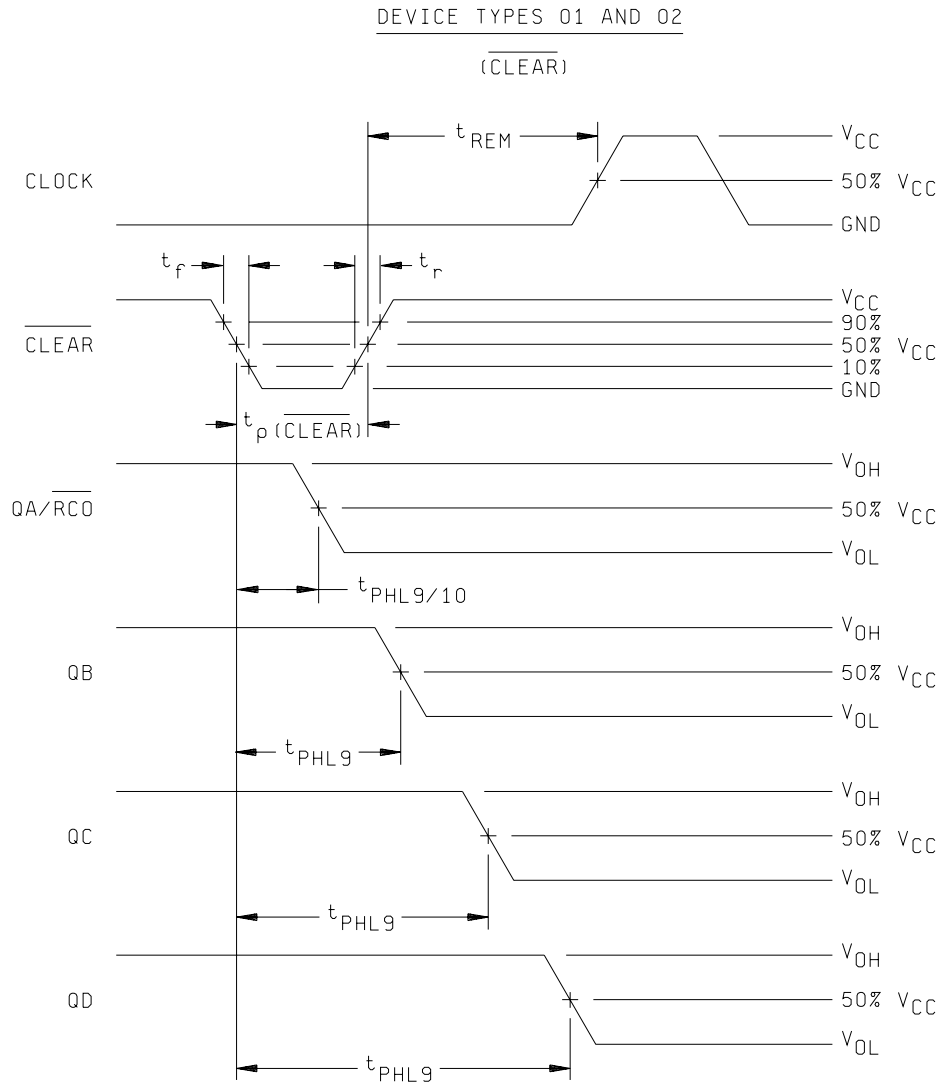


VOLTAGE WAVEFORMS

NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 30 ns.
2. ENABLE input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (ENABLE T) = t_p (ENABLE P) ≤ 68 ns, $t_{SETUP} \leq 60$ ns, $t_{HOLD} \leq 8$ ns.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 30 ns, $PRR \geq 21$ MHz.
4. $C_L = 50$ pF ± 10 percent (including probe and jig capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{TLH} = t_{TLH1} - t_{TLH2}$, $t_{THL} = t_{THL2} - t_{THL1}$.

FIGURE 4. Switching time test circuits and waveforms – Continued.

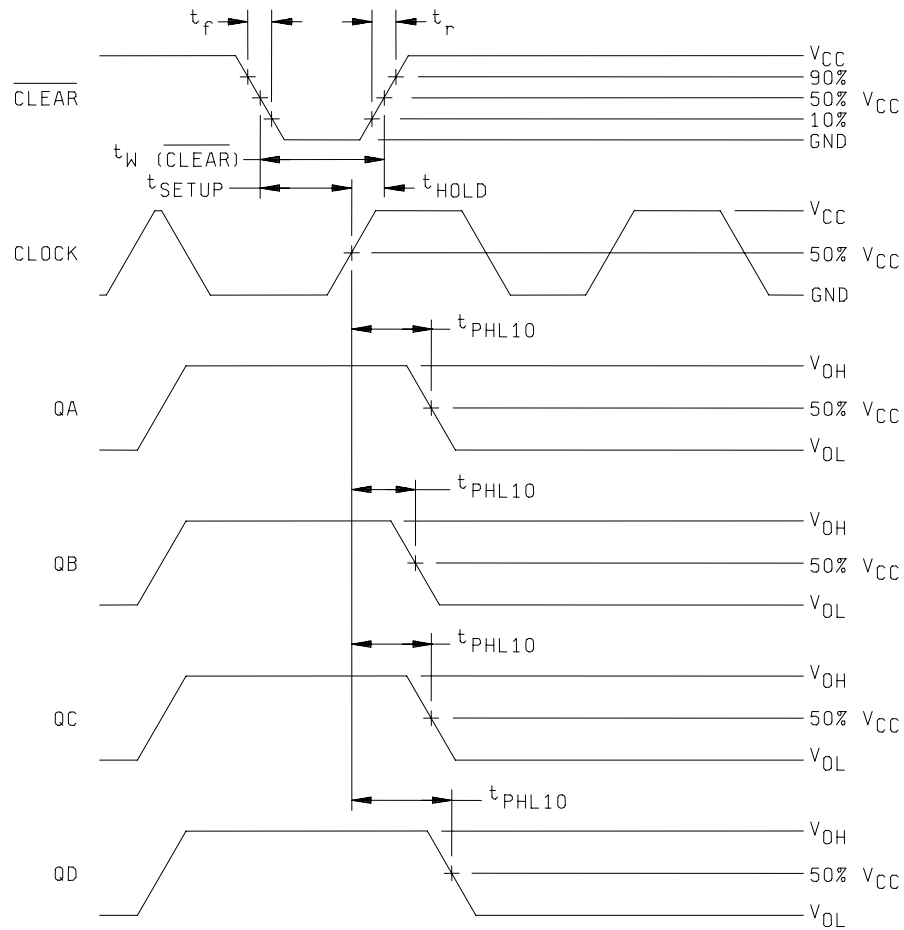


NOTES:

1. $\overline{\text{CLEAR}}$ device types 01 and 02 (asynchronous) pulses are active low and dominates regardless of the state of the clock.
2. $\overline{\text{CLEAR}}$ input pulse characteristics are as follows: $t_f = t_r \leq 6$ ns, clear $t_p(\overline{\text{CLR}}) \leq 24$ ns, $t_p(\text{CLK}) \leq 30$ ns, $t_{REM} \leq 38$ ns.
3. $C_L = 50$ pF ± 10 percent (including probe and jig capacitance).
4. Voltage measurements are to be made with respect to the network ground terminal.

FIGURE 4. Switching time test circuits and waveforms – Continued.

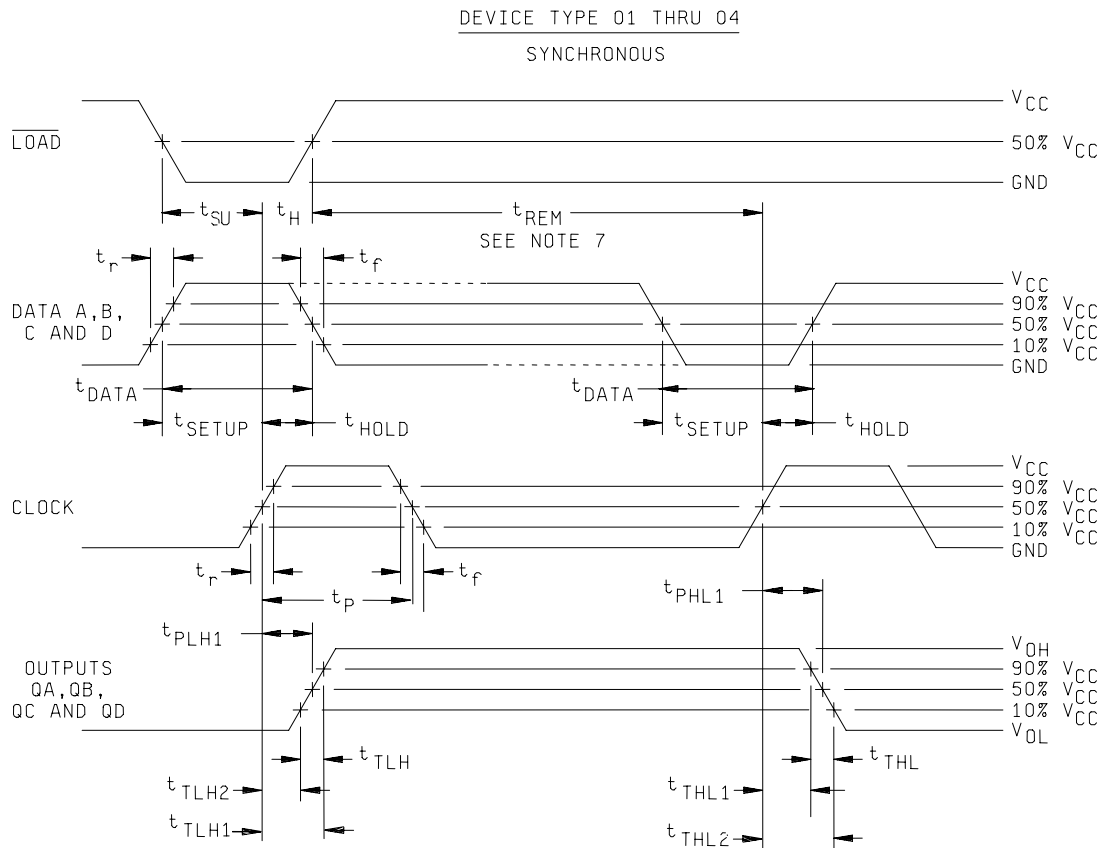
DEVICE TYPES 03 AND 04

 $\overline{\text{CLEAR}}$ 

NOTES:

1. $\overline{\text{CLEAR}}$ device types 03 and 04 (synchronous) pulses are active low and dominates regardless of the state of the clock.
2. $\overline{\text{CLEAR}}$ input pulse characteristics are as follows: $t_r = t_f \leq 6 \text{ ns}$, $t_p(\text{CLR}) \leq 56 \text{ ns}$, $t_r \leq 8 \text{ ns}$, $t_{\text{SU}} \leq 48 \text{ ns}$, $\text{PRR} \leq 1 \text{ MHz}$.
3. $C_L = 50 \text{ pF} \pm 10 \text{ percent}$ (including probe and jig capacitance).
4. $t_p(\text{CLK}) \leq 30 \text{ ns}$, $\text{PRR} \leq 1 \text{ MHz}$.
5. Voltage measurements are to be made with respect to the network ground terminal.

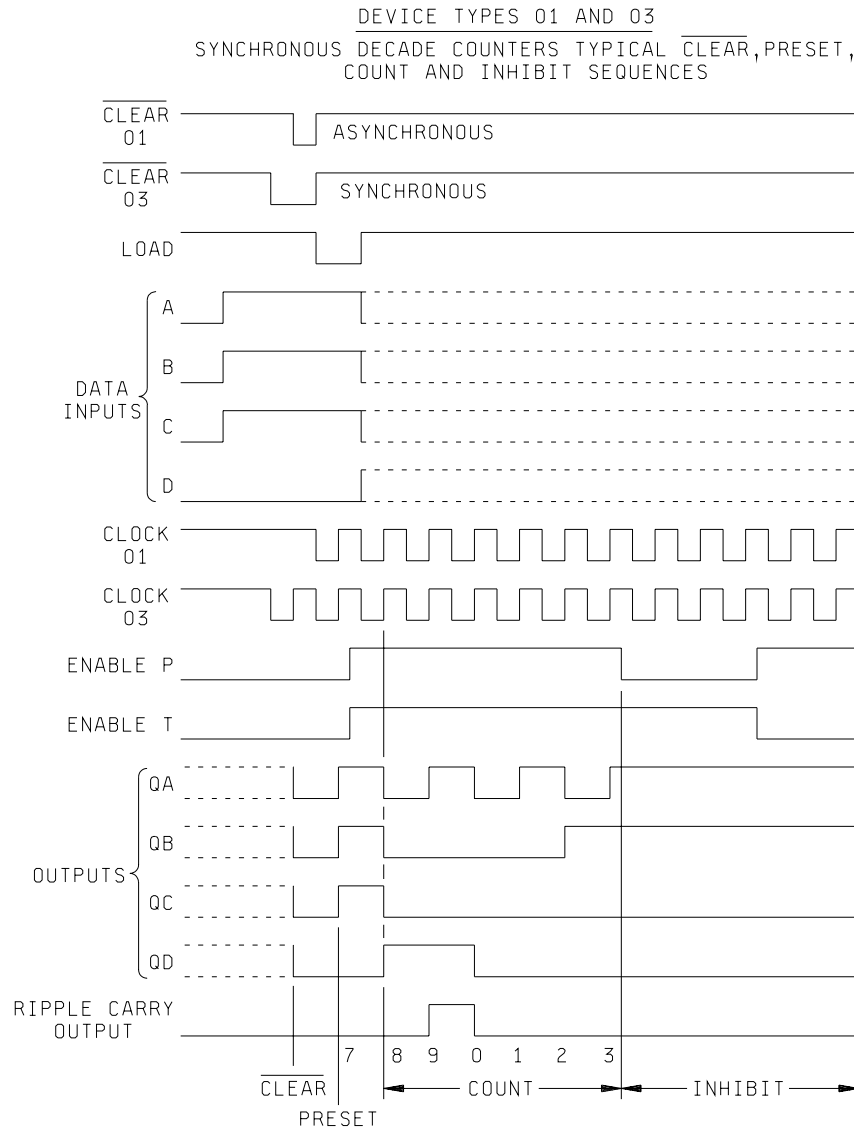
FIGURE 4. Switching time test circuits and waveforms – Continued.



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) = 60 ns, $t_{\text{SETUP}} \leq 45$ ns, $t_{\text{HOLD}} \leq 15$ ns.
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 ± 10 percent (including probe and jig capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{\text{TLH}} = t_{\text{TLH1}} - t_{\text{TLH2}}$, $t_{\text{THL}} = t_{\text{THL2}} - t_{\text{THL1}}$.
7. Device types 01 and 02 $t_{\text{REM}} \leq 38$ ns, load input characteristics:
 $t_r = t_f \leq 6$ ns, t_p (load) ≤ 53 ns, $t_{\text{SETUP}} \leq 45$ ns, $t_{\text{HOLD}} \leq 8$ ns.

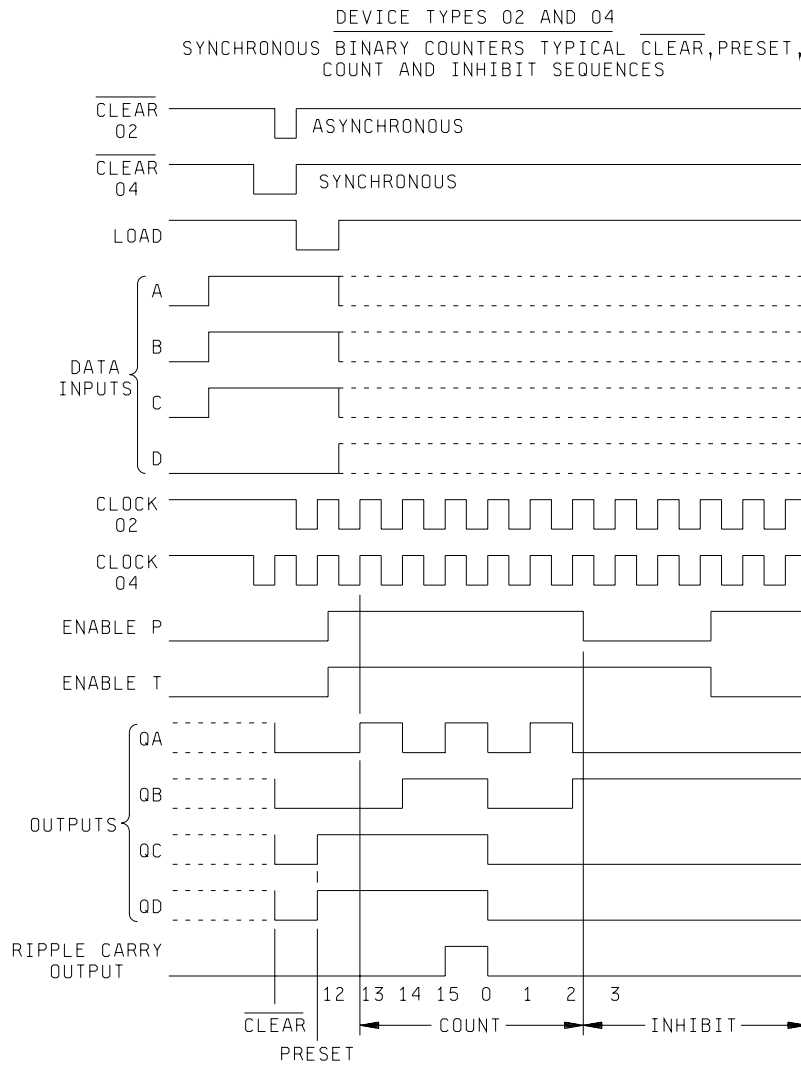
FIGURE 4. Switching time test circuits and waveforms – Continued.



Sequence:

1. CLEAR outputs to zero.
2. Preset BCD seven.
3. Count to eight, nine, zero, one, two, and three.
4. Inhibit.

FIGURE 4. Switching time test circuits and waveforms – Continued.

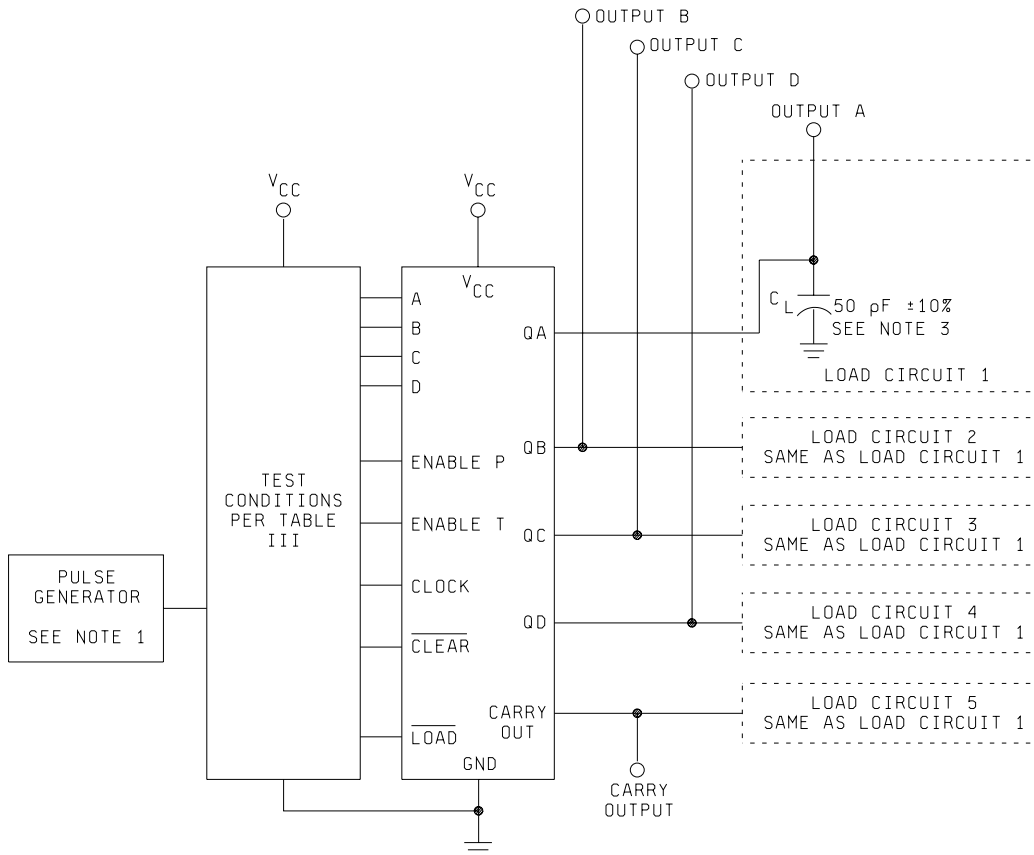


Sequence:

1. CLEAR outputs to zero.
2. Preset to binary.
3. Count to thirteen, fourteen, fifteen, zero, one, and two.
4. Inhibit.

FIGURE 4. Switching time test circuits and waveforms – Continued.

DEVICE TYPES 01,02,03 AND 04

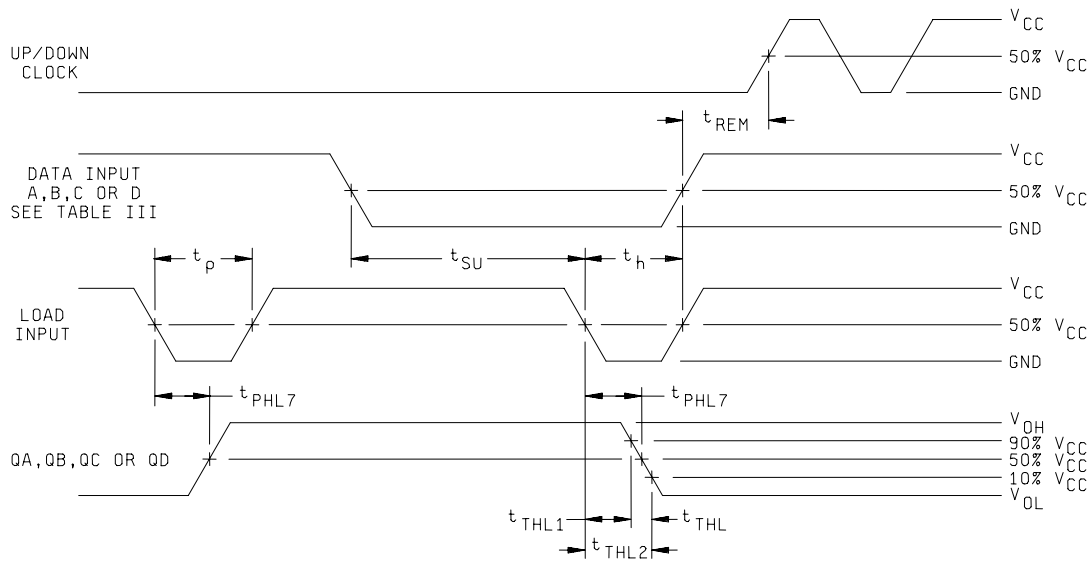


NOTES:

1. The pulse generator has the following characteristics: $V_{\text{gen}} = V_{\text{CC}}$, $t_r = t_f \leq 6 \text{ ns}$, $\text{PRR} \leq 1 \text{ MHz}$.
2. Voltage values are with respect to ground terminal.
3. C_L includes probe and jig capacitance.
4. f_{MAX} : $t_r = t_f \leq 6 \text{ ns}$.

FIGURE 4. Switching time test circuits and waveforms – Continued.

