MILITARY SPECIFICATION

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

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

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, 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 number.

1.2 Part number. The part number shall be in accordance with MIL-M-38510, and as specified herein.

1.2.1 Device type. The device types shall be as follows:

Device type	Circuit
01	Octal D - Flip-Flop with Clear
02	Octal Three-State D Flip-Flop
03	Octal D - Flip-Flop with Enable
04	Octal Three-State D Flip-Flop
05	Octal Three-State D Flip-Flop w/inverting outputs
06	Octal Three-State D Flip-Flop w/inverting outputs
52	Octal Three-State D Flip-Flop (LS-TTL input)

1.2.2 Device class. The device class shall be the product assurance level as defined in MIL-M-38510.

1.2.3 Case outlines. The case outlines shall be designated as follows:

Outline letter	Case outline (see MIL-M-38510, appendix C)
R	D-8 (20-lead, 1/4" x 1-1/6"), dual-in-line package
2	C-2 (20-terminal, .350" x .350") square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage (V_{CC})	-0.5 V dc +7.0 V dc
DC input voltage (V_{IN})	-0.5 V dc to V_{CC} +0.5 V dc
DC output voltage (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_{OC})	±50 mA
Storage temperature range (T_{STG})	-65°C to +150°C
Maximum power dissipation (P_D)	300 mW (02, 04-06, 52, 420 mW)
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Case R	(See MIL-M-38510, appendix C)
Case 2	60°C/W
Junction temperature (T_J)	+175°C

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Rome Air Development Center (RBE-2), Griffiss AFB, NY 13441, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

1.4 Recommended operating conditions.

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

Input low (V_{IL}) maximum voltage	0.3 V at V_{CC} = 2 V 0.9 V at V_{CC} = 4.5 V 1.2 V at V_{CC} = 6 V
Input high (V_{IH}) minimum voltage	1.5 V at V_{CC} = 3 V 3.15 V at V_{CC} = 4.5 V 4.2 V at V_{CC} = 6 V

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

Supply voltage (V_{CC})	2 V dc minimum to 6 V dc maximum
Output voltage	0 V dc to V_{CC}.
Operating temperature	-55°C to +125°C

Input rise and fall times (t_r, t_f) maximum:

V_{CC} = 2 V	1000 ns
V_{CC} = 4.5 V	500 ns
V_{CC} = 6 V	400 ns

Device type 52:

Input low (V_{IL}) maximum voltage	0.8 at V_{CC} = 4.5 to 5.5
Input high (V_{IH}) minimum voltage	2.0 V at V_{CC} = 4.5 - 5.5
Supply voltage (V_{CC})	4.5 V to 5.5 V dc
Output voltage	0 V dc to 5.5 V dc
Operating temperature	-55°C to +125°C

Input rise and fall times (t_r, t_f):

V_{CC} = 4.5 V	500 ns

Setup time before clock (t_{su}) 20 ns minimum.

Hold time (t_H):	
Device types 01, 03, 04, 06	5 ns minimum
Device types 02, 05, 52	10 ns minimum
Clock pulse (t_{CLK}):	
Device types 02, 04, 05, 06	16 ns minimum
Device type 01	18 ns minimum
Device types 03, 52	20 ns minimum
(t_{REM}):	
Device type 01	20 ns minimum

2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Detail specification. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Logic diagram and terminal connections. The logic diagram and terminal connections shall be as specified on figure 1.

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

3.2.3 Schematic circuits. The schematic circuits shall be submitted to the preparing activity prior to inclusion of a manufacturer's device in this specification and shall be submitted to the qualifying activity as a prerequisite for qualification. All qualified manufacturers' schematics shall be maintained and available upon request.

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

3.3 Lead material and finish. The lead material and finish shall be in accordance with MIL-M-38510 and 6.4 herein.

3.4 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.

3.5 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.

3.6 Marking. Marking shall be in accordance with MIL-M-38510. At the option of the manufacturer, marking of the country of origin may be omitted from the body of the microcircuit, but shall be retained on the initial container.

3.6.1. Total dose radiation hardness identifier. Total dose radiation hardness identifier shall be in accordance with MIL-M-38510 and 4.5.4 herein.

3.6.2 Serialization. All class S devices shall be serialized in accordance with MIL-M-38510.

3.6.3 Correctness of indexing and marking. All devices shall be subjected to the final electrical tests specified in table II after part number marking to verify that they are correctly indexed and identified by part number. Optionally, an approved electrical test may be devised especially for this requirement.

3.7 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 38 (see MIL-M-38510, appendix E).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and methods 5005 and 5007, as applicable, of MIL-STD-883, except as modified herein.

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

a. Delete the sequence specified in 3.1.10 through 3.1.14 of method 5004 and substitute lines 1 through 7 of table II herein.

b. Burn-in (method 1015 of MIL-STD-883).

(1) Static test (test condition A) using circuit shown on figure 3, or equivalent. 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.

(2) Dynamic test (test condition D) using circuit shown on figure 3, or equivalent. Ambient temperature shall be +125°C minimum. Test duration shall be in accordance with table I of method 1015.

c. Interim and final electrical parameters shall be as specified in table II herein.

d. 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 failures shall be cumulative for determining the PDA.

c. The PDA for class B devices shall be in accordance with MIL-M-38510 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-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510 and as specified herein. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table I of method 5005 of MIL-STD-883 and as follows:

a. Tests shall be performed in accordance with table II herein.

b. Subgroups 5, 6, 7, and 8 of table I of method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 4 (C_i measurement) shall be measured only for initial qualification and after process or design changes which may affect input capacitance. Capacitance shall be measured between the designated terminal and V_{SS} 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 method 5005 of MIL-STD-883 and as follows:

a. Class S steady-state life (accelerated) test circuits shall be submitted to the qualifying activity for approval. When the alternate steady-state life test is used, the circuit on figure 4, or equivalent, shall be used.

b. Electrostatic Discharge Sensitivity (ESDS) testing shall be performed in accordance with MIL-STD-883, method 3015. The option to categorize devices as ESD sensitive without performing the test is not allowed. Device types categorized as ESD sensitive shall be further tested using method 3015 modified as follows:

(1) Table I pin combinations 4 and 5 shall be deleted.

(2) The test sequence specified in 3.b shall be repeated an additional four times rather than the two specified.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device type	V_{CC}	Limits Min	Limits Max	Unit
High-level output voltage	V_{OH1} 2/	V_{IH} = 1.5 V V_{IL} = 0.3 V I_{OH} = -20 µA	01-06	2.0 V	1.90	---	V
	V_{OH2} 2/	V_{IH} = 3.15 V V_{IL} = 0.9 V I_{OH} = -20 µA	01-06	4.5 V	4.40	---	V
	V_{OH3}	V_{IH} = 4.2 V V_{IL} = 1.2 V I_{OH} = -20 µA	01-06	6.0 V	5.90	---	V
	V_{OH4} 2/	V_{IH} = 3.15 V V_{IL} = 0.9 V I_{OH} = -4.0 mA	01-06	4.5 V	3.7	---	V
	V_{OH5}	V_{IH} = 4.2 V V_{IL} = 1.2 V I_{OH} = -5.2 mA	01-06	6.0 V	5.2	---	V
	V_{OH6}	V_{IH} = 2.0 V V_{IL} = 0.8 V I_{OH} = -20 mA	52	4.5 V	4.4	---	V
	V_{OH7}	V_{IH} = 2.0 V V_{IL} = 0.8 V I_{OH} = -6.0 mA	52	5.5 V	3.7	---	V

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device type	V_{CC}	Limits Min	Limits Max	Unit
Low-level output voltage	V_{OL1} 2/	V_{IH} = 1.5 V V_{IL} = -0.3 V I_{OL} = 20 µA	01-06	2.0 V	---	0.10	V
	V_{OL2} 2/	V_{IH} = 3.15 V V_{IL} = -0.9 V I_{OL} = 20 µA	01-06	4.5 V	---	0.10	V
	V_{OL3}	V_{IH} = 4.2 V V_{IL} = -1.2 V I_{OL} = 20 µA	01-06	6.0 V	---	0.10	V
	V_{OL4} 2/	V_{IH} = 3.15 V V_{IL} = -0.9 V I_{OL} = 4.0 mA	01-06	4.5 V	---	0.4	V
	V_{OL5}	V_{IH} = 4.2 V V_{IL} = -1.2 V I_{OL} = 5.2 mA	01-06	6.0 V	---	0.4	V
	V_{OL6}	V_{IH} = 2.0 V V_{IL} = 0.8 V I_{OL} = 20 mA	52	4.5 V	---	0.1	V
	V_{OL7}	V_{IH} = 2.0 V V_{IL} = 0.8 V I_{OL} = 6.0 mA	52	5.5 V	---	0.4	V
Positive input clamp voltage	V_{IC+}	V_{CC} = GND I_{IN} = 1 mA T_C = +25°C	01-06 52	---	---	1.5	V
Negative input clamp voltage	V_{IC-}	V_{CC} = Open I_{IN} = -1 mA T_C = +25°C	01-06 52	---	---	-1.5	V
Input current low	I_{IL}	V_{IN} = GND	01-06	6.0 V	---	-0.1	µA
			52	5.5 V	---	-0.1	µA
Input current high	I_{IH}	V_{IN} = V_{CC}	01-06	6.0	---	0.1	µA
			52	5.5 V	---	0.1	µA

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device type	V_{CC}	Limits Min	Limits Max	Unit
Short circuit output current	I_{OS1} 2/	V_O = GND, V_I = GND	01,03	2.0 V	-2	-50	mA
			02,04, 05,06		-2	-60	
	I_{OS2} 2/		01,03	4.5 V	-15	-150	
			02,04, 05,06		-15	-165	
	I_{OS3} 2/		01,03	6.0 V	-25	-180	
			02,04, 05,06		-25	-210	
	I_{OS4}		01,03	4.0 V	-10	-120	
			02,04, 05,06,52		-10	-135	
	I_{OS5} 3/	V_I = 5.5 V	52	5.5 V	-25	-210	V
Supply current quiescent	I_{CC}	V_I = 6.0 V	01-06 3/	6.0 V	---	8	µA
		V_I = 5.5 V	52	5.5 V	---	8	µA
	I_{CCZ}		02,04, 05,06			4.0	µA
		V_I = 5.5 V	52	5.5 V		4.0	µA
Tri-state output leakage current low	I_{OZL}	V_{OUT} = GND, $\overline{OC}$ = V_{IH} 4/	02,04, 05,06	6.0 V		-0.2 V	µA
Tri-state output leakage current high	I_{OZH}	V_{OUT} = GND, $\overline{OC}$ = V_{IH} 4/	02,04, 05,06	6.0 V		+0.2 V	µA
Input capacitance	C_{IN}	T_C = 25°C	01-06 3/ 52			10	pF
	C_C		01-06, 52			15	pF
Clock, control capacitance tri-state output capacitance	C_O	T_C = 25°C	02,04-06,52			20	pF
Propagation delay times 5/, 6/ Clear to outputs	t_{PHL1}	C_L = 50 pF ±10%	01	4.5 V		41	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device type	V_{CC}	Limits Min	Limits Max	Unit
Propagation delay 5/, 6/ Clock to outputs	t_{PHL2} t_{PLH2}	C_L = 50 pF ±10%	01	4.5 V		37	ns
			01,52	4.5 V		42	ns
			03	4.5 V		37	ns
			04	4.5 V		42	ns
			05	4.5 V		42	ns
			06	4.5 V		41	ns
Output enable time 5/, 6/	t_{PZH} t_{PZL}	C_L = 50 pF ±10% R_L = 1 kΩ ±10%	02	4.5 V		35	ns
			52	4.5 V		41	ns
			04	4.5 V		35	ns
			05	4.5 V		41	ns
			06	4.5 V		35	ns
Output disable time 5/, 6/	t_{PHZ} t_{PLZ}	C_L = 50 pF ±10% R_L = 1 kΩ ±10%	02	4.5 V		35	ns
			52	4.5 V		41	ns
			04	4.5 V		35	ns
			05	4.5 V		35	ns
			06	4.5 V		35	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device type	V_{CC}	Limits Min	Limits Max	Unit
Transition delay 5/, 6/	t_{THL} t_{TLH}	C_L = 50 pF ±10%	01	4.5 V		20	ns
			02,52	4.5 V		16	ns
			03	4.5 V		20	ns
			04	4.5 V		16	ns
			05	4.5 V		16	ns
			06	4.5 V		16	ns
Maximum frequency test 5/, 6/	f_{MAX}	C_L = 50 pF ±10% 50% duty cycle	01	4.5 V		23	MHz
			02	4.5 V		25	MHz
			52	4.5 V		21	MHz
			03	4.5 V		21	MHz
			04	4.5 V		25	MHz
			05	4.5 V		25	MHz
			06	4.5 V		25	MHz

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

2/ Guaranteed but not tested.

