

INCH-POUND

MIL-M-38510/656A
12 October 2005

SUPERSEDING
MIL-M-38510/656
31 March 1986

MILITARY SPECIFICATION

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

Reactivated after 12 Oct. 2005 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).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	Octal D-type flip-flop with clear
02	Octal three-state D-type flip-flop
03	Octal D-type flip-flop with enable
04	Octal three-state D-type flip-flop
05	Octal three-state D-type flip-flop with inverting outputs
06	Octal three-state D-type flip-flop with inverting outputs
52	Octal three-state D-type flip-flop with TTL compatible inputs

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

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

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
R	GDIP1-T20 or CDIP2-T20	20	Dual-in-line
S	GDFP2-F20 or CDFP3-F20	20	Flat pack
2	CQCC1-N20	20	Square leadless chip carrier
X	See figure 4	20	Flat pack

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, 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):	
Device types 01 and 03	300 mW
Device types 02, 04, 05, 06, and 52	420 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction to case (θ_{JC})	See MIL-STD-1835
Junction temperature (T_J)	175°C

1.4 Recommended operating conditions.

Device types 01, 02, 03, 04, 05, 06:

Maximum input low voltage (V_{IL})	0.3 V at $V_{CC} = 2.0$ V 0.9 V at $V_{CC} = 4.5$ V 1.2 V at $V_{CC} = 6.0$ V
Minimum input high voltage (V_{IH})	1.5 V at $V_{CC} = 2.0$ V 3.15 V at $V_{CC} = 4.5$ V 4.2 V at $V_{CC} = 6.0$ V
Supply voltage range (V_{CC})	2.0 V dc to 6.0 V dc
Output voltage range (V_{OUT})	0.0 V dc to V_{CC}
Operating temperature range (T_C)	-55° to +125°C
Maximum input rise and fall times (t_r, t_f):	
$V_{CC} = 2.0$ V	1000 ns
$V_{CC} = 4.5$ V	500 ns
$V_{CC} = 6.0$ V	400 ns

Device type 52:

Maximum input low voltage (V_{IL})	0.8 V at $V_{CC} = 4.5$ V to 5.5 V
Minimum input high voltage (V_{IH})	2.0 V at $V_{CC} = 4.5$ V to 5.5 V
Supply voltage range (V_{CC})	4.5 V dc to 5.5 V dc
Output voltage range (V_{OUT})	0.0 V to 5.5 V
Operating temperature range (T_C)	-55° to +125°C
Maximum input rise and fall times (t_r, t_f):	
$V_{CC} = 4.5$ V	500 ns

Setup time before clock (t_{SU}):

All devices	20 ns minimum
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Hold time (t_H):

Device types 01, 03, 04, and 06	5 ns minimum
Device types 02, 05, and 52	10 ns minimum

Clock pulse (t_{CLK}):

Device types 02, 04, 05, and 06	16 ns minimum
Device type 01	18 ns minimum
Device types 03 and 52	20 ns minimum
Removal time (t_{REM}) (device type 01 only)	20 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 Logic diagrams and terminal connections. The logic diagrams and terminal connections shall be as specified on figure 1.

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

3.3.3 Switching time test circuit and waveforms. The switching time test circuit and waveforms shall be as specified on figure 3.

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

3.3.5 Case outlines. The case outlines shall be as specified in 1.2.3, figure 4, and MIL-STD-1835.

3.4 Lead material and finish. The lead material and finish shall be in accordance with MIL-PRF-38535 (see 6.6).

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

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

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

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 38 (see MIL-PRF-38535, appendix A).

4. VERIFICATION

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

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

- a. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in method 1015 of MIL-STD-883.
- b. Delete the sequence specified as interim (pre-burn-in) electrical parameters through interim (post-burn-in) electrical parameters of table IA of MIL-PRF-38535 and substitute lines 1 through 7 of table II herein.
- c. Burn-in (method 1015 of MIL-STD-883).
 - (1) Unless otherwise specified in the manufacturers QM plan for static tests (test condition A), ambient temperature (T_A) shall be +125°C minimum. Test duration for each static test shall be 24 hours minimum for class S devices and in accordance with table I of method 1015 for class B devices.
 - i. For static burn-in I, all inputs shall be connected to GND. Outputs may be open or connected to $V_{CC}/2$. Resistors R1 are optional on both inputs and open outputs, required on outputs connected to $V_{CC}/2$. Resistors R1 = 680Ω to 47 kΩ.
 - 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, required on outputs connected to $V_{CC}/2$. Resistors R1 = 680Ω to 47 kΩ.
 - iii. $V_{CC} = 6.0 \text{ V} \pm 0.5 \text{ V}$; $V_{CC}/2 = V_{CC}/2 \pm 0.5 \text{ V}$.
 - (2) Unless otherwise specified in the manufacturers QM plan for dynamic test (test condition D), ambient temperature shall be +125°C minimum. Test duration shall be in accordance with table I of method 1015.
 - i. For dynamic burn-in, all inputs shall be connected through the resistors in parallel to a common clock pulse. Outputs shall be connected to $V_{CC}/2 \pm 0.5 \text{ V}$ through the resistors. For device types 01 and 03 resistors = 1 kΩ $\pm 5\%$ for outputs. For device types 02, 04-06, and 52 resistors = 680Ω $\pm 5\%$ for outputs. For all devices input resistors = 1 kΩ to 47 kΩ $\pm 20\%$ for inputs.
 - ii. CP1 = 100 kHz, CP2 = 50 kHz $\pm 50\%$ square wave; duty cycle = 50% $\pm 15\%$; $V_{IH} = 4.5 \text{ V to } V_{CC}$; $V_{IL} = 0.0 \text{ V} \pm 0.5 \text{ V}$; t_{THL} , $t_{TLH} < 500 \text{ ns}$.
 - iii. $V_{CC} = 6.0 \text{ V} \pm 0.5 \text{ V}$; $V_{CC}/2 = V_{CC}/2 \pm 0.5 \text{ V}$.
- 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, 6, 7, and 8 shall be omitted.
- c. Subgroup 4 (C_{IN} and C_{OUT} 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} 2/	V _{IH} = 1.5 V V _{IL} = 0.3 V I _{OH} = -20 μA	01-06	2.0V	1.90		V
	V _{OH2} 2/	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OH} = -20 μA	01-06	4.5V	4.40		V
	V _{OH3}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OH} = -20 μA	01-06	6.0V	5.90		V
	V _{OH4} 2/	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OH} = -4.0 mA	01-06	4.5V	3.7		V
	V _{OH5}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OH} = -5.2 mA	01-06	6.0V	5.2		V
	V _{OH6}	V _{IH} = 2.0 V V _{IL} = 0.8 V I _{OH} = -20 mA	52	4.5V	4.4		V
	V _{OH7}	V _{IH} = 2.0 V V _{IL} = 0.8 V I _{OH} = -6.0 mA	52	5.5V	3.7		V
Low-level output voltage	V _{OL1} 2/	V _{IH} = 1.5 V V _{IL} = 0.3 V I _{OL} = 20 μA	01-06	2.0V		0.10	V
	V _{OL2} 2/	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OL} = 20 μA	01-06	4.5V		0.10	V
	V _{OL3}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OL} = 20 μA	01-06	6.0V		0.10	V
	V _{OL4} 2/	V _{IH} = 3.15 V V _{IL} = 0.9 V I _{OL} = 4.0 mA	01-06	4.5V		0.4	V
	V _{OL5}	V _{IH} = 4.2 V V _{IL} = 1.2 V I _{OL} = 5.2 mA	01-06	6.0V		0.4	V
	V _{OL6}	V _{IH} = 2.0 V V _{IL} = 0.8 V I _{OL} = 20 mA	52	4.5V		0.1	V
	V _{OL7}	V _{IH} = 2.0 V V _{IL} = 0.8 V I _{OL} = 6.0 mA	52	5.5V		0.4	V
Positive input clamp voltage	V _{IC+}	I _{IN} = 1 mA T _C = +25°C	01-06 52	GND		1.5	V
Negative input clamp voltage	V _{IC-}	I _{IN} = -1 mA T _C = +25°C	01-06 52	OPEN		-1.5	V

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	
Input current low	I _{IL}	V _{IN} = GND	01-06	6.0V		-0.1	μA
			52	5.5V		-0.1	μA
Input current high	I _{IH}	V _{IN} = V _{CC}	01-06	6.0V		0.1	μA
			52	5.5V		0.1	μA
Short circuit output current	I _{OS1} <u>2/</u>	V _O = GND V _I = GND	01,03	2.0V	-2	-50	mA
			02,04		-2	-60	
			05,06				
	I _{OS2} <u>2/</u>		01,03	4.5V	-15	-150	
			02,04		-15	-165	
			05,06				
	I _{OS3} <u>2/</u>		01,03	6.0V	-25	-180	
			02,04		-25	-210	
			05,06				
	I _{OS4}		01,03	4.0V	-10	-120	
	02,04		-10	-135			
	05,06,52						
Supply current quiescent	I _{CC}	V _I = 5.5 V	52	5.5V	-25	-210	
		V _I = 6.0 V	01-06	6.0V		8	μA
		V _I = 5.5 V	52	5.5V		8	μA
	I _{CCZ}	V _I = 6.0 V	02,04 05,06	6.0V		4.0	μA
		V _I = 5.5 V	52	5.5V		4.0	μA
Three-state output leakage current low	I _{OZL}	V _{OUT} = GND OC = V _{IH} <u>3/</u>	02,04,05,06	6.0V		-2.0	μA
			52	5.5V		-2.0	
Three-state output leakage current high	I _{OZH}	V _{OUT} = V _{CC} OC = V _{IH} <u>3/</u>	02,04,05,06	6.0V		+2.0	μA
			52	5.5V		+2.0	
Input capacitance	C _{IN}	T _C = 25°C	01-06 52 <u>4/</u>			10	pF
Clock, control capacitance	C _C	T _C = 25°C	01-06 52			15	pF
Three-state output capacitance	C _O	T _C = 25°C	02,04-06,52			20	pF
Propagation delay times, clear to outputs	t _{PHL1} <u>5/</u> , <u>6/</u>	C _L = 50 pF ± 10%	01	4.5V		41	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C unless otherwise specified	Device type	V _{CC}	Limits		Unit
					Min	Max	
Propagation delay time, clock to outputs	t _{PHL2} , t _{PLH2} <u>5/</u> , <u>6/</u>	C _L = 50 pF ± 10%	01	4.5V		37	ns
			02, 52			42	ns
			03			37	ns
			04			42	ns
			05			42	ns
			06			41	ns
Output enable time	t _{PZH} , t _{PZL} <u>5/</u> , <u>6/</u>	C _L = 50 pF ± 10% R _L = 1 kΩ ± 10%	02	4.5V		35	ns
			52			41	ns
			04			35	ns
			05			41	ns
			06			35	ns
Output disable time	t _{PHZ} , t _{PLZ} <u>5/</u> , <u>6/</u>	C _L = 50 pF ± 10% R _L = 1 kΩ ± 10%	02	4.5V		35	ns
			52			41	ns
			04			35	ns
			05			35	ns
			06			35	ns
Transition time	t _{THL} , t _{TLH} <u>5/</u> , <u>6/</u>	C _L = 50 pF ± 10%	01	4.5V		20	ns
			02, 52			16	ns
			03			20	ns
			04			16	ns
			05			16	ns
			06			16	ns
Maximum frequency test	f _{MAX} <u>5/</u> , <u>6/</u>	C _L = 50 pF ± 10%, 50% duty cycle	01	4.5V		23	MHz
			02			25	MHz
			52			21	MHz
			03			21	MHz
			04			25	MHz
			05			25	MHz
			06			25	MHz

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

2/ Guaranteed but not tested.

3/ I_{OZL} set internal D flip-flops to high state.
I_{OZH} set internal D flip-flops to low state.

4/ Power dissipation capacitance (C_{PD}) per gate typically equals 25 pF.

5/ 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.

6/ 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
2.0V	5.00X	5.00Y
4.5V	$X = 1$	$0.75X = Y$
6.0V	0.85X	0.85Y

Normalized numbers
(+125°C equals 1)

NOTE: The 2.0 V and 6.0 V numbers are derived from their 4.5 V integer value.
Rounding off according to 5/4.