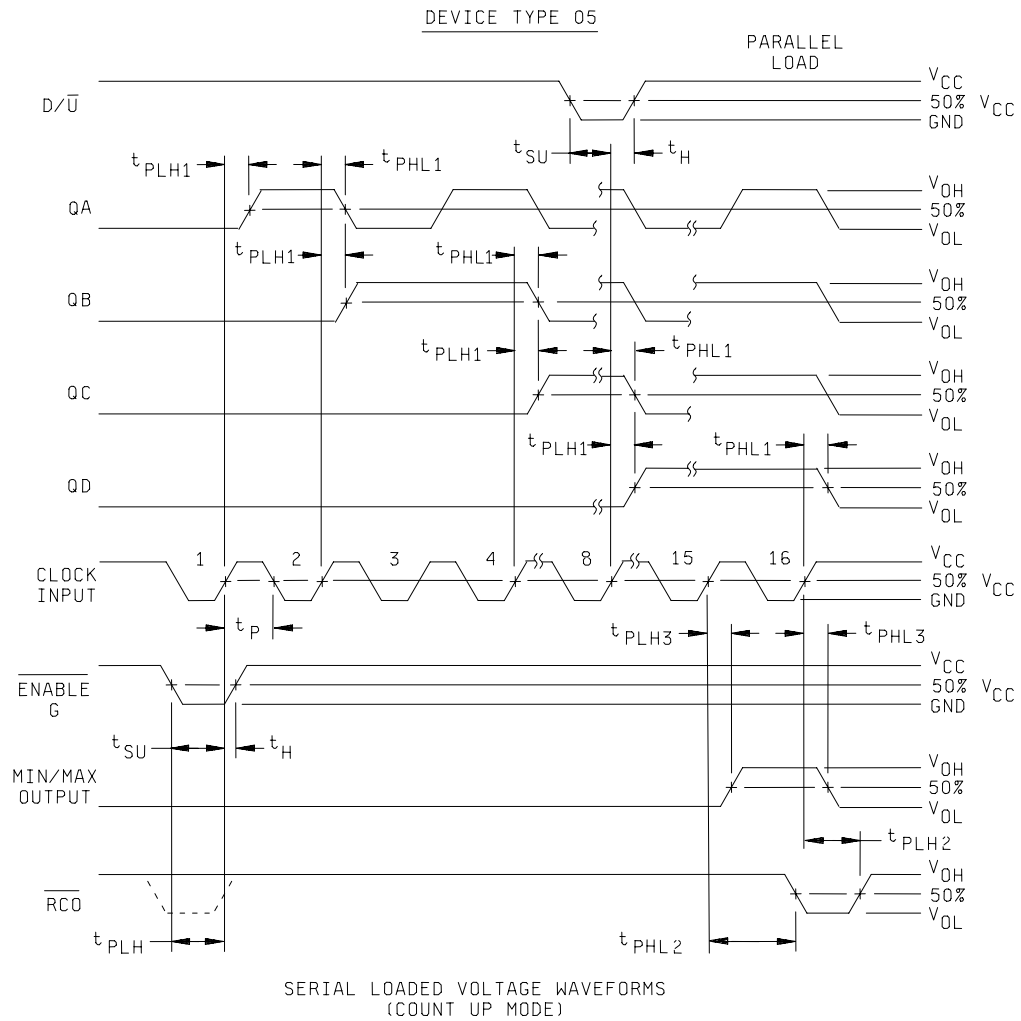
DEVICE TYPE 05



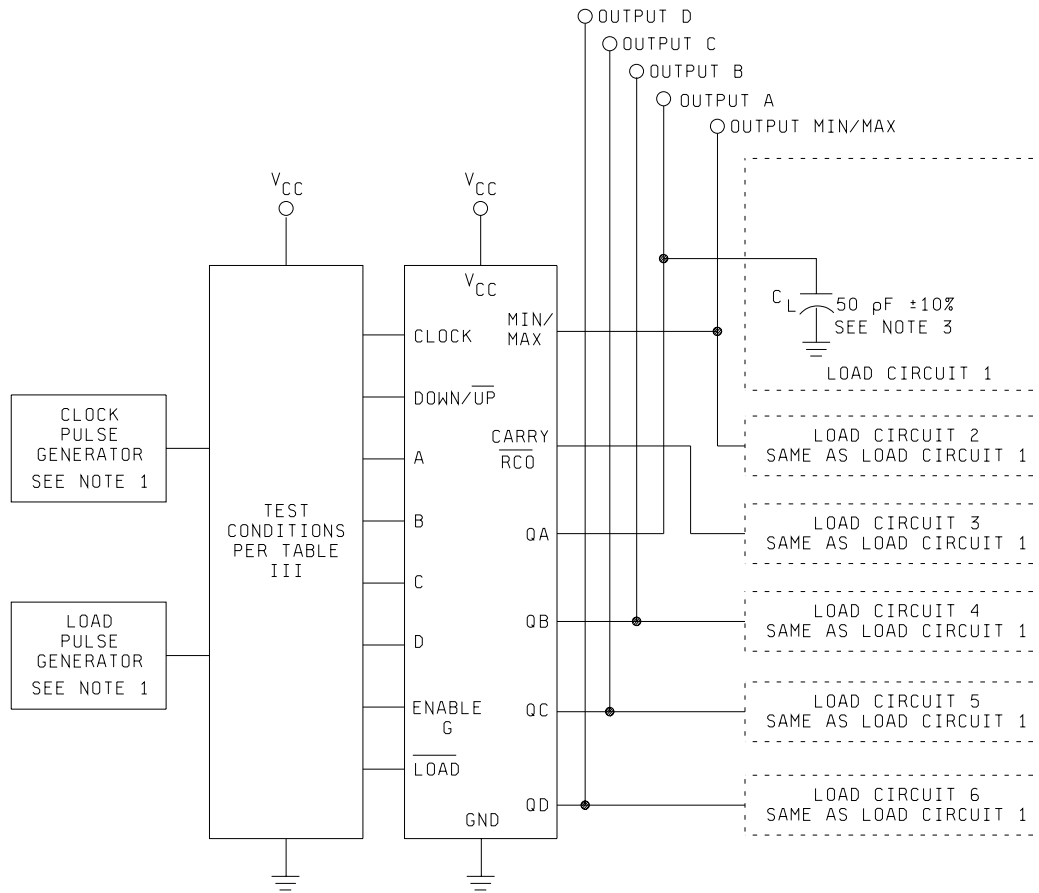
NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 38 ns.
2. Data input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (data) ≤ 53 ns, $t_{SETUP} \leq 45$ ns, $t_{HOLD} \leq 8$ ns.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 29 ns, $PRR \geq 17$ MHz.
4. $C_L = 50$ pF ± 10 percent (including probe and jig 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 4. Switching time test circuits and waveforms – Continued.

FIGURE 4. Switching time test circuits and waveforms – Continued.

DEVICE TYPE 05

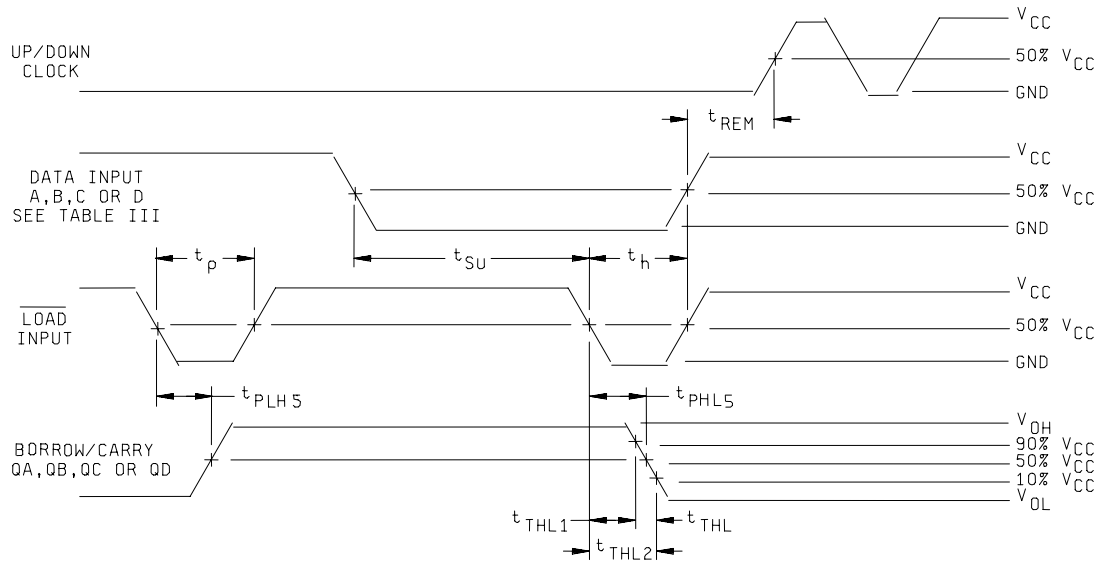


NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 38 ns, $PRR \leq 1$ MHz.
2. Load input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (load) = 36 ns, $t_{REM} \leq 45$ ns.
3. C_L Includes probe and jig capacitance.
4. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns; for 25°C, t_p (clock) ≥ 21 ns, $PRR \geq 23$ MHz; for 125°C, t_p (clock) ≥ 29 ns, $PRR \geq 17$ MHz.
5. ENABLE G input pulse characteristics: $t_{SETUP} = 62$ ns, (ENABLE G before clock), t_r (ENABLE G after clock) = 8 ns, $t_{SETUP} = 62$ ns, (down/up before clock), $t_r = 8$ ns, (down/up after clock).

FIGURE 4. Switching time test circuits and waveforms – Continued.

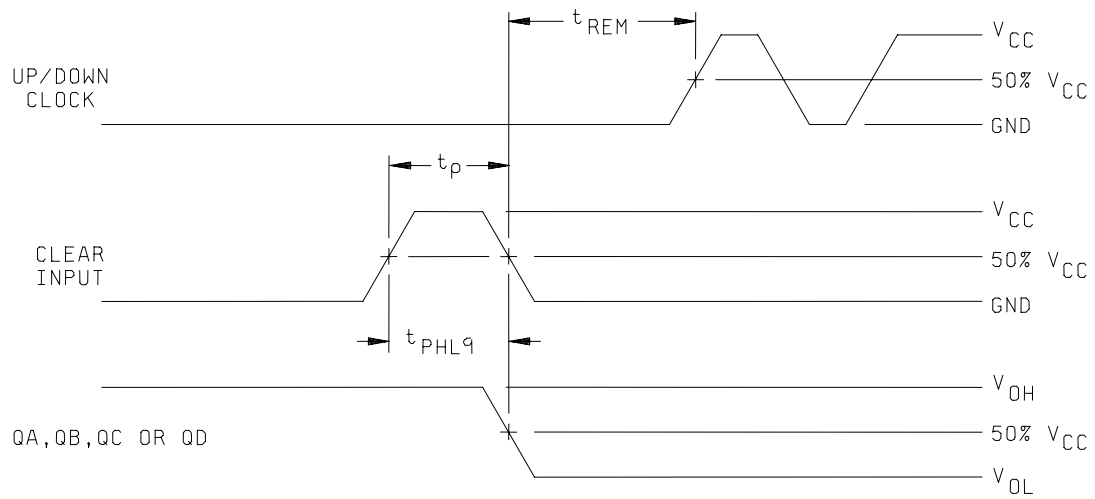
DEVICE TYPES 06 AND 07



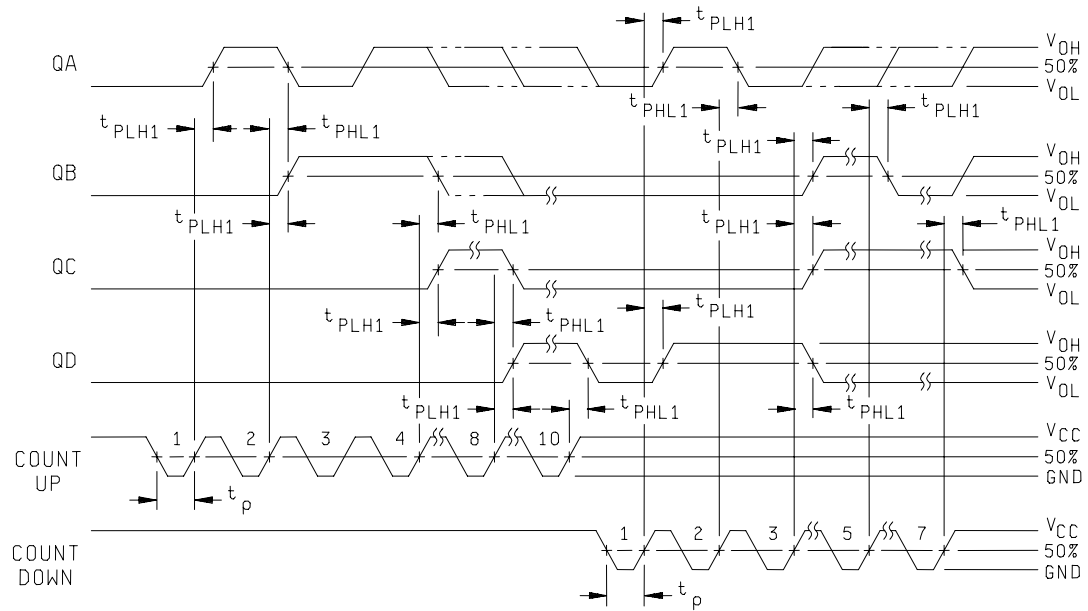
NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 45 ns.
2. Data input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (data) ≤ 41 ns, $t_{SETUP} \leq 33$ ns, $t_{HOLD} \leq 8$ ns.
3. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 36 ns, $PRR \geq 14$ MHz.
4. $C_L = 50$ pF ± 10 percent (including probe and jig capacitance).
5. Voltage measurements are to be made with respect to network ground terminal.
6. $t_{TLH} = t_{TLH1} - t_{TLH2}$; $t_{THL} = t_{THL2} - t_{THL1}$.

FIGURE 4. Switching time test circuits and waveforms – Continued.

DEVICE TYPES 06 AND 07CLEAR SWITCHING VOLTAGE WAVEFORMFIGURE 4. Switching time test circuits and waveforms – Continued.

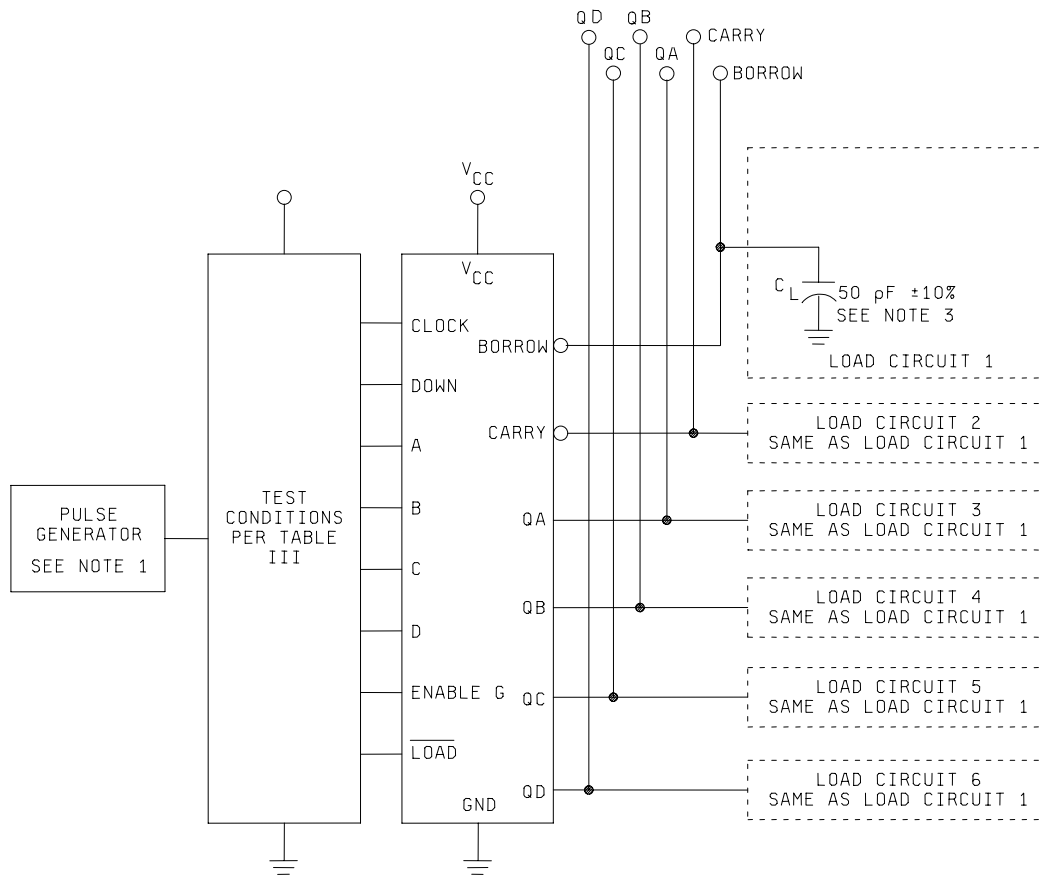
DEVICE TYPES 06 AND 07



SERIAL LOADED VOLTAGE WAVEFORMS

FIGURE 4. Switching time test circuits and waveforms – Continued.

DEVICE TYPE 06 AND 07



NOTES:

1. Clock (up or down) input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 45 ns, $PRR \leq 1$ MHz.
2. Load input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (load) $t_{REM} = 45$ ns, device 06, $t_p = 78$ ns, device 07, $t_p = 36$ ns.
3. C_L includes probe and jig capacitance.
4. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, for 25°C , t_p (clock) = 28 ns, $PRR \leq 18$ MHz, for $+125^\circ\text{C}$, t_p (clock) = 36 ns, $PRR = 14$ MHz.
5. Clear input pulse characteristics: t_p (clear) device type 06 = 78 ns, $t_{REM} = 33$ ns, device type 07, $t_p = 39$ ns.

FIGURE 4. Switching time test circuits and waveforms – Continued.

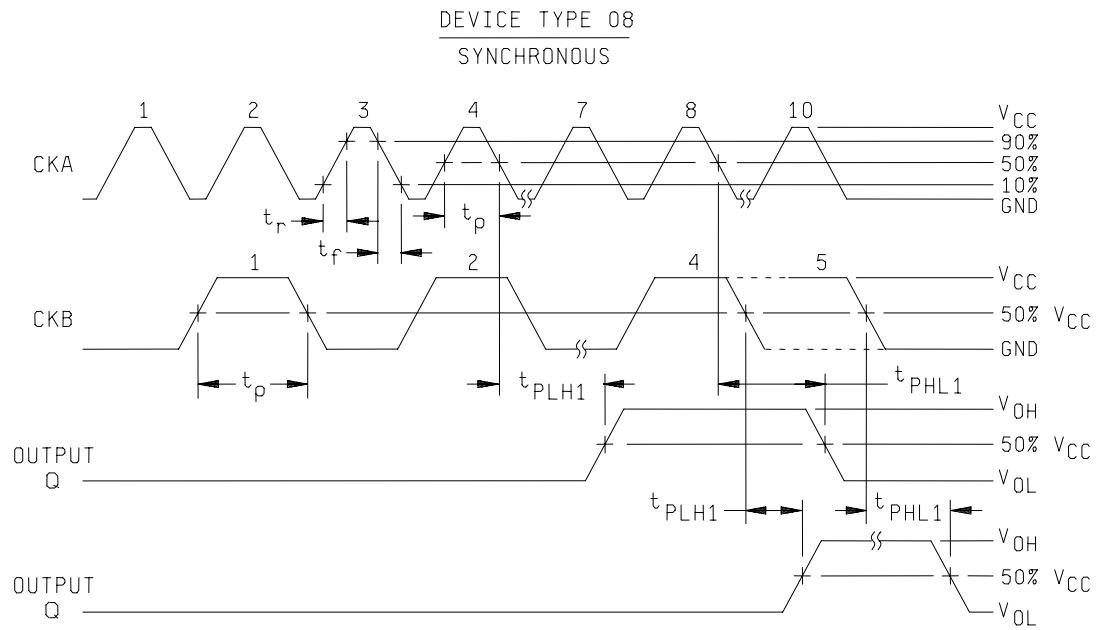
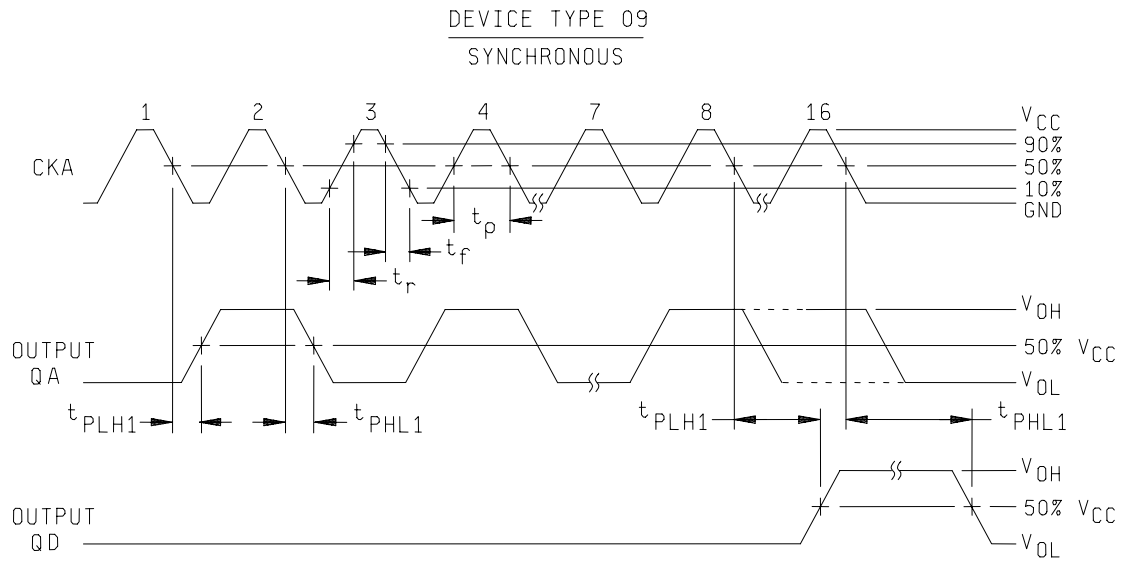


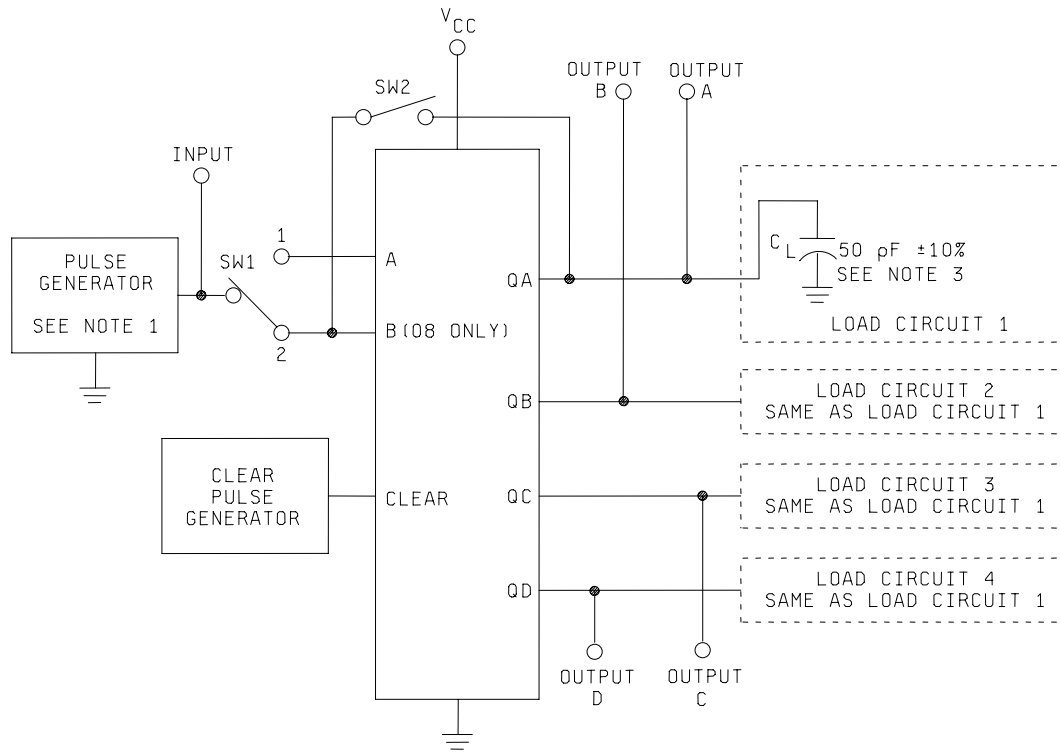
FIGURE 4. Switching time test circuits and waveforms – Continued.



COUNT VOLTAGE WAVEFORMS

FIGURE 4. Switching time test circuits and waveforms – Continued.

DEVICE TYPES 08 AND 09



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, $PRR \leq 1$ MHz. Device type 08, t_p (clock) ≤ 28 ns; device type 09, t_p (clock) ≤ 24 ns.
2. For f_{MAX} , clock input pulse characteristics are as follows: $t_r = t_f \leq 6$ ns; device type 08, t_p (clock) ≤ 22 ns, $PRR \geq 23$ MHz; device type 09, t_p (clock) ≤ 24 ns, $PRR \geq 21$ MHz.
3. C_L includes probe and jig capacitance.
4. Clear input pulse characteristics: t_p (clear) ≤ 38 ns; device type 08, $t_{REM} = 33$ ns; device type 09, $t_{REM} \leq 15$ ns.

FIGURE 4. Switching time test circuits and waveforms – Continued.

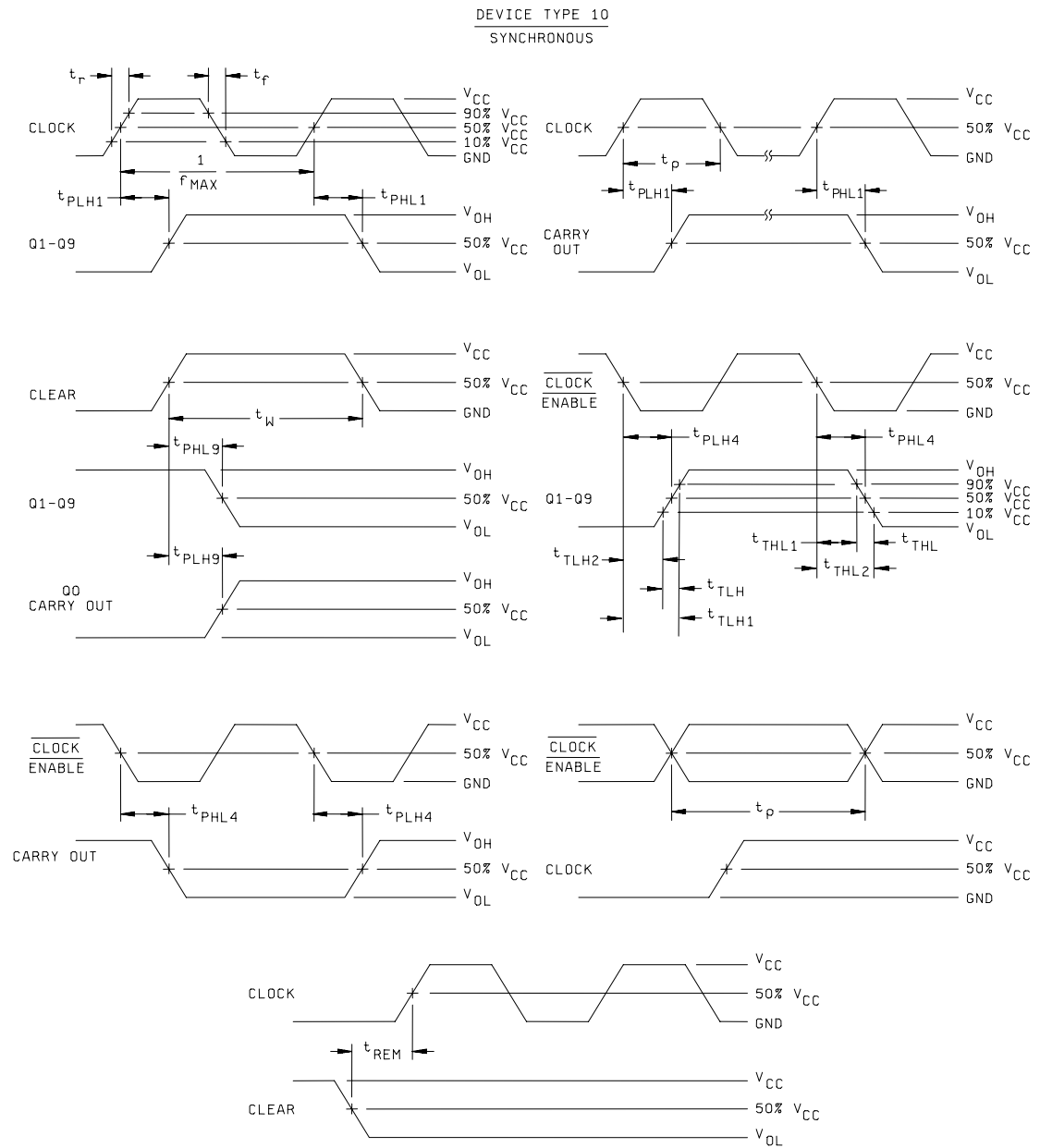
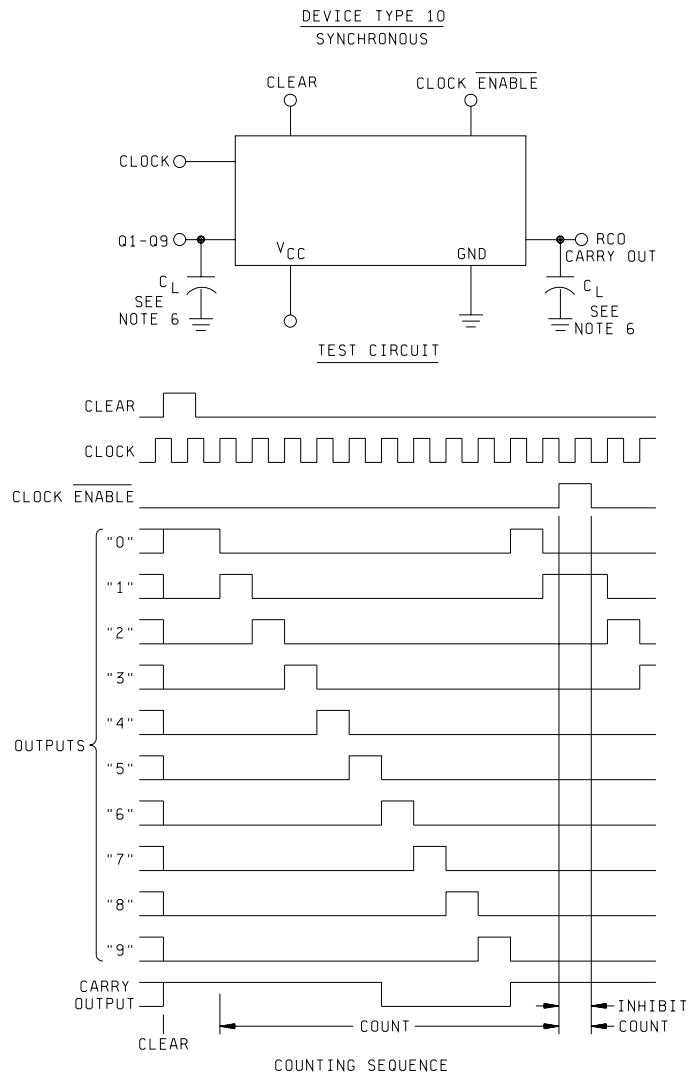


FIGURE 4. Switching time test circuits and waveforms – Continued.