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

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

I_{OZH} set internal D flips-flops to low state.

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 formulae for determining switching times and maximum frequencies shown in tables IA and IB respectively.

TABLE IA. Calculated dynamic figures at -55/25 ambient temperature (°C).

V_{CC}	T_A = (°C)	
	125	-55/25
2.0 V	5.00X	5.00Y
4.5 V	X = 1	0.75X = Y
6.0 V	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 5/4.

TABLE IB. Calculated f_{MAX} figures at -55/25 ambient temperature (°C).

V_{CC}	T_A = (°C)	
	125	-55/25
2.0 V	0.2X	0.2Y
4.5 V	X = 1	1.33X = Y
6.0 V	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 5/4.

TABLE II. Burn-in and electrical test requirements.

Line no.	Applicable tests and MIL-STD-883 test method	Class S device 1/				Class B device 1/			
		Ref. paragraph	Table III subgroups 2/	Table IV delta limits 3/	Test circuit figure	Ref. paragraph	Table III subgroups 2/	Table IV delta limits 3/	Test circuit figure
1	Interim electrical parameters (method 5004)		1				1		
2	Static burn-in I (method 1015)	4.2b 4.5.2	Req'd		3		Not req'd		
3	Same as line 1		1	Δ					
4	Static burn-in II (method 1015)	4.2b 4.5.2	Req'd		3	4.2b 4.5.2	4/ Req'd		3
5	Same as line 1	4.2d	1*	Δ		4.2d	1*	Δ	
6	Dynamic burn-in (method 1015)	4.2b 4.5.2	Req'd				Not req'd		
7	Same line 1	4.2d	1	Δ					
8	Final electrical parameters (method 5004)		1*,2,3,9				1*,2,3,9 4/		
9	Group A test requirements (method 5005)	4.4.1	1,2,3,4, 9,10,11			4.4.1	1,2,3,4, 9,10,11		
10	Group B end-point electrical parameters (method 5005)	4.4.2	*1,2,3,9, 10,11	Δ			*1		
11	Group C end-point electrical parameters (method 5005)					4.4.3	1,2	Δ	
12	Group D end-point electrical parameters (method 5005)	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 limit 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 (line 1).

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).

5/ * indicates also applies to electrostatic discharge sensitivity tests.

(3) Only those device types that pass EDS testing at 1000 volts or greater shall be considered as conforming to the requirements of this specification.

c. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 5 of group B inspections and shall consist of tests specified in table IV herein.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table III of method 5005 of MIL-STD-883 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. Steady-state life test (method 1005 of MIL-STD-883) conditions:

(1) Test condition D and as specified in 4.5.2 herein and as shown on figure 3 (note 3), or equivalent.

(2) T_A = +125°C minimum.

(3) Test duration, 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical parameters shall be as specified in table II herein.

4.4.5 Group E inspection. Group E inspection is required only for device types intended to be marked as radiation hardened (see 3.6.1). When group E testing is performed it shall be in accordance with table V of method 5005 of MIL-STD-883 and 4.5.4 herein.

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

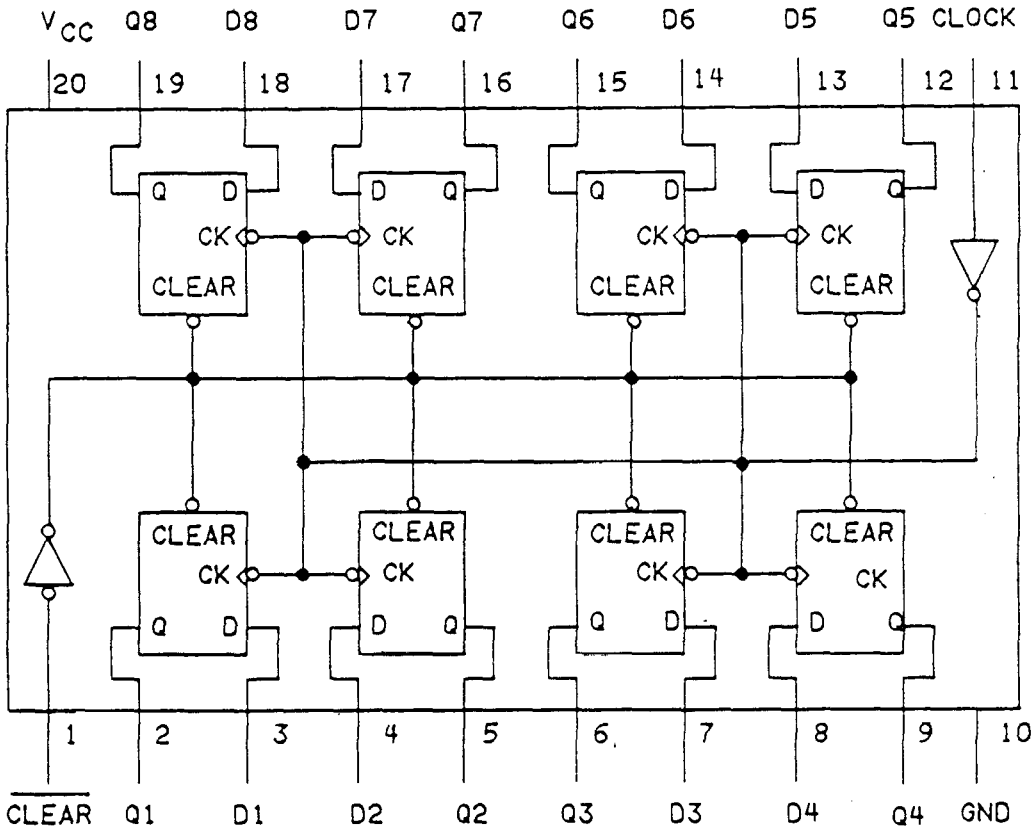
4.5.1 Voltage and current. Unless otherwise specified, all voltages given are referenced to the microcircuit GND terminal. Currents given are conventional current and positive when flowing into the referenced terminal.

Text continues on page 58

Device type 01

Case R

DUAL-IN-LINE PACKAGE



TOP VIEW

FIGURE 1. Logic diagram and terminal connections (top view).