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

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

Normalized numbers
(+125°C equals 1)

NOTE: The 2.0 V and 6.0 V numbers are derived from their 4.5 V integer value.
Rounding off according to 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	<u>4/</u> req'd	
5	Same as line 1	4.2e	1*	Δ	4.2e	1*	Δ
6	Dynamic burn-in (method 1015)	4.2c 4.5.2	Req'd			Not req'd	
7	Same as line 1	4.2e	1	Δ			
8	Final electrical parameters		* 1, 2, 3, 9			1*, 2, 3, 9 <u>4/</u>	
9	Group A test requirements	4.4.1	1, 2, 3, 4, 9, 10, 11		4.4.1	1, 2, 3, 4, 9, 10, 11	
10	Group B test when using method 5005 QCI option	4.4.2	1, 2, 3, 9, 10, 11	Δ			
11	Group C end-point electrical parameters	4.4.2	1, 2, 3, 9, 10, 11	Δ	4.4.3	1, 2	Δ
12	Group D end-point electrical parameters	4.4.4	1, 2, 3		4.4.4	1, 2	

1/ Blank spaces indicate tests are not applicable.

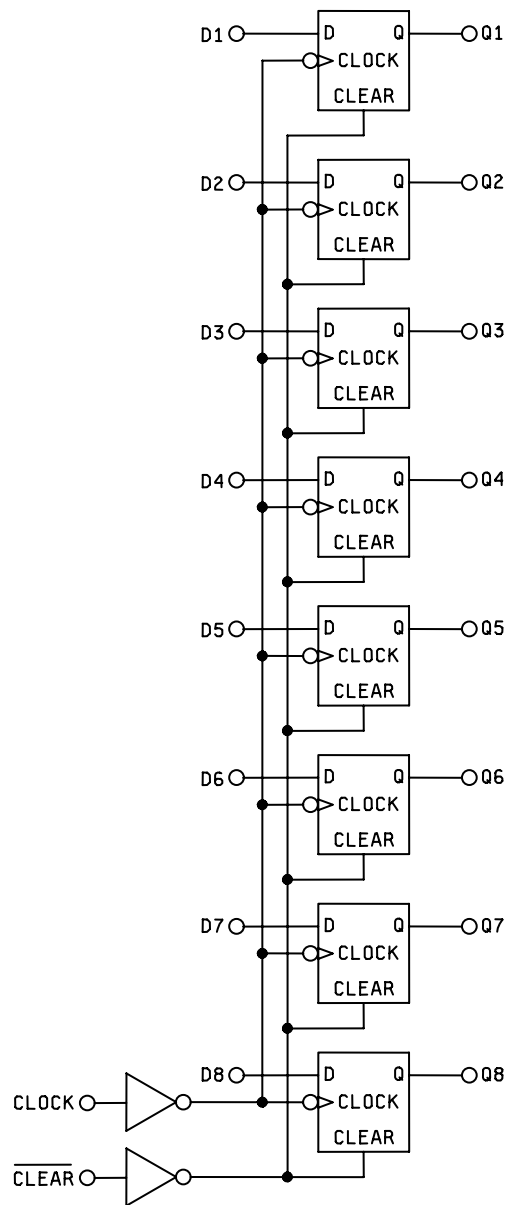
2/ * indicates PDA applies to subgroup 1 (see 4.2.1).

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

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

Device type	01
Case outlines	R, S, and 2
Terminal number	Terminal symbol
1	$\overline{\text{CLEAR}}$
2	Q1
3	D1
4	D2
5	Q2
6	Q3
7	D3
8	D4
9	Q4
10	GND
11	CLOCK
12	Q5
13	D5
14	D6
15	Q6
16	Q7
17	D7
18	D8
19	Q8
20	V _{CC}

FIGURE 1. Logic diagrams and terminal connections.

Device type 01FIGURE 1. Logic diagrams and terminal connections – Continued.

Device types	02 and 52
Case outlines	R, S, and 2
Terminal number	Terminal symbol
1	$\overline{OE}$
2	Q1
3	D1
4	D2
5	Q2
6	Q3
7	D3
8	D4
9	Q4
10	GND
11	CLK
12	Q5
13	D5
14	D6
15	Q6
16	Q7
17	D7
18	D8
19	Q8
20	V _{CC}

FIGURE 1. Logic diagrams and terminal connections – Continued.

Device types 02 and 52

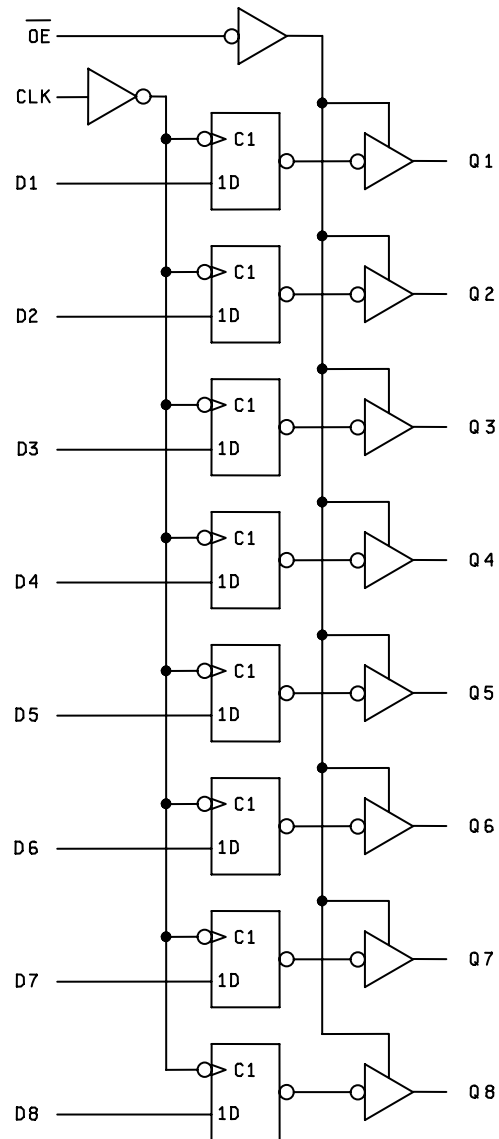
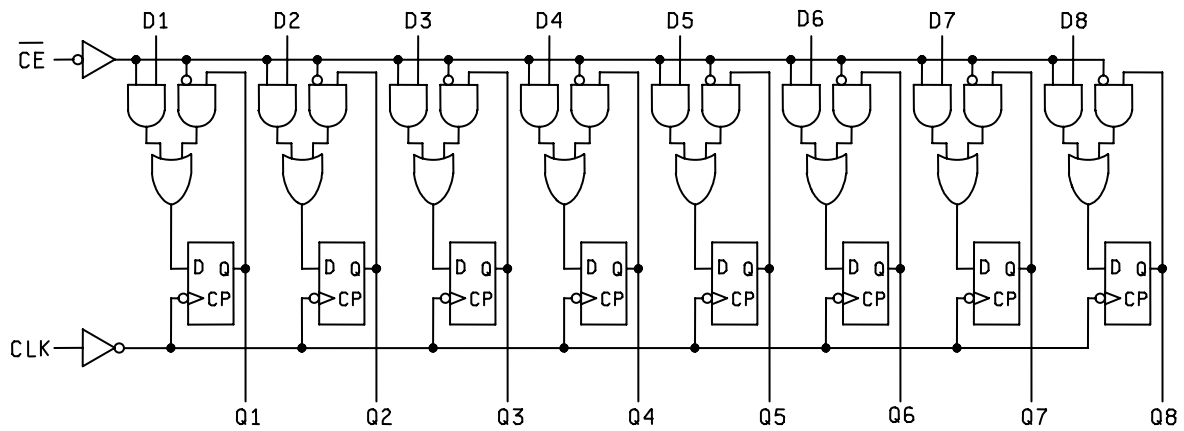


FIGURE 1. Logic diagrams and terminal connections – Continued.

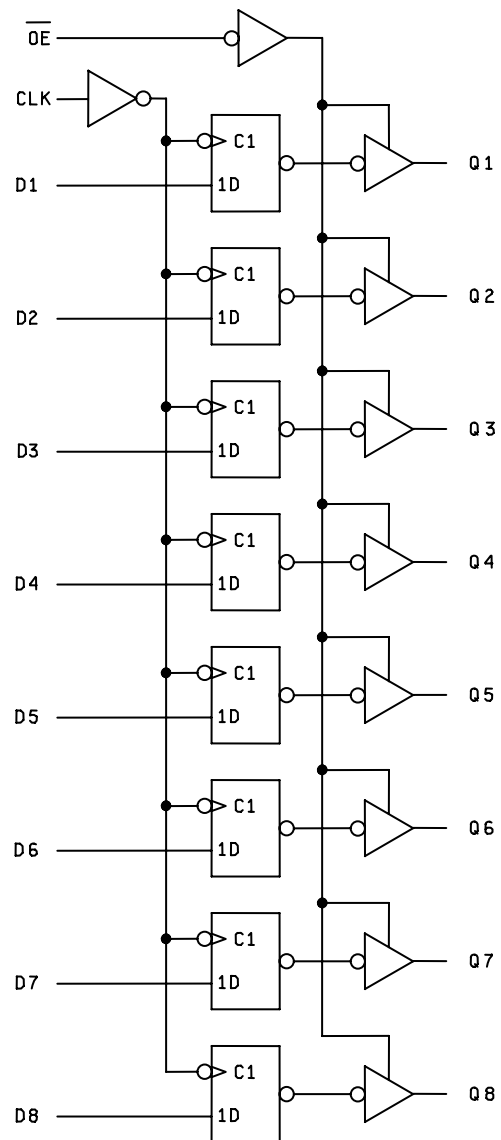
Device type	03
Case outlines	R, S, and 2
Terminal number	Terminal symbol
1	$\overline{\text{CE}}$
2	Q1
3	D1
4	D2
5	Q2
6	Q3
7	D3
8	D4
9	Q4
10	GND
11	CLK
12	Q5
13	D5
14	D6
15	Q6
16	Q7
17	D7
18	D8
19	Q8
20	V _{CC}

FIGURE 1. Logic diagrams and terminal connections – Continued.

Device type 03FIGURE 1. Logic diagrams and terminal connections – Continued.

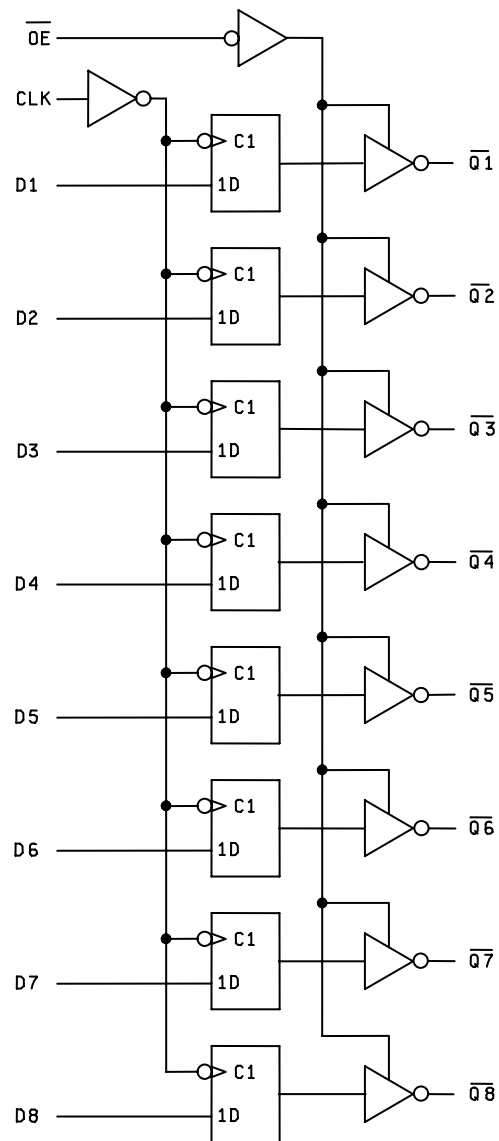
Device type	04
Case outlines	R, S, X, and 2
Terminal number	Terminal symbol
1	$\overline{OE}$
2	D1
3	D2
4	D3
5	D4
6	D5
7	D6
8	D7
9	D8
10	GND
11	CLK
12	Q8
13	Q7
14	Q6
15	Q5
16	Q4
17	Q3
18	Q2
19	Q1
20	V _{CC}

FIGURE 1. Logic diagrams and terminal connections – Continued.

Device type 04FIGURE 1. Logic diagrams and terminal connections – Continued.