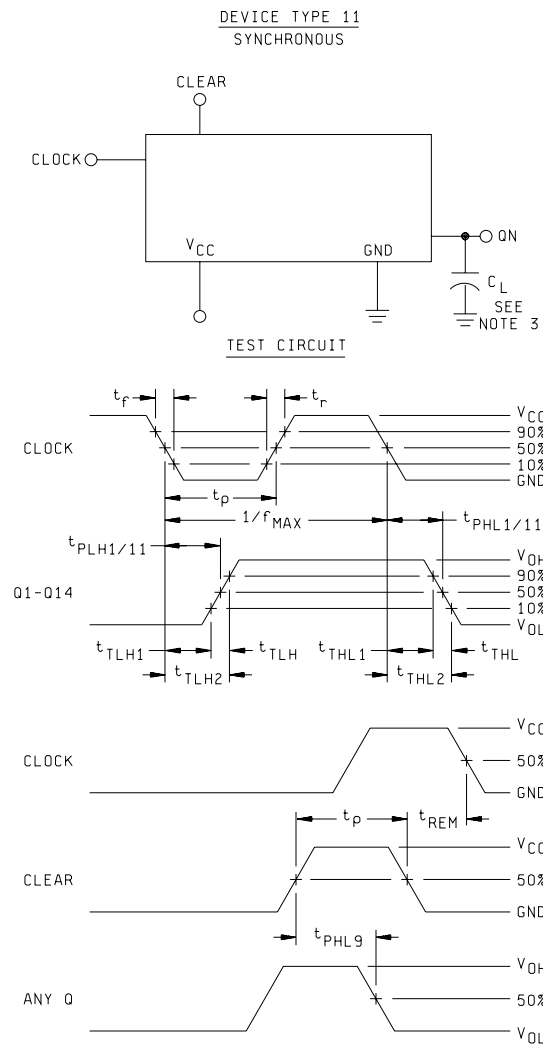


NOTES:

1. CLOCK ENABLE pulse is active low and dominates regardless of the state of the clock.
2. Clear input pulse characteristics are as follows: $t_r = t_f \leq 6$ ns, t_p (clear) ≤ 24 ns, $PRR \leq 1$ MHz, $t_{REM} \leq 30$ ns.
3. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 30 ns, $PRR \leq 1$ MHz.
4. CLOCK ENABLE pulse characteristics are as follows: $t_r = t_f \leq 6$ ns, t_p (enable) ≤ 30 ns, $PRR \leq 1$ MHz.
5. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 29 ns, $PRR \leq 17$ MHz.
6. $C_L = 50$ pF $\pm 10\%$ (includes probe and jig capacitance).
7. Voltage measurements are to be made with respect to network ground terminal.
8. $t_{TLH} = t_{TLH1} - t_{TLH2}$, $t_{THL} = t_{THL2} - t_{THL1}$.

FIGURE 4. Switching time test circuits and waveforms – Continued.

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NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 27 ns.
2. Clear input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clear) ≤ 24 ns, $t_{REM} \leq 30$ ns.
3. $C_L = 50$ pF $\pm 10\%$ (includes probe and jig capacitance).
4. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 24 ns, $PRR \geq 21$ MHz.
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 4. Switching time test circuits and waveforms – Continued.

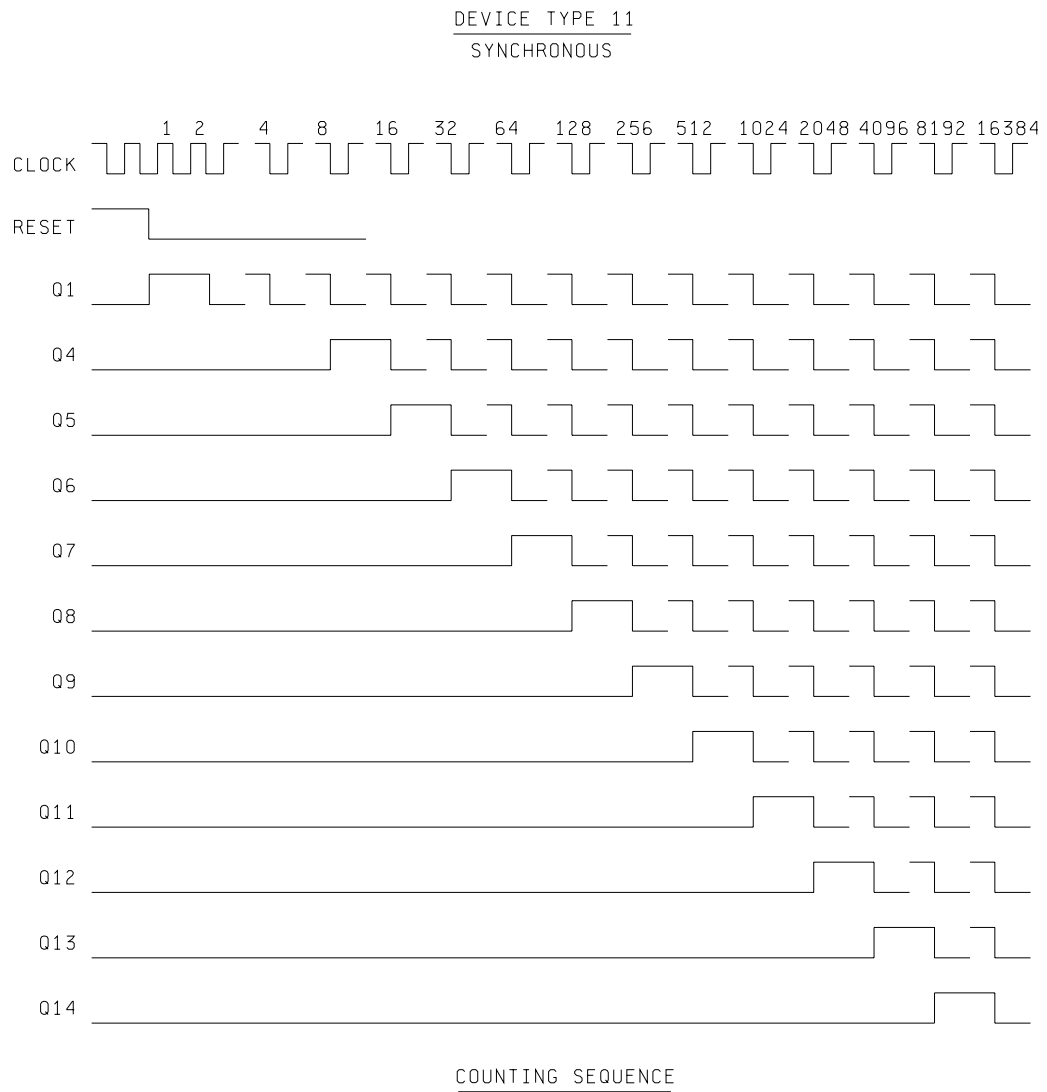
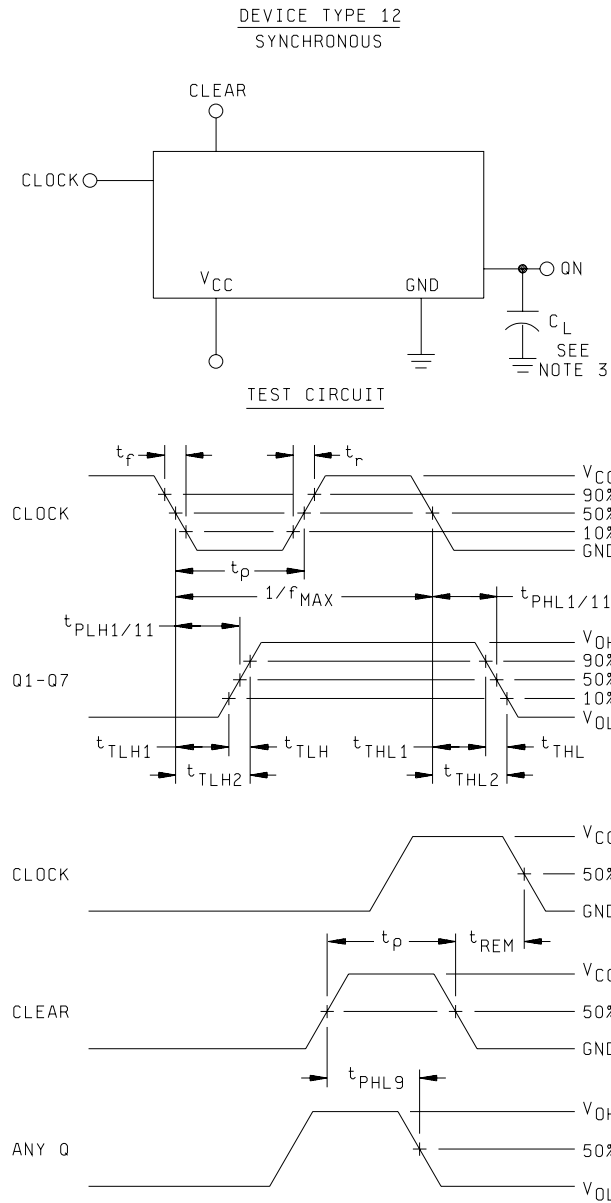


FIGURE 4. Switching time test circuits and waveforms – Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 27 ns.
2. Clear input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clear) ≤ 24 ns, $t_{REM} \leq 30$ ns.
3. $C_L = 50$ pF $\pm 10\%$ (includes probe and jig capacitance).
4. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 24 ns, $PRR \geq 21$ MHz.
5. $t_{TLH} = t_{TLH2} - t_{TLH1}$, $t_{THL} = t_{THL2} - t_{THL1}$.
6. Voltage measurements are to be made with respect to network ground terminal.

FIGURE 4. Switching time test circuits and waveforms – Continued.

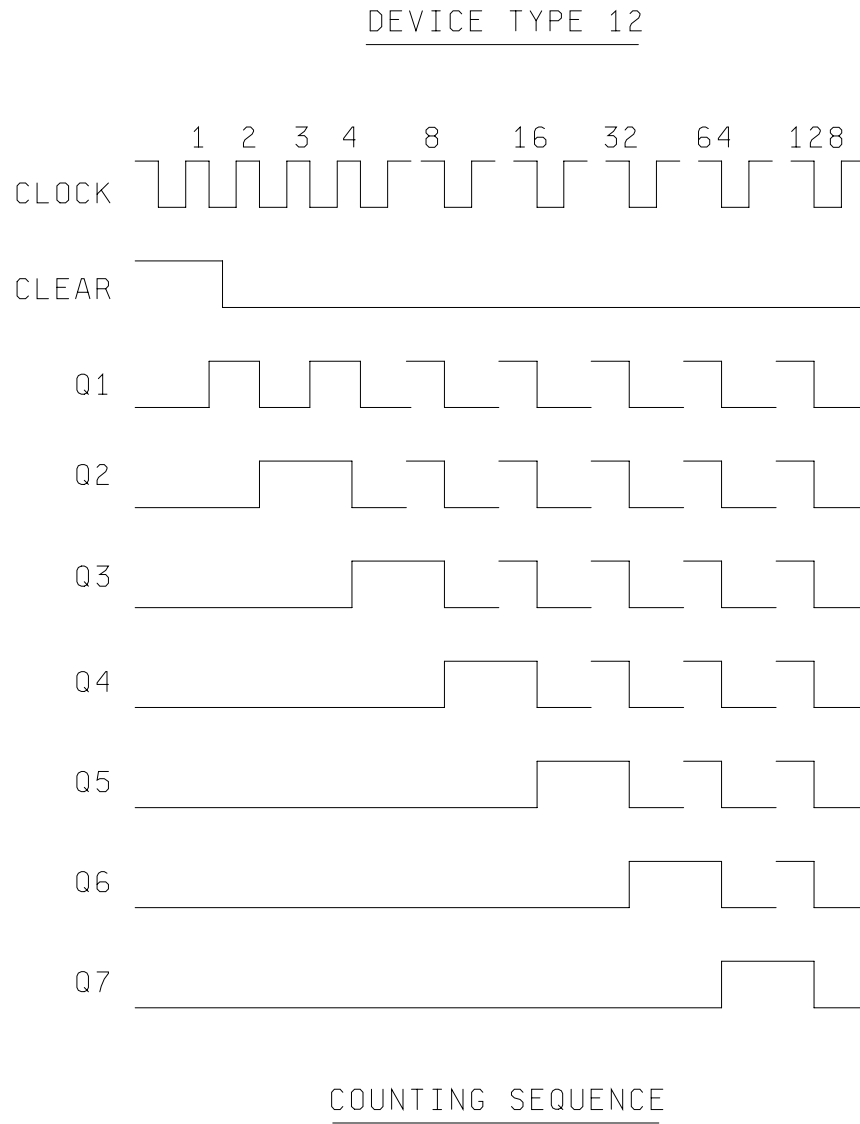
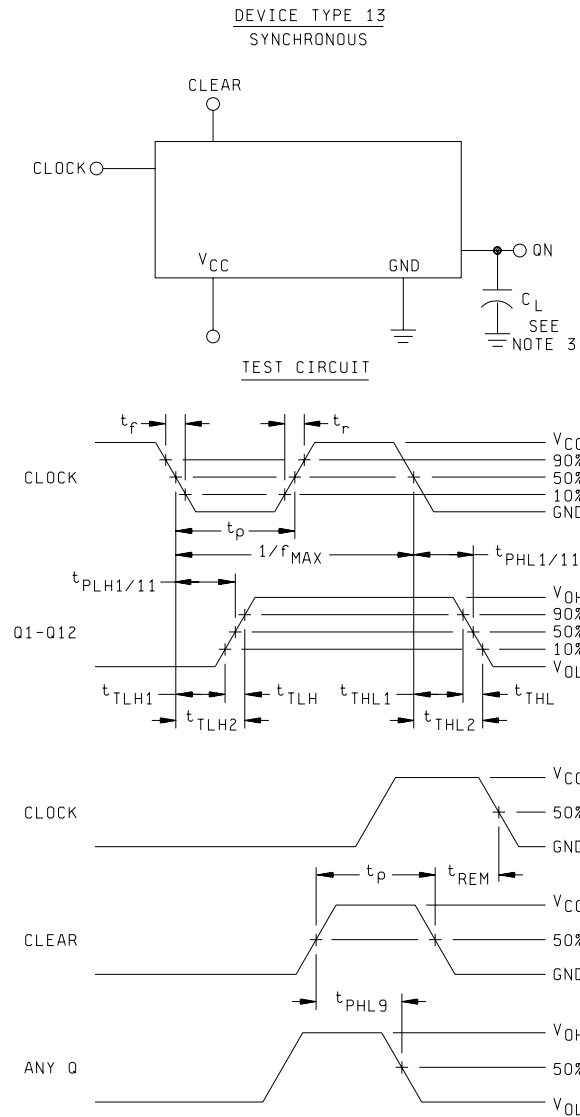


FIGURE 4. Switching time test circuits and waveforms – Continued.



NOTES:

1. Clock input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 27 ns.
2. Clear input pulse characteristics: $t_r = t_f \leq 6$ ns, t_p (clear) ≤ 24 ns, $t_{REM} \leq 30$ ns.
3. $C_L = 50$ pF $\pm 10\%$ (includes probe and jig capacitance).
4. The clock input characteristics for f_{MAX} are as follows: $t_r = t_f \leq 6$ ns, t_p (clock) ≤ 24 ns, $PRR \geq 21$ MHz.
5. $t_{TLH} = t_{TLH2} - t_{TLH1}$, $t_{THL} = t_{THL2} - t_{THL1}$.
6. Voltage measurements are to be made with respect to network ground terminal.

FIGURE 4. Switching time test circuits and waveforms – Continued.

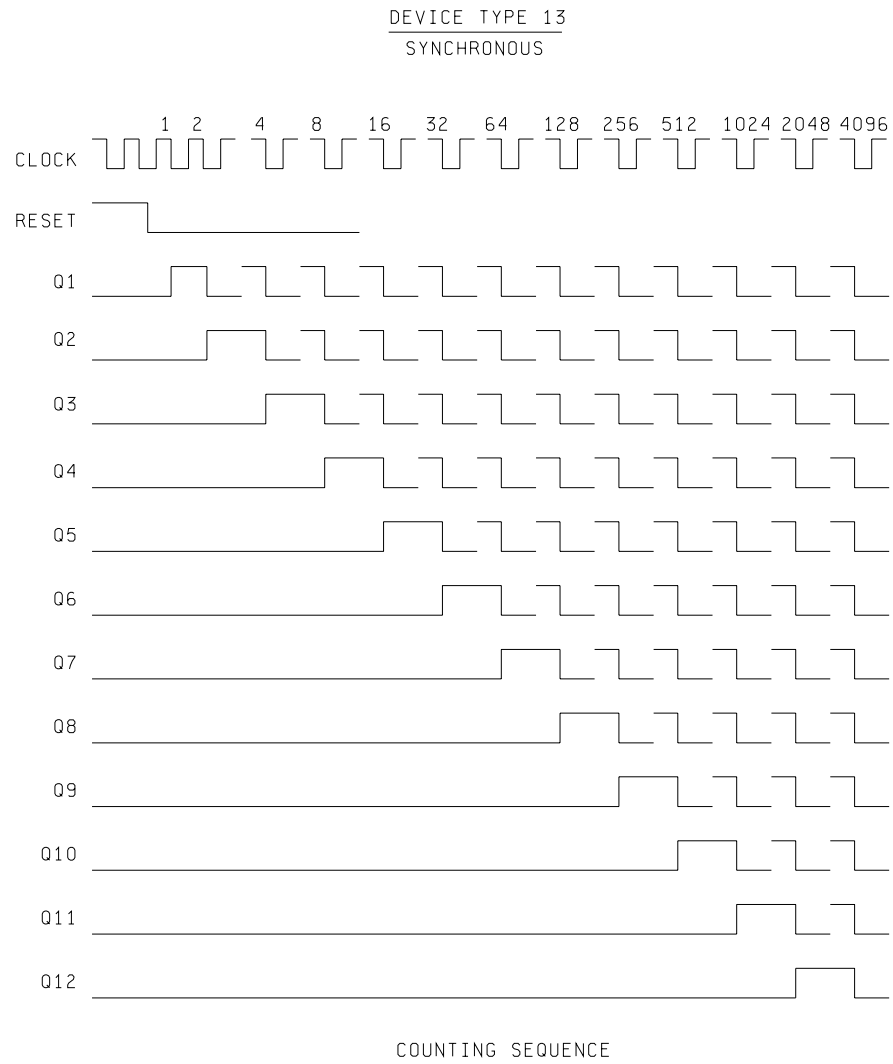


FIGURE 4. Switching time test circuits and waveforms – Continued.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
V _{IC(pos)} 1/		1 2 3 4 5 6 7 8 9	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA							GND	CLR CLK A B C D ENABLE P LOAD ENABLE T		1.5				V	
V _{IC(neg)}		10 11 12 13 14 15 16 17 18	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	GND								1/	CLR CLK A B C D ENABLE P LOAD ENABLE T		-1.5					
I _{CCH}	3005	19	6.0V	GND	6.0V	6.0V	6.0V	6.0V	6.0V		GND	6.0V						6.0V	V _{CC}		0.2		20			μA
I _{CCL}	3005	20	GND	6.0V	6.0V	6.0V	6.0V	6.0V	GND		6.0V	GND							V _{CC}		0.2		20			μA
V _{OH3}	3006 2/	21 22 23 24 25	4.2V	IN	4.2V	4.2V	4.2V	4.2V	4.2V		GND			-20μA	-20μA	-20μA			QA QB QC QD RCO	5.95		5.95		5.95		V
V _{OH5}	3006 2/	26 27 28 29 30			4.2V	4.2V	4.2V	4.2V	4.2V			4.2V		-20μA	-5.2mA	-5.2mA	-5.2mA		QA QB QC QD RCO	5.48		5.2		5.48		
V _{OL3}	3007 4/	31 32 33 34 35			1.2V	1.2V	1.2V	1.2V				1.2V	20μA	20μA	20μA	20μA	20μA		QA QB QC QD RCO		0.05		0.05		0.05	
V _{OL5}	3007 4/	36 37 38 39 40			1.2V	1.2V	1.2V	1.2V		GND		1.2V	5.2mA	5.2mA	5.2mA	5.2mA	5.2mA		QA QB QC QD RCO		0.26		0.4		0.26	
I _{OS4}	3011 5/	41 42 43 44 45	4.0V		4.0V	4.0V	4.0V	4.0V	4.0V		GND	4.0V		GND	GND	GND		4.0V	QA QB QC QD RCO	-10	-120	-10	-120	-10	-120	mA
I _{IH}	3010	46 47 48 49 50 51 52 53 54	6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND		GND	GND					GND	6.0V	CLR CLK A B C D ENABLE P LOAD ENABLE T		0.05		0.1			μA

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
		2	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Min		Max	Min	Max	Min	Max			
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}									
I _{IL}	3009	55 56 57 58 59 60 61 62 63	GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V 6.0V 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V 6.0V 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V 6.0V 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V 6.0V 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V 6.0V 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V 6.0V 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V	6.0V 6.0V 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V GND 6.0V						6.0V	CLR CLK A B C D ENABLE P LOAD ENABLE T		-0.05		-0.1			μA	
																			Subgroup 4 T _C = +25°C								
																			Min	Max							
C _C	3012	64 65 66 67 68	8/	8/						GND	8/	8/						GND	CLK CLR LOAD ENABLE T ENABLE P		15					pF	
C _{IN}	3012	69 70 71 72			8/	8/	8/	8/											A B C D		10						
																			Measured terminal 9/	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 10/ 11/	3014	73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103	B A																								

See footnotes at end of table III.