Device type 01

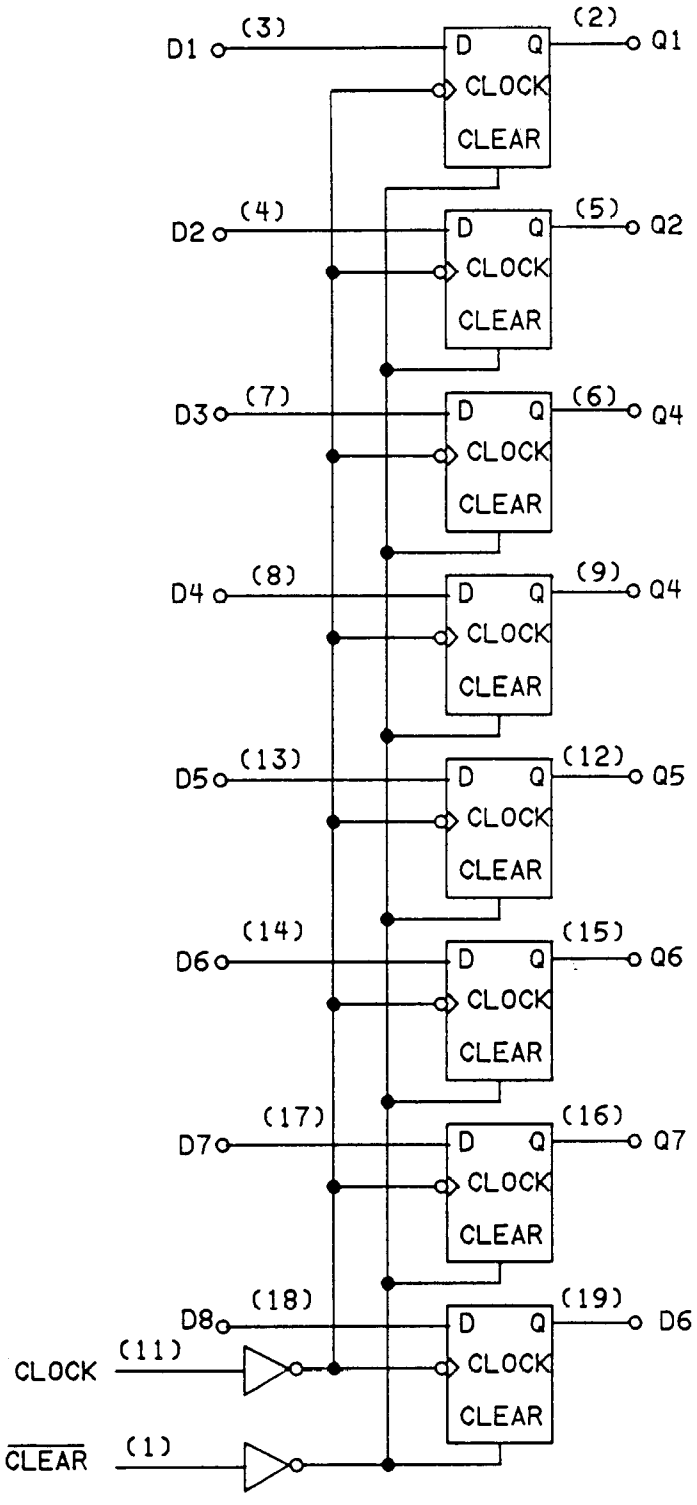


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device types 02, 52

DUAL-IN-LINE PACKAGE

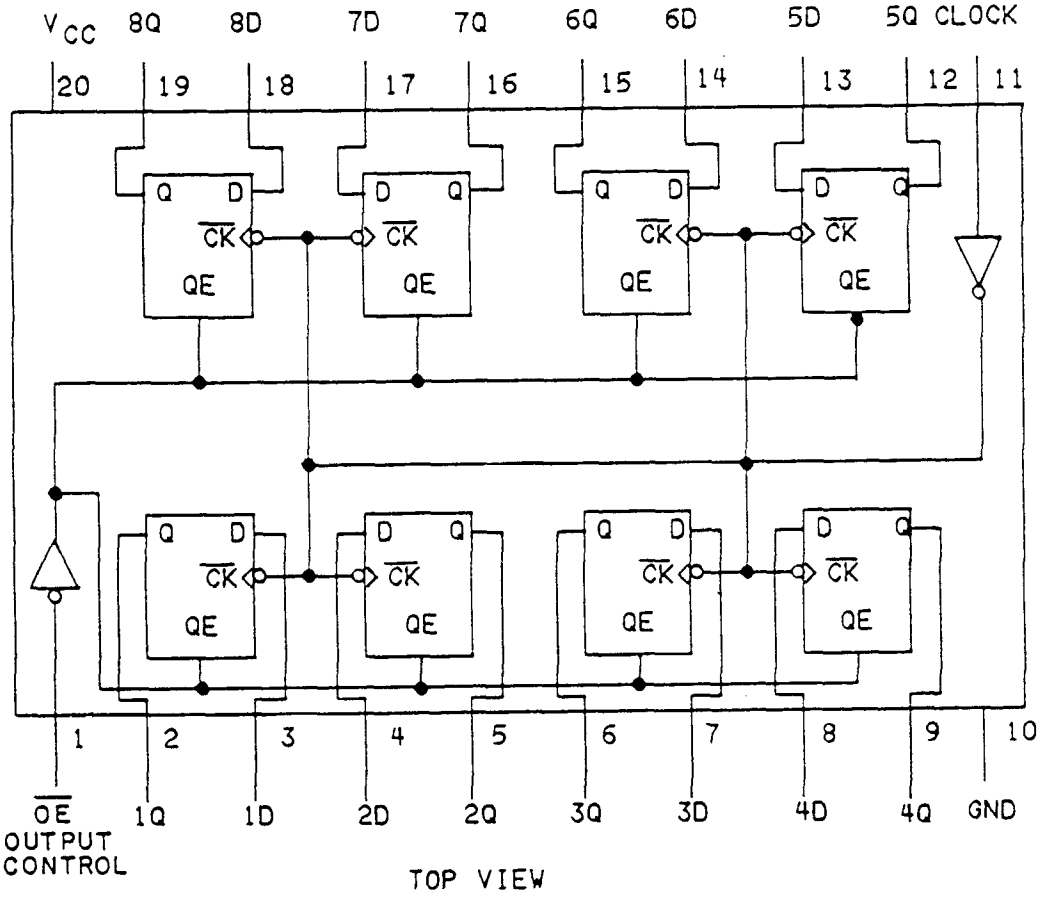


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device types 02, 52

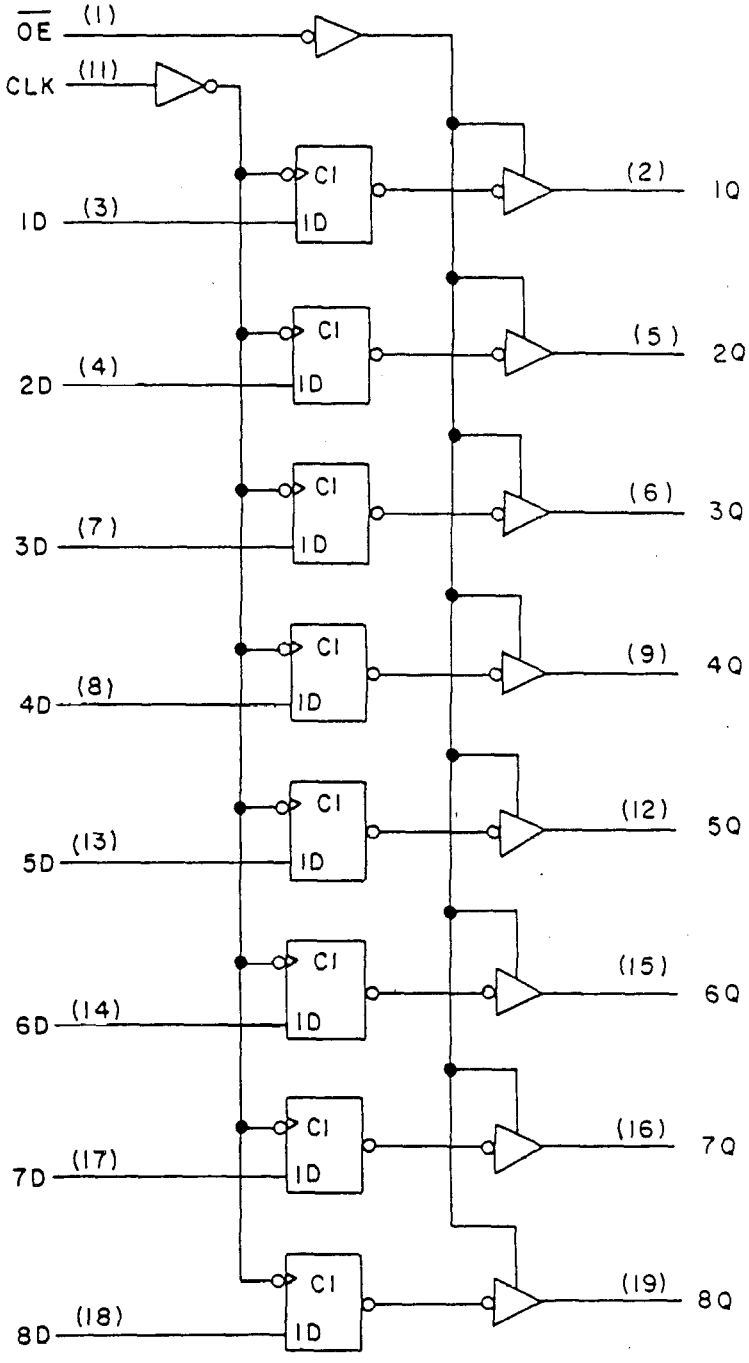


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 03

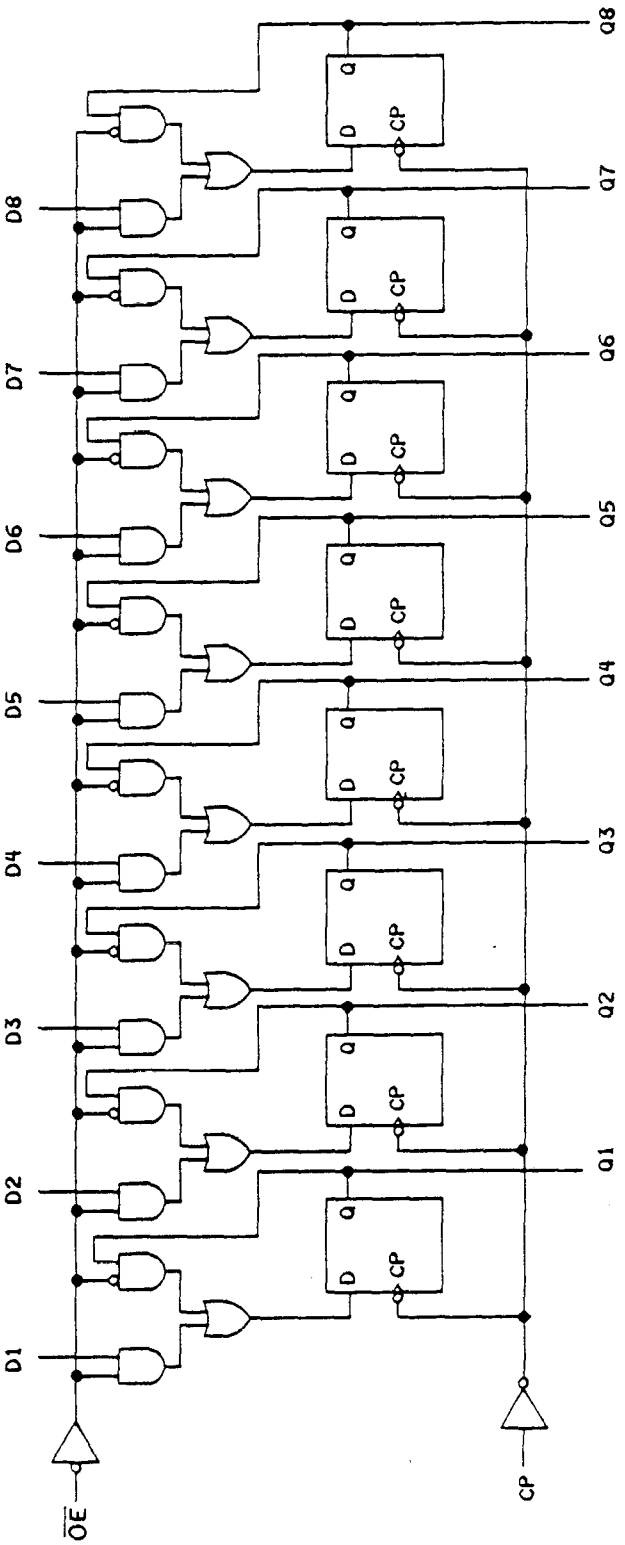


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 03

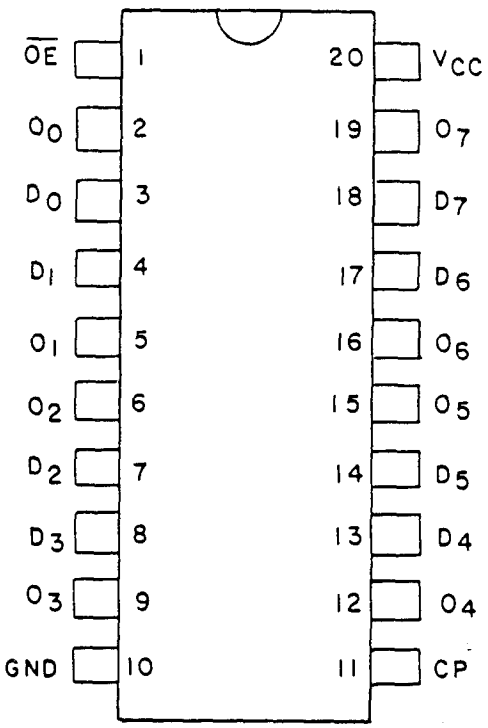


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 04

DUAL-IN-LINE PACKAGE

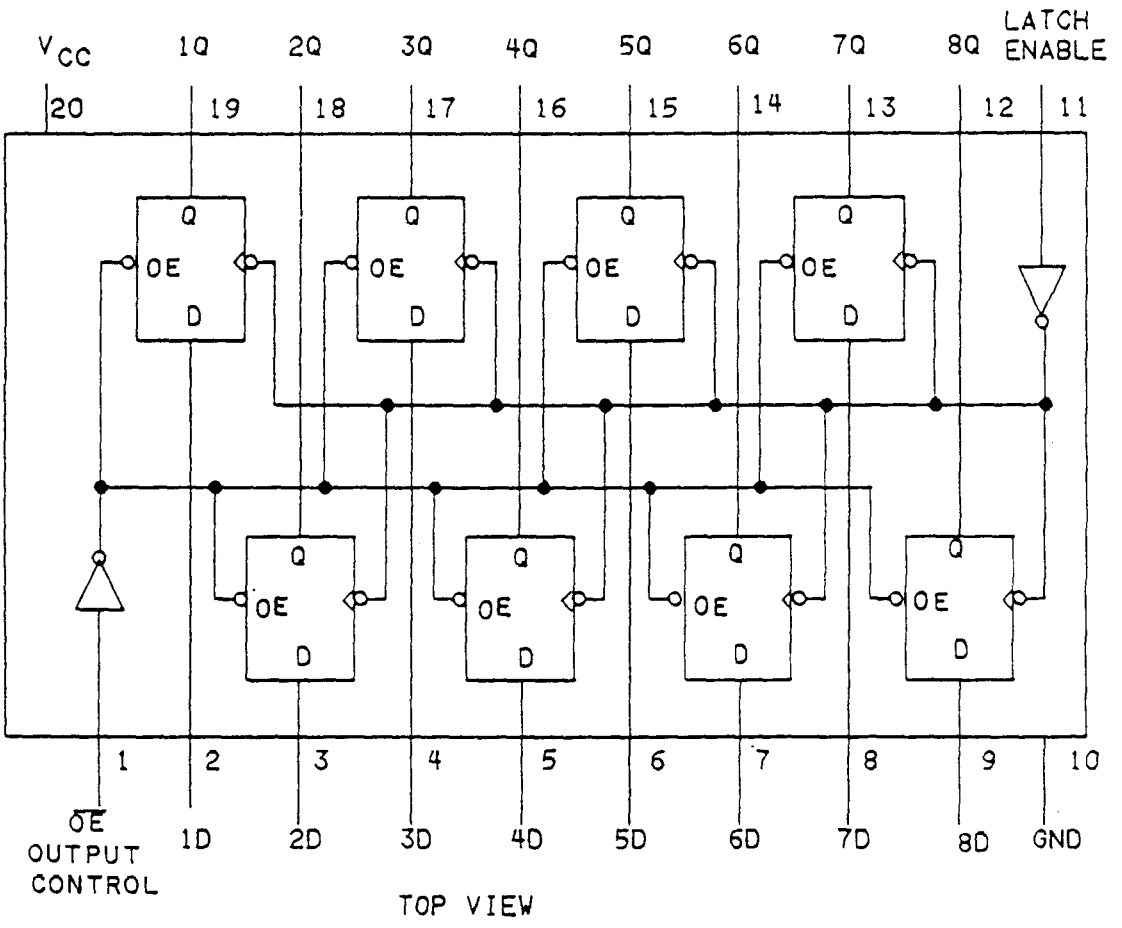