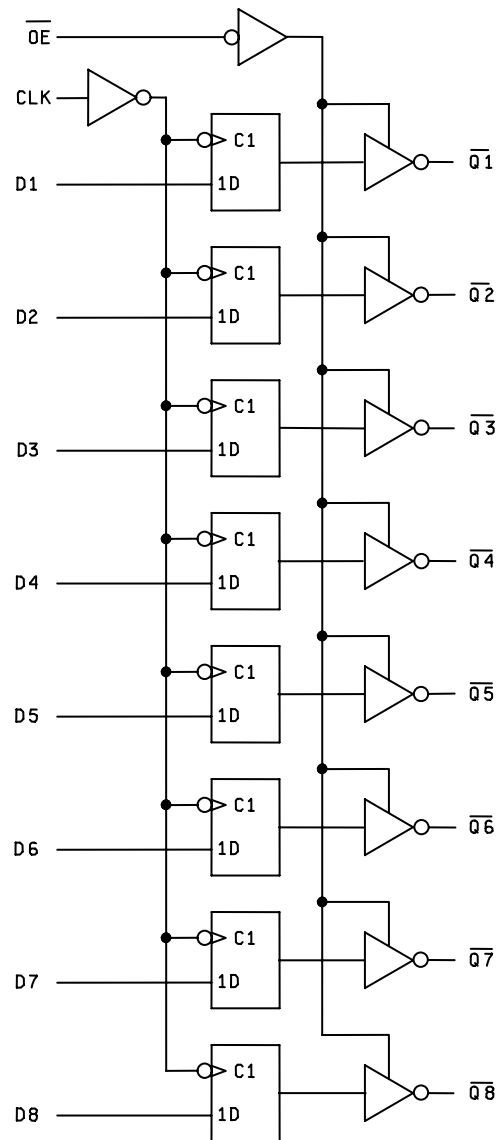
Device type	05
Case outlines	R, S, and 2
Terminal number	Terminal symbol
1	$\overline{\text{OE}}$
2	$\overline{\text{Q1}}$
3	D1
4	D2
5	$\overline{\text{Q2}}$
6	$\overline{\text{Q3}}$
7	D3
8	D4
9	$\overline{\text{Q4}}$
10	GND
11	CLK
12	$\overline{\text{Q5}}$
13	D5
14	D6
15	$\overline{\text{Q6}}$
16	$\overline{\text{Q7}}$
17	D7
18	D8
19	$\overline{\text{Q8}}$
20	V _{CC}

FIGURE 1. Logic diagrams and terminal connections – Continued.

Device type 05FIGURE 1. Logic diagrams and terminal connections – Continued.

Device type	06
Case outlines	R, S, and 2
Terminal number	Terminal symbol
1	$\overline{\text{OE}}$
2	D1
3	D2
4	D3
5	D4
6	D5
7	D6
8	D7
9	D8
10	GND
11	CLK
12	$\overline{\text{Q8}}$
13	$\overline{\text{Q7}}$
14	$\overline{\text{Q6}}$
15	$\overline{\text{Q5}}$
16	$\overline{\text{Q4}}$
17	$\overline{\text{Q3}}$
18	$\overline{\text{Q2}}$
19	$\overline{\text{Q1}}$
20	V_{CC}

FIGURE 1. Logic diagrams and terminal connections – Continued.

Device type 06FIGURE 1. Logic diagrams and terminal connections – Continued.

Device type 01

Inputs			Outputs
Clear	Clock	D	Q
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q0

Device types 02, 04, and 52

Inputs			Outputs
Output control	Clock	Data	Q
L	↑	H	H
L	↑	L	L
L	L	X	Q0
H	X	X	Z

Device type 03

Inputs			Outputs
$\overline{\text{CE}}$	Clock	Data	Q
H	X	X	Q0
L	↑	H	H
L	↑	L	L
X	L	X	Q0

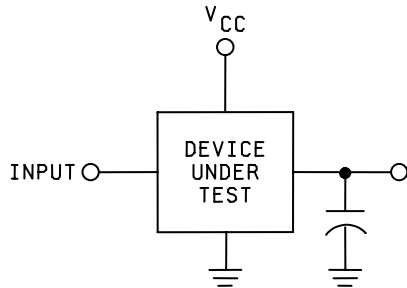
Device types 05 and 06

Inputs			Outputs
Output control	Clock	Data	$\overline{\text{Q}}$
L	↑	H	L
L	↑	L	H
L	L	X	$\overline{\text{Q0}}$
H	X	X	Z

H = High level voltage
 L = Low level voltage
 X = Don't care
 ↑ = Low-to-high level transition of the clock
 Z = High impedance state
 Q0, $\overline{\text{Q0}}$ = The level of the output before steady state input conditions were established

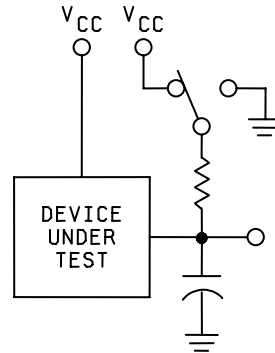
FIGURE 2. Truth tables.

DEVICE TYPES 01 AND 03



TEST CIRCUIT FOR PUSH PULL OUTPUTS

DEVICE TYPES 02,04,05,06 AND 52



TEST CIRCUIT FOR THREE-STATE
TEST - SEE NOTES 1 AND 2

DEVICE TYPES 01,02,03,04,05,06 AND 52

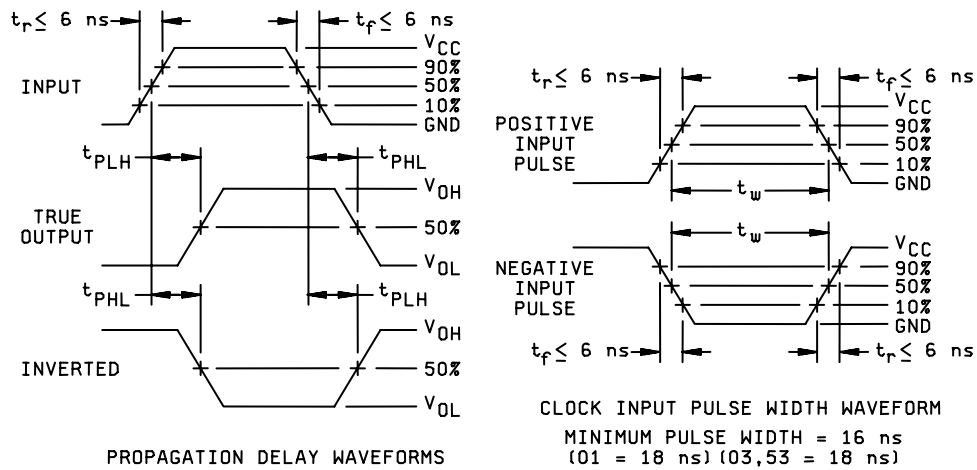
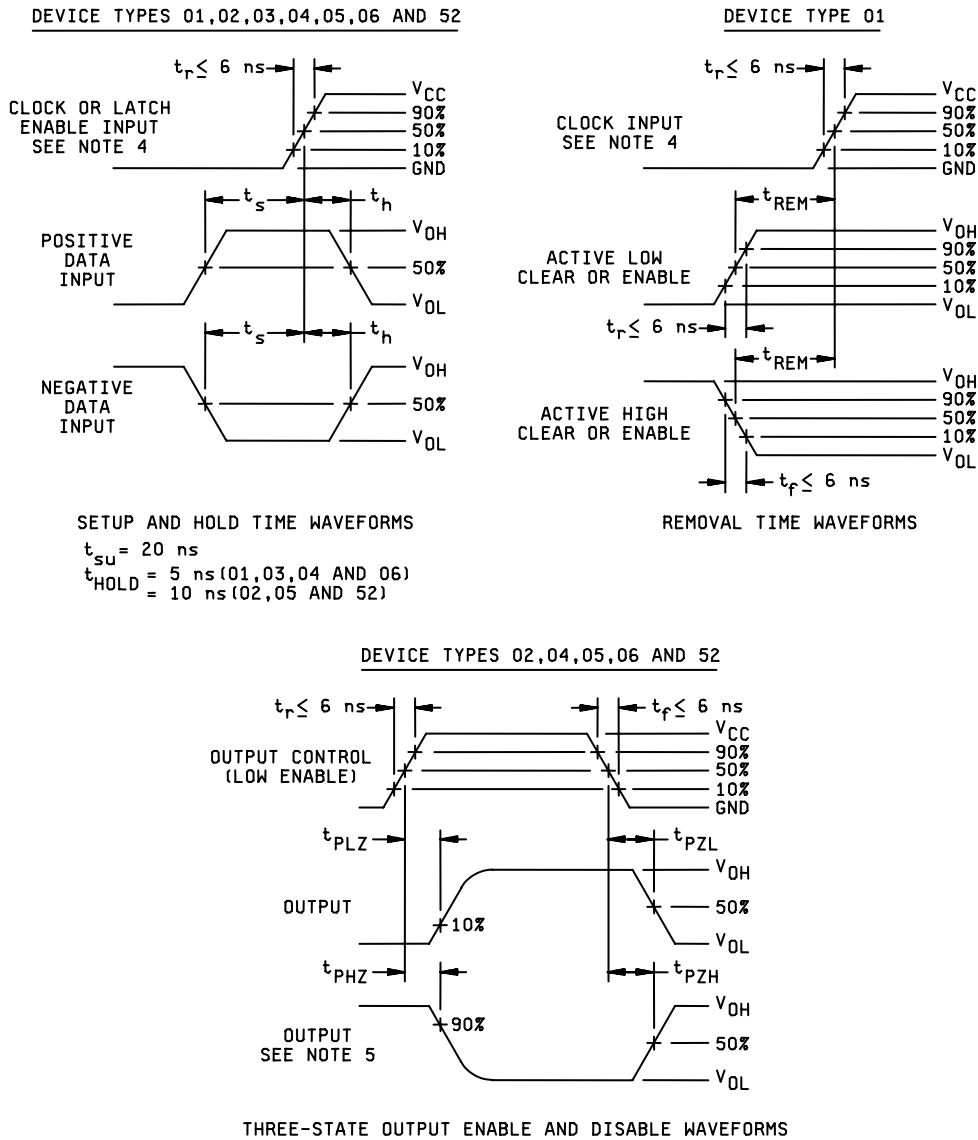


FIGURE 3. Switching time test circuit and waveforms.

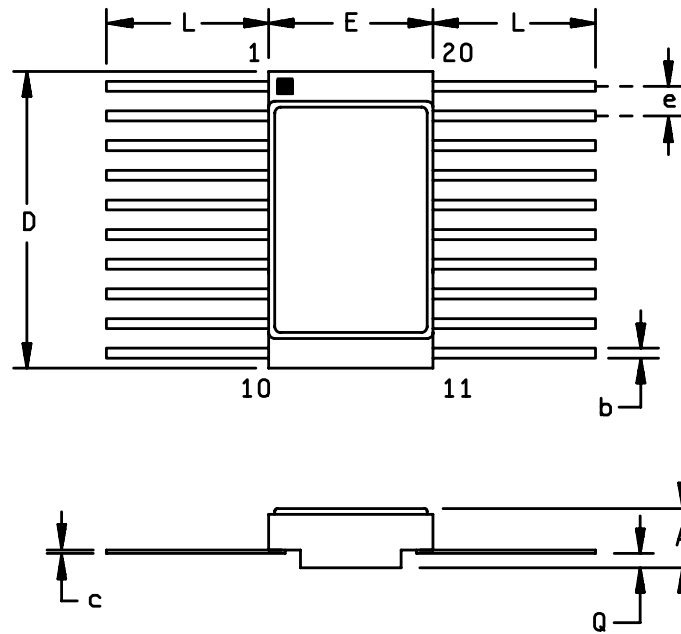


NOTES:

1. C_L includes load and test jig capacitance. See data sheets for values.
2. $S1 = V_{CC}$ for t_{PZL} and t_{PLZ} measurements. $S1 = GND$ for t_{PZH} and t_{PHZ} measurements.
3. Waveforms for negative edge sensitive circuits will be inverted, t_{REM} (20 ns).
4. This waveform is applicable to both three-state and open drain switching time measurements.

FIGURE 3. Switching time test circuit and waveforms – Continued.