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See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C 14/		T _C = +125°C		T _C = -55°C 14/		
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}		Min	Max	Min	Max	Min	Max	
f _{MAX} 15/	3003	168	4.5V	IN					4.5V	GND	4.5V	4.5V				OUT		4.5V	QA	28		21		28		MHz
t _{PLH1}	3003 Fig. 4	169 170 171 172	“	“					“	“	“	“		OUT	OUT	OUT	OUT	“	CLK to QA CLK to QB CLK to QC CLK to QD	8 “ “ “	36 “ “ “	8 “ “ “	48 “ “ “	8 “ “ “	36 “ “ “	ns
t _{PHL1}	3003 Fig. 4	173 174 175 176	“	“					“	“	“	“		OUT	OUT	OUT	OUT	“	CLK to QA CLK to QB CLK to QC CLK to QD	“ “ “ “	“ “ “ “	“ “ “ “	“ “ “ “	“ “ “ “	“ “ “ “	“
t _{PLH2}	3003 Fig. 4	177	“	“					“	“	“	“					OUT	“	CLK to RCO	“	38	“	50	“	38	“
t _{PHL2}	3003 Fig. 4	178	“	“					“	“	“	“					OUT	“	CLK to RCO	“	38	“	50	“	38	“
t _{PLH4}	3003 Fig. 4	179	“	Z/					“	“	“	IN					OUT	“	ENABLE T to RCO	7	34	7	46	7	34	“
t _{PHL4}	3003 Fig. 4	180	“	Z/					“	“	“	IN					OUT	“	ENABLE T to RCO	7	34	7	46	7	34	“
t _{PHL9}	3003 Fig. 4	181 182 183 184	IN “ “ “	16/ “ “ “	4.5V “ “ “	4.5V “ “ “	4.5V “ “ “	4.5V “ “ “	“ “ “ “	“ “ “ “	GND “ “ “	“ “ “ “	OUT “ “ “	OUT “ “ “	OUT “ “ “	OUT “ “ “	“ “ “ “	CLR to QA CLR to QB CLR to QC CLR to QD	8 “ “ “	40 “ “ “	8 “ “ “	53 “ “ “	8 “ “ “	40 “ “ “	“	
t _{PHL10}	3003 Fig. 4	185	“	5/	4.5V	4.5V	4.5V	4.5V	“	“	“	“					OUT	“	CLR to RCO	“	38	“	51	“	38	“
t _{TLH}	3004 Fig. 4	186 187 188 189 190	4.5V “ “ “ “	18/ “ “ “ “	GND 4.5V “ “ GND	GND GND 4.5V GND	GND “ 4.5V GND	GND “ 4.5V GND	4.5V “ “ “ “	“ “ “ “ “	19/ “ “ “ “	4.5V “ “ “ “	OUT “ “ “ “	OUT “ “ “ “	OUT “ “ “ “	OUT “ “ “ “	OUT “ “ “ “	QA QB QC QD RCO	3 “ “ “ “	15 “ “ “ “	3 “ “ “ “	20 “ “ “ “	3 “ “ “ “	15 “ “ “ “	“	
t _{THL}	3004 Fig. 4	191 192 193 194 195	“ “ “ “ “	“ “ “ “ “	4.5V GND 4.5V GND	“ GND 4.5V GND	“ “ 4.5V GND	GND “ 4.5V GND	“ “ “ “ “	“ “ “ “ “	“ “ “ “ “	“ “ “ “ “	OUT “ “ “ “	OUT “ “ “ “	OUT “ “ “ “	OUT “ “ “ “	“ “ “ “ “	QA QB QC QD RCO	“ “ “ “ “	“ “ “ “ “	“ “ “ “ “	“ “ “ “ “	“ “ “ “ “	“ “ “ “ “	“	

See footnotes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Subgroup 1		Subgroup 2		Subgroup 3				
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	T _C = +25°C		T _C = +125°C	T _C = -55°C					
		Test no.	CL _R	CL _K	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}		Min	Max	Min	Max	Min	Max	
V _{IC(pos)} 1/		1 2 3 4 5 6 7 8 9	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1/10 GND	1mA	1mA						GND	CLR CLK A B C D ENABLE P LOAD ENABLE T		1.5				V	
V _{IC(neg)}		10 11 12 13 14 15 16 17 18	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	GND	-1mA	-1mA						1/10 GND	CLR CLK A B C D ENABLE P LOAD ENABLE T		-1.5					
I _{CCH}	3005	19	6.0V	GND	6.0V	6.0V	6.0V	6.0V	6.0V	GND	GND	6.0V						6.0V	V _{CC}		0.2		20		μA	
I _{CCL}	3005	20	GND	6.0V	6.0V	6.0V	6.0V	6.0V	GND	GND	6.0V	GND						GND	V _{CC}		0.2		20		μA	
V _{OH3}	3006 2/	21 22 23 24 25	6.0V	IN	4.2V	4.2V	4.2V	4.2V	4.2V	GND	GND	4.2V	-20μA	-20μA	-20μA	-20μA		QA QB QC QD RCO	5.95		5.95		5.95		V	
V _{OH5}	3006 2/	26 27 28 29 30			4.2V	4.2V	4.2V	4.2V	4.2V			4.2V	-20μA	-5.2mA	-5.2mA	-5.2mA		QA QB QC QD RCO	5.48		5.2		5.48			
V _{OL3}	3007 4/	31 32 33 34 35			1.2V	1.2V	1.2V	1.2V			1.2V	20μA	20μA	20μA	20μA	20μA		QA QB QC QD RCO		0.05		0.05		0.05		
V _{OL5}	3007 4/	36 37 38 39 40			1.2V	1.2V	1.2V	1.2V		GND		5.2mA	5.2mA	5.2mA	5.2mA	5.2mA		QA QB QC QD RCO		0.26		0.4		0.26		
I _{OS4}	3011 5/	41 42 43 44 45	4.0V		4.0V	4.0V	4.0V	4.0V	4.0V	GND	4.0V		GND	GND	GND	GND	4.0V	QA QB QC QD RCO	-10	-120	-10	-120	-10	-120	mA	
I _{IH}	3010	46 47 48 49 50 51 52 53 54	6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND	GND	GND					6.0V	CLR CLK A B C D ENABLE P LOAD ENABLE T		0.05		0.1			μA	

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		2	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Min		Max	Min	Max	Min	Max		
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
I _{IL}	3009	55	GND	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	GND	6.0V	6.0V							6.0V	CLR		-0.05		-0.1		μA
		56	6.0V	GND	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	GND	6.0V	6.0V							CLK						
		57	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V							A						
		58	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V							B						
		59	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V							C						
		60	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V							D						
		61	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V							ENABLE P						
		62	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V							LOAD						
		63	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V							ENABLE T						
																					Subgroup 4 T _C = +25°C					
C _C	3012	64	8/	8/						GND	8/	8/						GND	CLK		15				pF	
		65																	CLR							
		66																	LOAD							
		67																	ENABLE T							
C _{IN}	3012	68			8/	8/	8/	8/											A		10					
		69																	B							
		70																	C							
		71																	D							
																			Measured terminal 9/	Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
																					Min	Max	Min	Max	Min	
Truth table tests 10/ 11/	3014	73	B	A	A	A	A	A	A	GND	A	A	A	L	L	L	L	L	4.5V	All outputs 12/ 13/						
		74	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		75	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		76	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		77	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		78	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		79	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		80	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		81	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		82	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		83	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		84	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		85	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		86	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		87	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		88	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		89	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		90	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		91	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		92	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		93	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		94	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		95	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		96	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		97	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		98	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		99	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		100	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		101	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		102	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								
		103	A	A	A	A	A	A	A	A	A	A	A	L	L	L	L	L								

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case E.F.X 2 Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
			CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
Truth table tests 10/ 11/	3014	104	A	A	B	B	B	B	A	GND	A	B	H	L	H	L	L	4.5V	All outputs 12/ 13/							
		105	"	B	A	A	A	A	"	"	"	A	"	"	"	"	"	"								
		106	"	A	A	B	B	B	"	"	"	B	"	"	"	"	H	"								
		107	"	A	A	B	A	B	"	"	"	B	"	"	"	"	"	"								
		108	"	A	B	A	A	A	"	"	"	A	"	"	"	"	"	"								
		109	"	A	B	A	B	A	"	"	"	A	"	H	"	L	"	"								
		110	"	A	B	A	B	A	"	"	"	B	"	"	"	"	"	"								
		111	"	A	B	A	B	A	"	"	"	B	"	"	"	"	"	"								
		112	"	A	A	B	A	A	"	"	"	A	"	"	"	"	"	H		"						
		113	"	A	B	A	B	A	"	"	"	B	"	"	"	"	"	"		"						
		114	"	A	B	A	B	A	"	"	"	B	"	"	"	"	"	"		"						
		115	"	A	B	A	B	A	"	"	"	B	"	"	"	H	L	"		"						
		116	"	A	A	B	A	B	"	"	"	B	"	"	"	"	"	"		"						
		117	"	A	B	A	B	A	"	"	"	B	"	"	"	"	"	"		"						
		118	"	A	A	B	A	B	"	"	"	B	"	"	"	"	H	"		H						
		119	"	A	B	A	B	A	"	"	"	A	"	"	"	"	"	L		L						
		120	"	A	A	B	A	B	"	"	"	A	"	"	"	"	"	L		L						
		121	B	A	"	"	"	"	"	"	"	"	"	"	L	L	L	L		L						
		122	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		123	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"		"						
		124	"	"	B	"	"	"	"	"	"	"	"	B	"	"	"	"		"						
		125	"	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		126	"	"	B	"	"	B	"	"	"	"	"	"	"	"	"	"		"						
		127	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		128	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		129	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		130	"	"	"	"	A	"	A	"	"	"	"	"	"	"	"	H		"						
		131	"	"	"	"	A	"	A	"	"	"	"	"	"	"	"	"		"						
		132	"	"	"	"	"	"	"	"	"	"	B	"	"	"	H	"		"						
		133	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"		"						
		134	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		135	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		136	"	"	"	"	B	"	B	"	A	"	"	"	"	"	"	"		"						
		137	"	"	"	"	B	"	B	"	"	"	"	"	"	"	"	"		"						
		138	"	B	A	"	"	"	"	"	"	"	"	A	"	"	"	L		"						
		139	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		140	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		141	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		142	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		143	"	B	"	"	"	"	"	"	"	"	A	"	"	"	"	L		"						
144	"	A	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"									
145	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
146	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
147	"	"	"	"	"	"	B	"	B	"	"	"	"	"	"	"	"									
148	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
149	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
150	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
151	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
152	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
153	"	"	"	"	B	"	B	"	A	"	"	"	"	"	"	"	"									
154	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
155	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
156	"	"	"	"	A	"	"	"	"	"	"	"	"	"	H	"	L									
157	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
158	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
159	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
160	"	"	"	"	B	"	A	"	"	"	"	"	"	"	"	"	"									
161	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
162	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
163	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"									
164	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
165	"	"	"	"	A	"	A	"	"	"	"	"	"	"	"	"	"									
166	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
167	"	"	"	"	"	"	"	"	"	"	"	"	"	"	H	"	H									

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7		Subgroup 8		Subgroup 8		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C		T _C = +125°C		T _C = -55°C		
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}		Min	Max	Min	Max	Min	Max	
Truth table tests 10/ 11/	3014	168	A	A	B	B	A	B	A	GND	B	A	H	L	H	H	L	4.5V	All outputs 12/ 13/							
		169	"	B	"	"	"	"	"	"	"	"	"	"	H	L	L	"								
		170	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		171	"	A	A	"	"	"	"	"	"	"	"	"	"	"	"	"								
		172	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		173	"	A	"	"	"	"	"	"	"	"	"	"	"	"	H	"		"						
																		Subgroup 9 T _C = +25°C 14/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 14/				
																		Min	Max	Min	Max	Min	Max			
f _{MAX}	3003 Fig. 4	174	4.5V	IN					4.5V	GND	4.5V	4.5V				OUT		4.5V	QA	28		21		28		MHz
t _{PLH1}	3003 Fig. 4	174	"	"					"	"	"	"				OUT		"	CLK to QA CLK to QB CLK to QC CLK to QD	8	36	8	48	8	36	ns
		176	"	"					"	"	"	"				OUT		"		"	"	"	"	"	"	
		177	"	"					"	"	"	"				OUT		"		"	"	"	"	"	"	
		178	"	"					"	"	"	"				OUT		"		"	"	"	"	"	"	
t _{PHL1}	3003 Fig. 4	179	"	"					"	"	"	"				OUT		"	CLK to QA CLK to QB CLK to QC CLK to QD	"	"	"	"	"	"	"
		180	"	"					"	"	"	"				OUT		"		"	"	"	"	"	"	
		181	"	"					"	"	"	"				OUT		"		"	"	"	"	"	"	
		182	"	"					"	"	"	"				OUT		"		"	"	"	"	"	"	
t _{PLH2}	3003 Fig. 4	183	"	"					"	"	"	"					OUT	"	CLK to RCO	"	38	"	50	"	38	"
t _{PHL2}	3003 Fig. 4	184	"	"					"	"	"	"					"	"	CLK to RCO	"	38	"	50	"	38	"
t _{PLH4}	3003 Fig. 4	185	"	Z/					"	"	"	IN					"	"	ENABLE T to RCO	7	34	7	46	7	34	"
t _{PHL4}	3003 Fig. 4	186	"	Z/					"	"	"	IN					"	"	ENABLE T to RCO	7	34	7	46	7	34	"
t _{PHL9}	3003 Fig. 4	187	IN	16/	4.5V					"	GND					OUT		"	CLR to QA CLR to QB CLR to QC CLR to QD	8	40	8	53	8	40	"
		188	"	"		4.5V				"	"				OUT		"	"		"	"	"	"	"	"	
		189	"	"			4.5V			"	"				OUT		"	"		"	"	"	"	"	"	
		190	"	"				4.5V		"	"				OUT		"	"		"	"	"	"	"	"	
t _{PHL10}	3003 Fig. 4	191	"	5/	4.5V	4.5V	4.5V	4.5V		"	"						OUT	"	CLR to RCO	"	38	"	51	"	38	"
t _{TLH}	3004 Fig. 4	192	4.5V	18/	GND	GND	GND	GND	4.5V	"	19/	4.5V				OUT		"	QA QB QC QD RCO	3	15	3	20	3	15	"
		193	"	"	4.5V	GND	"	"	"	"	"	"				OUT		"		"	"	"	"	"	"	
		194	"	"	"	4.5V	"	"	"	"	"	"				OUT		"		"	"	"	"	"	"	
		195	"	"	"	"	4.5V	"	"	"	"	"				OUT		"		"	"	"	"	"	"	
		196	"	"	GND	"	4.5V	4.5V	"	"	"	"					OUT	"		"	"	"	"	"	"	
		197	"	"	4.5V	GND	GND	GND	"	"	"	"				OUT		"		QA	"	"	"	"	"	"
t _{THL}	3004 Fig. 4	198	"	"	"	4.5V	GND	GND	"	"	"	"				OUT		"	QB QC QD RCO	"	"	"	"	"	"	"
		199	"	"	"	4.5V	GND	4.5V	"	"	"	"				OUT		"		"	"	"	"	"	"	
		200	"	"	"	GND	GND	4.5V	"	"	"	"				OUT		"		"	"	"	"	"	"	
		201	"	"	"	4.5V	4.5V	4.5V	"	"	"	"					OUT	"		"	"	"	"	"	"	

See footnotes at end of table III.

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C	Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Min			Max	Min	Max	Min	Max	
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
V _{IC(pos)}		1 2 3 4 5 6 7 8 9	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1/2	1mA	1mA						GND	CLR CLK A B C D ENABLE P LOAD ENABLE T		1.5				V	
V _{IC(neg)}		10 11 12 13 14 15 16 17 18	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	GND	-1mA	-1mA						1/2	CLR CLK A B C D ENABLE P LOAD ENABLE T		-1.5				V	
I _{CCH}	3005	19	6.0V	GND	6.0V	6.0V	6.0V	6.0V	6.0V		GND	6.0V						6.0V	V _{CC}		0.2		20		μA	
I _{CCL}	3005	20	GND	6.0V	6.0V	6.0V	6.0V	6.0V	GND		6.0V	GND							V _{CC}		0.2		20		μA	
V _{OH3}	3006 2/	21 22 23 24 25	4.2V	IN	4.2V	4.2V	4.2V	4.2V	4.2V		GND	4.2V	-20μA	-20μA	-20μA	-20μA	-20μA		QA QB QC QD RCO	5.95		5.95		5.95	V	
V _{OH5}	3006 2/	26 27 28 29 30			4.2V	4.2V	4.2V	4.2V	4.2V			4.2V	-5.2mA	-5.2mA	-5.2mA	-5.2mA	-5.2mA		QA QB QC QD RCO	5.48		5.2		5.48	V	
V _{OL3}	3007 4/	31 32 33 34 35			1.2V	1.2V	1.2V	1.2V				1.2V	20μA	20μA	20μA	20μA	20μA		QA QB QC QD RCO		0.05		0.05		0.05	V
V _{OL5}	3007 4/	36 37 38 39 40			1.2V	1.2V	1.2V	1.2V		GND			5.2mA	5.2mA	5.2mA	5.2mA	5.2mA		QA QB QC QD RCO		0.26		0.4		0.26	V
I _{OS4}	3011 5/	41 42 43 44 45	4.0V		4.0V	4.0V	4.0V	4.0V	4.0V		GND	4.0V		GND	GND	GND	GND	4.0V	QA QB QC QD RCO	-10	-120	-10	-120	-10	-120	mA
I _{IH}	3010	46 47 48 49 50 51 52 53 54	6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND		GND 6.0V GND	GND 6.0V						6.0V	CLR CLK A B C D ENABLE P LOAD ENABLE T		0.05		0.1		μA	

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max		
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}									
I _{IL}	3009	55	GND	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	GND	6.0V	6.0V						6.0V	CLR		-0.05		-0.1		μA		
		56	6.0V	GND	6.0V														CLK								
		57																	A								
		58																	B								
		59																	C								
		60																	D								
		61																	ENABLE P								
		62																	LOAD								
		63																	ENABLE T								
																					Subgroup 4 T _C = +25°C						
																			Min	Max							
C _C	3012	64		8/						GND								GND	CLK		15				pF		
		65										8/							CLR								
		66																	LOAD								
		67																	ENABLE T								
C _{IN}	3012	68																	ENABLE P								
		69				8/													A		10						
		70					8/												B								
		71						8/											C								
		72						8/											D								
																					Measured terminal 9/	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 10/ 11/	3014	73	B	B	B	B	B	B	A	GND	B	A	X	X	X	X	X	4.5V	All outputs 12/ 13/						
74	A			A									L	L	L	L	L										
75	A			A																							
76	A			A																							
77	B			A	A	A	A	A			A																
78	B			A																							
79	B			A																							
80	A			A	B	B	B	B				B															
81				A	A	A	A	A																			
82				A	A	A	A	A																			
83				A	A	B	B	B																			
84				B	A	A	A	A																			
85				A	A	A	A	A																			
86				A	A	B	B	B																			
87				B	A	A	A	A																			
88				A	A	A	B	A																			
89				A	B	A	B	B																			
90				B	A	A	A	A																			
91				A	A	B	A	B							H	L	L										
92				A	A	B	A	B																			
93				B	A	A	A	A																			
94				A	A	A	A	B																			
95				A	B	A	B	A																			
96				B	A	A	A	A																			
97				A	A	B	A	B																			
98				A	A	B	A	B																			
99				B	A	A	A	A																			
100				A	A	A	B	A																			
101				A	B	A	B	A																			
102				B	A	A	A	A																			
103				A	A	A	B	A																			
104				A	B	B	B	B																			

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/														Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	Subgroup 7 T _C = +25°C	Subgroup 8 T _C = +125°C	Subgroup 8 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	11	12	13	14	15	16								
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA		RCO	V _{CC}					
Truth table tests 10/ 11/	3014	105	A	B	B	B	B	B	A	GND	A	B	H	L	L	L	L	4.5V	All outputs 12/ 13/					
		106	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		107	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		108	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		109	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		110	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		111	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		112	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		113	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		114	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		115	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		116	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		117	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		118	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		119	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		120	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		121	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		122	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		123	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		124	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		125	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		126	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		127	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		128	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		129	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		130	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		131	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		132	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		133	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		134	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		135	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		136	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		137	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		138	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		139	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		140	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		141	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		142	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		143	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		144	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		145	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		146	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		147	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		148	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		149	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		150	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		151	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		152	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		153	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		154	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		155	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		156	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		157	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		158	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		159	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		160	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		161	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		162	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		163	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		164	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		165	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		166	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						
		167	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx						

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
Truth table tests 10/ 11/	3014	168 169 170	A " "	A B A	A " "	A " "	A " "	A " "	A " "	GND " "	A " "	A " "	H " L	L " "	L " "	H " L	H " L	4.5V " "	All outputs 12/ 13/							
																				Subgroup 9 T _C =+25°C 14/		Subgroup 10 T _C =+125°C		Subgroup 11 T _C = -55°C 14/		
																			Min	Max	Min	Max	Min	Max		
f _{MAX} 15/	3003 Fig. 4	171	4.5V	IN					4.5V	GND	4.5V	4.5V				OUT		4.5V	QA	28		21		28		MHz
t _{PLH1}	3003 Fig. 4	172 173 174 175	4.5V " " "	" " " "					" " " "	" " " "	" " " "	" " " "		OUT " "	OUT " "	OUT " "		" " " "	CLK to QA CLK to QB CLK to QC CLK to QD	8 " " "	36 " " "	8 " " "	48 " " "	8 " " "	36 " " "	ns
t _{PHL1}	3003 Fig. 4	176 177 178 179	4.5V " " "	" " " "					" " " "	" " " "	" " " "	" " " "		OUT " "	OUT " "	OUT " "		" " " "	CLK to QA CLK to QB CLK to QC CLK to QD	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	"
t _{PLH2}	3003 Fig. 4	180	"	"					"	"	"	"					OUT	"	CLK to RCO	"	38	"	50	"	38	"
t _{PHL2}	3003 Fig. 4	181	"	"					"	"	"	"					"	"	CLK to RCO	"	38	"	50	"	38	"
t _{PLH4}	3003 Fig. 4	182	"	Z/					"	"	"	IN					"	"	ENABLE T to RCO	7	34	7	46	7	34	"
t _{PHL4}	3003 Fig. 4	183	"	Z/					"	"	"	IN					"	"	ENABLE T to RCO	7	34	7	46	7	34	"
t _{TLH}	3004 Fig. 4	184 185 186 187 188	4.5V " " " "	18/ " " " "	GND 4.5V " " "	GND GND 4.5V 4.5V GND	GND " " " "	GND " " " "	" " " "	" " " "	19/ " " "	4.5V " " "		OUT " "	OUT " "	OUT " "		" " " "	QA QB QC QD RCO	3 " " " "	15 " " " "	3 " " "	20 " " "	3 " " "	15 " " "	"
t _{THL}	3004 Fig. 4	189 190 191 192 193	" " " " "	" " " " "	4.5V " " " "	GND 4.5V 4.5V GND GND	" " " " "	GND " " " "	" " " "	" " " "	" " " "	" " " "		OUT " "	OUT " "	OUT " "		" " " "	QA QB QC QD RCO	" " " " "	" " " " "	" " " "	" " " "	" " " "	" " " "	"

See footnotes at end of table III.

TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Min		Max	Min	Max	Min	Max		
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
V _{IC(pos)} 1/		1 2 3 4 5 6 7 8 9	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA						GND	CLR CLK A B C D ENABLE P LOAD ENABLE T		1.5				V	
V _{IC(neg)}		10 11 12 13 14 15 16 17 18	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA						1/	CLR CLK A B C D ENABLE P LOAD ENABLE T		-1.5					
I _{CCH}	3005	19	6.0V	GND	6.0V	6.0V	6.0V	6.0V	6.0V		GND	6.0V						6.0V	V _{CC}		0.2		20		μA	
I _{CCL}	3005	20	GND	6.0V	6.0V	6.0V	6.0V	6.0V	GND		6.0V	GND						V _{CC}		0.2		20			μA	
V _{OH3}	3006 2/	21 22 23 24 25	6.0V	IN	4.2V	4.2V	4.2V	4.2V			GND		-20μA	-20μA	-20μA	-20μA			QA QB QC QD RCO	5.95		5.95		5.95	V	
V _{OH5}	3006 2/	26 27 28 29 30			4.2V	4.2V	4.2V	4.2V	4.2V			4.2V	-20μA	-5.2mA	-5.2mA	-5.2mA	-20μA		QA QB QC QD RCO	5.48		5.2		5.48		
V _{OL3}	3007 4/	31 32 33 34 35			1.2V	1.2V	1.2V	1.2V				1.2V	20μA	20μA	20μA	20μA	20μA		QA QB QC QD RCO		0.05		0.05		0.05	
V _{OL5}	3007 4/	36 37 38 39 40			1.2V	1.2V	1.2V	1.2V		GND			5.2mA	5.2mA	5.2mA	5.2mA	5.2mA		QA QB QC QD RCO		0.26		0.4		0.26	
I _{OS4}	3011 5/	41 42 43 44 45	4.0V		4.0V	4.0V	4.0V	4.0V	4.0V		GND	4.0V		GND	GND	GND	4.0V		QA QB QC QD RCO	-10	-120	-10	-120	-10	-120	mA
I _{IH}	3010	46 47 48 49 50 51 52 53 54	6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND	GND 6.0V GND		GND 6.0V GND	GND 6.0V GND					GND	6.0V	CLR CLK A B C D ENABLE P LOAD ENABLE T		0.05		0.1		μA	

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case E,F,X Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
I _{IL}	3009	55	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}	CLR		-0.05		-0.1			μA
		56	GND 6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	6.0V	GND	6.0V	6.0V						6.0V	CLK						
		57	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	A						
		58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	B						
		59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	C						
		60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D						
		61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	ENABLE P						
		62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	LOAD						
		63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	ENABLE T						
																				Subgroup 4 T _C = +25°C						
																		Min	Max							
C _C	3012	64		8/						GND								GND	CLK		15				pF	
		65		"						"		8/	8/					"	CLR							
		66								"								"	LOAD							
		67								"								"	ENABLE T							
C _{IN}	3012	68			8/	8/	8/	8/	8/	"								"	A		10				"	
		69			"	"	"	"	"	"	"							"	B					"		
		70			"	"	"	"	"	"	"							"	C					"		
		71			"	"	"	"	"	"	"							"	D					"		
																		Measured terminal 9/	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 10/ 11/	3014	73	B	B	B	B	B	B	A	GND	B	A	X	X	X	X	X	4.5V	All outputs 12/ 13/							
		74	B	B	"	"	"	"	"	"	"	"	L	L	L	L	L	"								
		75	B	B	"	"	"	"	"	"	"	"	L	L	L	L	L	"								
		76	A	A	"	A	A	A	"	"	A	"	"	"	"	"	"	"								
		77	A	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		78	B	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		79	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		80	A	A	B	B	B	B	"	"	"	B	"	"	"	"	"	"								
		81	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		82	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		83	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		84	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		85	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		86	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		87	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		88	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		89	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		90	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		91	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		92	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		93	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		94	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		95	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		96	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
97	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
98	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
99	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
100	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
101	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
102	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
103	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
104	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
105	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
107	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"										

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
Truth table tests 10/ 11/	3014	108	A	A	B	B	B	B	A	GND	A	B	H	L	L	H	L	4.5V	All outputs 12/ 13/							
		109	A	B	A	B	B	B	A			B														
		110	A	A	B	B	B	B	A			A														
		111	A	A	B	B	B	B	A			B			H											
		112	A	A	B	B	B	B	A			B														
		113	A	A	B	B	B	B	A			B				H										
		114	A	A	B	B	B	B	A			B														
		115	A	B	A	B	B	B	A			B														
		116	A	A	B	B	B	B	A			B		H	L	L										
		117	A	A	B	B	B	B	A			B														
		118	A	B	A	B	B	B	A			B				H										
		119	A	A	B	B	B	B	A			B														
		120	A	A	B	B	B	B	A			B				H										
		121	A	B	A	B	B	B	A			B														
		122	A	A	B	B	B	B	A			B			H	L										
		123	A	A	B	B	B	B	A			B														
		124	A	B	A	B	B	B	A			B														
		125	A	A	B	B	B	B	A			B				H	H									
		126	A	A	B	B	B	B	A			B					L									
		127	A	B	A	B	B	B	A			B					L									
		128	A	A	B	B	B	B	A			B		L	L	L	L									
		129	A	B	A	B	B	B	A			B														
		130	A	A	B	B	B	B	A			B														
		131	A	B	A	B	B	B	A			B														
		132	A	A	B	B	B	B	A			B														
		133	A	B	A	B	B	B	A			B														
		134	A	A	B	B	B	B	A			B				H										
		135	A	A	B	B	B	B	A			B														
		136	A	B	A	B	B	B	A			B														
		137	A	A	B	B	B	B	A			B		H	H											
		138	A	A	B	B	B	B	A			B														
		139	A	B	A	B	B	B	A			B														
		140	A	A	B	B	B	B	A			B														
		141	A	B	A	B	B	B	A			B														
		142	A	A	B	B	B	B	A			B		H	L	L										
		143	A	A	B	B	B	B	A			B														
		144	A	B	A	B	B	B	A			B														
		145	A	A	B	B	B	B	A			B														
		146	A	A	B	B	B	B	A			B		H	H		H									
		147	A	A	B	B	B	B	A			B														
148	A	B	A	B	B	B	A			B																
149	A	A	B	B	B	B	A			B		L	L	L	L											
150	A	A	B	B	B	B	A			B																
151	A	A	B	B	B	B	A			B																
152	A	A	B	B	B	B	A			B																
153	A	A	B	B	B	B	A			B																
154	A	A	B	B	B	B	A			B																
155	A	A	B	B	B	B	A			B																
156	A	A	B	B	B	B	A			B																
157	A	B	A	B	B	B	A			B																
158	A	A	B	B	B	B	A			B				H												
159	A	A	B	B	B	B	A			B																
160	A	A	B	B	B	B	A			B																
161	A	A	B	B	B	B	A			B		H	L	L												
162	A	A	B	B	B	B	A			B																
163	A	A	B	B	B	B	A			B																
164	A	A	B	B	B	B	A			B				H												
165	A	A	B	B	B	B	A			B																
166	A	B	A	B	B	B	A			B																
167	A	A	B	B	B	B	A			B			H	L												
168	A	A	B	B	B	B	A			B																
169	A	A	B	B	B	B	A			B																
170	A	A	B	B	B	B	A			B		H	L	L												