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

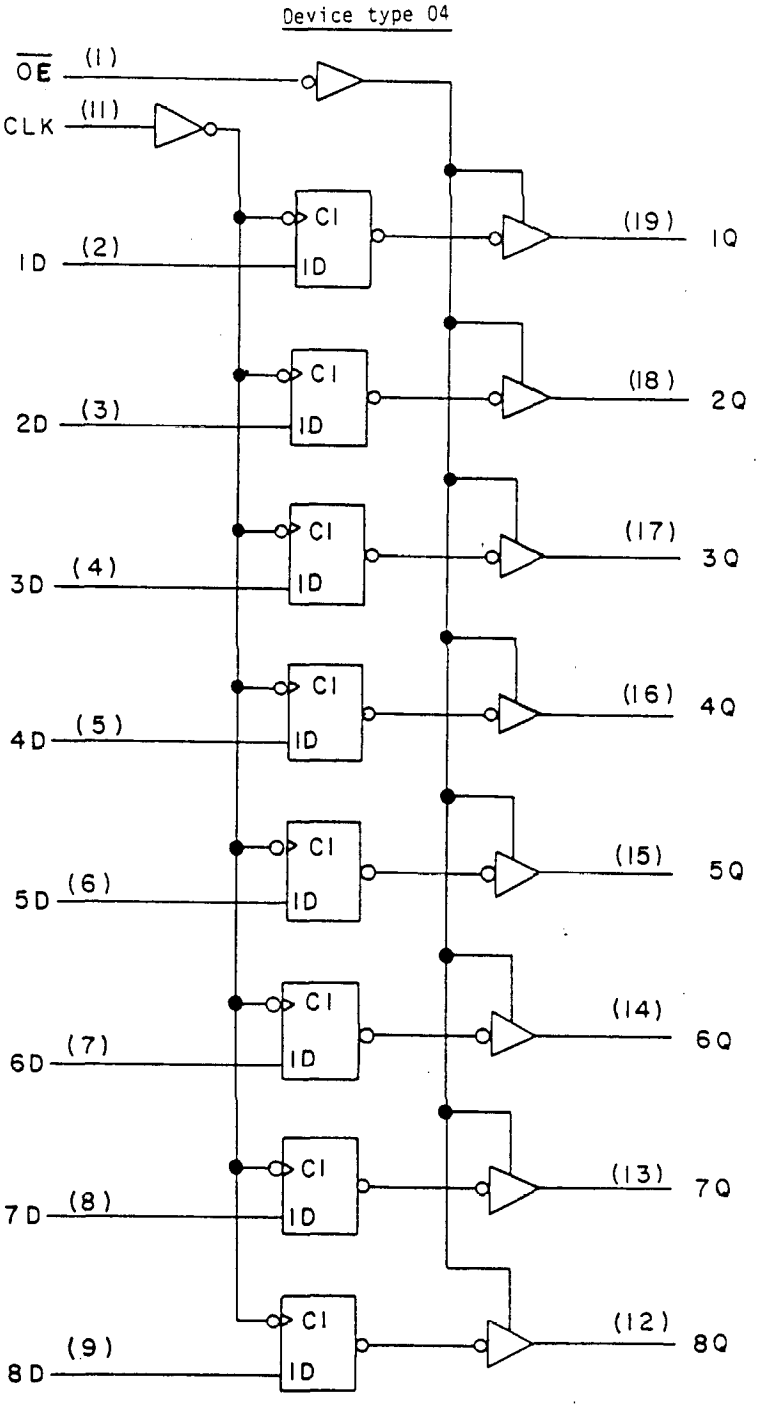


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 05

DUAL-IN-LINE PACKAGE

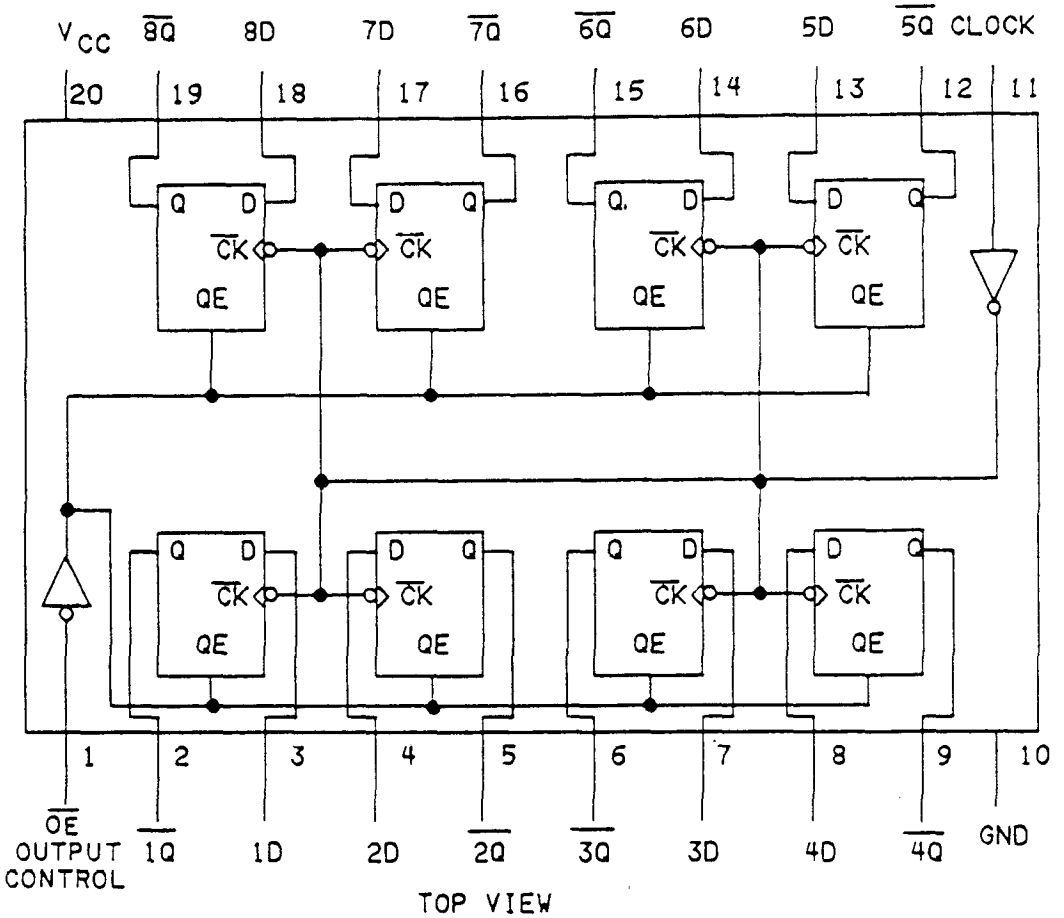


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 05

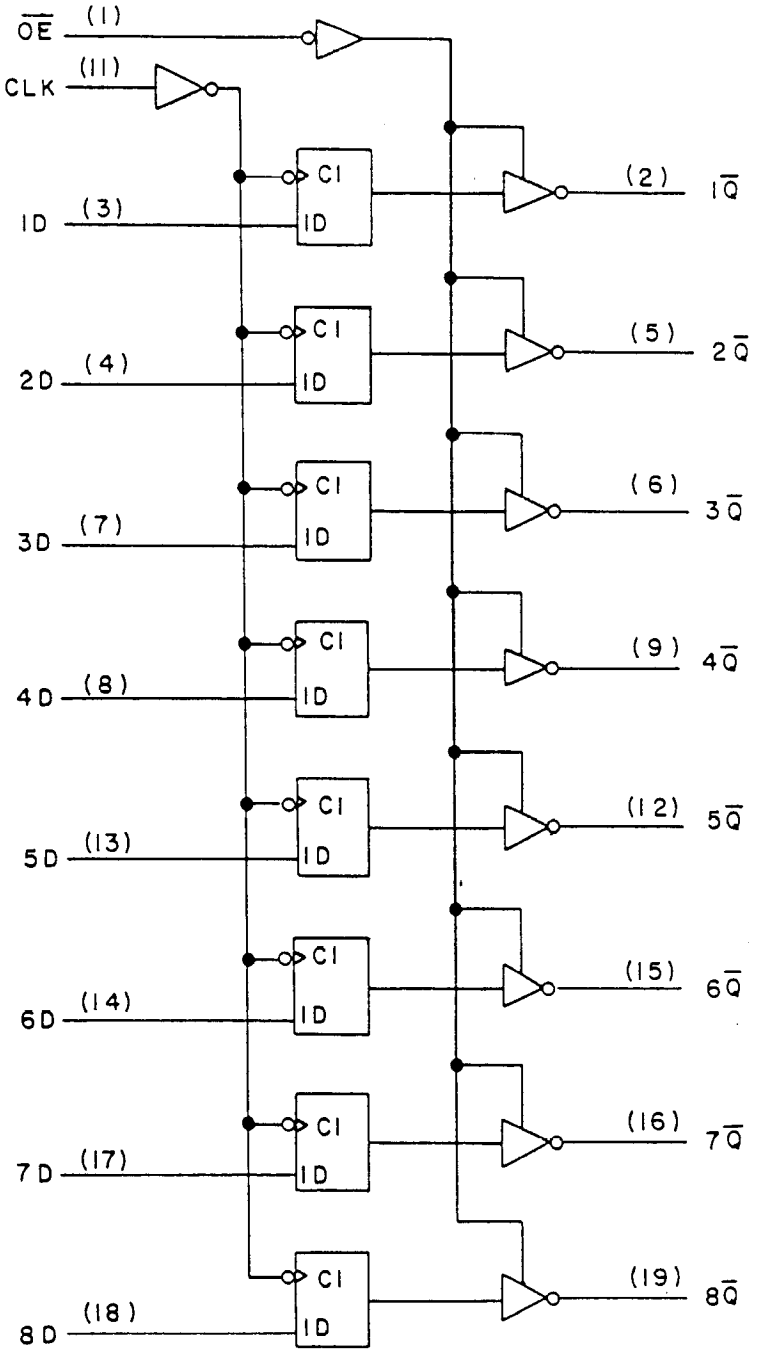


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 06

DUAL-IN-LINE PACKAGE

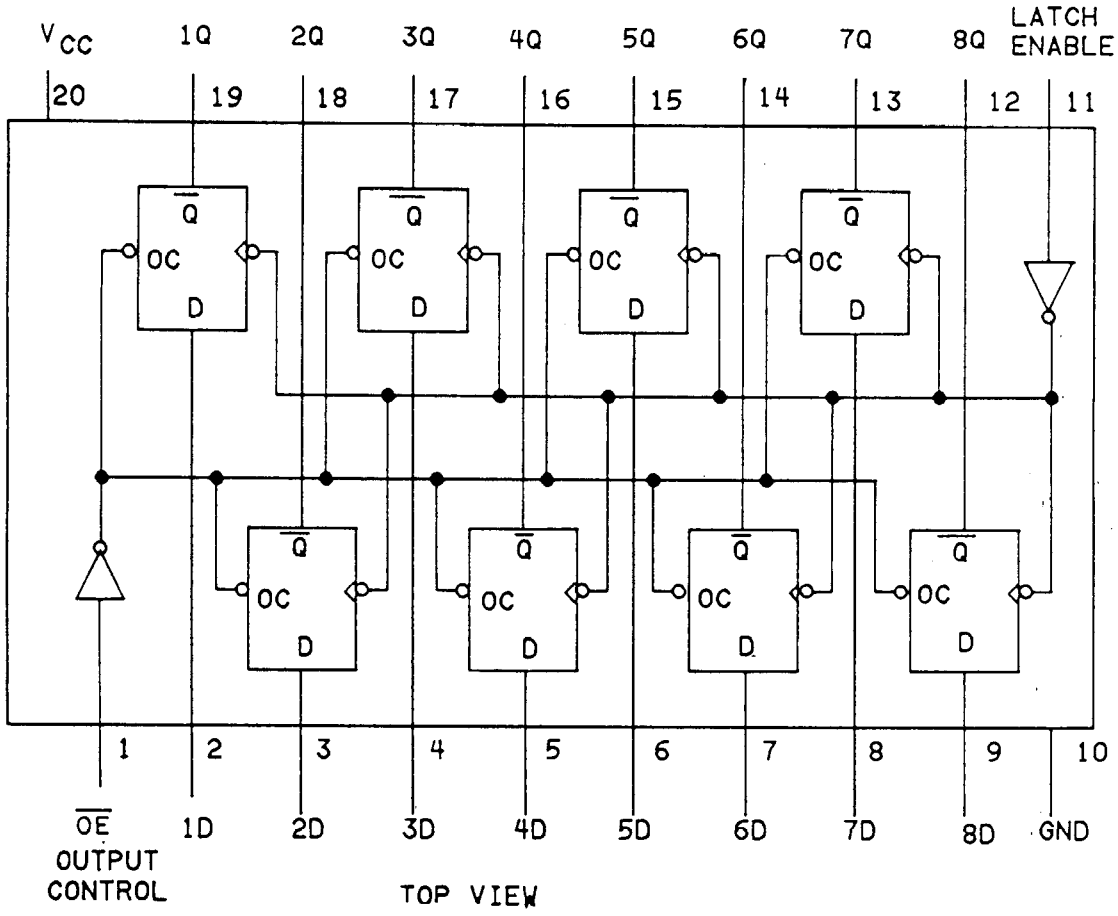


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 06

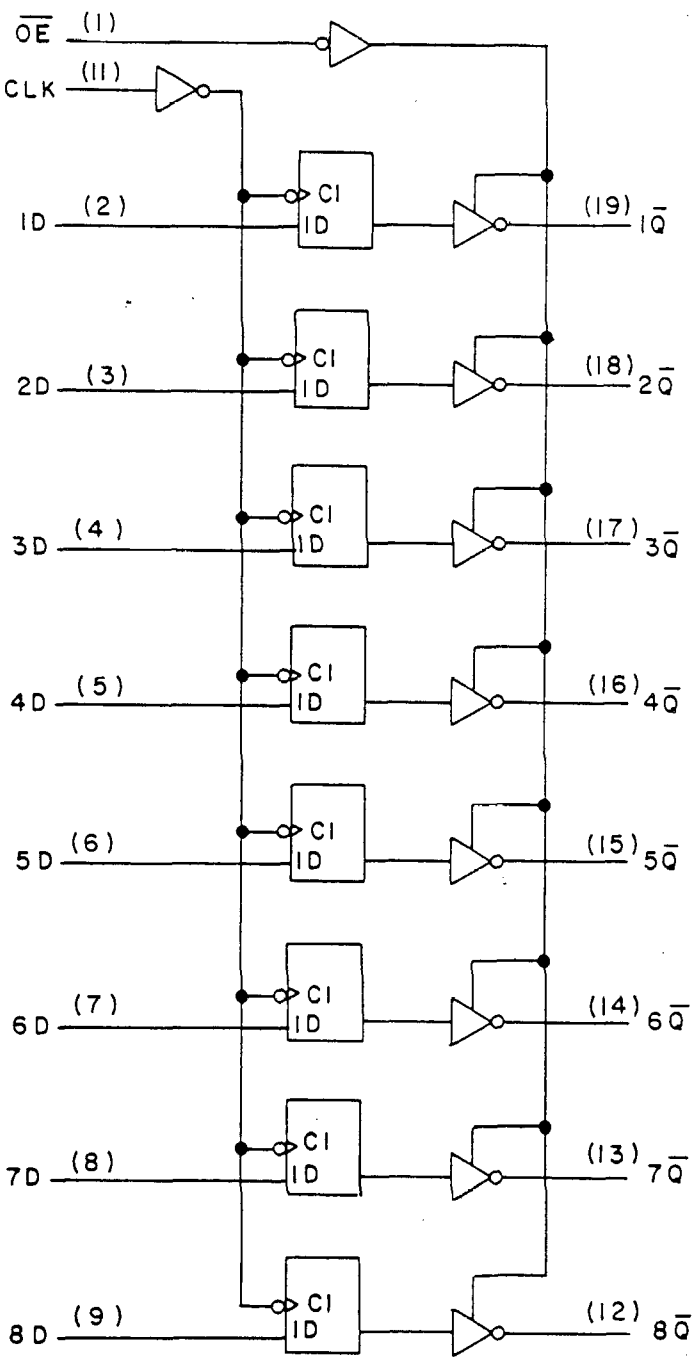


FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device type 01

(Each Flip-Flop)