Case X



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.045	.085	1.14	2.16
b	.015	.019	0.38	0.48
c	.003	.006	0.076	0.152
D	.505	.515	12.83	13.08
E	.275	.285	6.99	7.24
e	.045	.055	1.14	1.40
L	.250	.370	6.35	9.39
Q	.010		0.25	
N	20		20	

FIGURE 4. Case outline.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			Test no.	CLR	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max	
V _{IC} (pos)		1 2 3 4 5 6 7 8 9 10	1mA		1mA	1mA			1mA	1mA	1	/											GND	CLR D1 D2 D3 D4 CLK D5 D6 D7 D8	2/	1.5					V	
V _{IC} (neg)		11 12 13 14 15 16 17 18 19 20	-1mA		-1mA	-1mA			-1mA	-1mA		GND											1	/	CLR D1 D2 D3 D4 CLK D5 D6 D7 D8	-1.5						
I _{CCH}	3005	21	6V		6V	6V			6V	6V			3/		6V					6V		6V	V _{CC}		0.2						μA	
I _{CCL}		22	GND		GND	GND			GND	GND					GND	GND			GND	GND			V _{CC}		0.2						μA	
V _{OH3}	3006	24 25 26 27 28 29 30	4.2V	-20μA	4.2V	4.2V	-20μA	-20μA	4.2V	4.2V	-20μA			6V			6V							Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8	5.95		8.0 8.0		5.95		V	
V _{OH5}		31 32 33 34 35 36 37 38		-5.2mA	4.2V	4.2V	-5.2mA	-5.2mA	4.2V	4.2V	-5.2mA					4.2V	-5.2mA	-5.2mA	4.2V	4.2V	-5.2mA			Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8	5.48			5.2		5.48		
V _{OL3}	3007	40 41 42 43 44 45 46		20μA	1.2V	1.2V	20μA	20μA	1.2V	1.2V	20μA					1.2V	20μA	20μA	1.2V	1.2V				Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8		0.1		0.1		0.1		
V _{OL5}		47 48 49 50 51 52 53 54		5.2mA	1.2V	1.2V	5.2mA	5.2mA	1.2V	1.2V	5.2mA					1.2V	5.2mA	5.2mA	1.2V	1.2V	5.2mA			Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8		0.26		0.4		0.26		

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			Test no.	CLR	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max	
I _{OS4}	3011	55	4V	GND	4V	4V	GND		GND	4V	4V	GND	GND	3/									4V	Q1	-10	-120	-10	-120	-10	-120	mA	
		56	"						GND				"	"								"	Q2	"	"	"	"	"	"	"		
		57	"										"	"								"	Q3	"	"	"	"	"	"	"		
		58	"										"	"	GND	4V	4V	GND				"	Q4	"	"	"	"	"	"	"		
		59	"										"	"								"	Q5	"	"	"	"	"	"	"		
		60	"										"	"								"	Q6	"	"	"	"	"	"	"		
		61	"										"	"								"	Q7	"	"	"	"	"	"	"		
		62	"										"	"								"	Q8	"	"	"	"	"	"	"		
I _{IH}	3010	63	6V	GND					GND	GND			GND							GND	4V	GND	"	CLR							μA	
		64	"										"	"								"	D1									
		65	"										"	"	GND							"	D2									
		66	"										"	"								"	D3	.05		0.1						
		67	"										"	"								"	D4									
		68	"										"	"								"	CLK									
		69	"										"	"								"	D5									
		70	"										"	"								"	D6									
		71	"										"	"								"	D7									
		72	"										"	"								"	D8									
		I _{IL}	3009	73	GND																			"	CLR							
				74	6V																			"	D1							
75	"																					"	D2									
76	"																					"	D3									
77	"																					"	D4									
78	"																					"	CLK									
79	"																					"	D5									
80	"																					"	D6									
81	"																					"	D7									
82	"																					"	D8									
																								Subgroup 4 T _C = +25°C								
																								Min	Max							
C _C	3012		4/										GND									GND	CLR							pF		
C _I		84																														
		85																														
		86																														
		87																														
C _C	C _I 83	88																					CLK		10	15						
		89																														
		90																														
		91																														
		92																														
																								10		Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 9 T _C = -55°C		
																								Min	Max							
Truth table tests 5/ 6/	3014	93	B	L	A	A	L	L	A	A	L	"	A	B	L	A	A	L	L	A	A	L	4.5V	All outputs z/ 8/								
		94	"	"	"	"	"	"	"	"	"	"	"	A	B	"	"	"	"	"	"	"	"									
		95	"	"	"	"	"	"	"	"	"	"	"	A	B	"	"	"	"	"	"	"	"									
		96	A	"	"	"	"	"	"	"	"	"	"	"	A	B	"	"	"	"	"	"	"									
		97	"	"	"	"	"	"	"	"	"	"	"	"	A	B	"	"	"	"	"	"	"									
		98	"	H	"	"	"	H	H	B	B	H	"	"	A	B	"	H	H	B	B	H	"									
		99	"	"	"	"	"	"	"	"	"	"	"	"	A	B	"	"	"	"	"	"	"									
		100	"	"	"	"	"	"	"	"	"	"	"	"	A	B	"	"	"	"	"	"	"									
		101	"	L	"	"	"	L	L	A	A	L	"	"	A	B	"	L	L	A	A	L	"									
		102	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		104	"	H	"	"	"	H	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		105	"	H	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		106	B	L	"	"	"	L	L	"	"	"	"	"	"	"	"	"	"	"	"	"	"									

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 9 T _C = +25°C 10/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 10/				
			Test no.	CLR	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max	
t _{MAX} 9/	107	108	4.5V	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN										4.5V	Q1	31							
		109	"																					Q2								
		110	"																						Q3	23						
		111	"																						Q4							
		112	"												OUT	IN	IN	OUT	OUT	IN	IN	OUT			Q5							
		113	"																						Q6							
		114	"																					Q7								
			"																					Q8								
t _{PHL1}	3003 (Fig. 3)	116	IN	OUT	4.5V	4.5V	OUT	OUT	4.5V	4.5V	OUT	GND	3/										4.5V	CLR to Q1		31					ns	
		117	"																					CLR to Q2								
		118	"																						CLR to Q3							
		119	"																						CLR to Q4		41					
		120	"																						CLR to Q5							
		121	"																						CLR to Q6							
	115	122	"																					CLR to Q7								
																								CLR to Q8								
t _{PLH2}		123	4.5V	OUT	IN	IN	OUT	OUT	IN	IN	OUT													CLK to Q1		28						
		124	"																					CLK to Q2								
		125	"																						CLK to Q3							
		126	"																						CLK to Q4							
		127	"																					CLK to Q5		37						
		128	"																					CLK to Q6								
		129	"																					CLK to Q7								
		130	"																					CLK to Q8								
t _{PHL2}	3004	131	"	OUT	IN	IN	OUT	OUT	IN	IN	OUT													CLK to Q1								
		132	"																					CLK to Q2								
		133	"																					CLK to Q3								
		134	"																					CLK to Q4								
		135	"																					CLK to Q5								
		136	"																					CLK to Q6								
	139	137	"																					CLK to Q7								
		138	"																					CLK to Q8								
t _{THL}		140	"	OUT	IN	4.5V	OUT	OUT	4.5V	4.5V	OUT													Q1							ns	
		141	"																					Q2								
		142	"																					Q3								
		143	"																					Q4								
		144	"																				Q5									
		145	"																				Q6									
		146	"																				Q7									
			"																				Q8									
t _{TLH}	139	147	"	OUT	IN	GND	OUT	OUT	GND	GND	OUT													Q1								
		148	"																					Q2								
		149	"																					Q3								
		150	"																					Q4								
		151	"																					Q5								
		152	"																					Q6								
		153	"																				Q7									
		154	"																				Q8									

See footnotes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max
V _{IC} (pos)		1 2 3 4 5 6 7 8 9 10	1mA		1mA	1mA							/										GND	OE	2/	1.5				V	
										1mA	1mA	1													D1						
																									D2						
																									D3						
																									D4						
																									CLK						
															1mA										D5						
																	1mA								D6						
																					1mA				D7						
																						1mA			D8						
V _{IC} (neg)		11 12 13 14 15 16 17 18 19 20	-1mA		-1mA	-1mA						GND											/	OE							
																									D1		-1.5				
																									D2						
																									D3						
																									D4						
																									CLK						
																									D5						
																									D6						
																									D7						
																									D8						
I _{CCH}	3005	21	GND			6V				6V			3/		6V	6V			6V	6V		6V	V _{CC}			0.2				μA	
I _{CCL}		22	GND			GND				GND					GND	GND			GND	GND					0.2		8.0				
I _{CCZ}		23	6V		6V	GND			6V	GND	GND					GND	GND			GND	GND					0.1	8.0	4.0			
V _{OH3}	3006	25	1.2V	-20μA	4.2V	4.2V	-20μA				GND	-20μA	4.2V											Q1	5.95						
		26																						Q2							
		27																						Q3		5.95		5.95			V
		28																						Q4							
		29																						Q5							
V _{OH5}		30																						Q6							
		31																						Q7							
		32																						Q8							
		33																													
		34																													
		35																													
		36																													
		37																													
		38																													
		39																													
V _{OL3}	3007	41			20μA	1.2V	1.2V	20μA	20μA	1.2V	1.2V	20μA												Q1							
		42																						Q2							
		43																						Q3		0.1		0.1		0.1	
		44																						Q4							
		45																						Q5							
		46																						Q6							
		47																						Q7							
																								Q8							
V _{OL5}		48			5.2mA	1.2V	1.2V	5.2mA	5.2mA	1.2V	1.2V	5.2mA												Q1							
		49																						Q2							
		50																						Q3		0.26		0.4		0.26	
		51																						Q4							
		52																						Q5							
		53																						Q6							
		54																						Q7							
		55																						Q8							

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max	
I _{OS4}	3011	56	GND	GND	4V	4V	GND					GND	3/										4V	Q1	-10	-135	-10	-135	-10	-135	mA	
		57	"									"	"									"	Q2	"	"	"	"	"	"	"		
		58	"									"	"									"	Q3	"	"	"	"	"	"	"		
		59	"									"	"									"	Q4	"	"	"	"	"	"	"		
		60	"									"	"									"	Q5	"	"	"	"	"	"	"		
		61	"									"	"									"	Q6	"	"	"	"	"	"	"		
		62	"									"	"									"	Q7	"	"	"	"	"	"	"		
		63	"									"	"									"	Q8	"	"	"	"	"	"	"		
I _{IH}	3010	64	6V			GND				GND	GND		GND							GND	GND			OE							μA	
		65	GND			GND						"	"											D1								
		66	"									"	"											D2								
		67	"									"	"											D3								
		68	"									"	"											D4								
		69	"									"	"											CLK								
		70	"									"	"											D5								
		71	"									"	"											D6								
		72	"									"	"											D7								
		73	"									"	"											D8								
		I _{IL}	3009	75	GND			6V				6V	6V		6V							6V				OE						
76	"											"	"											D1								
77	"											"	"											D2								
78	"											"	"											D3								
79	"											"	"											D4								
80	"											"	"											CLK								
81	"											"	"											D5								
82	"											"	"											D6								
83	"											"	"											D7								
												"	"											D8								
I _{OZH}	74			84	4.2V	6.0V	1.2V	1.2V	6.0V	6.0V	1.2V	1.2V	6.0V		3/											Q1						
		85	"									"	"											Q2								
		86	"									"	"											Q3								
		87	"									"	"											Q4								
		88	"									"	"											Q5								
		89	"									"	"											Q6								
		90	"									"	"											Q7								
		91	"									"	"											Q8								
I _{OZL}		92	"									"	"											Q1								
		93	"									"	"											Q2								
		94	"									"	"											Q3								
		95	"									"	"											Q4								
		96	"									"	"											Q5								
		97	"									"	"											Q6								
		98	"									"	"											Q7								
		99	"									"	"											Q8								
																							Subgroup 4 T _C = +25°C									
																								Min	Max							
C _C	3012	100	4/									GND										GND	OE		15						pF	
C _I		101				4/						"										"	D1									
		102					4/					"										"	D2									
		103									4/		"									"	D3		10							
	104										4/	"									"	D4										
C _C		105										"	4/								"	CLK		15								
C _I	106											"				4/					"	D5										
	107											"									"	D6										
	108											"									"	D7										
	109											"									"	D8		10								