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case E,F,X Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
			CLR	CLK	A	B	C	D	ENABLE P	GND	LOAD	ENABLE T	QD	QC	QB	QA	RCO	V _{CC}								
Truth table tests 10/ 11/	3014	171	A	A	B	A	B	A	A	GND	A	A	H	L	L	L	L	4.5V	All outputs 12/ 13/							
		172	“	B	“	“	“	“	“	“	“	“	“	“	“	“	“	“								
		173	“	A	“	“	“	“	“	“	“	“	“	“	“	H	“	“								
		174	“	A	A	“	“	“	“	“	“	“	“	“	“	“	“	“								
		175	“	B	“	“	“	“	“	“	“	“	“	“	“	“	“	“								
		176	“	A	“	“	“	“	“	“	“	“	“	“	“	“	H	“								
		177	“	A	B	B	A	“	“	“	“	“	“	“	“	“	“	“								
		178	“	A	“	“	“	“	“	“	“	“	“	“	“	“	“	“								
		179	“	A	A	“	“	“	“	“	“	“	“	H	L	L	L	“								
		180	“	A	“	“	“	“	“	“	“	“	“	“	“	“	“	“								
		181	“	B	“	“	“	“	“	“	“	“	“	“	“	“	“	“								
		182	“	A	“	“	“	“	“	“	“	“	“	“	“	“	H	“								
		183	“	A	“	“	“	“	“	“	“	“	“	“	“	“	“	“								
		184	“	A	“	“	“	“	“	“	“	“	“	“	“	“	“	“								
		185	“	A	“	“	“	“	“	“	“	“	“	“	“	H	L	“								
																			Subgroup 9 T _C = +25°C 14/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 14/			
																			Min	Max	Min	Max	Min	Max		
t _{MAX} 15/	3003 Fig. 4	186	4.5V	IN					4.5V	GND	4.5V	4.5V				OUT		4.5V	QA	28		21		28		MHz
t _{PLH1}	3003 Fig. 4	187	4.5V	“					“	“	“	“				OUT		“	CLK to QA	8	36	8	48	8	36	ns
		188	“	“					“	“	“	“				OUT		“	CLK to QB	“	“	“	“	“	“	“
		189	“	“					“	“	“	“				OUT		“	CLK to QC	“	“	“	“	“	“	“
		190	“	“					“	“	“	“				OUT		“	CLK to QD	“	“	“	“	“	“	“
t _{PHL1}	3003 Fig. 4	191	4.5V	“					“	“	“	“				OUT		“	CLK to QA	“	“	“	“	“	“	“
		192	“	“					“	“	“	“				OUT		“	CLK to QB	“	“	“	“	“	“	“
		193	“	“					“	“	“	“				OUT		“	CLK to QC	“	“	“	“	“	“	“
		194	“	“					“	“	“	“				OUT		“	CLK to QD	“	“	“	“	“	“	“
t _{PLH2}	3003 Fig. 4	195	“	“					“	“	“	“					OUT	“	CLK to RCO	“	38	“	50	“	38	“
		196	“	“						“	“	“	“					“	CLK to RCO	“	38	“	50	“	38	“
t _{PLH4}	3003 Fig. 4	197	“	7/					“	“	“	IN						“	ENABLE T to RCO	7	34	7	46	7	34	“
		198	“	7/						“	“	“	IN					“	ENABLE T to RCO	7	34	7	46	7	34	“
t _{TLH}	3004 Fig. 4	199	4.5V	18/	GND	GND	GND	GND	“	“	19/	4.5V				OUT		“	QA	3	15	3	20	3	15	“
		200	“	“	4.5V	GND	“	“	“	“	“	“				OUT		“	QB	“	“	“	“	“	“	“
		201	“	“	“	4.5V	GND	“	“	“	“	“				OUT		“	QC	“	“	“	“	“	“	“
		202	“	“	“	4.5V	GND	“	“	“	“	“				OUT		“	QD	“	“	“	“	“	“	“
		203	“	“	GND	4.5V	GND	4.5V	4.5V	“	“	“	“				OUT	OUT	“	RCO	“	“	“	“	“	“
t _{THL}	3004 Fig. 4	204	“	“	4.5V	GND	GND	GND	“	“	“	“				OUT		“	QA	“	“	“	“	“	“	“
		205	“	“	“	4.5V	GND	“	“	“	“	“				OUT		“	QB	“	“	“	“	“	“	“
		206	“	“	“	4.5V	GND	“	“	“	“	“				OUT		“	QC	“	“	“	“	“	“	“
		207	“	“	“	GND	GND	4.5V	4.5V	“	“	“	“				OUT		“	QD	“	“	“	“	“	“
		208	“	“	“	4.5V	GND	4.5V	4.5V	“	“	“	“				OUT	OUT	“	RCO	“	“	“	“	“	“

See footnotes at end of table III.

TABLE III. Group A inspection for device type 05.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Min		Max	Min	Max	Min	Max			
		Test no.	DATA B	QB	QA	ENABLE G	U/D	QC	QD	GND	DATA D	DATA C	LOAD	Max/Min	RCO	CLK	DATA A	V _{CC}									
V _{IC} (pos) 1/		1 2 3 4 5 6 7 8	1mA			1mA	1mA			1/		1mA	1mA	1mA			1mA		GND	DATA B ENABLE G U/D DATA D DATA C LOAD CLK DATA A		1.5					V
V _{IC} (neg)		9 10 11 12 13 14 15 16	-1mA			-1mA	-1mA			GND		-1mA	-1mA					1/	DATA B ENABLE G U/D DATA D DATA C LOAD CLK DATA A		-1.5						
I _{CCH}	3005	17	6.0V			GND	6.0V				6.0V	6.0V	GND			6.0V	6.0V	6.0V	V _{CC}		0.2		20			μA	
I _{CCL}	3005	18	GND			GND	GND				GND	GND	GND			GND	GND		V _{CC}		0.2		20			μA	
V _{OH3}	3006 2/	19 20 21 22 23 24	4.2V	-20μA	-20μA			-20μA	-20μA			4.2V	4.2V				4.2V		QB QA QC QD Max/Min RCO	5.95		5.95		5.95		V	
V _{OH5}	3006 2/	25 26 27 28 29 30	4.2V	-5.2mA	-5.2mA			-5.2mA	-5.2mA			4.2V	4.2V				4.2V		QB QA QC QD Max/Min RCO	5.48		5.2		5.48			
V _{OL3}	3007 4/	31 32 33 34 35 36	1.2V	20μA	20μA			20μA	20μA			1.2V	1.2V				1.2V		QB QA QC QD Max/Min RCO		0.05		0.05		0.05		
V _{OL5}	3007 4/	37 38 39 40 41 42	1.2mA	5.2mA	5.2mA			5.2mA	5.2mA			1.2V	1.2V				1.2V		QB QA QC QD Max/Min RCO		0.26		0.4		0.26		
I _{OS4}	3011 5/	43 44 45 46 47 48	4.0V	GND	GND			GND	GND			4.0V	4.0V				4.0V		QB QA QC QD Max/Min RCO	-10	-120	-10	-120	-10	-120	mA	
I _{IH}	3010	49 50 51 52 53 54 55 56	6.0V GND			GND 6.0V GND	GND GND 6.0V GND			GND	GND	GND	GND				GND	6.0V	DATA B ENABLE G U/D DATA D DATA C LOAD CLK DATA A		0.05		0.1			μA	

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	DATA B	QB	QA	ENABLE G	U/D	QC	QD	GND	DATA D	DATA C	LOAD	Max/Min	RCO	CLK	DATA A	V _{CC}		Min	Max	Min	Max	Min	Max	
I _{IL}	3009	57	GND			6.0V	6.0V			GND	6.0V	6.0V	6.0V			6.0V	6.0V	6.0V	DATA B		-0.05		-0.1		μA	
		58	6.0V			GND	6.0V												ENABLE G							
		59				6.0V	6.0V												U/D							
		60					GND				GND								DATA D							
		61					6.0V												DATA C							
		62									6.0V	GND							LOAD							
		63										6.0V	GND						CLK							
		64											6.0V			GND			DATA A							
																				Subgroup 4 T _C = +25°C						
																				Min	Max					
C _{IN}	3012	65	4/							GND	4/	4/						GND	DATA B		10				pF	
		66																	DATA D							
		67																	DATA C							
		68																	DATA A							
C _C	3012	69				4/	4/								4/				CLK		15					
		70																	ENABLE G							
		71																	U/D							
		72											4/						LOAD							
																		Measured terminal 9/	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 10/ 11/	3014	73	A	H	H	B	B	H	H	GND	A	A	B	H	H	A	A	4.5V	All outputs 12/ 13/							
		74				A							A													
		75																								
		76	B								B	B				B	B									
		77																								
		78				B										A	A									
		79	A								A	A				B	A									
		80		L	L			L	L						L	L										
		81																								
		82															B									
		83																								
		84	B	H	H						B	B				B	A									
		85	A								A	A				B	A									
		86																								
		87																								
		88		L	H			H								B	B									
		89																								
		90									B	A				B	A									
		91									A	A					B									
		92		H	L																					
		93									B	A				B	A									
		94																								
		95	B								B	B				B	B									
		96	B	L				L	H		A	A				B	B									
		97	A								B	A														
		98																								
		99																								
		100	B	H							A	B				B	A									
		101										B					A									

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case E,F,X 2	Terminal conditions 1/																Measured terminal 9/	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
			Test no.	DATA B	QB	QA	ENABLE G	U/D	QC	QD	GND	DATA D	DATA C	LOAD	Max/Min	RCO	CLK	DATA A		V _{CC}	Min	Max	Min	Max	Min	
Truth table tests 10/ 11/	3014	102	B	H	H	B	B	L	H	GND	A	A	A	L	H	A	A	4.5V	All outputs 12/ 13/							
		103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		104	"	L	L	"	"	H	"	"	"	"	"	"	"	"	"	"								
		105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		106	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		107	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		108	A	"	H	"	B	B	H	H	"	B	B	A	L	H	"	"		"						
		109	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		110	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		111	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		112	A	"	L	"	"	"	L	L	"	B	B	"	"	"	"	"		"						
		113	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		114	A	"	"	"	A	"	"	"	"	B	B	"	"	"	"	"		"						
		115	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		116	A	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		"						
		117	A	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		"						
		118	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		119	A	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		120	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		121	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		122	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		123	A	"	L	"	B	A	"	"	"	"	"	"	"	"	"	"		"						
		124	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		125	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		126	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		127	A	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		128	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		129	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		130	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		131	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		132	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		133	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		134	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		135	"	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		136	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		137	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		138	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
		139	A	"	L	"	"	"	"	"	"	"	"	"	"	"	"	"		"						
140	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
141	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
142	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
143	B	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
144	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
145	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
146	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
147	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
148	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
149	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
150	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
151	A	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
152	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
153	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
154	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
155	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
156	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
157	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
158	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
159	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
160	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
161	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
162	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
163	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
164	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal 9/	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	DATA B	QB	QA	ENABLE G	U/D	QC	QD	GND	DATA D	DATA C	LOAD	Max/Min	RCO	CLK	DATA A	V _{CC}								
Truth table tests 10/ 11/	3014	165	B	H	L	B A B	B	L	H	GND	B	A	A	L	H	A	A	4.5V	All outputs 12/ 13/							
		166	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		167	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		168	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		169	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		170	A	"	"	"	"	"	"	"	"	"	"	"	"	"	B A B B									
		171	"	"	"	"	"	H H	L L	"	"	"	"	"	"	"	"									
		172	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
																			Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C			
																			14/		14/		14/			
t _{MAX} 15/	3003 Fig. 4	173			OUT	GND	GND			GND			4.5V			IN		4.5V	CLK to QA	23		17		23	MHz	
t _{PLH5}	3003 Fig. 4	174	4.5V	OUT	OUT			OUT	OUT	"		4.5V	IN				4.5V	"	LOAD to QA	8	51	8	68	8	51	ns
		175							"	"			"				"	"	LOAD to QB	"	"	"	"	"	"	"
		176							"	"			"				"	"	LOAD to QC	"	"	"	"	"	"	"
		177							"	"			"				"	"	LOAD to QD	"	"	"	"	"	"	"
t _{PHL5}	3003 Fig. 4	178	GND	OUT	OUT			OUT	OUT	"		GND	"				GND	"	LOAD to QA	"	"	"	"	"	"	"
		179							"	"			"				"	"	LOAD to QB	"	"	"	"	"	"	"
		180							"	"			"				"	"	LOAD to QC	"	"	"	"	"	"	"
		181							"	"			"				"	"	LOAD to QD	"	"	"	"	"	"	"
t _{PLH1}	3003 Fig. 4	182	GND	OUT	OUT	GND	GND	OUT	OUT	"		GND	19/			IN	GND	"	CLK to QA	7	39	7	52	7	39	"
		183	GND			"	"		"	"		"	"			"	4.5V	"	CLK to QB	"	"	"	"	"	"	"
		184	4.5V			"	"		"	"		"	"			"	"	"	CLK to QC	"	"	"	"	"	"	"
		185	4.5V			"	"		"	"		"	"			"	"	"	CLK to QD	"	"	"	"	"	"	"
t _{PHL1}	3003 Fig. 4	186		OUT	OUT	"	"	OUT	OUT	"			4.5V			"	"	"	CLK to QA	"	"	"	"	"	"	"
		187				"	"		"	"			"			"	"	"	CLK to QB	"	"	"	"	"	"	"
		188				"	"		"	"			"			"	"	"	CLK to QC	"	"	"	"	"	"	"
		189				"	"		"	"			"			"	"	"	CLK to QD	"	"	"	"	"	"	"
t _{PHL6}	3003 Fig. 4	190	IN	OUT	OUT	"		OUT	OUT	"			"			"	IN	"	DATA A to QA	"	42	"	56	"	42	"
		191				"			"	"			"			"	"	"	DATA B to QB	"	"	"	"	"	"	"
		192				"			"	"			"			"	"	"	DATA C to QC	"	"	"	"	"	"	"
		193				"			"	"			"			"	"	"	DATA D to QD	"	"	"	"	"	"	"
t _{PLH3}	3003 Fig. 4	194				"	GND			"			"	OUT		"	"	"	CLK to Max/Min	8	45	8	60	8	45	"
t _{PHL3}	3003 Fig. 4	195				"	"			"			"	OUT		"	"	"	CLK to Max/Min	8	45	8	60	8	45	"
t _{PLH2}	3003 Fig. 4	196				"	"			"			"		OUT	"	"	"	CLK to RCO	5	26	5	35	5	26	"
t _{PHL2}	3003 Fig. 4	197				"	"			"			"		"	"	"	"	CLK to RCO	5	26	5	35	5	26	"
t _{PLH4}	3003 Fig. 4	198				IN	"			"			"			"	"	"	ENABLE G to RCO	6	35	6	47	6	35	"
t _{PHL4}	3003 Fig. 4	199				IN	"			"			"			"	"	"	ENABLE G to RCO	"	35	"	47	"	35	"
t _{PLH7}	3003 Fig. 4	200				GND	IN			"			"	OUT		IN	"	"	U/D to Max/Min	"	33	"	44	"	33	"
t _{PHL7}	3003 Fig. 4	201				"	"			"			"	OUT		"	"	"	U/D to Max/Min	"	33	"	44	"	33	"
t _{PLH8}	3003 Fig. 4	202				"	"			"			"		OUT	"	"	"	U/D to RCO	8	41	8	54	8	41	"
t _{PHL8}	3003 Fig. 4	203				"	"			"			"		OUT	"	"	"	U/D to RCO	8	41	8	54	8	41	"

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C 14/		T _C = +125°C		T _C = -55°C 14/		
		Test no.	DATA B	QB	QA	ENABLE G	U/D	QC	QD	GND	DATA D	DATA C	LOAD	Max/Min	RCO	CLK	DATA A	V _{CC}		Min	Max	Min	Max	Min	Max	
t _{TLH}	3004 Fig. 4	204	4.5V	OUT		GND	GND			GND	GND	GND	20/				GND	4.5V	QB	3	15	3	20	3	15	ns
		205	"		OUT	"	"			"	"	GND	"				"	"	QA	"	"	"	"	"	"	
		206	"			"	"	OUT		"	"	"	"				"	"	QC	"	"	"	"	"	"	
		207	"			"	"		OUT	"	"	4.5V	"				"	"	QD	"	"	"	"	"	"	
		208	"			"	"			"	"	"	21/	OUT		29/	GND	"	Max/Min	"	"	"	"	"	"	
		209	"			"	"			"	"	"	19/		OUT	20/	4.5V	"	RCO	"	"	"	"	"	"	
t _{THL}	3004 Fig. 4	210	GND	OUT		"	"			"	"	"	20/				4.5V	"	QB	"	"	"	"	"	"	
		211	4.5V		OUT	"	"			"	"	"	"				GND	"	QA	"	"	"	"	"	"	
		212	"			"	"	OUT		"	"	"	"				4.5V	"	QC	"	"	"	"	"	"	
		213	"			"	"		OUT	"	"	GND	"				4.5V	"	QD	"	"	"	"	"	"	
		214	"			"	"			"	"	4.5V	"	OUT		23/	GND	"	Max/Min	"	"	"	"	"	"	
		215	"			"	"			"	"	4.5V	"	19/	OUT	21/	GND	"	RCO	"	"	"	"	"	"	

See footnotes at end of table III.

TABLE III. Group A inspection for device type 06.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max		
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}									
V _{IC (pos)} 1/		1 2 3 4 5 6 7 8	1mA			1mA				1/2									GND	DATA B CLK count down CLK count up DATA D DATA C LOAD CLR DATA A		1.5				V	
V _{IC (neg)}		9 10 11 12 13 14 15 16	-1mA			-1mA				GND									1/2	DATA B CLK count down CLK count up DATA D DATA C LOAD CLR DATA A		-1.5					
I _{CCH}	3005	17	6.0V								6.0V	6.0V	GND				GND	6.0V	6.0V	V _{CC}		0.2		20		μA	
I _{CCL}	3005	18	GND								GND	GND	GND				GND	6.0V		V _{CC}		0.2		20		μA	
V _{OH3} 2/	3006	19 20 21 22 23 24	4.2V	-20μA	-20μA			-20μA	-20μA			4.2V	4.2V					4.2V		QB QA QC QD CARRY BORROW	5.95		5.95		5.95	V	
V _{OH5} 2/	3006	25 26 27 28 29 30	4.2V	-5.2mA	-5.2mA			-5.2mA	-5.2mA			4.2V	4.2V					4.2V		QB QA QC QD CARRY BORROW	5.48		5.2		5.48	V	
V _{OL3} 4/	3007	31 32 33 34 35 36	1.2V	20μA	20μA			20μA	20μA			1.2V	1.2V				1.2V	1.2V		QB QA QC QD CARRY BORROW		0.05		0.05		0.05	V
V _{OL5} 4/	3007	37 38 39 40 41 42	1.2V	5.2mA	5.2mA			5.2mA	5.2mA			1.2V	1.2V				1.2V	1.2V		QB QA QC QD CARRY BORROW		0.26		0.4		0.26	V
I _{OS4} 5/	3011	43 44 45 46 47 48	4.0V	GND	GND			GND	GND			4.0V	4.0V				GND	4.0V	4.0V	QB QA QC QD CARRY BORROW	-10	-120	-10	-120	-10	-120	mA
I _{IH}	3010	49 50 51 52 53 54 55 56	6.0V GND			GND 6.0V GND	GND GND 6.0V GND			GND	GND	GND	GND				GND	GND	6.0V	DATA B CLK count down CLK count up DATA D DATA C LOAD CLR DATA A		0.05		0.1			μA

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case E.F.X	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19		20	Min	Max	Min	Max	Min		Max
			Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A		V _{CC}							
I _{IL}	3009	57 58 59 60 61 62 63 64	GND 6.0V " " " " " "			6.0V GND 6.0V GND 6.0V " "				GND " 6.0V GND 6.0V " "	6.0V " 6.0V GND 6.0V " "	6.0V " " GND 6.0V GND 6.0V "				6.0V " " " GND 6.0V GND 6.0V "	6.0V " " " " " " GND "	6.0V " " " " " " " "	DATA B CLK count down CLK count up DATA D DATA C LOAD CLR DATA A		-0.05 " " " " " " "		-0.1 " " " " " " "			μA " " " " " " "	
																		Subgroup 4 T _C = +25°C									
																		Min	Max								
C _{IN}	3012	65 66 67 68	8/ " " "						GND " "	8/ " "	8/ " "						GND " "	8/ " "	DATA B DATA D DATA C DATA A		10 " "					pF " "	
C _C	3012	69 70 71 72	" " " "			8/ " "	8/ " "		" " "							8/ " "	" " "	CLK count down CLK count up CLR LOAD		15 " "					" " "		
																		Measured terminal 9/	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 10/ 11/	3014	73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106	A "																								

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal 9/	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}								
Truth table tests 10/ 11/	3014	107	A	L	L	B	A	H	L	GND	A	A	A	H	H	B	A	4.5V	All outputs 12/ 13/							
		108	"	H	H	A	"	"	"	"	"	"	"	"	"	"	"	"								
		109	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		110	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"	"								
		111	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		112	"	L	L	A	"	"	"	"	"	"	"	"	"	"	"	"								
		113	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"								
		114	"	"	H	A	"	"	"	"	"	"	"	"	"	"	"	"								
		115	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		116	"	"	L	A	"	"	"	"	"	"	"	"	"	L	"	"								
		117	"	H	H	"	"	"	"	H	"	"	"	"	"	H	"	"								
		118	"	"	H	H	"	"	"	H	"	"	"	"	"	"	"	"								
		119	"	H	H	L	"	"	"	L	"	"	"	"	"	"	A	"								
		120	"	H	H	L	"	"	"	H	"	"	"	"	"	"	B	"								
		121	"	"	L	L	"	"	"	L	"	"	"	"	"	"	A	"								
		122	"	"	"	L	"	"	"	L	"	"	"	"	"	"	B	"								
		123	"	"	H	"	A	A	"	"	"	"	"	"	"	"	"	"								
		124	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		125	B	"	"	"	"	"	"	"	"	"	B	A	"	"	"	B								
		126	"	L	L	B	"	"	L	L	"	"	"	"	"	"	"	"								
		127	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		128	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"								
		129	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"								
		130	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"								
		131	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		132	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		133	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"								
		134	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"								
135	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"										
136	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"										
																		Measured terminal	Subgroup 9 T _C = +25°C 14/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 14/			
																			Min	Max	Min	Max	Min	Max		
t _{MAX} 15/	3003 Fig. 4	137			OUT	4.5V	IN			GND			4.5V			GND		4.5V	CLK count up to QA	19		14		19		MHz
		138			OUT	IN	4.5V			"			4.5V			"		"	CLK count down to QA	19		14		19		MHz
t _{PLH5}	3003 Fig. 4	139	4.5V	OUT	OUT				OUT	"			IN			"	4.5V	"	LOAD to QB	12	51	12	68	12	51	ns
		140							"	"			"			"	"	"	LOAD to QA	"	"	"	"	"	"	"
		141							"	"			"			"	"	"	LOAD to QC	"	"	"	"	"	"	"
		142							"	"	4.5V	4.5V	"			"	"	"	LOAD to QD	"	"	"	"	"	"	"
t _{PHL5}	3003 Fig. 4	143	GND	OUT	OUT				OUT	"			"			"	GND	"	LOAD to QB	"	"	"	"	"	"	"
		144							"	"			"			"	"	"	LOAD to QA	"	"	"	"	"	"	"
		145							"	"	GND	GND	"			"	"	"	LOAD to QC	"	"	"	"	"	"	"
		146							"	"	"	"	"			"	"	"	LOAD to QD	"	"	"	"	"	"	"
t _{PLH1}	3003 Fig. 4	147		OUT		4.5V	IN		OUT	"	GND		4.5V			"		"	CLK count up to QB	11	48	11	64	11	48	"
		148			OUT	"	"		"	"			"			"	"	"	CLK count up to QA	"	"	"	"	"	"	"
		149				"	"	OUT	"	"			"			"	"	"	CLK count up to QC	"	"	"	"	"	"	"
		150				"	"		OUT	"			"			"	"	"	CLK count up to QD	"	"	"	"	"	"	"
		151		OUT		IN	4.5V		"	"			"			"	"	"	CLK count down to QB	"	"	"	"	"	"	"
		152			OUT	"	"		"	"			"			"	"	"	CLK count down to QA	"	"	"	"	"	"	"
		153				"	"	OUT	"	"			"			"	"	"	CLK count down to QC	"	"	"	"	"	"	"
		154				"	"		OUT	"			"			"	"	"	CLK count down to QD	"	"	"	"	"	"	"

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11			
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C 14/		T _C = +125°C		T _C = -55°C 14/			
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}		Min	Max	Min	Max	Min	Max		
t _{PHL1}	3003 Fig. 4	155		OUT		4.5V	IN			GND				4.5V			GND		4.5V	CLK count up to QB CLK count up to QA CLK count up to QC CLK count up to QD CLK count down to QB CLK count down to QA CLK count down to QC CLK count down to QD	11	48	11	64	11	48	ns
		156			OUT	"	"			"				"			"		"		"	"	"	"	"	"	
		157				"	"	OUT		"				"			"		"		"	"	"	"	"	"	
		158				"	"		OUT	"				"			"		"		"	"	"	"	"	"	
		159		OUT		IN	4.5V			"				"			"		"		"	"	"	"	"	"	
		160			OUT	"	"			"				"			"		"		"	"	"	"	"	"	
		161				"	"	OUT		"				"			"		"		"	"	"	"	"	"	
162				"	"		OUT	"				"			"		"	"	"	"	"	"	"				
t _{PHL9}	3003 Fig. 4	163	4.5V	OUT						"							IN		"	CLR to QB CLR to QA CLR to QC CLR to QD	"	47	"	62	"	47	"
		164			OUT					"		4.5V	4.5V	"			"	4.5V	"		"	"	"	"	"	"	
		165						OUT		"			"	"			"	"	"		"	"	"	"	"	"	
		166							OUT	"	4.5V		"	"			"	"	"		"	"	"	"	"	"	
t _{PLH2}	3003 Fig. 4	167				4.5V	IN			"	4.5V		"	OUT			GND	4.5V	"	CLK count up to carry CLK count down to borrow	4	29	4	39	4	29	"
		168	GND			IN	4.5V			"	GND	GND	"			OUT	"	GND	"		"	"	"	"	"	"	
t _{PHL2}	3003 Fig. 4	169				4.5V	IN			"	4.5V		"	OUT			"	4.5V	"	CLK count up to carry CLK count down to borrow	"	"	"	"	"	"	"
		170	GND			IN	4.5V			"	GND	GND	"			OUT	"	GND	"		"	"	"	"	"	"	
t _{TLH}	3004 Fig. 4	171	4.5V	OUT						GND				20/			GND		4.5V	QB QA QC QD CARRY BORROW	3	15	3	20	3	15	"
		172			OUT					"				"			"		"		"	"	"	"	"	"	
		173						OUT		"		4.5V	4.5V	"			"		"		"	"	"	"	"	"	
		174							OUT	"	4.5V	GND	GND	"			"		"		"	"	"	"	"	"	
		175	GND			4.5V	20/			"	4.5V	GND	GND	19/	OUT			"	4.5V		"	"	"	"	"	"	"
176	GND			20/	4.5V			"	"			"			OUT	"	GND	"	"	"	"	"	"	"			
t _{THL}	3004 Fig. 4	177	4.5V	OUT						"				19/			21/		"	QB QA QC QD CARRY BORROW	"	"	"	"	"	"	"
		178			OUT					"				"			"		"		"	"	"	"	"	"	
		179						OUT		"		4.5V	4.5V	"			"		"		"	"	"	"	"	"	
		180							OUT	"		GND	GND	"			"		"		"	"	"	"	"	"	
		181	GND			4.5V	20/			"	4.5V	GND	GND	"			OUT	GND	4.5V		"	"	"	"	"	"	"
		182				20/	4.5V			"	"			"			OUT	GND	GND		"	"	"	"	"	"	"

See footnotes at end of table III.