Inputs			Outputs
Clear	Clock	D	Q
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q_0

H = high level (steady state)
L = low level (steady state)
X = don't care
↑ = transition from low to high level
Q_0 = the level of Q before the indicated steady state input conditions were established

Device types 02, 52

Output Control	Clock	Data	Outputs
L	↑	H	H
L	↑	L	L
L	L	X	Q_0
H	X	X	Z

H = high level, L = low level
X = don't care
↑ = transition from low-to-high
Z = high impedance state
Q_0 = the level of the output before steady state input conditions were established

Device type 03

$\overline{E}$	Clock	Data	Outputs
H	X	X	Q_0
L	↑	H	H
L	↑	L	L
X	L	X	Q_0

H = high level (steady state)
L = low level (steady state)
X = don't care
↑ = transition from low-to-high
Q_0 = the level of Q before the indicated steady state input conditions were established

Device type 04

Output Control	Clock	Data	Outputs
L	↑	H	H
L	↑	L	L
L	L	X	Q_0
H	X	X	Z

H = high level, L = low level
X = don't care
↑ = transition from low-to-high
Z = high impedance state
Q_0 = the level of the output before steady state input conditions were established

Device type 05

Output Control	Clock	Data	Outputs
L	↑	H	H
L	↑	L	L
L	L	X	$\overline{Q}_0$
H	X	X	Z

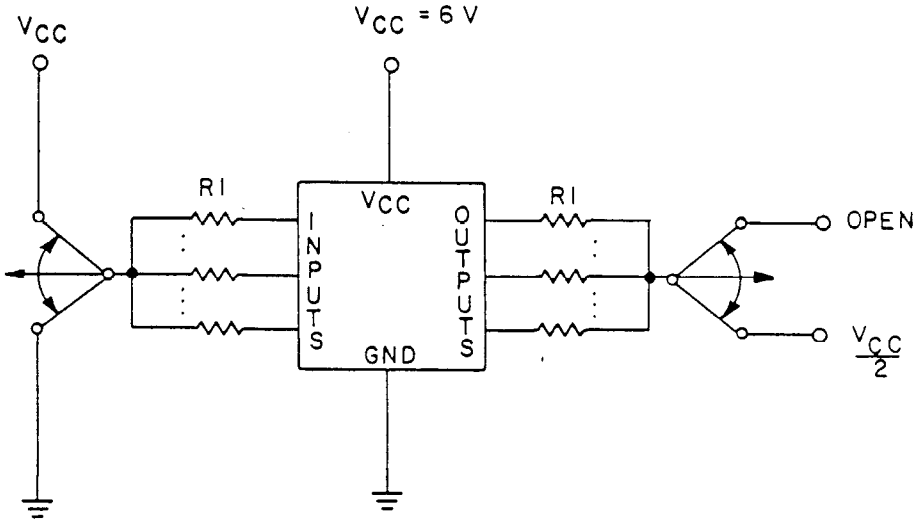
H = high level, L = low level
X = don't care
↑ = transition from low-to-high
Z = high impedance state
$\overline{Q}_0$ = the level of the output before steady state input conditions were established

Device type 06

Output Control	Clock	Data	Outputs
L	↑	H	H
L	↑	L	L
L	L	X	$\overline{Q}_0$
H	X	X	Z

H = high level, L = low level
X = don't care
↑ = transition from low-to-high
Z = high impedance state
$\overline{Q}_0$ = the level of the output before steady state input conditions were established

FIGURE 2. Truth tables.



1. 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 $V_{CC}/2$. R1 = 600Ω to 47 kΩ.

2. 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 $V_{CC}/2$. R1 = 680Ω to 47 kΩ.

3. V_{CC} = 6.0 V ±0.5 V.

   $\frac{V_{CC}}{2} = \frac{V_{CC}}{2}$ ±0.5 V.

FIGURE 3. Static burn-test circuits.

Device types 01 and 03

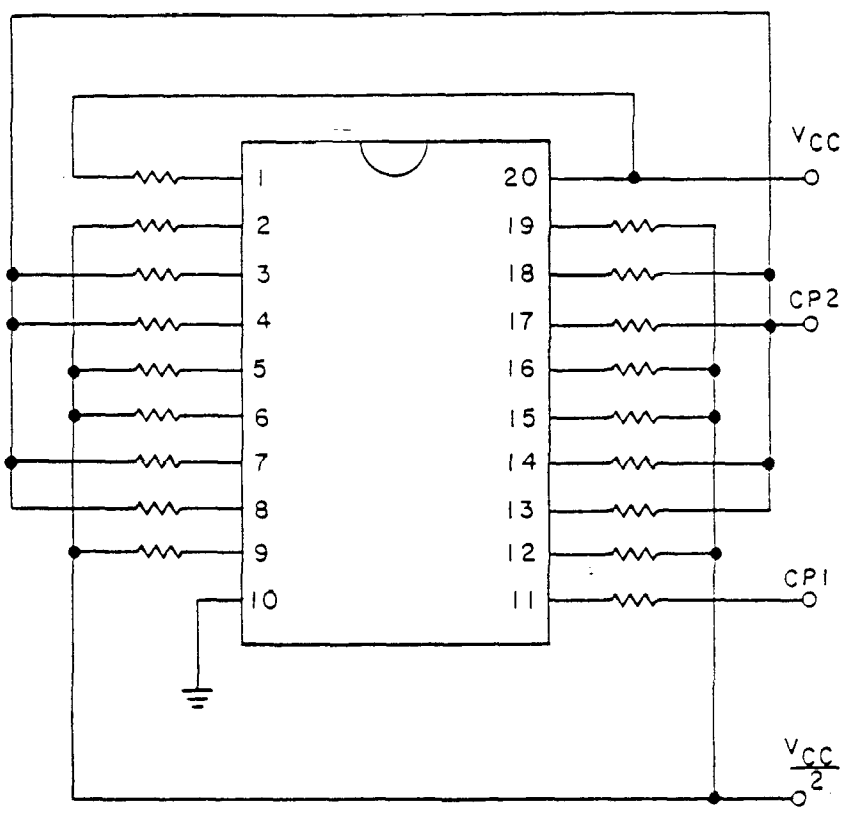


FIGURE 3. Dynamic burn-in and life test circuits - Continued.

Device types 02, 05, 52

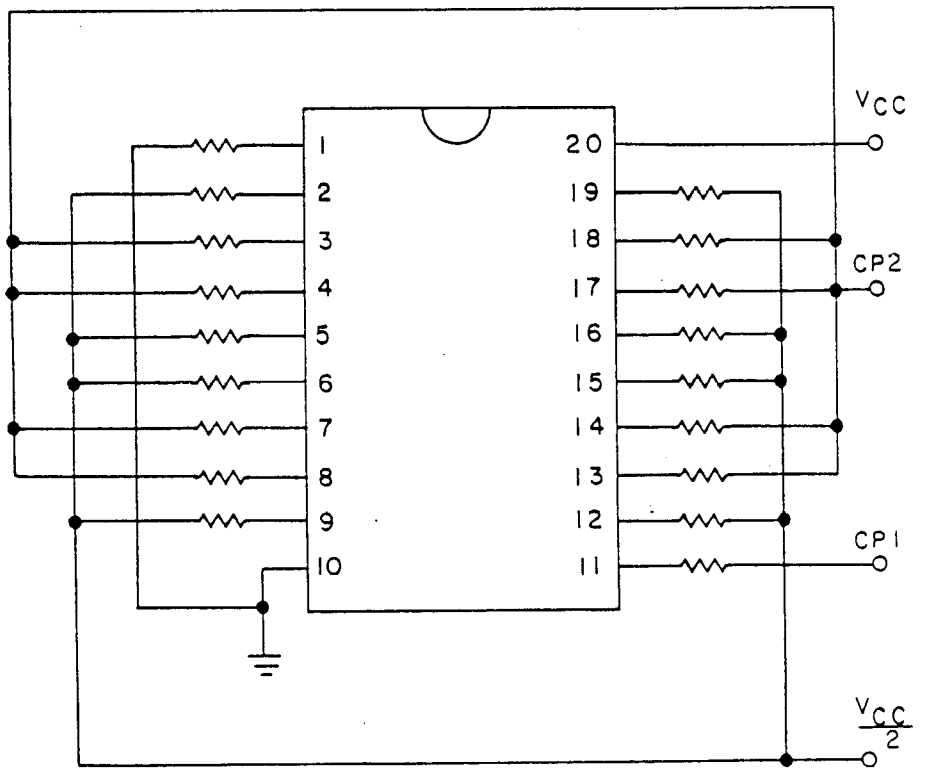
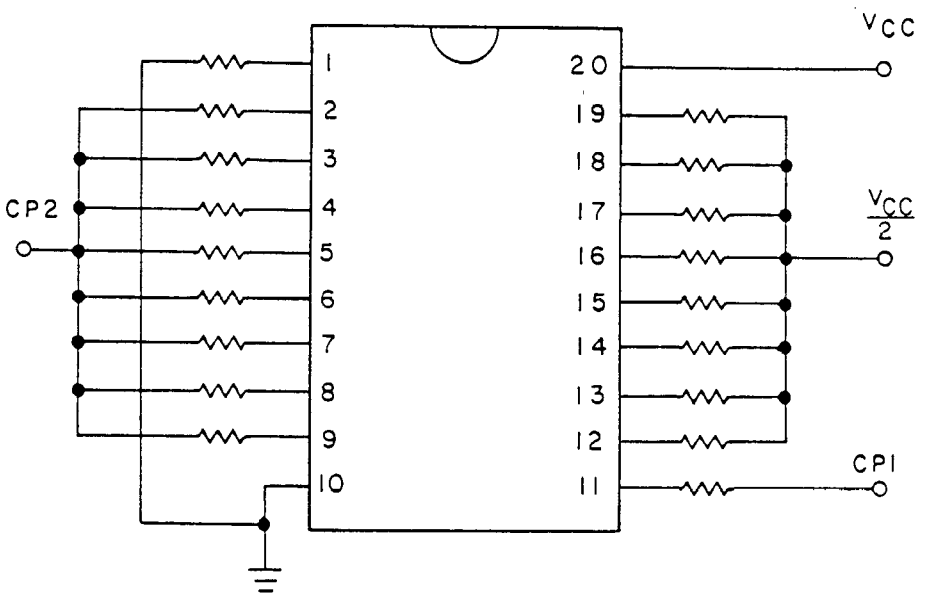
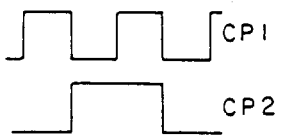


FIGURE 3. Dynamic burn-in and life test circuits - Continued.