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 4 T _C = +25°C							
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max
C _O	3012	110 111 112 113 114 115 116 117	6V " " " " " " "	4/ " " " " " " "			4/ " " " " " " "		4/ " " " " " " "				4/ " " " " " " "									6V " " " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8	20	" " " " " " " "						pF
																							Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C				
																							Min	Max	Min	Max	Min	Max			
Truth table tests 5/ 6/	3014	118 119 120 121 122 123 124	B " " " " " "	X H " " " " "	A A B " " " "	A A B " " " "	X H " " " " "	X H " " " " "	A A B " " " "	A A B " " " "	X H " " " " "	" " " " " " "	B A A B A A A	X H " " " " "	A A B " " " "	A A B " " " "	X H " " " " "	X H " " " " "	A A B " " " "	A A B " " " "	X H " " " " "	4.5V All outputs 7/ 8/									
																							Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C				
																							Min	Max	Min	Max	Min	Max			
f _{MAX} 9/		125 126 127 128 129 130 131 132	GND " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	GND " " " " " " "	IN " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	OUT " " " " " " "	IN " " " " " " "	IN " " " " " " "	OUT " " " " " " "	4.5V Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8	33 " " " " " " "	25	33	" " " " " " "	MHz				
t _{PHL2}	3003 (Fig. 3)	134 135 136 137 138 139 140	" " " " " " "	OUT " " " " " "	IN 4.5V " " " "	4.5V IN 4.5V " " "	OUT " " " " " "	OUT " " " " " "	4.5V IN 4.5V " " "	4.5V IN 4.5V " " "	OUT " " " " " "	" " " " " "	" " " " " "	4.5V " " " " " "	4.5V " " " " " "	OUT " " " " " "	OUT " " " " " "	OUT " " " " " "	IN " " " " " "	IN " " " " " "	OUT " " " " " "	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4 CLK to Q5 CLK to Q6 CLK to Q7 CLK to Q8	32	" " " " " " "	42	" " " " " " "	32	" " " " " " "	ns		
t _{PLH2}		141 142 143 144 145 146 147 148	" " " " " " "	OUT " " " " " "	IN GND " " " "	GND IN GND " " "	OUT " " " " " "	OUT " " " " " "	GND GND IN GND " " "	GND " " " " " "	OUT " " " " " "	" " " " " "	" " " " " "	OUT " " " " " "	IN GND " " " "	GND " " " " " "	OUT " " " " " "	OUT " " " " " "	OUT " " " " " "	IN GND " " " "	IN GND " " " "	OUT " " " " " "	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4 CLK to Q5 CLK to Q6 CLK to Q7 CLK to Q8	"	"	"	"	"	"		
t _{PZH}		149 150 151 152 153 154 155 156	IN " " " " " "	OUT " " " " " "	4.5V " " " " " "	4.5V " " " " " "	OUT " " " " " "	OUT " " " " " "	4.5V " " " " " "	4.5V " " " " " "	OUT " " " " " "	" " " " " "	" " " " " "	OUT " " " " " "	4.5V " " " " " "	4.5V " " " " " "	OUT " " " " " "	OUT " " " " " "	OUT " " " " " "	4.5V " " " " " "	4.5V " " " " " "	OUT " " " " " "	OE to Q1 OE to Q2 OE to Q3 OE to Q4 OE to Q5 OE to Q6 OE to Q7 OE to Q8	26	" " " " " " "	35	" " " " " " "	26	" " " " " " "	"	

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C			
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max
t _{PZL}	3003 (Fig. 3)	157	158	IN	OUT	GND		OUT	OUT	GND			GND										4.5V	OE to Q1		26				ns	
			159	"			GND						"										"	OE to Q2						"	
			160	"					OUT	GND			"										"	OE to Q3		35		26		"	
			161	"							GND	OUT	"			OUT	GND						"	OE to Q4						"	
			162	"									"				GND	OUT					"	OE to Q5						"	
			163	"									"						OUT	GND			"	OE to Q6						"	
			164	"									"							OUT	GND	GND	OUT	"	OE to Q7						"
													"										"	OE to Q8						"	
		t _{PHZ}	165	"	OUT	4.5V							"										"	OE to Q1						"	
			166	"			4.5V	OUT		OUT	4.5V		"										"	OE to Q2						"	
			167	"					OUT	4.5V			"										"	OE to Q3	"					"	
			168	"							4.5V	OUT	"			OUT	4.5V						"	OE to Q4						"	
			169	"									"				4.5V	OUT					"	OE to Q5						"	
			170	"									"					OUT		OUT	4.5V		"	OE to Q6						"	
			171	"									"						OUT	4.5V		4.5V	OUT	"	OE to Q7						"
			172	"									"								4.5V	OUT	"	OE to Q8						"	
t _{PLZ}	173	"	OUT	GND			OUT	GND			"										"	OE to Q1						"			
	174	"			GND	OUT					"										"	OE to Q2						"			
	175	"					OUT	GND			"										"	OE to Q3	"					"			
	176	"							GND	OUT	"										"	OE to Q4						"			
	177	"									"			OUT	GND						"	OE to Q5						"			
	178	"									"				GND	OUT					"	OE to Q6						"			
	179	"									"						OUT	GND			"	OE to Q7						"			
	180	"									"							GND	GND	OUT	"	OE to Q8						"			
t _{THL}	3004	181	182	GND	OUT	IN	4.5V	OUT		4.5V	4.5V		"	IN		4.5V	4.5V			4.5V	4.5V		"	Q1						ns	
			183	"									"										"	Q2						"	
			184	"									"										"	Q3	12		16		12	"	
			185	"									"										"	Q4						"	
			186	"									"										"	Q5						"	
			187	"									"										"	Q6						"	
			188	"									"										"	Q7						"	
													"								IN	4.5V	IN	OUT	"	Q8					
t _{TLH}			189	"	OUT	IN	GND	OUT		GND	GND		"			GND	GND			GND	GND		"	Q1						"	
			190	"									"										"	Q2						"	
			191	"					OUT				"										"	Q3	"					"	
			192	"									"										"	Q4						"	
			193	"									"										"	Q5						"	
			194	"									"										"	Q6						"	
			195	"									"										"	Q7						"	
			196	"									"								IN	IN	OUT	"	Q8						"

See footnotes at end of table.

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-883 method	Cases R, S, 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	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C		
			CE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8	V _{CC}		Min	Max	Min	Max	Min	Max	
V _{IC} (pos)		1 2 3 4 5 6 7 8 9 10	1mA		1mA	1mA			1mA	1mA	1	/										GND	CE	2/	1.5					V
V _{IC} (neg)		11 12 13 14 15 16 17 18 19 20	-1mA		-1mA	-1mA			-1mA	-1mA		GND									1	/	CE	-1.5						
I _{CCH}	3005	21	6V		6V	6V			6V	6V			3/			6V					6V		V _{CC}		0.2		8.0			μA
I _{CCL}		22	GND		GND	GND			GND	GND					GND	GND			GND	GND			V _{CC}		0.2		8.0			μA
V _{OH3}	3006	23 24 25 26 27 28 29 30	1.2V	-20μA	4.2V	4.2V	-20μA	-20μA	4.2V	4.2V	-20μA			6V			6V						Q1	5.95						
																							Q2		5.95		5.95		V	
																							Q3							
																							Q4							
																							Q5							
																							Q6							
																							Q7							
																							Q8							
V _{OH5}		31 32 33 34 35 36 37 38		-5.2mA	4.2V	4.2V	-5.2mA	-5.2mA	4.2V	4.2V	-5.2mA					4.2V	-5.2mA	-5.2mA	4.2V				Q1	5.48						
																							Q2							
																							Q3		5.2		5.48			
																							Q4							
																							Q5							
																							Q6							
																							Q7							
																							Q8							
V _{OL3}	3007	39 40 41 42 43 44 45 46		20μA	1.2V	1.2V	20μA	20μA	1.2V	1.2V	20μA												Q1							
																							Q2							
																							Q3	0.1		0.1		0.1		
																							Q4							
																							Q5							
																							Q6							
																							Q7							
																							Q8							
V _{OL5}		47 48 49 50 51 52 53 54		5.2mA	1.2V	1.2V	5.2mA	5.2mA	1.2V	1.2V	5.2mA												Q1							
																							Q2							
																							Q3	0.26		0.4		0.26		
																							Q4							
																							Q5							
																							Q6							
																							Q7							
																							Q8							

See footnotes at end of table.

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																		Measured terminal	Test limits						Unit			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19	20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C			Subgroup 3 T _C = -55°C		
			Test no.	CE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7		D8	Q8	V _{CC}	Min	Max	Min		Max	Min	Max
I _{OS4}	3011	55	GND	GND	4V	4V	GND	GND	4V	4V	GND	GND	3/									4V	Q1	-10	-120	-10	-120	-10	-120	mA	
		56	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q2	"	"	"	"	"	"	"	
		57	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q3	"	"	"	"	"	"	"	
		58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q4	"	"	"	"	"	"	"	
		59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q5	"	"	"	"	"	"	"	
		60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q6	"	"	"	"	"	"	"	
		61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q7	"	"	"	"	"	"	"	
		62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q8	"	"	"	"	"	"	"	
I _{IH}	3010	63	6V			GND			GND	GND			GND			GND			GND	4V	GND		CE							μA	
		64	GND			GND			GND	GND			GND			GND			GND	GND			D1							"	
		65	"			6V			"	"			"			"			"	"			D2							"	
		66	"	GND	GND	GND			6V	"			"			"			"	"	6V			D3	.05		0.1				"
		67	"	"	"	"			GND	GND			"			"			"	"	"			D4							"
		68	"	"	"	"			"	"			6V			"			"	"	"			CLK							"
		69	"	"	"	"			"	"			GND			6V			"	"	"			D5							"
		70	"	"	"	"			"	"			"			GND			"	"	"			D6							"
I _{IL}	3009	71	"			"			"	"			"			"			6V	6V			D7							"	
		72	"			"			"	"			"			"			GND	GND			D8							"	
		73	GND			6V			6V	6V			6V			6V			6V	"			CE							"	
		74	6V			6V			"	"			"			"			"	"			D1							"	
		75	"			"			"	"			"			"			"	"			D2	-0.5		-0.1				"	
		76	"	6V		6V			GND	GND			"			"			"	"			D3							"	
		77	"	"	"	"			6V	"			"			"			"	"			D4							"	
		78	"	"	"	"			"	"			GND			"			"	"			CLK							"	
C																															

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																		Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19	20	Subgroup 9 T _C = +25°C 10/		Subgroup 10 T _C = +125°C			Subgroup 11 T _C = -55°C 10/	
			Test no.	CE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7		D8	Q8	V _{CC}	Min	Max	Min		Max	Min
f _{MAX} 9/		110	GND	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN										Q1	28						MHz
		111	"									"	"									"	Q2							
		112	"									"	"									"	Q3							
		113	"									"	"									"	Q4	21			28			
		114	"									"	"	OUT	IN	IN	OUT	OUT	IN			"	Q5							
		115	"									"	"									"	Q6							
		116	"									"	"							IN	IN	OUT	"	Q7						
t _{PLH2}	3003 (Fig. 3)	117	GND	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN									4.5V	CLK to Q1		28					ns
		119	"									"	"										CLK to Q2							
		120	"									"	"										CLK to Q3			37		28		
		121	"									"	"										CLK to Q4							
		122	"									"	"	OUT	IN	IN	OUT	OUT	IN			"	CLK to Q5							
		123	"									"	"									"	CLK to Q6							
		124	"									"	"							IN	OUT	"	CLK to Q7							
t _{PHL2}		125	"									"	"										CLK to Q8							
		126	"	OUT	IN	IN	OUT	OUT	IN	IN	OUT	"	"										CLK to Q1							
		127	"									"	"										CLK to Q2							
		128	"									"	"										CLK to Q3							
		129	"									"	"	OUT	IN	IN	OUT	OUT	IN				CLK to Q4							
		130	"									"	"										CLK to Q5							
		131	"									"	"							IN	OUT		CLK to Q6							
t _{THL}	3004	132	"									"	"										CLK to Q7							
		133	4.5V	OUT	IN	4.5V	OUT	OUT	4.5V	4.5V		"	"		4.5V	4.5V			4.5V	4.5V			Q1							ns
		135	"									"	"										Q2							
		136	"									"	"										Q3	15			20		15	
		137	"									"	"										Q4							
		138	"									"	"	OUT									Q5							
		139	"									"	"	IN	4.5V	IN	OUT	OUT	IN				Q6							
140	"									"	"							IN	4.5V	OUT	"	Q7								
t _{TLH}		141	"									"	"										Q8							
		142	"	OUT	IN	GND	OUT	OUT	GND	GND		"	"		GND	GND			GND	GND			Q1							
		143	"									"	"										Q2							
		144	"									"	"										Q3							
		145	"									"	"										Q4							
		146	"									"	"										Q5							
		147	"									"	"										Q6							
148	"									"	"										Q7									
149	"									"	"							IN	IN	OUT	"	Q8								

See footnotes at end of table.