TABLE III. Group A inspection for device type 07.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	11	12	13	14	15	16										
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}		Min	Max	Min	Max	Min	Max	
V _{IC} (pos) 1/		1	1mA			1mA				1/							GND	DATA B		1.5				V		
		2																CLK count down								
		3					1mA											CLK count up								
		4									1mA							DATA D								
		5										1mA						DATA C								
		6											1mA					LOAD								
		7													1mA			CLR								
		8														1mA		DATA A								
V _{IC} (neg)		9	-1mA			-1mA				GND							1/	DATA B		-1.5						
		10																CLK count down								
		11					-1mA											CLK count up								
		12									-1mA							DATA D								
		13										-1mA						DATA C								
		14											-1mA					LOAD								
		15																CLR								
		16																DATA A								
I _{CCH}	3005	17	6.0V								6.0V	6.0V	GND				GND	V _{CC}		0.2		20		μA		
I _{CCL}	3005	18	GND									GND	GND				GND	V _{CC}		0.2		20		μA		
V _{OH3} 2/	3006	19	4.2V	-20μA														QB	5.95		5.95		5.95	V		
		20			-20μA													QA								
		21																QC								
		22																QD								
		23																QO								
		24					4.2V				4.2V								CARRY							
		25	4.2V										-20μA						BORROW							
		26																								
V _{OH5} 2/	3006	27	4.2V	-5.2mA														QB	5.48		5.2		5.48			
		28																QA								
		29																QC								
		30					4.2V				4.2V							QD								
		31	4.2V										-5.2mA					QO								
		32																CARRY								
		33																BORROW								
		34																								
V _{OL3} 4/	3007	31	1.2V	20μA														QB		0.05		0.05		0.05		
		32			20μA													QA								
		33																QC								
		34																QD								
		35	1.2V								1.2V	1.2V						QO								
		36												20μA				CARRY								
		37																BORROW								
		38																								
V _{OL5} 4/	3007	39	1.2V	5.2mA														QB		0.26		0.4		0.26		
		40																QA								
		41																QC								
		42																QD								
		43	1.2V								1.2V	1.2V						QO								
		44												5.2mA				CARRY								
		45																BORROW								
		46																								
I _{OS4} 5/	3011	43	4.0V	GND														QB	-10	-120	-10	-120	-10	-120	mA	
		44																QA								
		45																QC								
		46																QD								
		47																QO								
		48																CARRY								
		49																BORROW								
		50																								
I _{IH}	3010	49	6.0V															QB		0.05		0.1			μA	
		50	GND				GND											CLK count down								
		51					GND											CLK count up								
		52																DATA D								
		53																DATA C								
		54																LOAD								
		55																CLR								
		56																DATA A								

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}								
I _{IL}	3009	57	GND			6.0V	6.0V			GND	6.0V	6.0V	6.0V			6.0V	6.0V	6.0V	DATA B CLK count down CLK count up DATA D DATA C LOAD CLR DATA A		-0.05		-0.1			μA
		58	6.0V			GND	6.0V																			
		59	"			6.0V	GND																			
		60	"			"	6.0V				GND															
		61	"			"	"				6.0V	GND														
		62	"			"	"				"	6.0V	GND													
																		Subgroup 4 T _C = +25°C								
																		Min	Max							
C _{IN}	3012	65	8/							GND	8/	8/						GND	DATA B DATA D DATA C DATA A		10					pF
		66	"							"		8/						"			"					
		67	"							"								8/		"		"				
C _C	3012	69				8/	8/			"						8/	"	CLK count down CLK count up LOAD CLR		15						"
		70					8/			"							"			"						
		71								"			8/				8/		"		"					
																		Measured terminal 9/	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 10/ 11/	3014	73	B	L	L	A	A	L	L	GND	B	B	B	H	H	B	B	4.5V	All outputs 12/ 13/							
		74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		76	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		77	A	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"								
		78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		79	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		81	B	L	H	"	"	H	"	"	"	"	A	"	"	"	"	"								
		82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		83	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		84	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		85	A	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"								
		86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		88	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		89	B	L	L	"	"	L	H	"	"	A	B	"	"	"	"	"								
		90	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		91	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		93	A	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"								
94	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
97	B	L	L	"	"	H	H	"	"	A	B	"	"	"	"	"										
98	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
99	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
100	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
101	A	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"										
102	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
104	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal 9/	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max	
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}								
Truth table tests 10/ 11/	3014	107	A	L	L	B	A	L	L	GND	A	A	A	H	L	B	A	4.5V	All outputs 12/ 13/							
		108	"	H	H	B	"	H	H	"	"	"	"	"	"	"	"	"								
		109	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		110	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		111	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		112	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		113	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		114	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		115	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		116	"	H	L	B	"	L	"	"	"	"	"	"	"	"	"	"								
		117	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		118	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		119	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		120	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		121	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		122	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		123	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		124	"	H	L	B	"	H	L	"	"	"	"	"	"	"	"	"								
		125	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		126	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		127	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		128	"	L	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		129	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		130	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		131	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		132	"	"	H	L	"	L	"	"	"	"	"	"	"	"	"	"								
		133	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		134	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		135	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		136	"	L	L	B	"	"	"	"	"	"	"	"	"	"	"	"								
		137	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		138	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"								
		139	"	"	"	L	"	"	"	"	"	"	"	"	"	"	"	"								
		140	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		141	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		142	"	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"								
		143	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		144	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		145	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		146	"	L	L	"	"	H	"	"	"	"	"	"	"	"	"	"								
		147	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		148	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		149	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		150	"	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"								
		151	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		152	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		153	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		154	"	L	L	"	"	L	H	"	"	"	"	"	"	"	"	"								
		155	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		156	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		157	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		158	"	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"								
		159	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		160	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		161	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		162	"	L	L	"	"	H	"	"	"	"	"	"	"	"	"	"								
		163	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		164	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		165	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		166	"	H	L	"	"	"	"	"	"	"	"	"	"	"	"	"								
		167	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		168	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		169	"	"	"	"	"	"	"	"	"	"	"	"	"	L	"	"								

See footnotes at end of table III

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal 9/	Test limits						Unit	
			E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	Subgroup 9 T _C = +25°C 14/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 14/		
			2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19		20	Min	Max	Min	Max	Min		Max
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}									
Truth table tests 10/ 11/	3014	170	A	L	L	A	A	L	L	GND	A	A	A	H	H	B	A	4.5V	All outputs 12/ 13/								
		171	"	"	"	"	A	"	"	"	"	"	"	"	"	A	"	"									
		172	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"									
		173	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		"							
		174	"	"	"	B	"	"	"	"	"	"	"	"	"	L	"	"		"							
		175	"	"	"	A	"	"	"	"	"	"	"	"	"	H	"	"		"							
		176	"	"	"	"	"	"	"	"	"	"	"	"	"	"	B	"		"							
		177	"	H	H	"	"	H	H	"	"	"	B	L	"	"	"	"		"							
		178	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		"							
		179	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		"							
		180	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"		"							
		181	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"	"		"							
t _{PHL1}	3003 Fig. 4	182		OUT		4.5V	IN			GND			4.5V			GND		4.5V	CLK count up to QB	11	48	11	64	11	48	ns	
		183			OUT	"	"			"			"			"		"	CLK count up to QA	"	"	"	"	"	"	"	
		184				"	"	OUT		"			"			"		"	CLK count up to QC	"	"	"	"	"	"	"	
		185				"	"		OUT	"			"			"		"	CLK count up to QD	"	"	"	"	"	"	"	
		186		OUT		IN	4.5V			"			"			"		"	CLK count down to QB	"	"	"	"	"	"	"	
		187			OUT	"	"			"			"			"		"	CLK count down to QA	"	"	"	"	"	"	"	
		188				"	"	OUT		"			"			"		"	CLK count down to QC	"	"	"	"	"	"	"	
		189				"	"		OUT	"			"			"		"	CLK count down to QD	"	"	"	"	"	"	"	
t _{PHL9}	3003 Fig. 4	190	4.5V	OUT						"			19/			IN		"	CLR to QB	"	47	"	62	"	47	"	
		191			OUT			OUT		"			"			"	4.5V	"	CLR to QA	"	"	"	"	"	"	"	
		192								"	4.5V	4.5V	"			"		"	CLR to QC	"	"	"	"	"	"	"	
		193							OUT	"			"			"		"	CLR to QD	"	"	"	"	"	"	"	
t _{PLH2}	3003 Fig. 4	194	4.5V			4.5V	IN			"	4.5V	4.5V	"	OUT		GND	4.5V	"	CLK count up to CARRY	4	29	4	39	4	29	"	
		195	GND			IN	4.5V			"	GND	GND	"		OUT	"	GND	"	CLK count down to BORROW	"	"	"	"	"	"	"	
t _{PHL2}	3003 Fig. 4	196	4.5V			4.5V	IN			"	4.5V	4.5V	"	OUT		"	4.5V	"	CLK count up to CARRY	"	"	"	"	"	"	"	
		197	GND			IN	4.5V			"	GND	GND	"		OUT	"	GND	"	CLK count down to BORROW	"	"	"	"	"	"	"	
f _{MAX} 15/	3003 Fig. 4	198			OUT	4.5V	IN			GND			4.5V			GND		4.5V	CLK count up to QA	19		14		19		MHz	
		199			OUT	IN	4.5V			"			4.5V			"		"	CLK count down to QA	19		14		19		MHz	
t _{PLH5}	3003 Fig. 4	200	4.5V	OUT						"			IN			"	4.5V	"	LOAD to QB	12	51	12	68	12	51	ns	
		201			OUT					"			"			"		"	LOAD to QA	"	"	"	"	"	"	"	
		202						OUT		"			"			"		"	LOAD to QC	"	"	"	"	"	"	"	
		203							OUT	"	4.5V	4.5V	"			"		"	LOAD to QD	"	"	"	"	"	"	"	
t _{PHL5}	3003 Fig. 4	204	GND	OUT						"			"			"		"	LOAD to QB	"	"	"	"	"	"	"	
		205			OUT					"			"			"	GND	"	LOAD to QA	"	"	"	"	"	"	"	
		206						OUT		"	GND	GND	"			"		"	LOAD to QC	"	"	"	"	"	"	"	
		207							OUT	"			"			"		"	LOAD to QD	"	"	"	"	"	"	"	

See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C 14/		T _C = +125°C		T _C = -55°C 14/		
		Test no.	DATA B	QB	QA	CLK count down	CLK count up	QC	QD	GND	DATA D	DATA C	LOAD	CARRY	BORROW	CLR	DATA A	V _{CC}		Min	Max	Min	Max	Min	Max	
t _{PLH1}	3003 Fig. 4	208		OUT		4.5V	IN			GND			4.5V			GND		4.5V	CLK count up to QB	11	48	11	64	11	48	ns
		209			OUT		"			"			"			"		"	CLK count up to QA	"	"	"	"	"	"	"
		210					"	"	OUT		"			"		"		"	CLK count up to QC	"	"	"	"	"	"	"
		211					"	"		OUT	"			"		"		"	CLK count up to QD	"	"	"	"	"	"	"
		212		OUT			IN	4.5V			"			"		"		"	CLK count down to QB	"	"	"	"	"	"	"
		213			OUT		"	"			"			"		"		"	CLK count down to QA	"	"	"	"	"	"	"
		214					"	"	OUT		"			"		"		"	CLK count down to QC	"	"	"	"	"	"	"
		215				"	"	OUT		"			"		"		"	CLK count down to QD	"	"	"	"	"	"	"	
t _{TLH}	3004 Fig. 4	216	4.5V	OUT						"			20/			"		"	QB	3	15	3	20	3	15	"
		217			OUT				OUT		"			"		"		"	QA	"	"	"	"	"	"	"
		218									"			"		"		"	QC	"	"	"	"	"	"	"
		219								OUT	"	4.5V	4.5V	"			"		"	QD	"	"	"	"	"	"
		220	4.5V				4.5V	20/			"	4.5V	4.5V	19/	OUT			"	CARRY	"	"	"	"	"	"	"
		221	GND				"	4.5V			"	GND	GND	"		OUT		"	BORROW	"	"	"	"	"	"	"
t _{THL}	3004 Fig. 4	222	4.5V	OUT						"			"			21/		"	QB	"	"	"	"	"	"	"
		223			OUT				OUT		"			"			"		"	QA	"	"	"	"	"	"
		224									"	4.5V	4.5V	"			"		"	QC	"	"	"	"	"	"
		225								OUT	"			"			"		"	QD	"	"	"	"	"	"
		226	4.5V				4.5V	20/			"	4.5V	4.5V	"	OUT			"	CARRY	"	"	"	"	"	"	"
		227	GND				"	4.5V			"	GND	GND	"		OUT		"	BORROW	"	"	"	"	"	"	"

See footnotes at end of table III.

TABLE III. Group A inspection for device type 08.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		Test no.	CLK 1A	CLR1	1QA	CLK 1B	1QB	1QC	1QD	GND	2QD	2QC	2QB	CLK 2B	2QA	CLR2	CLK 2A	V _{CC}		Min	Max	Min	Max	Min	Max	
V _{IC(pos)}		1 2 3 4 5 6	1mA	1mA		1mA				1/				1mA		1mA	1mA	GND	CLK 1A CLR1 CLK 1B CLK 2B CLR2 CLK 2A		1.5					V
V _{IC(neg)}		7 8 9 10 11 12	-1mA	-1mA		-1mA				GND				-1mA		-1mA	-1mA	1/	CLK 1A CLR1 CLK 1B CLK 2B CLR2 CLK 2A		-1.5					V
I _{CCH}	3005	13	2/			2/							2/				2/	6.0V	V _{CC}		0.2		20			μA
I _{CCL}	3005	14	GND	24/		GND							GND		24/		GND		V _{CC}		0.2		20			μA
V _{OH3}	3006	15 16 17 18 19 20 21 22	24/	25/	-20μA	24/ 26/ 27/	-20μA	-20μA	-20μA					-20μA	25/	24/			1QA 1QB 1QC 1QD 2QA 2QB 2QC 2QD	5.95		5.95		5.95		V
V _{OH5}	3006	23 24 25 26 27 28 29 30	24/	25/	-5.2mA	24/ 26/ 27/	-5.2mA	-5.2mA	-5.2mA					-5.2mA	25/	24/			1QA 1QB 1QC 1QD 2QA 2QB 2QC 2QD	5.48		5.2		5.48		V
V _{OL3}	3007	31 32 33 34 35 36 37 38	24/	25/	20μA	24/ 26/ 27/	20μA	20μA	20μA					20μA	25/	24/			1QA 1QB 1QC 1QD 2QA 2QB 2QC 2QD		0.05		0.05		0.05	V
V _{OL5}	3007	39 40 41 42 43 44 45 46	24/	25/	5.2mA	24/ 26/ 27/	5.2mA	5.2mA	5.2mA					5.2mA	25/	24/			1QA 1QB 1QC 1QD 2QA 2QB 2QC 2QD		0.26		0.4		0.26	V
I _{OS4} 5/	3011	47 48 49 50 51 52 53 54	IN	IN	GND	IN	GND	GND	GND					GND	IN	GND	IN	4.0V	1QA 1QB 1QC 1QD 2QA 2QB 2QC 2QD	-10	-120	-10	-120	-10	-120	mA

See footnotes at end of table.

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See footnotes at end of table III.

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

Symbol	MIL-STD-883 method	Case E,F,X	Terminal conditions 1/																Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11		
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C 14/		T _C = +125°C		T _C = -55°C 14/		
		Test no.	CLK 1A	CLR1	1QA	CLK 1B	1QB	1QC	1QD	GND	2QD	2QC	2QB	CLK 2B	2QA	CLR2	CLK 2A	V _{CC}		Min	Max	Min	Max	Min	Max	
t _{PHL1}	3003 Fig. 4	103	IN	GND	OUT					GND								4.5V	CLK 1A to 1QA	4	26	4	34	4	26	ns
		104	"	"						"								"	CLK 1A to 1QC	9	51	9	68	9	51	"
		105	"	"		IN	OUT	OUT		"								"	CLK 1B to 1QB	4	27	4	36	4	27	"
		106	"	"		"		OUT		"								"	CLK 1B to 1QC	5	37	5	49	5	37	"
		107	"	"		"			OUT	"								"	CLK 1B to 1QD	4	27	4	36	4	27	"
		108								"		OUT	OUT		OUT	GND	IN	"	CLK 2A to 2QA	4	26	4	34	4	26	"
		109								"		OUT				"	"	"	CLK 2A to 2QC	9	51	9	68	9	51	"
		110								"		OUT	OUT			"	"	"	CLK 2B to 2QB	4	27	4	36	4	27	"
		111								"						"	"	"	CLK 2B to 2QC	5	37	5	49	5	37	"
		112								"	OUT	OUT				"	"	"	CLK 2B to 2QD	4	27	4	36	4	27	"
t _{PHL9}	3003 Fig. 4	113	28/	IN	OUT					"								"	CLR1 to 1QA	5	29	5	39	5	29	"
		114	"	"		28/	OUT	OUT		"								"	CLR1 to 1QB	"	"	"	"	"	"	"
		115	"	"		"		OUT		"								"	CLR1 to 1QC	"	"	"	"	"	"	"
		116	"	"		"			OUT	"								"	CLR1 to 1QD	"	"	"	"	"	"	"
		117								"					OUT	IN	5/	"	CLR2 to 2QA	"	"	"	"	"	"	"
		118								"		OUT	OUT	5/		"	"	"	CLR 2 to 2QB	"	"	"	"	"	"	"
		119								"				"		"	"	"	CLR2 to 2QC	"	"	"	"	"	"	"
		120								"	OUT			"		"	"	"	CLR2 to 2QD	"	"	"	"	"	"	"
t _{TLH}	3004 Fig. 4	121	23/	GND	OUT					GND								4.5V	1QA	3	15	3	20	3	15	ns
		122	"	"		23/	OUT	OUT		"								"	1QB	"	"	"	"	"	"	"
		123	"	"		"			OUT	"								"	1QC	"	"	"	"	"	"	"
		124								"								"	1QD	"	"	"	"	"	"	"
		125								"					OUT	GND	23/	"	2QA	"	"	"	"	"	"	"
		126								"						"	"	"	2QB	"	"	"	"	"	"	"
		127								"		OUT	OUT	23/		"	"	"	2QC	"	"	"	"	"	"	"
		128								"	OUT					"	"	"	2QD	"	"	"	"	"	"	"
t _{THL}	3004 Fig. 4	129	5/	IN	OUT					"								"	1QA	"	"	"	"	"	"	"
		130	"	"		5/	OUT	OUT		"								"	1QB	"	"	"	"	"	"	"
		131	"	"		"			OUT	"								"	1QC	"	"	"	"	"	"	"
		132				"				"								"	1QD	"	"	"	"	"	"	"
		133								"					OUT	IN	5/	"	2QA	"	"	"	"	"	"	"
		134								"				5/		"	"	"	2QB	"	"	"	"	"	"	"
		135								"		OUT	OUT			"	"	"	2QC	"	"	"	"	"	"	"
		136								"	OUT					"	"	"	2QD	"	"	"	"	"	"	"

See footnotes at end of table III.

TABLE III. Group A inspection for device type 09.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/														Measured terminal	Test limits						Unit	
			C,D	1	2	3	4	5	6	7	8	9	10	11	12	13		14	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
			2	2	3	4	6	8	9	10	12	13	14	16	18	19		20	Min	Max	Min	Max	Min		Max
			Test no.	CLK 1A	CLR1	1QA	1QB	1QC	1QD	GND	2QD	2QC	2QB	2QA	CLR2	CLK 2A		V _{CC}							
V _{IC(pos)} 1/		1 2 3 4	1mA	1mA					1/					1mA	1mA	GND	CLK 1A CLR1 CLR2 CLK 2A		1.5					V	
V _{IC(neg)}		5 6 7 8	-1mA	-1mA					GND					-1mA	-1mA	1/	CLK 1A CLR1 CLR2 CLK 2A		-1.5						
I _{CCH}	3005	9	5/												5/	6.0V	V _{CC}		0.2		20			μA	
I _{CCL}	3005	10	GND	25/										25/	GND		V _{CC}		0.2		20			μA	
V _{OH3}	3006	11 12 13 14 15 16 17 18	5/ 25/		-20μA	-20μA	-20μA	-20μA			-20μA	-20μA	-20μA	25/	5/		1QA 1QB 1QC 1QD 2QD 2QC 2QB 2QA	5.95		5.95		5.95		V	
V _{OH5}	3006	19 20 21 22 23 24 25 26	5/ 25/	-5.2mA	-5.2mA	-5.2mA	-5.2mA				-5.2mA	-5.2mA	-5.2mA	25/	5/		1QA 1QB 1QC 1QD 2QD 2QC 2QB 2QA	5.48		5.2		5.48			
V _{OL3}	3007	27 28 29 30 31 32 33 34	34/ 12/	1.2V	20μA	20μA	20μA	20μA			20μA	20μA	20μA		1.2V		1QA 1QB 1QC 1QD 2QD 2QC 2QB 2QA		0.05		0.05		0.05		
V _{OL5}	3007	35 36 37 38 39 40 41 42	1.2V 5.2mA 5.2mA 5.2mA 1.2V	5.2mA	5.2mA	5.2mA	5.2mA				5.2mA	5.2mA	5.2mA	1.2V			1QA 1QB 1QC 1QD 2QD 2QC 2QB 2QA		0.26		0.4		0.26		
I _{OS4} 5/	3011	43 44 45 46 47 48 49 50	IN IN GND GND GND GND	IN	GND	GND	GND				GND	GND	GND	IN	IN	4.0V	1QA 1QB 1QC 1QD 2QD 2QC 2QB 2QA	-10	-120	-10	-120	-10	-120	mA	
I _{IH}	3010	51 52 53 54	6.0V GND 6.0V	GND	6.0V									6.0V GND	GND 6.0V	6.0V	CLK 1A CLR1 CLR2 CLK 2A		0.05		0.1			μA	
I _{IL}	3009	55 56 57 58	GND 6.0V GND	6.0V GND										GND 6.0V	6.0V GND		CLK 1A CLR1 CLR2 CLK 2A		-0.05		-0.1				

See footnotes at end of table III.

TABLE III. Group A inspection for device type 09 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/														Measured terminal	Test limits						Unit	
		C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 4 T _C = +25°C							
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		Min	Max						
C _C	3012	Test no.	CLK 1A	CLR1	1QA	1QB	1QC	1QD	GND	2QD	2QC	2QB	2QA	CLR2	CLK 2A	V _{CC}	CLR1 CLR2 CLK 1A CLK 2A		15 " "					pF " "	
		59	8/						GND					8/		GND									
		60																							
		61	8/																						
62														8/											
																	Measured terminal 9/	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 10/ 11/	3014	63	A	A	L	L	L	L	GND	L	L	L	L	A	A	4.5V	All outputs 12/ 13/								
		64	B	B	"	"	"	"	"	"	"	"	"	"	"	"								"	
		65	B	B	"	"	"	"	"	"	"	"	"	"	"	"								"	
		66	B	B	"	"	"	"	"	"	"	"	"	"	"	"								"	
		67	B	B	H	"	"	"	"	"	"	"	"	H	"	"								"	
		68	A	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		69	B	"	L	H	"	"	"	"	"	"	"	L	"	"								"	
		70	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		71	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		72	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		73	B	"	L	L	H	"	"	"	"	"	"	H	"	"								"	
		74	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		75	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		76	A	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		77	B	"	L	H	"	"	"	"	"	"	"	L	"	"								"	
		78	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		79	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		80	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		81	B	"	L	L	H	"	"	"	"	"	"	L	"	"								"	
		82	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		83	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		84	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		85	B	"	L	H	"	"	"	"	"	"	"	H	"	"								"	
		86	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		87	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		88	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		89	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		90	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		91	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		92	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		93	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		94	A	"	L	"	"	"	"	"	"	"	"	L	"	"								"	
		95	B	"	H	"	"	"	"	"	"	"	"	H	"	"								"	
		96	B	A	L	L	L	L	L	L	L	L	L	A	B	B								"	
																	Measured terminal	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} 15/	3003	97	IN	GND	OUT				GND				OUT	GND	IN	4.5V	CLK 1A to 1QA	28		4		28	MHz		
t _{PLH1}	3003 Fig. 4	98	"	"	OUT				"				OUT	"	"	"	CLK 2A to 2QA	28	24	4	32	4	24		
		99	"	"		OUT			"				"	"	"	"	CLK 1A to 1QA	4	34	6	45	6	34		
		100	"	"			OUT		"				"	"	"	"	CLK 1A to 1QB	6	42	8	56	8	42		
		101	"	"				OUT	"				"	"	"	"	CLK 1A to 1QC	8	42	8	56	8	42		
		102	"	"					"				"	"	"	"	CLK 1A to 1QD	9	55	9	73	9	55		
		103	"	"					"			OUT	OUT	GND	IN	"	CLK 2A to 2QA	4	24	4	32	4	24		
		104	"	"					"	OUT			OUT	"	"	"	CLK 2A to 2QB	6	34	6	45	6	34		
		105	"	"					"		OUT			"	"	"	CLK 2A to 2QC	8	42	8	56	8	42		
		106	"	"					"	OUT				"	"	"	CLK 2A to 2QD	9	55	9	73	9	55		

See footnotes at end of table III.