Device types 04 and 06

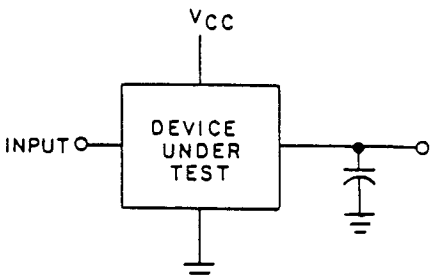




1. Input resistors = 1 kΩ to 47 kΩ ±20%.
2. Output resistors = 1 kΩ ±5% (680Ω 5% on 02, 04-06, 52).
3. V_{CC} = 6.0 V ±0.5 V.
4. $V_{\overline{CC}}$ = $V_{\frac{CC}{2}}$ ±0.5 V.
5. CP1 = 100 kHz, CP2 = 50 kHz ±50% square wave; duty cycle = 50 ±15%, V_{IH} = 4.5 minimum to V_{CC} volts maximum; V_{IL} = 0 V ±.5 V; t_{THL}, t_{TLH}, < 500 ns.

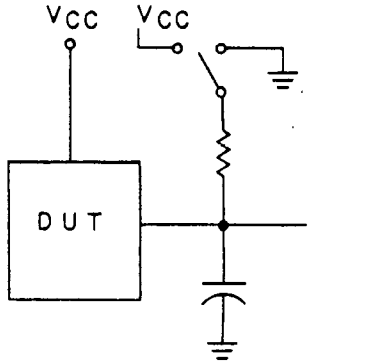
FIGURE 3. Dynamic burn-in and life test circuits - Continued.

Device types 01, 03



Test circuit for push pull outputs

Device types 02, 04, 05, 06, 52

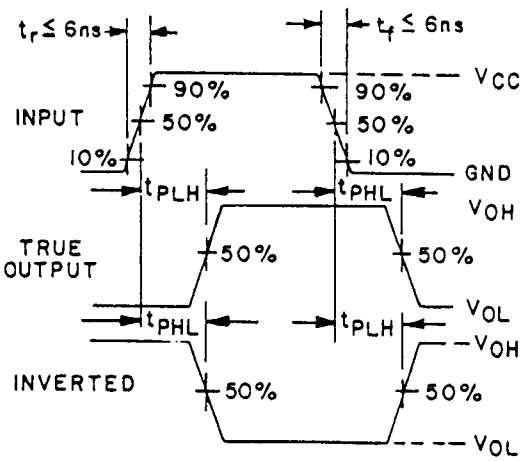


Test circuit for THREE-STATE Test (Notes 1 and 2)

Note 1: C_L includes load and test jig capacitance. See data sheets for values.

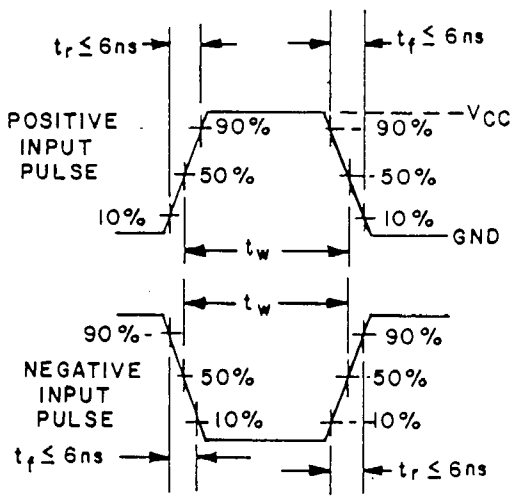
Note 2: S1 = V_{CC} for t_{PZL}, and t_{PLZ} measurements.
S1 = GND for t_{PZH}, and t_{PHZ} measurements.

Device types 01, 02, 03, 04, 05, 06, 52



Propagation delay waveforms

Device types 01, 02, 03, 04, 05, 06, 52

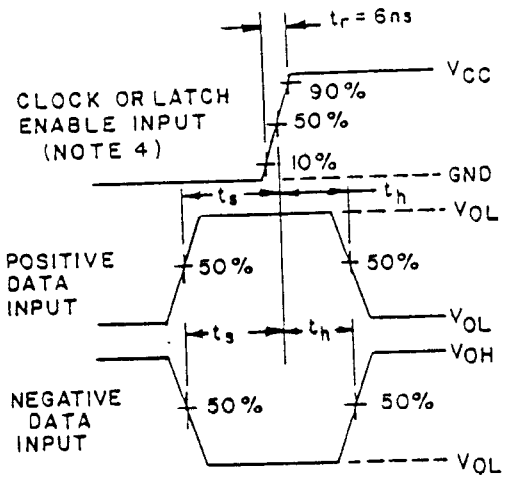


Clock input pulse width waveforms

Minimum pulse width = 16 ns
(01 = 18 ns) (03, 53 = 18 ns)

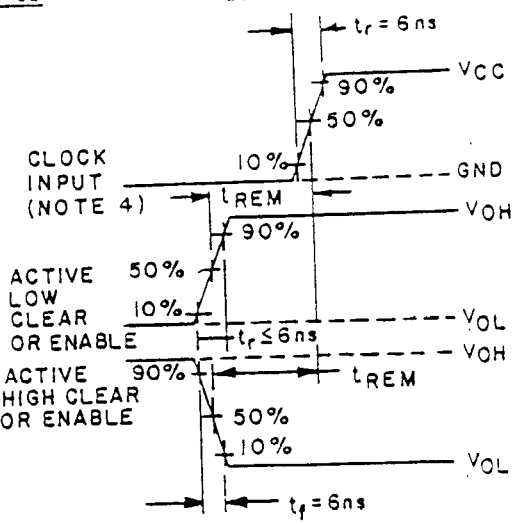
FIGURE 4. Switching time test circuit and waveforms.

Device types 01, 02, 03, 04, 05, 06, 52



Setup and hold time waveforms

Device type 01

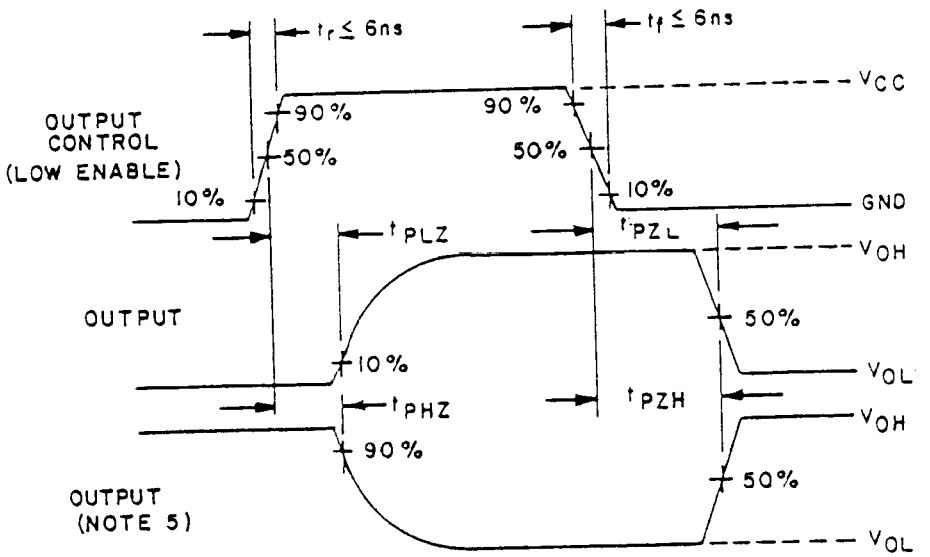


Removal time waveforms

t_{su} = 20 ns

t_{HOLD} = 5 ns (01, 03, 04, 06)
= 10 ns (02, 05, 52)

Device types 02, 04, 05, 06, 52



THREE-STATE Output enable and disable waveforms

Note 4: Waveform for negative edge sensitive circuits will be inverted, t_{REM} (20 ns).

Note 5: This waveform is applicable to both THREE-STATE and open drain switching time measurements.

FIGURE 4. Switching time test circuit and waveforms - continued.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Cases R,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.	$\overline{CLR}$	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	1 mA									1/										GND	$\overline{CLR}$	2/	1.5					V
		2			1 mA							"										"	D1		"					"
		3				1 mA						"										"	D2		"					"
		4							1 mA			"										"	D3		"					"
		5								1 mA		"										"	D4		"					"
		6										"	1 mA									"	CLK		"					"
		7										"			1 mA							"	D5		"					"
		8										"				1 mA						"	D6		"					"
		9										"							1 mA			"	D7		"					"
		10										"								1 mA			"	D8		"					"
V_{IC} (neg)		11	-1 mA									GND										1/	$\overline{CLR}$		-1.5					"
		12			-1 mA							"										"	D1		"					"
		13				-1 mA						"										"	D2		"					"
		14							-1 mA			"										"	D3		"					"
		15								-1 mA		"										"	D4		"					"
		16										"	-1 mA									"	CLK		"					"
		17										"			-1 mA							"	D5		"					"
		18										"				-1 mA						"	D6		"					"
		19										"							-1 mA			"	D7		"					"
		20										"								-1 mA			"	D8		"					"
I_{CCH}	3005	21	6 V		6 V	6 V			6 V	6 V		"	3/		6 V	6 V			6 V	6 V		6 V	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	4.2 V	-20 µA	4.2 V																		Q1	5.95		5.95		5.95		V
		24	"			4.2 V	-20 µA																Q2	"		"		"		"
		25	"					-20 µA	4.2 V														Q3	"		"		"		"
		26	"							4.2 V	-20 µA												Q4	"		"		"		"
		27	"											-20 µA	4.2 V								Q5	"		"		"		"
		28	"													4.2 V	-20 µA						Q6	"		"		"		"
		29	"															-20 µA	4.2 V				Q7	"		"		"		"
		30	"																	4.2 V	-20 µA		Q8	"		"		"		"
V_{OH5}		31	"	-5.2 mA	4.2 V																		Q1	5.48		5.2		5.48		"
		32	"			4.2 V	-5.2 mA																Q2	"		"		"		"
		33	"					-5.2 mA	4.2 V														Q3	"		"		"		"
		34	"							4.2 V	-5.2 mA												Q4	"		"		"		"
		35	"											-5.2 mA	4.2 V								Q5	"		"		"		"
		36	"													4.2 V	-5.2 mA						Q6	"		"		"		"
		37	"															-5.2 mA	4.2 V				Q7	"		"		"		"
		38	"																	4.2 V	-5.2 mA		Q8	"		"		"		"
V_{OL3}	3007	39	"	20 µA	1.2 V																		Q1		0.1		0.1		0.1	"
		40	"			1.2 V	20 µA																Q2		"		"		"	"
		41	"					20 µA	1.2 V														Q3		"		"		"	"
		42	"							1.2 V	20 µA												Q4		"		"		"	"
		43	"											20 µA	1.2 V								Q5		"		"		"	"
		44	"													1.2 V	20 µA						Q6		"		"		"	"
		45	"															20 µA	1.2 V				Q7		"		"		"	"
		46	"																	1.2 V	20 µA		Q8		"		"		"	"
V_{OL5}		47	"	5.2 mA	1.2 V																		Q1		0.26		0.4		0.26	"
		48	"			1.2 V	5.2 mA																Q2		"		"		"	"
		49	"					5.2 mA	1.2 V														Q3		"		"		"	"
		50	"							1.2 V	5.2 mA												Q4		"		"		"	"
		51	"											5.2 mA	1.2 V								Q5		"		"		"	"
		52	"													1.2 V	5.2 mA						Q6		"		"		"	"
		53	"															5.2 mA	1.2 V				Q7		"		"		"	"
		54	"																	1.2 V	5.2 mA		Q8		"		"		"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,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.	$\overline{CLR}$	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	4 V	GND	4 V	4 V	GND	GND	4 V	4 V	GND	GND	3/	GND	4 V	4 V	GND	GND	4 V	4 V	GND	4 V	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	6 V		GND	GND			GND	GND		"	GND		GND	GND			GND	GND		6 V	$\overline{CLR}$		.05		0.1			µA
		64	GND		6 V	GND			"	"		"	"		"	"			"	"		"	D1		"		"			"
		65	"		GND	6 V			6 V	6 V		"	"		"	"			"	"		"	D2		"		"			"
		66	"		"	GND			GND	GND		"	6 V		"	"			"	"		"	D3		"		"			"
		67	"		"	"			"	"		"	GND		"	"			"	"		"	D4		"		"			"
		68	"		"	"			"	"		"	"		"	"			"	"		"	CLK		"		"			"
		69	"		"	"			"	"		"	"		6 V	6 V			"	"		"	D5		"		"			"
		70	"		"	"			"	"		"	"		GND	GND			6 V	6 V		"	D6		"		"			"
		71	"		"	"			"	"		"	"		"	"			GND	"		"	D7		"		"			"
		72	"		"	"			"	"		"	"		"	"			"	"		"	D8		"		"			"
I_{IL}	3009	73	GND		6 V	6 V			6 V	6 V		"	6 V		6 V	6 V			6 V	"		"	$\overline{CLR}$		-.05		-0.1			"
		74	6 V		GND	6 V			"	"		"	"		"	"			"	"		"	D1		"		"			"
		75	"		6 V	GND			GND	GND		"	"		"	"			"	"		"	D2		"		"			"
		76	"		"	6 V			6 V	6 V		"	GND		"	"			"	"		"	D3		"		"			"
		77	"		"	"			"	"		"	6 V		"	"			"	"		"	D4		"		"			"
		78	"		"	"			"	"		"	"		"	"			"	"		"	CLK		"		"			"
		79	"		"	"			"	"		"	"		GND	GND			"	"		"	D5		"		"			"
		80	"		"	"			"	"		"	"		6 V	GND			"	"		"	D6		"		"			"
		81	"		"	"			"	"		"	"		"	6 V			GND	GND		"	D7		"		"			"
		82	"		"	"			"	"		"	"		"	6 V			6 V	"		"	D8		"		"			"
																								Subgroup 4 T_C = +25°C						
C_C	3012	83	4/									GND										GND	$\overline{CLR}$		15					pF
C_I		84			4/	4/						"										"	D1		10					"
		85										"										"	D2		"					"
		86							4/			"										"	D3		"					"
		87								4/		"										"	D4		"					"
C_C		88										"	4/									"	CLK		15					"
C_I		89										"			4/							"	D5		10					"
		90										"				4/						"	D6		"					"
		91										"							4/			"	D7		"					"
		92										"								4/			"	D8		"					"
																								Subgroup 7 T_C = +25°C		Subgroup 8 T_C = +125°C		Subgroup 8 T_C = -55°C		
Truth table tests 5/ 6/	3014	93	B	L	A	A	L	L	A	A	L	"	A	L	A	A	L	L	A	A	L	4.5 V	All outputs 7/ 8/							
		94	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"									
		95	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"									
		96	A	H	B	B	H	H	B	B	H	"	A	H	B	B	H	H	B	B	H	"									
		97	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"									
		98	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"									
		99	"	"	A	A	L	L	A	A	L	"	A	L	A	A	L	L	A	A	L	"									
		100	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"									
		101	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"									
		102	"	"	B	B	H	H	B	B	H	"	A	H	B	B	H	H	B	B	H	"									
		103	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"									
		104	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"									
		105	"	"	A	A	L	L	A	A	L	"	A	L	A	A	L	L	A	A	L	"									
		106	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"									