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See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2, 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	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			Test no.	OE	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1		V _{CC}	Min	Max	Min	Max	Min		Max	
I _{OS4}	3011	56	GND	4V	4V	4V	4V	4V	4V	4V	4V	GND	3/							GND	GND	GND	4V	Q1	-10	-135	-10	-135	-10	-135	mA	
		57	"									"	"									"	Q2	"	"	"	"	"	"	"		
		58	"									"	"									"	Q3	"	"	"	"	"	"	"		
		59	"									"	"									"	Q4	"	"	"	"	"	"	"		
		60	"									"	"									"	Q5	"	"	"	"	"	"	"		
		61	"									"	"									"	Q6	"	"	"	"	"	"	"		
		62	"									"	"									"	Q7	"	"	"	"	"	"	"		
		63	"									"	"									"	Q8	"	"	"	"	"	"	"		
I _{IH}	3010	64	6V	GND	GND	GND	GND	GND	GND	GND	GND	"	GND									6V	OE							μA		
		65	GND	6V	GND	6V	GND	6V	GND	6V	GND	"	"									"	D1							"		
		66	"	GND	6V	GND	6V	GND	6V	GND	6V	"	"									"	D2	.05		0.1				"		
		67	"	"	"	"	"	"	"	"	"	"	"									"	D3							"		
		68	"	"	"	"	"	"	"	"	"	"	"									"	D4							"		
		69	"	"	"	"	"	"	"	"	"	"	"									"	D5							"		
		70	"	"	"	"	"	"	"	"	"	"	"									"	D6							"		
		71	"	"	"	"	"	"	"	"	"	"	"									"	D7							"		
		72	"	"	"	"	"	"	"	"	"	"	"									"	D8							"		
		73	"	"	"	"	"	"	"	"	"	"	"									"	CLK							"		
		I _{IL}	3009	75	GND	6V	6V	6V	6V	6V	6V	6V	6V	"	6V									"	OE							"
76	"			"	"	"	"	"	"	"	"	"	"									"	D1							"		
77	"			"	"	"	"	"	"	"	"	"	"									"	D2							"		
78	"			"	"	"	"	"	"	"	"	"	"									"	D3							"		
79	"			"	"	"	"	"	"	"	"	"	"									"	D4							"		
80	"			"	"	"	"	"	"	"	"	"	"									"	D5							"		
81	"			"	"	"	"	"	"	"	"	"	"									"	D6							"		
82	"			"	"	"	"	"	"	"	"	"	"									"	D7							"		
83	"			"	"	"	"	"	"	"	"	"	"									"	D8							"		
I _{OZH}	74			84	4.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	"	3/								6.0V	6.0V	"	Q1						"
				85	"	"	"	"	"	"	"	"	"	"	"									"	Q2							"
		86	"	"	"	"	"	"	"	"	"	"	"									"	Q3							"		
		87	"	"	"	"	"	"	"	"	"	"	"									"	Q4							"		
		88	"	"	"	"	"	"	"	"	"	"	"									"	Q5							"		
		89	"	"	"	"	"	"	"	"	"	"	"									"	Q6							"		
		90	"	"	"	"	"	"	"	"	"	"	"									"	Q7							"		
		91	"	"	"	"	"	"	"	"	"	"	"									"	Q8							"		
I _{OZL}	74	92	"	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	"	"								GND	GND	"	Q1						"		
		93	"	"	"	"	"	"	"	"	"	"	"									"	Q2							"		
		94	"	"	"	"	"	"	"	"	"	"	"									"	Q3							"		
		95	"	"	"	"	"	"	"	"	"	"	"									"	Q4							"		
		96	"	"	"	"	"	"	"	"	"	"	"									"	Q5							"		
		97	"	"	"	"	"	"	"	"	"	"	"									"	Q6							"		
		98	"	"	"	"	"	"	"	"	"	"	"									"	Q7							"		
		99	"	"	"	"	"	"	"	"	"	"	"									"	Q8							"		
																						Subgroup 4 T _C = +25°C										
																						Min	Max									
C _C	3012	100	4/	—								GND									GND	OE		15						pF		
C _I		101		—								"									"	D1								"		
		102			4/	4/	4/	4/	4/	4/	4/	"									"	D2								"		
		103	4									"									"	D3								"		
		104										"									"	D4								"		
		105										"									"	D5								"		
C _C	109											4/									"	CLK		15						"		

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S, 2, 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	17	18	19	20		Subgroup 4 T _C = +25°C						
			Test no.	OE	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1		V _{CC}	Min	Max	Min	Max	Min	
C _O	3012	110	6V									GND									4/	6V	Q1	20						pF
		111																					Q2							
		112																					Q3							
		113																					Q4							
		114															4/		4/				Q5							
		115																					Q6							
		116																					Q7							
		117													4/	4/							Q8							
																							All outputs Z/	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 5/ 6/	3014	118	B	A	A	A	A	A	A	A	A	A		B	X	X	X	X	X	X	X	4.5V	8/	8/						
		119		A	A	A	A	A	A	A	A	A		A	H	H	H	H	H	H	H	H								
		120		B	B	B	B	B	B	B	B	B		A	B	B	B	B	B	B	B	B								
		121													L	L	L	L	L	L	L	L								
		122													L	L	L	L	L	L	L	L								
		123		A	A	A	A	A	A	A	A	A		A	B	B	B	B	B	B	B	B								B
124													L	H	L	L	L	L	L	L	L									
																							All outputs Z/	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} 9/		125	GND	IN	IN	IN	IN	IN	IN	IN	IN	GND	IN									4.5V	Q1	33	Max	Min	Max	Min	Max	MHz
		126																					Q2							
		127																					Q3							
		128																					Q4							
		129																					Q5							
		130																					Q6							
		131																					Q7							
		132																					Q8							
t _{PHL2}	3003 (Fig. 3)	134		IN	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V												CLK to Q1		32					ns
		135		4.5V	IN	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V											CLK to Q2							
		136																					CLK to Q3							
		137																					CLK to Q4							
		138																					CLK to Q5							
		139																					CLK to Q6							
		140																					CLK to Q7							
		141																					CLK to Q8							
t _{PLH2}		142		IN	GND	GND	GND	GND	GND	GND	GND												CLK to Q1							
		143		GND	IN	GND	GND	GND	GND	GND	GND	GND											CLK to Q2							
		144																					CLK to Q3							
		145																					CLK to Q4							
		146																					CLK to Q5							
		147																					CLK to Q6							
		148																					CLK to Q7							
		149																					CLK to Q8							
t _{PZH}		149	IN	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V												OE to Q1		26					
		150																					OE to Q2							
		151																					OE to Q3							
		152																					OE to Q4							
		153																					OE to Q5							
		154																					OE to Q6							
		155																					OE to Q7							
		156																					OE to Q8							
t _{PZL}		157		GND	GND	GND	GND	GND	GND	GND	GND												OE to Q1							
		158																					OE to Q2							
		159																					OE to Q3							
		160																					OE to Q4							
		161																					OE to Q5							
		162																					OE to Q6							
		163																					OE to Q7							
		164																					OE to Q8							

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2, 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	17	18		19	20	Subgroup 9 T _C = +25°C 10/		Subgroup 10 T _C = +125°C			Subgroup 11 T _C = -55°C 10/	
			Test no.	OE	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	Q8	Q7	Q6	Q5	Q4	Q3		Q2	Q1	V _{CC}	Min	Max	Min		Max	Min
t _{PHZ}	3003 (Fig. 3)	165	IN	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	GND								OUT	OUT	OUT	4.5V	OE to Q1		26				ns	
		166	"								"											"	OE to Q2						"	
		167	"								"											"	OE to Q3						"	
		168	"								"											"	OE to Q4						"	
		169	"								"											"	OE to Q5						"	
		170	"								"											"	OE to Q6						"	
		171	"								"											"	OE to Q7						"	
		172	"								"				OUT	OUT						"	OE to Q8						"	
t _{PLZ}		173	"	GND								"									OUT	OUT	"	OE to Q1						"
		174	"									"											"	OE to Q2						"
	175	"									"											"	OE to Q3						"	
	176	"									"											"	OE to Q4						"	
	177	"									"											"	OE to Q5						"	
	178	"									"											"	OE to Q6						"	
	179	"									"											"	OE to Q7						"	
	180	"									"			OUT	OUT							"	OE to Q8						"	
	t _{THL}	181	GND	IN	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	GND	IN								OUT	OUT	4.5V	Q1						ns
		182	"	4.5V	IN	4.5V	"	"	"	"	"	"	"									"	Q2							"
183		"	"	4.5V	IN	"	"	"	"	"	"	"									"	Q3	12		16		12		"	
184		"	"	"	4.5V	IN	"	"	"	"	"	"									"	Q4							"	
185		"	"	"	"	4.5V	IN	"	"	"	"	"									"	Q5							"	
186		"	"	"	"	"	4.5V	IN	"	"	"	"									"	Q6							"	
187		"	"	"	"	"	"	4.5V	IN	"	"	"									"	Q7							"	
188		"	"	"	"	"	"	"	4.5V	IN	"	"	OUT	OUT							"	Q8							"	
t _{TLH}		189	"	IN	GND	GND	GND	GND	GND	GND	GND	"	"								OUT	OUT	"	Q1						"
		190	"	"	"	"	"	"	"	"	"	"	"									"	Q2							"
	191	"	"	"	"	"	"	"	"	"	"	"									"	Q3							"	
	192	"	"	"	"	IN	GND	IN	"	"	"	"									"	Q4							"	
	193	"	"	"	"	"	"	IN	"	"	"	"									"	Q5							"	
	194	"	"	"	"	"	"	"	IN	"	"	"									"	Q6							"	
	195	"	"	"	"	"	"	"	"	IN	"	"									"	Q7							"	
	196	"	"	"	"	"	"	"	"	IN	"	"	OUT	OUT							"	Q8							"	

See footnotes at end of table.

TABLE III. Group A inspection for device type 05.

Symbol	MIL-STD-883 method	Cases R.S.2	Terminal conditions 1/																				Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C			
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max
V _{IC} (pos)		1	1mA		1mA	1mA						/										GND	OE	2/	1.5				V		
		2																					D1								
		3																					D2								
		4																					D3								
		5																					D4								
		6																					CLK								
		7																					D5								
		8																					D6								
		9																		1mA				D7							
		10														1mA					1mA			D8							
V _{IC} (neg)		11	-1mA		-1mA	-1mA						GND										/	OE								
		12																					D1								
		13																					D2								
		14																					D3		-1.5						
		15																					D4								
		16																					CLK								
		17																					D5								
		18																					D6								
		19																			-1mA			D7							
		20																			-1mA			D8							
I _{CCH}	3005	21	GND			GND				GND		3/			GND				GND	GND	6V	V _{CC}			0.2		8.0		μA		
22		GND			6V				6V					6V						6V				0.2		8.0					
23		6V	GND		6V		GND		6V				GND		6V				6V						.1		4				
V _{OH3}	3006	25	1.2V	-20μA	1.2V	1.2V	-20μA	6V	1.2V	1.2V	-20μA			6V				6V					Q1		5.95						
		26		6V				-20μA						6V									Q2								
		27		6V											6V								Q3			5.95		5.95		V	
		28																					Q4								
		29													-20μA	1.2V							Q5								
		30														1.2V	-20μA						Q6								
		31															-20μA	1.2V					Q7								
																				1.2V				Q8							
																					-20μA										
V _{OH5}		32		-5.2mA	1.2V	1.2V	-5.2mA	-5.2mA	1.2V	1.2V	-5.2mA												Q1		5.48						
		33																					Q2								
		34																					Q3			5.2		5.48			
		35													-5.2mA	1.2V							Q4								
		36																					Q5								
		37																					Q6								
		38																					Q7								
		39																					Q8								
V _{OL3}	3007	41		20μA	4.2V	4.2V	20μA	20μA	4.2V	4.2V	20μA												Q1								
		42																					Q2								
		43																					Q3								
		44																					Q4		0.1		0.1		0.1		
		45																					Q5								
		46																					Q6								
		47																					Q7								
																							Q8								
V _{OL5}		48		5.2mA	4.2V	4.2V	5.2mA	5.2mA	4.2V	4.2V	5.2mA												Q1								
		49																					Q2								
		50																					Q3		0.26		0.4		0.26		
		51																					Q4								
		52																					Q5								
		53																					Q6								
		54																					Q7								
		55																					Q8								

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S,2	Terminal conditions 1/																				Measured terminal	Test limits						Unit																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C																										
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max																							
I _{OS4}	3011	56	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	3/	GND	GND	GND	GND	GND	GND	GND	GND	4V	Q1	-10	-135	-10	-135	-10	-135	mA																								
		57																																Q2																				
		58																																Q3																				
		59																																Q4																				
		60																				Q5																																
		61																				Q6																																
		62																				Q7																																
		63																				GND							Q8																									
I _{IH}	3010	64	6V		6V GND	6V GND			6V GND	6V GND			GND									6V		OE	.05		0.1			μA																								
		65	GND										D1																																									
		66											D2																																									
		67											D3																																									
		68											D4																																									
		69											CLK																																									
		70											D5																																									
		71											D6																																									
72		D7																																																				
73		D8																																																				
I _{IL}	3009	75	6V	6V	GND 6V	6V GND 6V			6V GND 6V	6V GND 6V			6V	6V									OE	-0.05		-0.1																												
		76											D1																																									
		77											D2																																									
		78											D3																																									
		79											D4																																									
		80											CLK																																									
		81											D5																																									
		82											D6																																									
		83											D7																																									
		84											D8																																									
I _{OZH}		85	4.2V	6.0V	1.2V	1.2V	6.0V	6.0V	1.2V	1.2V	6.0V		3/	6.0V	1.2V	1.2V	6.0V	6.0V	1.2V	6.0V	1.2V			Q1	0.2		2.0																											
		86																																																				
		87																																																				
		88																																																				
		89																																																				
		90																																																				
		91																																																				
		92																																																				
I _{OZL}		93		GND	4.2V	4.2V	GND	GND	4.2V	4.2V	GND			GND	4.2V	4.2V	GND	GND	4.2V	4.2V	GND		Q1	-0.2		-2.0																												
		94																												D1																								
		95																												D2																								
		96																												D3																								
		97																												D4																								
		98																												CLK																								
		99																												D5																								
		100																												D6																								
C _C	3012	101	4/								GND											GND	OE		15					pF																								
		C _I	102			4/	4/																	D1																														
			103							4/	4/														D2																													
			104																							D3	10																											
C _C	105																						CLK		15																													
C _I		106													4/	4/								D5																														
		107																						D6																														
		108																							D7																													
		109																								D8	10																											