TABLE III. Group A inspection for device type 09 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/														Measured terminal	Test limits						Unit
		C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9		Subgroup 10		Subgroup 11		
		2	2	3	4	6	8	9	10	12	13	14	16	18	19	20		T _C = +25°C		T _C = +125°C		T _C = -55°C		
		Test no.	CLK 1A	CLR1	1QA	1QB	1QC	1QD	GND	2QD	2QC	2QB	2QA	CLR2	CLK 2A	V _{CC}		Min	Max	Min	Max	Min	Max	
t _{PHL1}	3003 Fig. 4	107	IN	GND	OUT		OUT		GND							4.5V	CLK 1A to 1QA	4	24	4	32	4	24	ns
		108		"					"							"	CLK 1A to 1QB	6	34	6	45	6	34	"
		109		"				OUT		"						"	CLK 1A to 1QC	8	42	8	56	8	42	"
		110		"					OUT	"						"	CLK 1A to 1QD	9	55	9	73	9	55	"
		111								"			OUT	GND	IN	"	CLK 2A to 2QA	4	24	4	32	4	24	"
		112								"		OUT	OUT		"	"	CLK 2A to 2QB	6	34	6	45	6	34	"
		113								"					"	"	CLK 2A to 2QC	8	42	8	56	8	42	"
		114							OUT	"	OUT				"	"	CLK 2A to 2QD	9	55	9	73	9	55	"
t _{PHL9}	3003 Fig. 4	115	5/	IN	OUT		OUT		"						"	CLR1 to 1QA	5	29	5	39	5	29	"	
		116	"	"					"						"	CLR1 to 1QB	"	"	"	"	"	"	"	
		117	"	"				OUT		"					"	CLR1 to 1QC	"	"	"	"	"	"	"	
		118	"	"					OUT	"					"	CLR1 to 1QD	"	"	"	"	"	"	"	
		119								"			OUT	OUT	IN	5/	CLR2 to 2QA	"	"	"	"	"	"	"
		120								"		OUT	OUT		"	"	CLR2 to 2QB	"	"	"	"	"	"	"
		121								"	OUT	OUT			"	"	CLR2 to 2QC	"	"	"	"	"	"	"
		122								"					"	"	CLR2 to 2QD	"	"	"	"	"	"	"
t _{TLH}	3004 Fig. 4	123	IN	GND	OUT		OUT		"						"	1QA	3	15	3	20	3	15	"	
		124	"						"						"	1QB	"	"	"	"	"	"	"	
		125	"					OUT		"					"	1QC	"	"	"	"	"	"	"	
		126	"						OUT	"					"	1QD	"	"	"	"	"	"	"	
		127								"			OUT	OUT	GND	IN	"	2QA	"	"	"	"	"	"
		128								"		OUT	OUT		"	"	2QB	"	"	"	"	"	"	"
		129								"	OUT				"	"	2QC	"	"	"	"	"	"	"
		130							OUT	"					"	"	2QD	"	"	"	"	"	"	"
t _{THL}	3004 Fig. 4	131	5/	IN	OUT		OUT		"						"	1QA	"	"	"	"	"	"	"	
		132	"	"					"						"	1QB	"	"	"	"	"	"	"	
		133	"	"				OUT		"					"	1QC	"	"	"	"	"	"	"	
		134	"	"					OUT	"					"	1QD	"	"	"	"	"	"	"	
		135								"			OUT	IN	34/	"	2QA	"	"	"	"	"	"	"
		136								"		OUT	OUT		"	"	2QB	"	"	"	"	"	"	"
		137								"	OUT				"	"	2QC	"	"	"	"	"	"	"
		138							OUT	"					"	"	2QD	"	"	"	"	"	"	"

See footnotes at end of table III.

TABLE III. Group A inspection for device type 10.

Symbol	MIL-STD-883 method	Case E,F,X	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Min		Max	Min	Max	Min	Max			
			Test no.	5 OUT	1 OUT	0 OUT	2 OUT	6 OUT	7 OUT	3 OUT	GND	8 OUT	4 OUT	9 OUT	CARRY OUT	CLOCK ENABLE	CLK	CLR		V _{CC}							
V _{IC(pos)}		1 2 3							1/						1mA	1mA	1mA	GND	CLR CLK CLK ENABLE	1/	1.5					V	
V _{IC(neg)}		4 5 6							GND						-1mA	-1mA	-1mA	1/	CLR CLK CLK ENABLE		-1.5						
I _{CCH} I _{CCL} I _{CCH} I _{CCH}	3005 29/	7 8 9 10													GND	GND PA PF 6.0V	6.0V GND	6.0V	V _{CC}		0.2		20			μA	
V _{OH3}	3006 2/	11 12 13 14 15 16 17 18 19 20 21		-20μA	-20μA	-20μA					-20μA						IN	GND	6.0V	0 OUT 1 OUT 2 OUT 3 OUT 4 OUT 5 OUT 6 OUT 7 OUT 8 OUT 9 OUT CARRY OUT	5.95		5.95		5.95	V	
V _{OH5}	3006 2/	22 23 24 25 26 27 28 29 30 31 32		-5.2mA	-5.2mA	-5.2mA					-5.2mA									0 OUT 1 OUT 2 OUT 3 OUT 4 OUT 5 OUT 6 OUT 7 OUT 8 OUT 9 OUT CARRY OUT	5.48		5.2		5.48		
V _{OL3}	3007 4/	33 34 35 36 37 38 39 40 41 42 43		20μA	20μA	20μA					20μA									0 OUT 1 OUT 2 OUT 3 OUT 4 OUT 5 OUT 6 OUT 7 OUT 8 OUT 9 OUT CARRY OUT		0.05		0.05		0.05	V
V _{OL5}	3007 4/	44 45 46 47 48 49 50 51 52 53 54		5.2mA	5.2mA	5.2mA					5.2mA									0 OUT 1 OUT 2 OUT 3 OUT 4 OUT 5 OUT 6 OUT 7 OUT 8 OUT 9 OUT CARRY OUT		0.26		0.4		0.26	
I _{IH}	3010	55 56 57															GND GND 6.0V	GND 6.0V GND	6.0V GND 6.0V	CLR CLK CLK ENABLE		0.05		0.1		μA	
I _{IL}	3009	58 59 60															GND GND 6.0V	GND 6.0V 6.0V		CLR CLK CLK ENABLE		-0.05		-0.1			

See footnotes at end of table III.

TABLE III. Group A inspection for device type 10 – Continued.

Symbol	MIL-STD-883 method	Case E.F.X	Terminal conditions 1/																Measured terminal	Test limits						Unit																																																																																																																																																																																																																																																																																																																																																																																																																																																		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C																																																																																																																																																																																																																																																																																																																																																																																																																																																				
			Test no.	5 OUT	1 OUT	0 OUT	2 OUT	6 OUT	7 OUT	3 OUT	GND	8 OUT	4 OUT	9 OUT	CARRY OUT	CLOCK ENABLE	CLK	CLR		V _{CC}	Min	Max	Min	Max	Min		Max																																																																																																																																																																																																																																																																																																																																																																																																																																																	
I _{OS4} 5/	3011	61	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND

See footnotes at end of table III.

TABLE III. Group A inspection for device type 10 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit		
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11				
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C 14/		T _C = +125°C		T _C = -55°C 14/				
		Test no.	5 OUT	1 OUT	0 OUT	2 OUT	6 OUT	7 OUT	3 OUT	GND	8 OUT	4 OUT	9 OUT	CARRY OUT	CLOCK ENABLE	CLK	CLR	V _{CC}		Min	Max	Min	Max	Min	Max			
t _{PHL1}	3003 Fig. 4	101 102 103 104 105 106 107 108 109 110 111	OUT	OUT	OUT	OUT	OUT	OUT	GND	8 OUT	4 OUT	9 OUT	CARRY OUT	GND	CLK	CLR	4.5V	CLK to 0 OUT				6	40	6	54	6	40	ns
CLK to 1 OUT																												
CLK to 2 OUT																												
CLK to 3 OUT																												
CLK to 4 OUT																												
CLK to 5 OUT																												
CLK to 6 OUT																												
CLK to 7 OUT																												
CLK to 8 OUT																												
CLK to 9 OUT																												
CLK to CARRY OUT																												
t _{PLH1}	3003 Fig. 4	112 113 114 115 116 117 118 119 120 121 122	OUT	OUT	OUT	OUT	OUT	OUT		8 OUT		OUT						CLK to 0 OUT										
CLK to 1 OUT																												
CLK to 2 OUT																												
CLK to 3 OUT																												
CLK to 4 OUT																												
CLK to 5 OUT																												
CLK to 6 OUT																												
CLK to 7 OUT																												
CLK to 8 OUT																												
CLK to 9 OUT																												
CLK to CARRY OUT																												
t _{PHL9}	3003 Fig. 4	123 124 125 126 127 128 129 130 131 132 133	OUT	OUT	OUT	OUT	OUT	OUT		8 OUT		OUT				IN		CLR to 0 OUT										
CLR to 1 OUT																												
CLR to 2 OUT																												
CLR to 3 OUT																												
CLR to 4 OUT																												
CLR to 5 OUT																												
CLR to 6 OUT																												
CLR to 7 OUT																												
CLR to 8 OUT																												
CLR to 9 OUT																												
CLR to CARRY OUT																												
t _{PLH9}	3003 Fig. 4	112 113 114 115 116 117 118 119 120 121 122	OUT	OUT	OUT	OUT	OUT	OUT		8 OUT		OUT						CLR to 0 OUT										
CLR to 1 OUT																												
CLR to 2 OUT																												
CLR to 3 OUT																												
CLR to 4 OUT																												
CLR to 5 OUT																												
CLR to 6 OUT																												
CLR to 7 OUT																												
CLR to 8 OUT																												
CLR to 9 OUT																												
CLR to CARRY OUT																												
t _{PHL4}	3003 Fig. 4	145 146 147 148 149 150 151 152 153 154 155	OUT	OUT	OUT	OUT	OUT	OUT		8 OUT	4 OUT	9 OUT	OUT	IN		GND		CE to 0 OUT				7	44	7	59	7	44	ns
CE to 1 OUT																												
CE to 2 OUT																												
CE to 3 OUT																												
CE to 4 OUT																												
CE to 5 OUT																												
CE to 6 OUT																												
CE to 7 OUT																												
CE to 8 OUT																												
CE to 9 OUT																												
CE to CARRY OUT																												

See footnotes at end of table III.

TABLE III. Group A inspection for device type 10 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11			
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		T _C = +25°C 14/		T _C = +125°C		T _C = -55°C 14/			
		Test no.	5 OUT	1 OUT	0 OUT	2 OUT	6 OUT	7 OUT	3 OUT	GND	8 OUT	4 OUT	9 OUT	CARRY OUT	CLOCK ENABLE	CLK	CLR	V _{CC}		Min	Max	Min	Max	Min	Max		
t _{PLH4}	3003 Fig. 4	156			OUT					GND					IN	IN	GND	4.5V	CE to 0 OUT	7	44	7	59	7	44	ns	
		157			OUT														CE to 1 OUT								
		158					OUT												CE to 2 OUT								
		159								OUT									CE to 3 OUT								
		160										OUT							CE to 4 OUT								
		161	OUT																CE to 5 OUT								
		162						OUT											CE to 6 OUT								
		163							OUT										CE to 7 OUT								
		164									OUT								CE to 8 OUT								
		165											OUT						CE to 9 OUT								
		166												OUT					CE to CARRY OUT								
f _{MAX 15/}	3003 Fig. 4	167			OUT									GND				0 OUT	23		17		23		MHz		
t _{THL}	3004 Fig. 4	168			OUT														0 OUT	3	15	3	20	3	15	ns	
		169			OUT														1 OUT								
		170					OUT												2 OUT								
		171								OUT										3 OUT							
		172											OUT							4 OUT							
		173	OUT																	5 OUT							
		174						OUT												6 OUT							
		175							OUT											7 OUT							
		176									OUT									8 OUT							
		177											OUT							9 OUT							
		178												OUT						CARRY OUT							
t _{TLH}	3004 Fig. 4	180			OUT														0 OUT								
		181			OUT														1 OUT								
		182					OUT												2 OUT								
		183								OUT										3 OUT							
		184											OUT							4 OUT							
		185	OUT																	5 OUT							
		186																		6 OUT							
		187						OUT												7 OUT							
		188									OUT									8 OUT							
		189											OUT							9 OUT							
		190												OUT						CARRY OUT							

See footnotes at end of table III.

TABLE III. Group A inspection for device type 11.

Symbol	MIL-STD-883 method	Case E,F,X	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			Test no.	Q12	Q13	Q14	Q6	Q5	Q7	Q4	GND	Q1	CLK	CLR	Q9	Q8	Q10	Q11		V _{CC}	Min	Max	Min	Max	Min		Max
V _{IC(pos)}		1								1/		1mA	1mA					GND	CLK	1/	1.5					V	
V _{IC(neg)}		2								GND		-1mA						GND	CLK		-1.5					"	
		3								"		-1mA						1/	CLR		-1.5					"	
I _{CCH}	3005	4										GND	6.0V					6.0V	V _{CC}		0.2		20			μA	
I _{CCL}		5										GND	GND					"	V _{CC}		0.2		20			μA	
I _{CCL}		6										"	"					"	None							μA	
I _{CCL}		7										"	"					"	V _{CC}		0.2		20			μA	
I _{CCH}		8										"	"					"	V _{CC}		0.2		20			μA	
I _{CCH}		9										"	"					"	None		0.2		20			μA	
I _{CCH}		10										"	"					"	V _{CC}		0.2		20			μA	
V _{OH3}	3006 2/	11										"	-20μA	IN	IN			"	Q1	5.95		5.95		5.95		V	
		12										"		"	"			"	Q4							"	
		13										"		"	"			"	Q5							"	
		14										"		"	"			"	Q6							"	
		15										"		"	"			"	Q7							"	
		16										"		"				"	Q8							"	
		17										"		"				"	Q9							"	
		18										"		"				"	Q10							"	
		19										"		"				"	Q11							"	
		20										"		"				"	Q12							"	
		21										"		"				"	Q13							"	
		22										"		"				"	Q14							"	
V _{OH5}	3006 2/	23										"	-5.2mA	"	"			"	Q1	5.48		5.2		5.48		"	
		24										"		"	"			"	Q4							"	
		25										"		"	"			"	Q5							"	
		26										"		"	"			"	Q6							"	
		27										"		"	"			"	Q7							"	
		28										"		"				"	Q8							"	
		29										"		"				"	Q9							"	
		30										"		"				"	Q10							"	
		31										"		"				"	Q11							"	
		32										"		"				"	Q12							"	
		33										"		"				"	Q13							"	
		34										"		"				"	Q14							"	
V _{OL3}	3007 4/	35										"	20μA	"	"			"	Q1		0.05		0.05		0.05		"
		36										"		"	"			"	Q4							"	
		37										"		"	"			"	Q5							"	
		38										"		"	"			"	Q6							"	
		39										"		"	"			"	Q7							"	
		40										"		"				"	Q8							"	
		41										"		"				"	Q9							"	
		42										"		"				"	Q10							"	
		43										"		"				"	Q11							"	
		44										"		"				"	Q12							"	
		45										"		"				"	Q13							"	
		46										"		"				"	Q14							"	
V _{OH5}	3007 4/	47										"	5.2mA	"	"			"	Q1		0.26		0.4		0.26		"
		48										"		"	"			"	Q4							"	
		49										"		"	"			"	Q5							"	
		50										"		"	"			"	Q6							"	
		51										"		"	"			"	Q7							"	
		52										"		"				"	Q8							"	
		53										"		"				"	Q9							"	
		54										"		"				"	Q10							"	
		55										"		"				"	Q11							"	
		56										"		"				"	Q12							"	
		57										"		"				"	Q13							"	
		58										"		"				"	Q14							"	
I _{IH}	3010	59										"	6.0V	GND	GND			6.0V	CLK		0.05		0.1			μA	
I _{IL}	3009	60										"	GND	6.0V	GND			"	CLR		-0.05		-0.1			"	

See footnotes at end of table III.

TABLE III. Group A inspection for device type 11 – Continued.

Symbol	MIL-STD-883 method	Case E,F,X Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit		
			1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C						
			Q12	Q13	Q14	Q6	Q5	Q7	Q4	GND	Q1	CLK	CLR	Q9	Q8	Q10	Q11	V _{CC}		Min	Max	Min	Max	Min	Max			
I _{OS4}	3011 5/	63																4.0V	Q1	-10	-120	-10	-120	-10	-120	mA		
		64																	Q4									
		65																	Q5									
		66																	Q6									
		67																	Q7									
		68																	Q8									
		69																	Q9									
		70																	Q10									
		71																	Q11									
		72																	Q12									
		73																	Q13									
		74																	Q14									
																				Subgroup 4 T _C = +25°C								
																				Min	Max							
C _C	3012	75																GND	CLK		15					pF		
																			15									
																		Measured terminal 9/	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 29/	3014	77	L	L	L	L	L	L	L	L	GND	L	GND	4.5V	L	L	L	L	4.5V	Each output								
		78	"	"	"	"	"	"	"	"	"	"	"	4.5V	"	"	"	"	"		"							
		79	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"		"							
		80	"	"	"	"	"	"	"	"	"	"	"	"	4.5V	"	"	"	"		"	"						
		81	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"		"	"						
		82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"						
		83	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		84	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		85	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		86	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		87	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		88	X	X	X	X	X	X	X	X	"	"	"	"	"	L	X	X	X		"	"						
		89	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		90	L	L	L	L	L	L	L	L	"	"	"	"	"	X	X	X	X		"	"						
		91	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		92	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		93	L	L	L	L	L	L	L	L	"	"	"	"	"	L	X	L	L		"	"						
		94	L	L	L	L	L	L	L	L	"	"	"	"	"	L	X	L	L		"	"						
		95	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		96	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		97	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		98	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		99	L	L	L	L	L	L	L	L	"	"	"	"	"	L	X	L	L		"	"						
		100	L	L	L	L	L	L	L	L	"	"	"	"	"	H	X	L	L		"	"						
		101	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		102	L	L	L	L	L	L	L	L	"	"	"	"	"	L	X	X	X		"	"						
		103	L	L	L	L	L	L	L	L	"	"	"	"	"	L	X	X	X		"	"						
		104	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		105	L	L	L	L	L	L	L	L	"	"	"	"	"	H	L	X	H		"	"						
		106	L	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L		"	"						
		107	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		108	L	L	L	L	L	L	L	L	"	"	"	"	"	H	X	X	X		"	"						
		109	H	X	X	X	X	X	X	X	"	"	"	"	"	"	"	"	"		"	"						
		110	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X		"	"						
		111	H	L	L	L	L	L	L	L	"	"	"	"	"	H	X	X	X		"	"						
		112	X	X	X	X	X	X	X	X	"	"	"	"	"	L	L	L	L		"	"						
113	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X	"	"									
114	H	L	L	L	L	L	L	L	"	"	"	"	"	L	L	L	L	"	"									
115	L	X	X	X	X	X	X	X	"	"	"	"	"	L	X	X	X	"	"									
116	X	X	X	X	X	X	X	X	"	"	"	"	"	X	X	X	X	"	"									
117	H	X	X	X	X	X	X	X	"	"	"	"	"	H	X	X	X	"	"									
118	L	X	X	X	X	X	X	X	"	"	"	"	"	L	L	L	L	"	"									
119	X	L	"	"	"	"	"	"	"	"	"	"	"	X	X	X	X	"	"									
120	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
121	L	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									

See footnotes at end of table III.

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See footnotes at end of table III.

TABLE III. Group A inspection for device type 11 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit	
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 14/			
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		14/							
		Test no.	Q12	Q13	Q14	Q6	Q5	Q7	Q4	GND	Q1	CLK	CLR	Q9	Q8	Q10	Q11	V _{CC}		Min	Max	Min	Max	Min	Max		
t _{PHL9}	3003 Fig. 4	173								GND	OUT	IN	IN					4.5V	CLR to Q1	6	42	6	56	6	42	ns	
		174																	CLR to Q4								
		175																		CLR to Q5							
		176																		CLR to Q6							
		177																		CLR to Q7							
		178																		CLR to Q8							
		179																		CLR to Q9							
		180																		CLR to Q10							
		181																		CLR to Q11							
		182	OUT																	CLR to Q12							
		183		OUT																CLR to Q13							
		184			OUT															CLR to Q14							
t _{THL}	3004 Fig. 4	185									OUT		GND						Q1	3	15	3	20	3	15		
		186																	Q4								
		187																	Q5								
		188																	Q6								
		189																	Q7								
		190																	Q8								
		191																	Q9								
		192																	Q10								
		193																	Q11								
		194	OUT																Q12								
		195		OUT															Q13								
		196			OUT														Q14								
t _{TLH}	3004 Fig. 4	197									OUT								Q1								
		198																	Q4								
		199																	Q5								
		200																	Q6								
		201																	Q7								
		202																	Q8								
		203																	Q9								
		204																	Q10								
		205																	Q11								
		206	OUT																Q12								
		207		OUT															Q13								
		208			OUT														Q14								
f _{MAX}	Fig. 4	209									OUT							Q1	28		21		28		MHz		

See footnotes at end of table III.

TABLE III. Group A inspection for device type 12.

Symbol	MIL-STD-883 method	Case C,D	Terminal conditions 1/														Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			2	3	4	6	8	9	10	11	13	14	16	18	19	20		Min	Max	Min	Max	Min	Max		
		Test no.	CLK	CLR	Q7	Q6	Q5	Q4	GND	NC	Q3	NC	Q2	Q1	NC	V _{CC}		Min	Max	Min	Max	Min	Max		
V _{IC(pos)}		1 2	1mA	1mA					1/ 1/							GND GND	CLK CLR		1.5 1.5					V "	
V _{IC(neg)}		3 4	-1mA	-1mA					GND							1/ 1/	CLK CLR		-1.5 -1.5					"	
I _{CCH} I _{CCL} I _{CCL} 29/ I _{CCL} I _{CCL} 29/ I _{CCH}	3005	5 6 7 8 9 10	GND GND PI GND PI 6.0V	6.0V GND " " " "					"							6.0V " V _{CC} None V _{CC} None V _{CC}	V _{CC} CLR CLR CLR CLR CLR		0.2 0.2 0.2 0.2 0.2		20 20 20 20		μA μA μA μA		
V _{OH3}	3006 2/	11 12 13 14 15 16 17	IN " " " " " "	IN " " " " " "					"		-20μA		-20μA	-20μA		" " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7	5.95 " " " " " "		5.95 " " " " " "	5.95 " " " " " "		V " " " " " "		
V _{OH5}	3006 2/	18 19 20 21 22 23 24	" " " " " " "	" " " " " " "					"		-5.2mA		-5.2mA	-5.2mA		" " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7	5.48 " " " " " "		5.2 " " " " " "	5.48 " " " " " "		" " " " " "		
V _{OL3}	3007 4/	25 26 27 28 29 30 31	" " " " " " "	" " " " " " "					"		20μA		20μA	20μA		" " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7		0.05 " " " " " "		0.05 " " " " " "	0.05 " " " " " "		" " " " " "	
V _{OL5}	3007 4/	32 33 34 35 36 37 38	" " " " " " "	" " " " " " "					"		5.2mA		5.2mA	5.2mA		" " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7		0.26 " " " " " "		0.4 " " " " " "	0.26 " " " " " "		" " " " " "	
I _{IH}	3010	39 40	6.0V GND	GND 6.0V					"							"	CLK CLR		0.05 0.05		0.1 0.1			μA "	
I _{IL}	3009	41 42	GND 6.0V	6.0V GND					"							"	CLK CLR		-0.05 -0.05		-0.1 -0.1			"	
I _{OS4} 5/	3011	43 44 45 46 47 48 49	IN " " " " " "	IN " " " " " "					"		GND		GND	GND		4.0V " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7	-10 " " " " " "	-120 " " " " " "	-10 " " " " " "	-120 " " " " " "	-10 " " " " " "	-120 " " " " " "	mA " " " " " "	
																		Subgroup 4 T _C = +25°C							
																		Min	Max						
C _C	3012	50 51	8/ "	8/ "					GND GND							GND GND	CLK CLR		15 15					pF pF	

See footnotes at end of table III.