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,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.	$\overline{CLR}$	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	
f_{MAX} 9/	3003	107	4.5 V	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN	OUT	IN	IN	OUT	OUT	IN	IN	OUT	4.5 V	Q1	31		23		31		MHz
		108	"									"	"									"	Q2	"		"		"		"
		109	"									"	"									"	Q3	"		"		"		"
		110	"									"	"									"	Q4	"		"		"		"
		111	"									"	"									"	Q5	"		"		"		"
		112	"									"	"									"	Q6	"		"		"		"
		113	"									"	"									"	Q7	"		"		"		"
		114	"									"	"									"	Q8	"		"		"		"
t_{PHL1}	3003 (Fig. 4)	115	IN	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	GND	3/	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	4.5 V	CLK to Q1		31		41		31	ns
		116	"									"	"									"	CLK to Q2		"		"		"	"
		117	"									"	"									"	CLK to Q3		"		"		"	"
		118	"									"	"									"	CLK to Q4		"		"		"	"
		119	"									"	"									"	CLK to Q5		"		"		"	"
		120	"									"	"									"	CLK to Q6		"		"		"	"
		121	"									"	"									"	CLK to Q7		"		"		"	"
		122	"									"	"									"	CLK to Q8		"		"		"	"
t_{PLH2}		123	4.5 V	OUT	IN	IN	OUT	OUT	IN	IN	OUT	"	"	OUT	IN	IN	OUT	OUT	IN	IN	OUT	"	CLK to Q1		28		37		28	"
		124	"									"	"									"	CLK to Q2		"		"		"	"
		124	"									"	"									"	CLK to Q3		"		"		"	"
		126	"									"	"									"	CLK to Q4		"		"		"	"
		127	"									"	"									"	CLK to Q5		"		"		"	"
		128	"									"	"									"	CLK to Q6		"		"		"	"
		129	"									"	"									"	CLK to Q7		"		"		"	"
		130	"									"	"									"	CLK to Q8		"		"		"	"
t_{PHL2}		131	"	OUT	IN	IN	OUT	OUT	IN	IN	OUT	"	"	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		"		"		"	"
		137	"									"	"									"	CLK to Q7		"		"		"	"
		138	"									"	"									"	CLK to Q8		"		"		"	"
t_{THL}		139	"	OUT	IN	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	"	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	Q1		15		20		15	ns
		140	"		4.5 V	IN			4.5 V	"		"	"		"	"			"	"		"	Q2		"		"		"	"
		141	"		"	4.5 V			IN	"		"	"		"	"			"	"		"	Q3		"		"		"	"
		142	"		"	"			4.5 V	IN		"	"		"	"			"	"		"	Q4		"		"		"	"
		143	"		"	"			"	4.5 V		"	"		IN	"			"	"		"	Q5		"		"		"	"
		144	"		"	"			"	"		"	"		4.5 V	IN	OUT		"	"		"	Q6		"		"		"	"
		145	"		"	"			"	"		"	"		"	4.5 V		OUT	IN	"		"	Q7		"		"		"	"
		146	"		"	"			"	"		"	"		"	4.5 V			4.5 V	IN	OUT	"	Q8		"		"		"	"
t_{TLH}		147	"	OUT	IN	GND	OUT	OUT	GND	GND	OUT	"	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	Q1		"		"		"	ns
		148	"		GND	IN			GND	"		"	"		"	"			"	"		"	Q2		"		"		"	"
		149	"		"	GND			IN	"		"	"		"	"			"	"		"	Q3		"		"		"	"
		150	"		"	"			GND	IN		"	"		"	"			"	"		"	Q4		"		"		"	"
		151	"		"	"			"	GND		"	"		IN	"			"	"		"	Q5		"		"		"	"
		152	"		"	"			"	"		"	"		GND	IN	OUT		"	"		"	Q6		"		"		"	"
		153	"		"	"			"	"		"	"		"	GND		OUT	IN	"		"	Q7		"		"		"	"
		154	"		"	"			"	"		"	"		"	GND			GND	IN	OUT	"	Q8		"		"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases R,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.	O/E	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	1 mA									1/										GND	D/E	2/	1.5					V
		2			1 mA							"										"	D1		"					"
		3				1 mA						"										"	D2		"					"
		4							1 mA			"										"	D3		"					"
		5								1 mA		"										"	D4		"					"
		6										"	1 mA									"	CLK		"					"
		7										"			1 mA							"	D5		"					"
		8										"				1 mA						"	D6		"					"
		9										"							1 mA			"	D7		"					"
		10										"								1 mA			"	D8		"					"
V_{IC} (neg)		11	-1 mA									GND										1/	Q/E		-1.5					
		12			-1 mA							"										"	D1		"					
		13				-1 mA						"										"	D2		"					
		14							-1 mA			"										"	D3		"					
		15								-1 mA		"										"	D4		"					
		16										"	-1 mA									"	CLK		"					
		17										"			-1 mA							"	D5		"					
		18										"				-1 mA						"	D6		"					
		19										"							-1 mA			"	D7		"					
		20										"								-1 mA			"	D8		"					
I_{CCH}	3005	21	GND		6 V	6 V.			6 V	6 V		"	3/		6 V	6 V			6 V	6 V		6 V	V_{CC}		0.2		8.0			μA
I_{CCL}		22	GND		GND	GND			GND	GND		"	"		GND	GND			GND	GND		"	"		0.2		8.0			"
I_{CCZ}		23	6 V		GND	GND			GND	GND		"	"		GND	GND			GND	GND		"	"		0.1		4.0			"
V_{OH3}	3006	24	1.2 V	-20 μA	4.2 V																		Q1	5.95		5.95		5.95		V
		25	"	"	"	4.2 V	-20 μA																Q2	"		"		"		"
		26	"	"	"			-20 μA	4.2 V														Q3	"		"		"		"
		27	"	"	"					4.2 V	-20 μA												Q4	"		"		"		"
		28	"	"	"									-20 μA	4.2 V								Q5	"		"		"		"
		29	"	"	"											4.2 V	-20 μA						Q6	"		"		"		"
		30	"	"	"													-20 μA	4.2 V				Q7	"		"		"		"
		31	"	"	"															4.2 V	-20 μA		Q8	"		"		"		"
V_{OH5}		32	"	-5.2 mA	4.2 V																		Q1	5.48		5.2		5.48		"
		33	"	"	"	4.2 V	-5.2 mA																Q2	"		"		"		"
		34	"	"	"			-5.2 mA	4.2 V														Q3	"		"		"		"
		35	"	"	"					4.2 V	-5.2 mA												Q4	"		"		"		"
		36	"	"	"									-5.2 mA	4.2 V								Q5	"		"		"		"
		37	"	"	"											4.2 V	-5.2 mA						Q6	"		"		"		"
		38	"	"	"													-5.2 mA	4.2 V				Q7	"		"		"		"
		39	"	"	"															4.2 V	-5.2 mA		Q8	"		"		"		"
V_{OL3}	3007	40	"	20 μA	1.2 V																		1Q		0.1		0.1		0.1	"
		41	"	"	"	1.2 V	20 μA																2Q		"		"		"	"
		42	"	"	"			20 μA	1.2 V														3Q		"		"		"	"
		43	"	"	"					1.2 V	20 μA												4Q		"		"		"	"
		44	"	"	"									20 μA	1.2 V								5Q		"		"		"	"
		45	"	"	"											1.2 V	20 μA						6Q		"		"		"	"
		46	"	"	"													20 μA	1.2 V				7Q		"		"		"	"
		47	"	"	"															1.2 V	20 μA		8Q		"		"		"	"
V_{OL5}		48	"	5.2 mA	1.2 V																		1Q		0.26		0.4		0.26	"
		49	"	"	"	1.2 V	5.2 mA																2Q		"		"		"	"
		50	"	"	"			5.2 mA	1.2 V														3Q		"		"		"	"
		51	"	"	"					1.2 V	5.2 mA												4Q		"		"		"	"
		52	"	"	"									5.2 mA	1.2 V								5Q		"		"		"	"
		53	"	"	"											1.2 V	5.2 mA						6Q		"		"		"	"
		54	"	"	"													5.2 mA	1.2 V				7Q		"		"		"	"
		55	"	"	"															1.2 V	5.2 mA		8Q		"		"		"	"

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

Symbol	MIL-STD-883 method	Cases R,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.	O/E	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	4 V		GND					GND	3/									4 V	Q1	-10	-135	-10	-135	-10	-135	mA
		57	"			4 V		GND	4 V			"	"									"	Q2	"	"	"	"	"	"	"
		58	"							4 V	GND	"	"	GND	4 V							"	Q3	"	"	"	"	"	"	"
		59	"									"	"			4 V	GND					"	Q4	"	"	"	"	"	"	"
		60	"									"	"					GND				"	Q5	"	"	"	"	"	"	"
		61	"									"	"						4 V			"	Q6	"	"	"	"	"	"	"
		62	"									"	"							4 V		"	Q7	"	"	"	"	"	"	"
		63	"									"	"								GND	"	Q8	"	"	"	"	"	"	"
I_{IH}	3010	64	6 V		GND	GND			GND	GND		"	GND		GND	GND			GND	GND		6 V	O/E		.05		0.1			µA
		65	GND		6 V	GND			"	"		"	"		"	"			"	"		"	D1		"		"			"
		66	"		GND	6 V			"	"		"	"		"	"			"	"		"	D2		"		"			"
		67	"		"	GND			6 V	"		"	"		"	"			"	"		"	D3		"		"			"
		68	"		"	"			GND	6 V		"	"		"	"			"	"		"	D4		"		"			"
		69	"		"	"			"	GND		"	6 V		"	"			"	"		"	CLK		"		"			"
		70	"		"	"			"	"		"	GND		6 V	"			"	"		"	D5		"		"			"
		71	"		"	"			"	"		"	"		GND	6 V			"	"		"	D6		"		"			"
		72	"		"	"			"	"		"	"		"	GND			6 V	"		"	D7		"		"			"
		73	"		"	"			"	"		"	"		"	GND			GND	6 V		"	D8		"		"			"
I_{IL}	3009	74	GND		6 V	6 V			6 V	6 V		"	6 V		6 V	6 V			6 V	"		"	O/E		-.05		-0.1			"
		75	6 V		GND	6 V			"	"		"	"		"	"			"	"		"	D1		"		"			"
		76	"		6 V	GND			"	"		"	"		"	"			"	"		"	D2		"		"			"
		77	"		"	6 V			GND	"		"	"		"	"			"	"		"	D3		"		"			"
		78	"		"	"			6 V	GND		"	"		"	"			"	"		"	D4		"		"			"
		79	"		"	"			"	6 V		"	GND		"	"			"	"		"	CLK		"		"			"
		80	"		"	"			"	"		"	6 V		GND	"			"	"		"	D5		"		"			"
		81	"		"	"			"	"		"	"		6 V	GND			"	"		"	D6		"		"			"
		82	"		"	"			"	"		"	"		"	6 V			GND	"		"	D7		"		"			"
		83	"		"	"			"	"		"	"		"	6 V			6 V	GND		"	D8		"		"			"
I_{OZH}		84	4.2 V	6.0 V	1.2 V		6.0 V					"	3/									"	Q1		0.1		0.2			"
		85	"			1.2 V		6.0 V	1.2 V			"	"									"	Q2		"		"			"
		86	"							1.2 V	6.0 V	"	"	6.0 V	1.2 V							"	Q3		"		"			"
		87	"									"	"			1.2 V	6.0 V					"	Q4		"		"			"
		88	"									"	"					6.0 V	1.2 V			"	Q5		"		"			"
		89	"									"	"							1.2 V	6.0 V	"	Q6		"		"			"
		90	"									"	"									"	Q7		"		"			"
		91	"									"	"									"	Q8		"		"			"
I_{OZL}		92	"	GND	4.2 V		GND					"	"									"	Q1		-0.1		-0.2			"
		93	"			4.2 V		GND	4.2 V			"	"									"	Q2		"		"			"
		94	"							4.2 V	GND	"	"	GND	4.2 V							"	Q3		"		"			"
		95	"									"	"			4.2 V	GND					"	Q4		"		"			"
		96	"									"	"					GND	4.2 V			"	Q5		"		"			"
		97	"									"	"							4.2 V	GND	"	Q6		"		"			"
		98	"									"	"									"	Q7		"		"			"
		99	"									"	"									"	Q8		"		"			"
																								Subgroup 4 T_C = +25°C						
C_C	3012	100	4/									GND										GND	O/E		15					pF
C_I		101			4/	4/						"										"	D1		10					"
		102										"										"	D2		"					"
		103							4/			"										"	D3		"					"
		104								4/		"										"	D4		"					"
C_C		105										"	4/									"	CLK		15					"
C_I		106										"			4/							"	D5		10					"
		107										"				4/						"	D6		"					"
		108										"							4/			"	D7		"					"
		109										"								4/			"	D8		"					"