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S,2	Terminal conditions 1/																			Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	Subgroup 4 T _C = +25°C						
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8		Q8	V _{CC}	Min	Max	Min	Max		Min
C ₀	3012	110	6V	4/			4/				GND											6V	Q1	20						pF
		111																					Q2							
		112						4/															Q3							
		113									4/												Q4							
		114																					Q5							
		115															4/						Q6							
		116																4/					Q7							
		117																		4/			Q8							
																							Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C			
Truth table tests 5/ 6/	3014	118	B	H	B	A	L	H	B	A	L	GND	A	H	B	A	L	H	B	A	L	4.5V	All outputs 7/ 8/							
		119																												
		120																												
		121		L			H	L		B	A			L		B	A		L											
		122			B	A																								
		123																												
		124		H			L	H						H				L												
		125																												
		126			A	B			A	B																				
		127		L			H	L						L				H												
		128																												
129																														
130		H	B	A	L	H	B	A	L			H	B	A	L	H	B	A	L											
																							Subgroup 9 T _C = +25°C 10/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 10/			
t _{MAX} 9/		131	GND	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN									4.5V	Q1	33						MHz
		132																												
		133																												
		134																												
		135																												
		136																												
		137																												
		138																												
t _{PHL2}	3003 (Fig.3)	140		OUT	IN	GND	OUT	OUT	GND	GND	OUT				GND	GND			GND	GND			CLK to Q1	32						ns
		141																					CLK to Q2							
		142																					CLK to Q3							
		143																					CLK to Q4		42			32		
		144																					CLK to Q5							
		145																					CLK to Q6							
		146																					CLK to Q7							
																							CLK to Q8							
t _{PLH2}	139	147		OUT	IN	4.5V	OUT	OUT	4.5V	4.5V	OUT				4.5V	4.5V			4.5V	4.5V			CLK to Q1							
		148																					CLK to Q2							
		149																					CLK to Q3							
		150																					CLK to Q4							
		151																					CLK to Q5							
		152																					CLK to Q6							
		153																					CLK to Q7							
		154																					CLK to Q8							
t _{PZH}		155	IN	OUT	GND	GND	OUT	OUT	GND	GND	OUT												OE Q1	31						
		156																					OE Q2							
		157																					OE Q3							
		158																					OE Q4							
		159																					OE Q5							
		160																					OE Q6							
		161																					OE Q7							
		162																					OE Q8							

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S,2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C				
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max	
t _{PZL}	3003 (Fig. 3)	163	164	IN	OUT	4.5V	4.5V	OUT	OUT	4.5V	4.5V	OUT	GND										4.5V	OE Q1	31	"	41	"	31	"	ns	
			165	"			4.5V	OUT																OE Q2								
			166	"							4.5V	OUT												OE Q3								
			167	"											OUT	4.5V	4.5V	OUT					4.5V	OUT								OE Q4
			168	"																				OE Q5								
			169	"																				OE Q6								
			169	"																				OE Q7								
			170	"																				OE Q8								
		t _{PHZ}	171	171	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT												OE Q1	26	"	35	"	26	"	"
				172	"																				OE Q2							
				173	"																				OE Q3							
				174	"																				OE Q4							
				175	"																				OE Q5							
				176	"																				OE Q6							
				177	"																				OE Q7							
				178	"																				OE Q8							
t _{PLZ}	179	179	IN	OUT	4.5V	4.5V	OUT	OUT	4.5V	4.5V	OUT	GND											OE Q1	26	"	35	"	26	"	ns		
		180	"																				OE Q2									
		181	"																				OE Q3									
		182	"																				OE Q4									
		183	"																				OE Q5									
		184	"																				OE Q6									
		185	"																				OE Q7									
		186	"																				OE Q8									
t _{THL}	3004	187	188	GND	OUT	IN	GND	OUT	OUT	GND	GND	IN								GND	GND			Q1	12	"	16	"	12	"	ns	
			189	"																				Q2								
			190	"																				Q3								
			191	"																				Q4								
			192	"																				Q5								
			193	"																				Q6								
			194	"																				Q7								
			194	"																				Q8								
t _{TLH}			195	"	OUT	IN	4.5V	OUT	OUT	4.5V	4.5V									4.5V	4.5V			Q1	"	"	"	"	"	"	"	
			196	"		4.5V	IN																	Q2								
			197	"		"																		Q3								
			198	"		"																		Q4								
			199	"		"																		Q5								
			200	"		"																		Q6								
			201	"		"																		Q7								
			202	"		"																		Q8								

See footnotes at end of table.

TABLE III. Group A inspection for device type 06.

Symbol	MIL-STD-883 method	Cases R,S,2	Terminal conditions 1/																			Measured terminal	Test limits						Unit				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C					
			Test no.	OE	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	Q8	Q7	Q6	Q5	Q4	Q3	Q2		Q1	V _{CC}	Min	Max	Min	Max		Min	Max		
V _{IC} (pos)		1	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1/										GND	OE	2/	1.5					V			
		2										"										"	D1	"	"					"			
		3										"										"	D2	"	"					"			
		4										"										"	D3	"	"					"			
		5										"										"	D4	"	"					"			
		6										"										"	D5	"	"					"			
		7										"										"	D6	"	"					"			
		8										"										"	D7	"	"					"			
		9										"										"	D8	"	"					"			
		10										"	1mA									"	CLK	"	"					"			
V _{IC} (neg)		11	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	-1mA	GND										1/	OE		-1.5					"			
		12										"										"	D1	"	"					"			
		13										"										"	D2	"	"					"			
		14										"										"	D3	"	"					"			
		15										"										"	D4	"	"					"			
		16										"										"	D5	"	"					"			
		17										"										"	D6	"	"					"			
		18										"										"	D7	"	"					"			
		19										"										"	D8	"	"					"			
		20										"	-1mA									"	CLK	"	"					"			
I _{CCH}	3005	21	GND	GND	GND	GND	GND	GND	GND	GND	GND	"	3/									6V	V _{CC}		0.2		8.0			μA			
		22	GND	6V	6V	6V	6V	6V	6V	6V	6V	"	"									"	"		0.2		8.0			"			
		23	6V	6V	6V	6V	6V	6V	6V	6V	6V	"	"									"	"		.1		4			"			
V _{OH3}	24	3006	24	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	"	"									-20μA	Q1	5.95						"			
			25	"									"	"									"	Q2	"	"					"		
			26	"									"	"									"	Q3	"	5.95		5.95			"		
			27	"									"	"									"	Q4	"	"					"		
			28	"									"	"									"	Q5	"	"					"		
			29	"									"	"									"	Q6	"	"					"		
			30	"									"	"									"	Q7	"	"					"		
			31	"									"	"									"	Q8	"	"					"		
			V _{OH5}			32	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	"	"									-5.2mA	Q1	5.48						"
						33	"									"	"									"	Q2	"	"				
34	"												"	"									"	Q3	"	5.2		5.48			"		
35	"												"	"									"	Q4	"	"					"		
36	"												"	"									"	Q5	"	"					"		
37	"												"	"									"	Q6	"	"					"		
38	"												"	"									"	Q7	"	"					"		
39	"												"	"									"	Q8	"	"					"		
V _{OL3}	40	3007	40	1.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	"	"									20μA	Q1							"			
			41	"									"	"									"	Q2							"		
			42	"									"	"									"	Q3	0.1		0.1		0.1		"		
			43	"									"	"									"	Q4	"	"					"		
			44	"									"	"									"	Q5	"	"					"		
			45	"									"	"									"	Q6	"	"					"		
			46	"									"	"									"	Q7	"	"					"		
			47	"									"	"									"	Q8	"	"					"		
V _{OL5}			48	1.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	"	"									5.2mA	Q1							"			
			49	"									"	"									"	Q2							"		
			50	"									"	"									"	Q3	0.26		0.4		0.26		"		
			51	"									"	"									"	Q4	"	"					"		
			52	"									"	"									"	Q5	"	"					"		
			53	"									"	"									"	Q6	"	"					"		
			54	"									"	"									"	Q7	"	"					"		
			55	"									"	"									"	Q8	"	"					"		

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S,2	Terminal conditions 1/																				Measured terminal	Test limits						Unit																																																
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C																																																		
			Test no.	OE	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1		V _{CC}	Min	Max	Min	Max	Min		Max																																															
I _{OS4}	3011	56	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	3/	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	GND	4V	Q1	-10	-135	-10	-135	-10	-135	mA																																															
		57	"	"								"	"											"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		58	"	"								"	"											"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		59	"	"								"	"											"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"																																														
		61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"																																													
		62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"																																													
		63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"																																													
I _{IH}	3010	64	6V	GND	GND	GND	GND	GND	GND	GND	GND	"	"	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	6V	OE	0.1	.05	0.1	"	"	"	"	μA																																															
		65	GND	6V	GND	6V	GND	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		66	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		67	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		68	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		69	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		70	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		71	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		72	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		73	"	"	"	"	"	"	"	"	"	"	"										"									"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		I _{IL}	3009	75	6V	6V	6V	6V	6V	6V	6V	6V	6V										"									"	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	"	-0.05	-0.1	"	"	"	"	"	"	"																												
76	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																																														
77	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																																														
78	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																																														
79	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																																														
80	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																																														
81	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																																														
82	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																																														
83	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																			"																											
I _{OZH}				84	4.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	3/	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	"	0.2	2.0	"	"	"	"	"	"																			"																											
				85	"	"																																														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
				86	"	"																																														"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
		87	"	"	"	"																											"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"																				
		88	"	"	"	"	"	"	"	"	"	"	"	"	"																		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		89	"	"	"	"	"	"	"	"	"	"	"	"	"																		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		90	"	"	"	"	"	"	"	"	"	"	"	"	"																		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		91	"	"	"	"	"	"	"	"	"	"	"	"	"																		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
I _{OZL}		92	"	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	4.2V	"	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	"	-0.2	-2.0	"	"	"	"	"	"	"																																															
		93	"	"																												"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																				
		94	"	"																												"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																				
		95	"	"																												"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																				
		96	"	"	"	"	"	"	"	"	"	"	"																			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		97	"	"	"	"	"	"	"	"	"	"	"																			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		98	"	"	"	"	"	"	"	"	"	"	"																			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																													
		99	"	"	"	"	"	"	"	"	"	"	"																			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"																												
																								Subgroup 4 T _C = +25°C																																																						
																									Min	Max																																																				
C _C	3012	100	4/	4/	4/	4/	4/	4/	4/	4/	4/	GND									GND	OE			15						pF																																															
C _i		101		4/		4/							"									"	D1			10						"																																														
		102											"									"	D2									"																																														
		103											"									"	D3									"																																														
		104	4										"									"	D4									"																																														
		105											"									"	D5									"																																														
		106											"									"	D6									"																																														
		107											"									"	D7									"																																														
108											"									"	D8									"																																																
C _C		109										4/	"	4/							"	CLK			15						"																																															