TABLE III. Group A inspection for device type 12 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/														Measured terminal 9/	Test limits						Unit
		C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C		
		Test no.	CLK	CLR	Q7	Q6	Q5	Q4	GND	NC	Q3	NC	Q2	Q1	NC	V _{CC}		Min	Max	Min	Max	Min	Max	
Truth table tests 17/	3014	52	GND	4.5V	L	L	L	L	GND		L		L	L		4.5V	Each output							
		53	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"								
		54	4.5V	"	"	"	"	"	"	"	"	"	"	"	"	"								
		55	GND	"	"	"	"	"	"	"	"	"	"	"	"	"								
		56	4.5V	"	"	"	"	"	"	"	"	"	"	"	"	"								
		57	GND	"	"	"	"	"	"	"	"	"	"	"	"	"								
		58	4.5V	"	"	"	"	"	"	"	"	"	"	"	"	"								
		59	GND	"	"	"	"	"	"	"	"	"	"	"	"	"								
		60	4.5V	"	"	"	"	"	"	"	"	"	"	"	"	"								
		61	GND	"	"	"	"	"	"	"	"	"	"	"	"	"								
		62	PC	"	X	X	X	X	X	"	"	"	"	L	X	X								
		63	4.5V	"	L	L	L	L	L	"	"	"	"	X	H	L								
		64	GND	"	"	"	"	"	"	"	"	"	"	X	H	L								
		65	PF	"	X	X	X	X	X	"	"	"	"	X	H	L								
		66	4.5V	"	L	L	L	L	L	"	"	"	"	X	H	L								
		67	GND	"	"	"	"	"	"	"	"	"	"	X	H	L								
		68	PG	"	X	X	X	X	X	"	"	"	"	X	H	L								
		69	4.5V	"	L	L	L	L	L	"	"	"	"	X	H	L								
		70	GND	"	"	"	"	"	"	"	"	"	"	X	H	L								
		71	PH	"	X	X	X	X	X	"	"	"	"	X	H	L								
		72	4.5V	"	L	L	L	L	L	"	"	"	"	X	H	L								
		73	GND	"	"	"	"	"	"	"	"	"	"	X	H	L								
		74	PJ	"	X	X	X	X	X	"	"	"	"	X	H	L								
		75	4.5V	"	H	L	L	L	L	"	"	"	"	X	H	L								
76	GND	"	"	"	"	"	"	"	"	"	"	X	H	L										
77	PI	"	X	L	X	X	X	"	"	"	"	X	H	L										
78	GND	"	"	"	"	"	"	"	"	"	"	X	H	L										
79	"	4.5V	"	"	"	"	"	"	"	"	"	"	"	"										
80	"	GND	"	"	"	"	"	"	"	"	"	"	"	"										
81	PK	"	X	X	X	X	X	"	"	"	"	X	H	L										
82	GND	"	"	"	"	"	"	"	"	"	"	"	"	"										
83	"	4.5V	"	"	"	"	"	"	"	"	"	"	"	"										
84	"	GND	"	"	"	"	"	"	"	"	"	"	"	"										
																Measured terminal	Subgroup 9 T _C = +25°C 14/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 14/			
																	Min	Max	Min	Max	Min	Max		
t _{PHL1}	3003 Fig. 4	85	IN	GND				GND				OUT	OUT		4.5V	CLK to Q1	5	37	5	49	5	37	ns	
		86	"	"				"				OUT	OUT		"	CLK to Q2	10	74	10	98	10	74	"	
		87	"	"				"				OUT	OUT		"	CLK to Q3	15	111	15	147	15	111	"	
		88	"	"				"				OUT	OUT		"	CLK to Q4	20	148	20	196	20	148	"	
		89	"	"				"				OUT	OUT		"	CLK to Q5	25	185	25	245	25	185	"	
		90	"	"				"				OUT	OUT		"	CLK to Q6	30	222	30	294	30	222	"	
t _{PLH1}	3003 Fig. 4	91	"	"	OUT	OUT	OUT	"				OUT	OUT		"	CLK to Q7	35	259	35	343	35	259	"	
		92	"	"				"				OUT	OUT		"	CLK to Q1	5	37	5	49	5	37	"	
		93	"	"				"				OUT	OUT		"	CLK to Q2	10	74	10	98	10	74	"	
		94	"	"				"				OUT	OUT		"	CLK to Q3	15	111	15	147	15	111	"	
		95	"	"				"				OUT	OUT		"	CLK to Q4	20	148	20	196	20	148	"	
		96	"	"				"				OUT	OUT		"	CLK to Q5	25	185	25	245	25	185	"	
t _{PHL11}	3003 Fig. 4	97	"	"	OUT	OUT	OUT	"				OUT	IN		"	CLK to Q6	30	222	30	294	30	222	"	
		98	"	"	OUT	OUT	OUT	"				OUT	IN		"	CLK to Q7	35	259	35	343	35	259	"	
		99	"	"				"				OUT	IN		"	Q1 to Q2	4	22	4	29	4	22	"	
		100	"	"				"				OUT	IN		"	Q2 to Q3	"	"	"	"	"	"	"	
		101	"	"				"				OUT	IN		"	Q3 to Q4	"	"	"	"	"	"	"	
		102	"	"				"				OUT	IN		"	Q4 to Q5	"	"	"	"	"	"	"	
t _{PLH11}	3003 Fig. 4	103	"	"	OUT	OUT	OUT	"				OUT	IN		"	Q5 to Q6	"	"	"	"	"	"	"	
		104	"	"	OUT	OUT	OUT	"				OUT	IN		"	Q6 to Q7	"	"	"	"	"	"	"	
		105	"	"				"				OUT	IN		"	Q1 to Q2	"	"	"	"	"	"	"	
		106	"	"				"				OUT	IN		"	Q2 to Q3	"	"	"	"	"	"	"	
		107	"	"				"				OUT	IN		"	Q3 to Q4	"	"	"	"	"	"	"	
		108	"	"				"				OUT	IN		"	Q4 to Q5	"	"	"	"	"	"	"	
		109	"		OUT	OUT	OUT	"				OUT	IN		"	Q5 to Q6	"	"	"	"	"	"	"	
		110	"		OUT	OUT	OUT	"				OUT	IN		"	Q6 to Q7	"	"	"	"	"	"	"	

See footnotes at end of table III.

TABLE III. Group A inspection for device type 12 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/														Measured terminal	Test limits						Unit	
		C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C			
		2	2	3	4	6	8	9	10	11	13	14	16	18	19	20		14/		14/		14/			
		Test no.	CLK	CLR	Q7	Q6	Q5	Q4	GND	NC	Q3	NC	Q2	Q1	NC	V _{CC}		Min	Max	Min	Max	Min	Max		
t _{PHL9}	3003 Fig. 4	111	IN	IN					GND					OUT	OUT		4.5V	CLR to Q1	5	37	5	49	5	37	ns
		112	⋮	⋮					⋮								⋮	CLR to Q2	⋮	⋮	⋮	⋮	⋮	⋮	
		113	⋮	⋮					⋮								⋮	CLR to Q3	⋮	⋮	⋮	⋮	⋮	⋮	
		114	⋮	⋮					⋮			OUT					⋮	CLR to Q4	⋮	⋮	⋮	⋮	⋮	⋮	
		115	⋮	⋮					⋮								⋮	CLR to Q5	⋮	⋮	⋮	⋮	⋮	⋮	
		116	⋮	⋮					⋮								⋮	CLR to Q6	⋮	⋮	⋮	⋮	⋮	⋮	
		117	⋮	⋮	OUT		OUT		OUT		⋮						⋮	CLR to Q7	⋮	⋮	⋮	⋮	⋮	⋮	
t _{THL}	3004 Fig. 4	118	⋮	GND					⋮					OUT	OUT		⋮	Q1	3	15	3	20	3	15	⋮
		119	⋮	⋮					⋮								⋮	Q2	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		120	⋮	⋮					⋮								⋮	Q3	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		121	⋮	⋮					⋮			OUT					⋮	Q4	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		122	⋮	⋮					⋮								⋮	Q5	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		123	⋮	⋮					⋮								⋮	Q6	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		124	⋮	⋮	OUT		OUT		OUT		⋮						⋮	Q7	⋮	⋮	⋮	⋮	⋮	⋮	⋮
t _{TLH}	3004 Fig. 4	125	⋮	⋮					⋮					OUT	OUT		⋮	Q1	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		126	⋮	⋮					⋮								⋮	Q2	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		127	⋮	⋮					⋮			OUT					⋮	Q3	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		128	⋮	⋮					⋮								⋮	Q4	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		129	⋮	⋮					⋮								⋮	Q5	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		130	⋮	⋮					⋮								⋮	Q6	⋮	⋮	⋮	⋮	⋮	⋮	⋮
		131	⋮	⋮	OUT		OUT		OUT		⋮						⋮	Q7	⋮	⋮	⋮	⋮	⋮	⋮	⋮
f _{MAX} 15/	Fig. 4	132	⋮	⋮					⋮				OUT			Q1	28		21		28		MHz		

See footnotes at end of table III.

TABLE III. Group A inspection for device type 13.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
		2	Q12	Q6	Q5	Q7	Q4	Q3	Q2	GND	Q1	CLK	CLR	Q9	Q8	Q10	Q11	V _{CC}		Min	Max	Min	Max	Min	Max	
V _{IC(pos)}		1 2								1/ 7/		1mA						GND	CLK		1.5				V	
V _{IC(neg)}		3 4								GND		-1mA	1mA					GND	CLK		-1.5				"	
I _{CCH}	3005	5										GND	6.0V					6.0V	V _{CC}		0.2		20		μA	
I _{CCL}		6										GND	GND					V _{CC}	V _{CC}		0.2		20		μA	
I _{CCL}	29/	7										PS	PS					None	None		0.2		20		μA	
I _{CCL}	29/	8										GND	GND					V _{CC}	V _{CC}		0.2		20		μA	
I _{CCH}		9										PS	PS					None	None		0.2		20		μA	
V _{OH3}	3006 2/	10 11 12 13 14 15 16 17 18 19 20 21 22			-20μA	-20μA	-20μA	-20μA	-20μA		-20μA	IN	IN						Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12	5.95		5.95		5.95	V	
V _{OH5}	3006 2/	23 24 25 26 27 28 29 30 31 32 33 34			-5.2mA	-5.2mA	-5.2mA	-5.2mA	-5.2mA		-5.2mA								Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12	5.48		5.2		5.48	"	
V _{OL3}	3007 4/	35 36 37 38 39 40 41 42 43 44 45 46			20μA	20μA	20μA	20μA	20μA		20μA								Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12		0.05		0.05		0.05	"
V _{OL5}	3007 4/	47 48 49 50 51 52 53 54 55 56 57 58			5.2mA	5.2mA	5.2mA	5.2mA	5.2mA		5.2mA								Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12		0.26		0.4		0.26	"
I _{IH}	3010	59 60										6.0V GND	GND 6.0V					6.0V	CLK CLR		0.05 0.05		0.1 0.1		μA	
I _{IL}	3009	61 62										GND 6.0V	6.0V GND						CLK CLR		-0.05 -0.05		-0.1 -0.1		"	

See footnotes at end of table III.

TABLE III. Group A inspection for device type 13 – Continued.

Symbol	MIL-STD-883 method	Case E.F.X	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		Min	Max	Min	Max	Min	Max		
I _{OS4}	3011	Test no.	Q12	Q6	Q5	Q7	Q4	Q3	Q2	GND	Q1	CLK	CLR	Q9	Q8	Q10	Q11	V _{CC}	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12	-10	-120	-10	-120	-10	-120	mA	
		63																4.0V									
		64																									
		65																									
		66																									
		67																									
		68																									
		69																									
		70																									
		71																									
		72																									
		73																									
		74	GND																								
																				Subgroup 4 T _C = +25°C							
																				Min	Max						
C _C	3012	75 76								GND GND		8/ 8/						GND GND	CLK CLR		15 15					pF pF	
																				Measured terminal 9/	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 29/	3014	77	L	L	L	L	L	L	L	GND	L	GND	4.5V	L	L	L	L	4.5V	Each output								
		78	"	"	"	"	"	"	"	"	"	H	L	L	L	L	L	"									
		79	"	"	"	"	"	"	"	"	"	L	L	L	L	L	L	"									
		80	"	"	"	"	"	"	"	"	"	L	L	L	L	L	L	"									
		81	"	"	"	"	"	"	"	"	"	L	L	L	L	L	L	"									
		82	"	"	"	"	"	"	"	"	"	H	X	"	"	"	"	"									
		83	X	X	X	X	X	X	X	H	X	"	"	"	"	"	"	"									
		84	L	L	L	L	L	L	L	X	"	4.5V	"	"	"	"	"	"									
		85	L	L	L	L	L	L	L	X	"	4.5V	"	"	"	"	"	"									
		86	X	X	X	X	X	X	X	"	"	GND	"	"	"	"	"	"									
		87	L	L	L	L	L	L	L	X	"	4.5V	"	"	"	"	"	"									
		88	L	L	L	L	L	L	L	X	"	GND	"	"	"	"	"	"									
		89	X	X	X	X	X	X	X	"	"	PF	"	"	"	"	"	"									
		90	L	L	L	L	L	L	L	X	"	4.5V	"	"	"	"	"	"									
		91	L	L	L	L	L	L	L	X	"	GND	"	"	"	"	"	"									
		92	X	X	X	X	X	X	X	"	"	PG	"	"	"	"	"	"									
		93	X	X	X	X	X	X	X	"	"	4.5V	"	"	"	"	"	"									
		94	L	L	L	L	L	L	L	X	"	GND	"	"	"	"	"	"									
		95	L	L	L	L	L	L	L	X	"	PH	"	"	"	"	"	"									
		96	L	L	L	L	L	L	L	X	"	4.5V	"	"	"	"	"	"									
97	L	L	L	L	L	L	L	X	"	GND	"	"	"	"	"	"											
98	X	X	X	X	X	X	X	"	"	PJ	"	"	"	"	"	"											
99	L	L	L	L	L	L	L	X	"	4.5V	"	"	"	"	"	"											
100	L	L	L	L	L	L	L	X	"	GND	"	"	"	"	"	"											
101	X	X	X	X	X	X	X	"	"	PL	"	"	"	"	"	"											
102	L	L	L	L	L	L	L	X	"	4.5V	"	"	"	"	"	"											
103	L	L	L	L	L	L	L	X	"	GND	"	"	"	"	"	"											
104	X	X	X	X	X	X	X	"	"	PM	"	"	"	"	"	"											
105	L	L	L	L	L	L	L	"	"	4.5V	GND	"	"	"	"	"	"										
106	L	L	L	L	L	L	L	"	"	PN	"	"	"	"	"	"	"										
107	L	L	L	L	L	L	L	"	"	4.5V	"	"	"	"	"	"	"										
108	L	L	L	L	L	L	L	"	"	GND	"	"	"	"	"	"	"										
109	X	X	X	X	X	X	X	"	"	PR	"	"	"	"	"	"	"										
110	L	L	L	L	L	L	L	"	"	4.5V	"	"	"	"	"	"	"										
111	L	L	L	L	L	L	L	"	"	GND	"	"	"	"	"	"	"										
112	X	X	X	X	X	X	X	"	"	PS	"	"	"	"	"	"	"										
113	L	L	L	L	L	L	L	"	"	4.5V	"	"	"	"	"	"	"										
114	X	X	X	X	X	X	X	"	"	GND	"	"	"	"	"	"	"										
115	L	L	L	L	L	L	L	"	"	4.5V	"	"	"	"	"	"	"										
116	X	X	X	X	X	X	X	"	"	PY	"	"	"	"	"	"	"										
117	L	L	L	L	L	L	L	"	"	GND	"	"	"	"	"	"	"										
118	L	L	L	L	L	L	L	"	"	"	"	"	"	"	"	"	"										
119	L	L	L	L	L	L	L	"	"	"	"	"	"	"	"	"	"										
120	X	X	X	X	X	X	X	"	"	PU	"	"	"	"	"	"	"										
121	L	L	L	L	L	L	L	"	"	GND	"	"	"	"	"	"	"										
122	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										
123	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"										

TABLE III. Group A inspection for device type 13 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal g/	Test limits						Unit	
		E,F,X	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C					
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		14/		14/		14/			
		Test no.	Q12	Q6	Q5	Q7	Q4	Q3	Q2	GND	Q1	CLK	CLR	Q9	Q8	Q10	Q11	V _{CC}		Min	Max	Min	Max	Min	Max		
t _{PHL1}	3003 Fig. 4	124								GND	OUT	IN	GND					4.5V	CLK to Q1	5	37	5	49	5	37	ns	
		125																	CLK to Q2	10	74	10	98	10	74		
		126																	CLK to Q3	15	111	15	147	15	111		
		127																	CLK to Q4	20	148	20	196	20	148		
		128						OUT	OUT										CLK to Q5	25	185	25	245	25	185		
		129			OUT	OUT													CLK to Q6	30	222	30	294	30	222		
		130		OUT															CLK to Q7	35	259	35	343	35	259		
		131														OUT	OUT		CLK to Q8	40	296	40	392	40	296		
		132																OUT	CLK to Q9	45	333	45	441	45	333		
		133																OUT	CLK to Q10	50	370	50	490	50	370		
		134																	CLK to Q11	55	407	55	539	55	407		
		135	OUT																CLK to Q12	60	444	60	588	60	444		
t _{PLH1}	3003 Fig. 4	136									OUT								CLK to Q1	5	37	5	49	5	37		
		137																	CLK to Q2	10	74	10	98	10	74		
		138																	CLK to Q3	15	111	15	147	15	111		
		139																	CLK to Q4	20	148	20	196	20	148		
		140																	CLK to Q5	25	185	25	245	25	185		
		141		OUT	OUT														CLK to Q6	30	222	30	294	30	222		
		142																	CLK to Q7	35	259	35	343	35	259		
		143														OUT	OUT		CLK to Q8	40	296	40	392	40	296		
		144																OUT	CLK to Q9	45	333	45	441	45	333		
		145																OUT	CLK to Q10	50	370	50	490	50	370		
		146																	CLK to Q11	55	407	55	539	55	407		
		147	OUT																CLK to Q12	60	444	60	588	60	444		
t _{PHL11}	3003 Fig. 4	148							OUT		IN								Q1 to Q2	4	22	4	29	4	22		
		149																	Q2 to Q3								
		150																	Q3 to Q4								
		151																	Q4 to Q5								
		152																	Q5 to Q6								
		153		OUT	IN	OUT	IN													Q6 to Q7							
		154																	Q7 to Q8								
		155														OUT	IN		Q8 to Q9								
		156																OUT	Q9 to Q10								
		157																OUT	Q10 to Q11								
		158	OUT															OUT	Q11 to Q12								
		t _{PLH11}	3003 Fig. 4	159							OUT		IN								Q1 to Q2						
160																			Q2 to Q3								
161																			Q3 to Q4								
162																			Q4 to Q5								
163																			Q5 to Q6								
164				OUT	IN	OUT	IN													Q6 to Q7							
165																			Q7 to Q8								
166																OUT	IN		Q8 to Q9								
167																		OUT	Q9 to Q10								
168																		OUT	Q10 to Q11								
169	OUT																	OUT	Q11 to Q12								
t _{PHL9}	3003 Fig. 4			170									OUT		IN						CLR to Q1	6	42	6	56	6	42
		171																	CLR to Q2								
		172																	CLR to Q3								
		173																	CLR to Q4								
		174																	CLR to Q5								
		175		OUT	OUT														CLR to Q6								
		176																	CLR to Q7								
		177																	CLR to Q8								
		178														OUT	OUT		CLR to Q9								
		179																OUT	CLR to Q10								
		180																OUT	CLR to Q11								
		181	OUT															OUT	CLR to Q12								

See footnotes at end of table III.

TABLE III. Group A inspection for device type 13 – Continued.

Symbol	MIL-STD-883 method	Case	Terminal conditions 1/																Measured terminal	Test limits						Unit
		E,F,X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C		
		2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20		14/		14/		14/		
		Test no.	Q12	Q6	Q5	Q7	Q4	Q3	Q2	GND	Q1	CLK	CLR	Q9	Q8	Q10	Q11	V _{CC}		Min	Max	Min	Max	Min	Max	
t _{THL}	3004 Fig. 4	182								GND	OUT	IN	GND					4.5V	Q1	3	15	3	20	3	15	ns
		183								cc		cc	cc					cc	Q2	cc	cc	cc	cc	cc	cc	cc
		184								cc		cc	cc					cc	Q3	cc	cc	cc	cc	cc	cc	cc
		185								cc		cc	cc					cc	Q4	cc	cc	cc	cc	cc	cc	cc
		186								cc		cc	cc					cc	Q5	cc	cc	cc	cc	cc	cc	cc
		187		OUT	OUT			OUT	OUT	cc		cc	cc					cc	Q6	cc	cc	cc	cc	cc	cc	cc
		188					OUT			cc		cc	cc					cc	Q7	cc	cc	cc	cc	cc	cc	cc
		189								cc		cc	cc		OUT	OUT		cc	Q8	cc	cc	cc	cc	cc	cc	cc
		190								cc		cc	cc					cc	Q9	cc	cc	cc	cc	cc	cc	cc
		191								cc		cc	cc		OUT		OUT	cc	Q10	cc	cc	cc	cc	cc	cc	cc
		192								cc		cc	cc					cc	Q11	cc	cc	cc	cc	cc	cc	cc
		193	OUT							cc		cc	cc					cc	Q12	cc	cc	cc	cc	cc	cc	cc
t _{TLH}	3004 Fig. 4	194								cc	OUT	cc	cc					cc	Q1	cc	cc	cc	cc	cc	cc	cc
		195								cc		cc	cc					cc	Q2	cc	cc	cc	cc	cc	cc	cc
		196								cc		cc	cc					cc	Q3	cc	cc	cc	cc	cc	cc	cc
		197								cc		cc	cc					cc	Q4	cc	cc	cc	cc	cc	cc	cc
		198								cc		cc	cc					cc	Q5	cc	cc	cc	cc	cc	cc	cc
		199		OUT	OUT			OUT	OUT	cc		cc	cc					cc	Q6	cc	cc	cc	cc	cc	cc	cc
		200								cc		cc	cc					cc	Q7	cc	cc	cc	cc	cc	cc	cc
		201								cc		cc	cc					cc	Q8	cc	cc	cc	cc	cc	cc	cc
		202								cc		cc	cc		OUT	OUT		cc	Q9	cc	cc	cc	cc	cc	cc	cc
		203								cc		cc	cc					cc	Q10	cc	cc	cc	cc	cc	cc	cc
		204								cc		cc	cc					cc	Q11	cc	cc	cc	cc	cc	cc	cc
		205	OUT							cc		cc	cc					cc	Q12	cc	cc	cc	cc	cc	cc	cc
f _{MAX} 15/	Fig. 4	206								cc	OUT	cc	cc					Q1	28		21		28		MHz	

See footnotes on next page.

TABLE III. Group A inspection – Continued.

- 1/ Input pins not designated shall be “high” level logic or “low” level logic, or may be left open provided they do not influence the outcome of the measurement. Output pins not designated shall be tied to the loads or left open provided they do not influence the outcome of the measurement. Exceptions are as follows:
- $V_{IC(POS)}$ tests, the GND terminal shall be open and the minimum limit of 0.4 V applies only where test equipment limitations do not allow for the GND pin to be open during test.
 - $V_{IC(NEG)}$ tests, the V_{CC} terminal shall be open.
 - I_{CC} tests, the output terminal shall be open.
- 2/ Apply sufficient clock pulses (see 28/) to set outputs ‘high’.
- 3/ Apply 1.2 V for device types 01 and 03; apply 4.2 V for device types 02 and 04.
- 4/ Apply sufficient  (3.7 V minimum/6.0 V maximum for high; 0.0 V + 0.9 V for low) pulses to set outputs ‘low’ prior to test.
- 5/ Apply sufficient  (3.15 V minimum/4.0 V maximum for high; 0.0 V + 0.9 V for low) pulses to set outputs ‘high’ prior to test.
- 6/ Apply GND for device types 01 and 03; apply 4.0 V for device types 02 and 04.
- 7/ For device types 01 and 04, set outputs to count of nine ($QA = 1, QD = 1, QB = 0, QC = 0$) prior to measurements. For device types 02 and 04, set outputs to count of fifteen ($QA = QB = QC = QD = 1$) prior to test.
- 8/ See 4.4.1c.
- 9/ Only summary attributes data is required.
- 10/ Tests performed in sequence.
- 11/ A = 3.7 V; B = 0.4 V.
- 12/ X = indeterminate output voltage.
- 13/ Output shall be: high ≥ 2.5 V; low < 2.5 V; $|I_{OUT}| = 20 \mu A$.
- 14/ See 4.4.1d.
- 15/ f_{MAX} minimum limit specified is the frequency of the pulse. The output frequency shall be one-half the input frequency. The f_{MAX} requirement is considered met if proper output state changes occur with the pulse repetition period set to that given in the limits column.
- 16/ For device types 01 and 02, apply one clock pulse prior to test. For device types 03 and 04, apply one clock pulse prior to test and another clock pulse during test.
- 17/ Apply a positive going pulse  (4.2 V minimum/6.0 V maximum for high; 0.0 V + 1.2 V for low).
- 18/ Apply  (3.15 V minimum/4.5 V maximum for high; 0.0 V + 0.9 V for low), one pulse while load is ‘low’ and another pulse after load has gone ‘high’ (during test).
- 19/ Apply  (3.15 V minimum/4.5 V maximum for high; 0.0 V + 0.9 V for low) pulse prior to test.
- 20/ Apply  (3.15 V minimum/4.5 V maximum for high; 0.0 V + 0.9 V for low) pulse during test.
- 21/ Apply  (3.15 V minimum/4.5 V maximum for high; 0.0 V + 0.9 V for low) pulse during test.

TABLE III. Group A inspection – Continued.

22/ Apply a positive going pulse  (3.7 V minimum/4.5 V maximum for high; 0.0 V + 0.9 V for low).

23/ Apply sufficient pulses (see 5/) to cause the output to transition.

24/ Apply  (4.2 V minimum/6.0 V maximum for high; 0.0 V + 0.9 V for low) prior to test after clear pulse.

25/ Apply  (4.2 V minimum/6.0 V maximum for high; 0.0 V + 0.9 V for low) pulse prior to test.

26/ Apply 2 pulses prior to test after clear pulse (see 24/).

27/ Apply 4 pulses prior to test after clear pulse (see 24/).

28/ Apply  (4.2 V minimum/6.0 V maximum for high; 0.0 V + 1.2 V for low) pulses to set output 'high' prior to test.

29/ This I_{CC} and functional tests shall be performed in the test number sequence shown with no intervening changes to terminal conditions. During the functional test, input terminals designated "PA", "PB", etc., shall have applied thereto a specified number of single pulses with the following parameters: Pulse amplitude = V_{CC} maximum to V_{CC} , 4 percent minimum. For I_{CC} tests, the input terminal is as designated. These pulses are enumerated as follows:

Symbol	Pulses	Symbol	Pulses	Symbol	Pulses	Symbol	Pulses
PA	1	PF	7	PK	85	PS	2047
PB	2	PG	15	PL	127	PT	4095
PC	3	PH	31	PM	255	PU	5461
PD	4	PI	42	PN	511	PV	8191
PE	5	PJ	63	PR	1023	PY	10922

During the functional tests, device output voltages are: Don't care "X", high "H", or low "L" as specified in the terminal condition columns. The output voltage limits over the specified temperature range are "H" ≥ 2.5 V, "L" < 2.5 V, $|I_{OUT}| = 20$ μ A maximum. Only a summary of attribute data is required.

30/ f_{MAX} minimum limits specified are the frequency at the inputs. The output frequency shall be one-half the input frequency when measured at QA. The output frequency shall be one-fifth the input frequency when measured at QD.

31/ 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.

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 <u>1/</u>	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. PIN and compliance identifier, if applicable (see 1.2)..
- b. 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.
- c. Requirements for certificate of compliance, if applicable.
- d. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.
- e. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.
- f. Requirements for product assurance options.
- g. 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.
- h. 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:

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

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.

- a. 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).
- b. A copy of each radiograph.
- c. The technology conformance inspection (TCI) data (see 4.4).
- d. Parameter distribution data on parameters evaluated during burn-in (see 3.6).
- e. 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	54HC160
02	54HC161
03	54HC162
04	54HC163
05	54HC191
06	54HC192
07	54HC193
08	54HC390
09	54HC393
10	54HC4017
11	54HC4020
12	54HC4024
13	54HC4040

6.9 Changes from previous issue. 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 5962-2005-025)

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

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/>.