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S,2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 4 T _C = +25°C		Test limits						
			Test no.	OE	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1		V _{CC}	Min	Max	Min	Max	Min		Max	
C _O	3012	110	6V									GND		—/	4/	4/	4/	4/	4/	4/	4/	4/	6V	Q8	20	"					pF	
		111	"									"	4									"	Q7									
		112	"									"										"	Q6									
		113	"									"					4/					"	Q5									
		114	"									"					4/					"	Q4									
		115	"									"					4/					"	Q3									
		116	"									"					4/			4/		"	Q2									
117	"									"								4/		"	Q1											
																							Subgroup 7 T _C = +25°C		Subgroup 8 T _C = +125°C		Subgroup 8 T _C = -55°C					
Truth table tests 5/ 6/	3014	118	B	B	B	B	B	B	B	B	B	"	B	X	X	X	X	X	X	X	X	4.5V	All outputs 7/	8/	8/							
		119	"	B	B	B	B	B	B	B	B	"	A	H	H	H	H	H	H	H	H	"										
		120	"	A	A	A	A	A	A	A	A	"	A	"	"	"	"	"	"	"	"	"		"								
		121	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"		"								
		122	"	"	"	"	"	"	"	"	"	"	B	L	L	L	L	L	L	L	L	L		"								
		123	"	B	B	B	B	B	B	B	B	"	B	L	L	L	L	L	L	L	L	L		"								
		124	"	B	B	B	B	B	B	B	B	"	A	H	H	H	H	H	H	H	H	H		"								
																							Subgroup 9 T _C = +25°C		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C					
f _{MAX} 9/		125	GND	IN	IN	IN	IN	IN	IN	IN	IN	GND	IN									4.5V	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8	33	25	"	33	"	"	"	MHz	
		126	"									"	"									"		Q2								
		127	"									"	"									"		Q3								
		128	"									"	"									"		Q4								
		129	"									"	"									"		Q5								
		130	"									"	"									"		Q6								
		131	"									"	"									"		Q7								
132	"										IN	"	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	Q8											
t _{PHL2}	3003 (Fig. 3)	134	"	IN	GND	GND	GND	GND	GND	GND	GND	"	"									"	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4 CLK to Q5 CLK to Q6 CLK to Q7 CLK to Q8		31	"	"	"	"	ns		
		135	"	GND	IN	IN	IN	IN	IN	IN	IN	"	"																		"	Q2
		136	"	"	"	"	"	"	"	"	"	"	"																		"	Q3
		137	"	"	"	"	"	"	"	"	"	"	"																		"	Q4
		138	"	"	"	"	"	"	"	"	"	"	"																		"	Q5
		139	"	"	"	"	"	"	"	"	"	"	"																		"	Q6
		140	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"									Q7	
t _{PLH2}		141	"	IN	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	"	"									"	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4 CLK to Q5 CLK to Q6 CLK to Q7 CLK to Q8		"	"	"	"	"			
		142	"	4.5V	IN	IN	IN	IN	IN	IN	IN	"	"									"								Q2		
		143	"	"	"	"	"	"	"	"	"	"	"									"								Q3		
		144	"	"	"	"	"	"	"	"	"	"	"									"								Q4		
		145	"	"	"	"	"	"	"	"	"	"	"									"								Q5		
		146	"	"	"	"	"	"	"	"	"	"	"									"								Q6		
		147	"	"	"	"	"	"	"	"	"	"	"									"								Q7		
148	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	Q8											
t _{P2H}		149	IN	GND	GND	GND	GND	GND	GND	GND	GND	"	"									"	OE to Q1 OE to Q2 OE to Q3 OE to Q4 OE to Q5 OE to Q6 OE to Q7 OE to Q8		26	"	"	"	"	"		
		150	"									"	"									"									Q2	
		151	"									"	"									"									Q3	
		152	"									"	"									"									Q4	
		153	"									"	"									"									Q5	
		154	"									"	"									"									Q6	
		155	"									"	"									"									Q7	
156	"									"	"	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	Q8											

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S,2	Terminal conditions 1/																			Measured terminal	Test limits						Unit																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	Subgroup 9 T _C = +25°C 10/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 10/																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
			Test no.	OE	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	Q8	Q7	Q6	Q5	Q4	Q3	Q2		Q1	V _{CC}	Min	Max	Min	Max		Min	Max																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
t _{PZL}	3003 (Fig. 3)	157	IN	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	4.5V	OE to Q1		26		35		26		ns																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		158	OE to Q2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

See footnotes at end of table.

TABLE III. Group A inspection for device type 52.

Symbol	MIL-STD-883 method	Cases R.S.2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max	
V _{IC} (pos)			1	1mA		1mA	1mA					1											GND	OE	2/	1.5				V		
			2																					D1							"	
			3																					D2							"	
			4																					D3							"	
			5																					D4							"	
			6																					CLK							"	
			7																					D5							"	
			8																					D6							"	
			9																					D7							"	
			10																					D8							"	
V _{IC} (neg)			11	-1mA		-1mA	-1mA																1	OE						"		
			12																					D1		-1.5					"	
			13																					D2							"	
			14																					D3							"	
			15																					D4							"	
			16																					CLK							"	
			17																					D5							"	
			18																					D6							"	
			19																					D7							"	
			20																					D8							"	
I _{CCH}	3005		21	GND			5.5V				5.5V			3/		5.5V			5.5V	5.5V		5.5V	V _{CC}			0.2		8.0		μA		
I _{CCL}			22	GND			GND				GND					GND			GND	GND						0.2		8.0			"	
I _{CCZ}			23	5.5V		5.5V	GND			5.5V	GND				5.5V	GND			GND	GND							0.1		4.0			"
V _{OH6}	24	3006	25	0.8V	-20μA	2.0V	2.0V	-20μA															4.5V	Q1	4.4					"		
			26																					Q2							"	
			27																					Q3		4.4		4.4			V	"
			28																					Q4							"	
			29																					Q5							"	
			30																					Q6							"	
			31																					Q7							"	
			32																					Q8							"	
			33		-6.0mA	2.0V	2.0V	-6.0mA																5.5V	Q1	3.98						"
			34																					Q2								"
V _{OH7}			35																				Q3		3.7			3.98			"	
			36																				Q4								"	
			37																				Q5								"	
			38																				Q6								"	
			39																				Q7								"	
V _{OL6}	40	3007	41		20μA	0.8V	0.8V	20μA															4.5V	Q1						"		
			42																					Q2							"	
			43																					Q3		0.1			0.1			"
			44																					Q4							"	
			45																					Q5							"	
			46																					Q6							"	
			47																					Q7							"	
V _{OL7}			48		6.0mA	0.8V	0.8V	6.0mA															5.5V	Q1						"		
			49																					Q2		0.26			0.4			"
			50																					Q3							"	
			51																					Q4							"	
			52																					Q5							"	
			53																					Q6							"	
			54																					Q7							"	
			55																					Q8							"	

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 1 T _C = +25°C		Subgroup 2 T _C = +125°C		Subgroup 3 T _C = -55°C				
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max	
I _{OS4}	3011	56	GND	GND	4V	4V	GND	GND	4V	4V	GND	GND	3/									4V	Q1	-10	-135	-10	-135	-10	-135	mA		
		57	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q2	"	"	"	"	"	"	"		
		58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q3	"	"	"	"	"	"	"		
		59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q4	"	"	"	"	"	"	"		
		60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q5	"	"	"	"	"	"	"		
		61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q6	"	"	"	"	"	"	"		
		62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q7	"	"	"	"	"	"	"		
		63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q8	"	"	"	"	"	"	"		
I _{IH}	3010	64	5.5V		5.5V	GND			GND	GND			GND			GND			GND	GND		5.5V	OE							μA		
		65	GND		GND	GND																										
		66			GND	5.5V																										
		67				5.5V																										
		68				GND																										
		69				5.5V																										
		70																														
		71																														
		72																														
		73																														
		I _{IL}	3009	75	5.5V		5.5V	5.5V			5.5V	5.5V			5.5V			5.5V			5.5V			5.5V	OE							
				76			5.5V	5.5V																								
77						5.5V																										
78																																
79																																
80																																
81																																
82																																
83																																
I _{OZH}	74			84	2.0V	2.0V	0.8V	0.8V	2.0V	2.0V	0.8V	0.8V	2.0V		3/										Q1							
				85																												
				86																												
		87																														
		88																														
		89																														
		90																														
		91																														
I _{OZL}	74	92			GND	2.0V	2.0V	GND	GND	2.0V	2.0V	GND											Q1									
		93																														
		94																														
		95																														

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																				Measured terminal	Test limits						Unit					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Subgroup 4 T _C = +25°C											
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8		V _{CC}	Min	Max	Min	Max	Min		Max				
C _O	3012	110	5.5V	4/			4/					GND										5.5V	Q1	20	"					pF					
		111										"										"	Q2												
		112						4/				"										"	Q3												
		113									4/											"	Q4												
		114										"		4/								"	Q5												
		115										"				4/						"	Q6												
		116										"					4/					"	Q7												
117										"								4/		"	Q8														
																						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 5/ 6/	3014	118	B	X	A	A	X	X	A	A	X	GND	B	X	A	A	X	X	A	A	X	4.5V	All outputs 7/ 8/												
		119	"	H	A	A	"	"	"	A	A	B	"	A	A	B	"	"	A	A	B	"								"					
		120	"	"	B	B	"	"	"	B	B	"	"	B	B	"	"	"	"	B	B	"								"	"				
		121	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								"	"	"	"	"	"
		122	"	L	"	"	"	L	L	"	A	A	"	"	"	"	L	L	"	A	A	"								"	"	L	L	"	"
123	"	L	A	"	"	L	L	"	A	A	"	"	"	"	A	A	"	A	A	"	"	"	L	L	"	"	"								
124	"	H	A	A	"	L	L	"	A	A	"	"	"	A	A	"	L	L	"	A	"	"	"	"	"	"	"	"							
																						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} 9/		125	GND	OUT	IN		IN	OUT		IN		OUT	GND	IN								4.5V	Q1	28		21		28			MHz				
		126	"										"	"								"	Q2												
		127	"										"	"								"	Q3												
		128	"										"	"								"	Q4												
		129	"										"	"								"	Q5												
		130	"										"	"								"	Q6												
		131	"										"	"								"	Q7												
132	"										"	"								"	Q8														
t _{PHL2}	3003 (Fig. 3)	134	"	OUT	IN	4.5V	OUT		4.5V	4.5V		"	"		4.5V	4.5V		4.5V	4.5V		"	CLK to Q1	32		42		32			ns					
		135	"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									CLK to Q2				
		136	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									CLK to Q3				
		137	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									CLK to Q4				
		138	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									CLK to Q5				
		139	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									CLK to Q6				
		140	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									CLK to Q7				
t _{PLH2}		141	"	OUT	IN	GND	OUT		GND	GND		"	"		GND	GND		GND	GND		"	CLK to Q1													
		142	"		"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								CLK to Q2					
		143	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								CLK to Q3					
		144	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								CLK to Q4					
		145	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								CLK to Q5					
		146	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								CLK to Q6					
		147	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								CLK to Q7					
t _{PZH}		148	"			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q8		31		41	31							
		149	IN	OUT	4.5V	4.5V	OUT		OUT	4.5V	4.5V	OUT	"	"		OUT	4.5V	4.5V	OUT	OUT	4.5V	4.5V	OUT								OE to Q1				
		150	"									"	"									"	OE to Q2												
		151	"									"	"									"	OE to Q3												
		152	"									"	"									"	OE to Q4												
		153	"									"	"									"	OE to Q5												
		154	"									"	"									"	OE to Q6												
155	"									"	"									"	OE to Q7														
156	"									"	"									"	OE to Q8														

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R, S, 2	Terminal conditions 1/																			Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	Subgroup 9 T _C = +25°C 10/		Subgroup 10 T _C = +125°C		Subgroup 11 T _C = -55°C 10/		
			Test no.	OE	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8		Q8	V _{CC}	Min	Max	Min	Max		Min
t _{PZL} <																														

1/ Output pins not designated may be "high" level logic, "low" level logic, or open. Input pins not designated may be "high" level logic or "low" level logic. Exceptions are as follows:

- V_{IC}(pos) tests, the GND terminal shall be open.
- V_{IC}(neg) tests, the V_{CC} terminal shall be open.
- I_{CC} tests, the output terminal shall be open.

2/ For equipment that does not allow GND pin to be open during test, minimum limit of 0.4 V applies.

3/ Apply a positive going pulse.  2.5 V minimum/5.5 V maximum.

4/ See 4.4.1c.

TABLE III. Group A inspection – Continued.

- 5/ Tests performed in sequence.
- 6/ A = 3.7 V, B = 0.4 V for device types 01 through 06. A = 2.4 V, B = 0.4 V for device type 52.
- 7/ X = Indeterminate output voltage.
- 8/ Output shall be: High ≥ 1.5 V; Low ≤ 1.5 V, $|I_{OUT}| = 20 \mu A$.
- 9/ f_{MAX} , minimum limit specified, is the frequency of the input pulse. The output frequency shall be one-half of 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.
- 10/ See 4.4.1d.

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

4.5.1 Voltage and current. Unless otherwise specified, all voltages given are referenced to the microcircuit GND terminal. Currents given are conventional current and positive when flowing into the referenced terminal.

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

TABLE IV. Delta limits at 25°C.

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

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

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

5. PACKAGING

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

6. NOTES

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

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

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. PIN and compliance identifier, if applicable (see 1.2).
- c. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- d. Requirements for certificate of compliance, if applicable.
- e. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.
- f. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.
- g. Requirements for product assurance options.
- h. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements should not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
- i. Requirements for "JAN" marking.
- j. Packaging requirements (see 5.1).

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

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, P.O. Box 3990, Columbus, Ohio 43218-3990.

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

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

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-38510 device types and may have slight physical variations in relation to case size. The presence of this information should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

Military device type	Generic-industry type
01	54HC273
02	54HC374
03	54HC377
04	54HC574
05	54HC534
06	54HC564
52	54HCT374

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 5962-2005-022)

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

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