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

Symbol	MIL-STD-883 method	Cases B,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.	O/E	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8	V_{CC}		Min	Max				
C_O	3012	110	6 V	2/			2/					GND										6 V	Q1		20				pF
		111	"					2/				"										"	Q2		"				"
		112	"								2/	"										"	Q3		"				"
		113	"									"		2/								"	Q4		"				"
		114	"									"					2/					"	Q5		"				"
		115	"									"						2/				"	Q6		"				"
		116	"									"									2/	"	Q7		"				"
		117	"									"										"	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	X	A	A	A	X	X	A	A	"	B	X	A	A	X	X	A	A	X	4.5 V	All outputs 7/ 8/						
		119	"	H	A	A	A	H	H	A	A	"	A	H	A	A	H	H	A	A	H	"								
		120	"	"	B	B	B	"	"	B	B	"	B	"	A	A	"	"	A	A	"	"								
		121	"	"	"	"	"	"	"	"	"	"	A	"	A	A	"	"	A	A	"	"								
		122	"	"	"	"	A	"	"	"	"	"	B	"	A	A	"	"	A	A	"	"								
		123	"	"	"	"	"	L	L	"	"	"	A	"	A	A	"	"	A	A	"	"								
		124	"	"	"	"	A	"	"	"	"	"	B	"	A	A	"	"	A	A	"	"								
																								Subgroup 9 T_C = +25°C 10/		Subgroup 10 T_C = +125°C		Subgroup 10 T_C = -55°C 10/		
f_{MAX} 9/	3003	125	GND	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN	OUT	IN	IN	OUT	OUT	IN	IN	OUT	4.5 V	Q1	33		25		33		MHz
		126	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q2	"	"	"	"	"	"	"
		127	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q3	"	"	"	"	"	"	"
		128	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q4	"	"	"	"	"	"	"
		129	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q5	"	"	"	"	"	"	"
		130	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q6	"	"	"	"	"	"	"
		131	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q7	"	"	"	"	"	"	"
		132	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q8	"	"	"	"	"	"	"
t_{PHL2}	3004 (Fig. 4)	133	"	OUT	IN	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	"	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	tCLK to Q1		32		42		32	ns
		134	"	"	4.5 V	IN	"	"	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q2		"		"		"	"
		135	"	"	IN	4.5 V	"	"	4.5 V	IN	"	"	"	"	IN	IN	"	"	IN	IN	"	"	tCLK to Q3		"		"		"	"
		136	"	"	4.5 V	"	"	"	"	4.5 V	"	"	"	"	4.5 V	4.5 V	"	"	4.5 V	4.5 V	"	"	tCLK to Q4		"		"		"	"
		137	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q5		"		"		"	"
		138	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q6		"		"		"	"
		139	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q7		"		"		"	"
		140	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q8		"		"		"	"
t_{PLH2}		141	"	OUT	IN	GND	OUT	OUT	GND	GND	OUT	"	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	tCLK to Q1		"		"		"	"
		142	"	"	GND	IN	"	"	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q2		"		"		"	"
		143	"	"	"	GND	"	"	IN	IN	"	"	"	"	IN	IN	"	"	IN	IN	"	"	tCLK to Q3		"		"		"	"
		144	"	"	"	"	"	"	GND	"	"	"	"	"	GND	GND	"	"	GND	GND	"	"	tCLK to Q4		"		"		"	"
		145	"	"	"	"	"	"	"	IN	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q5		"		"		"	"
		146	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q6		"		"		"	"
		147	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q7		"		"		"	"
		148	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tCLK to Q8		"		"		"	"
t_{PZH}		149	IN	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"		OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	tO/E to Q1		26		35		26	ns
		150	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tO/E to Q2		"		"		"	"
		151	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tO/E to Q3		"		"		"	"
		152	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tO/E to Q4		"		"		"	"
		153	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tO/E to Q5		"		"		"	"
		154	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tO/E to Q6		"		"		"	"
		155	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tO/E to Q7		"		"		"	"
		156	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	tO/E to Q8		"		"		"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,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.	O/E	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. 4)	157	IN	OUT	GND		OUT					GND										4.5 V	IO/E to Q1		26		36		26	ns
		158	"			GND		OUT	GND			"										"	IO/E to Q2		"		"		"	"
		159	"							GND	OUT	"										"	IO/E to Q3		"		"		"	"
		160	"									"										"	IO/E to Q4		"		"		"	"
		161	"									"		OUT	GND							"	IO/E to Q5		"		"		"	"
		162	"									"				GND	OUT					"	IO/E to Q6		"		"		"	"
		163	"									"						OUT	GND			"	IO/E to Q7		"		"		"	"
		164	"									"								GND	OUT	"	IO/E to Q8		"		"		"	"
t_{PHZ}		165	"	OUT	4.5 V		OUT					"										"	IO/E to Q1		"		"		"	"
		166	"			4.5 V		OUT	4.5 V			"										"	IO/E to Q2		"		"		"	"
		167	"							4.5 V	OUT	"										"	IO/E to Q3		"		"		"	"
		168	"									"		OUT	4.5 V							"	IO/E to Q4		"		"		"	"
		169	"									"				4.5 V	OUT					"	IO/E to Q5		"		"		"	"
		170	"									"						OUT	4.5 V			"	IO/E to Q6		"		"		"	"
		171	"									"								4.5 V	OUT	"	IO/E to Q7		"		"		"	"
		172	"									"										"	IO/E to Q8		"		"		"	"
t_{PLZ}		173	"	OUT	GND		OUT					"										"	IO/E to Q1		"		"		"	"
		174	"			GND		OUT	GND			"										"	IO/E to Q2		"		"		"	"
		175	"							GND	OUT	"										"	IO/E to Q3		"		"		"	"
		176	"									"		OUT	GND							"	IO/E to Q4		"		"		"	"
		177	"									"				GND	OUT					"	IO/E to Q5		"		"		"	"
		178	"									"						OUT	GND			"	IO/E to Q6		"		"		"	"
		179	"									"								GND	OUT	"	IO/E to Q7		"		"		"	"
		180	"									"										"	IO/E to Q8		"		"		"	"
t_{THL}		181	GND	OUT	IN	4.5 V	OUT		4.5 V	4.5 V		"	IN		4.5 V	4.5 V			4.5 V	4.5 V		"	Q1		12		16		12	ns
		182	"		4.5 V	IN		OUT	4.5 V	"		"	"		"	"			"	"		"	Q2		"		"		"	"
		183	"		"	4.5 V			IN			"	"		"	"			"	"		"	Q3		"		"		"	"
		184	"		"	"			4.5 V	IN	OUT	"	"		"	"			"	"		"	Q4		"		"		"	"
		185	"		"	"			"	4.5 V		"	"	OUT	IN	"			"	"		"	Q5		"		"		"	"
		186	"		"	"			"	"		"	"		4.5 V	IN	OUT		"	"		"	Q6		"		"		"	"
		187	"		"	"			"	"		"	"		"	4.5 V		OUT	IN	"		"	Q7		"		"		"	"
		188	"		"	"			"	"		"	"		"	4.5 V			4.5 V	IN	OUT	"	Q8		"		"		"	"
t_{TLH}		189	"	OUT	IN	GND	OUT		GND	GND		"	"		GND	GND			GND	GND		"	Q1		"		"		"	"
		190	"		GND	IN		OUT	GND	"		"	"		"	"			"	"		"	Q2		"		"		"	"
		191	"		"	GND			IN			"	"		"	"			"	"		"	Q3		"		"		"	"
		192	"		"	"			GND	IN	OUT	"	"		"	"			"	"		"	Q4		"		"		"	"
		193	"		"	"			"	GND		"	"	OUT	IN	"			"	"		"	Q5		"		"		"	"
		194	"		"	"			"	"		"	"		GND	IN	OUT		"	"		"	Q6		"		"		"	"
		195	"		"	"			"	"		"	"		"	GND		OUT	IN	"		"	Q7		"		"		"	"
		196	"		"	"			"	"		"	"		"	GND			GND	IN	OUT	"	Q8		"		"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Cases B,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.	E	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	1 mA									1/										GND	E	2/	1.5					V
		2			1 mA							"										"	D1		"					"
		3				1 mA						"										"	D2		"					"
		4							1 mA			"										"	D3		"					"
		5								1 mA		"										"	D4		"					"
		6										"	1 mA									"	CLK		"					"
		7										"			1 mA							"	D5		"					"
		8										"				1 mA						"	D6		"					"
		9										"							1 mA			"	D7		"					"
		10										"								1 mA			"	D8		"					"
V_{IC} (neg)		11	-1 mA									GND										1/	E		-1.5					
		12			-1 mA							"										"	D1		"					
		13				-1 mA						"										"	D2		"					
		14							-1 mA			"										"	D3		"					
		15								-1 mA		"										"	D4		"					
		16										"	-1 mA									"	CLK		"					
		17										"			-1 mA							"	D5		"					
		18										"				-1 mA						"	D6		"					
		19										"							-1 mA			"	D7		"					
		20										"								-1 mA			"	D8		"					
I_{CCH}	3005	21	6 V		6 V	6 V			6 V	6 V		"	3/		6 V	6 V			6 V	6 V		6 V	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	1.2 V	-20 µA	4.2 V	4.2 V	-20 µA		4.2 V														Q1	5.95		5.95		5.95		V
		24	"	"	"	"	"	-20 µA	"														Q2	"		"		"		"
		25	"	"	"	"	"	"	"	4.2 V	-20 µA												Q3	"		"		"		"
		26	"	"	"	"	"	"	"	"	"			-20 µA									Q4	"		"		"		"
		27	"	"	"	"	"	"	"	"	"			"	4.2 V								Q5	"		"		"		"
		28	"	"	"	"	"	"	"	"	"			"	"	4.2 V	-20 µA						Q6	"		"		"		"
		29	"	"	"	"	"	"	"	"	"			"	"	"	"	-20 µA	4.2 V				Q7	"		"		"		"
		30	"	"	"	"	"	"	"	"	"			"	"	"	"	"	"	4.2 V	-20 µA		Q8	"		"		"		"
V_{OH5}		31	"	5.2 mA	4.2 V																		Q1	5.48		5.2		5.48		
		32	"	"	"	4.2 V	-5.2 mA																Q2	"		"		"		
		33	"	"	"	"	"	-5.2 mA	4.2 V														Q3	"		"		"		
		34	"	"	"	"	"	"	"	4.2 V	-5.2 mA												Q4	"		"		"		
		35	"	"	"	"	"	"	"	"	"			-5.2 mA	4.2 V								Q5	"		"		"		
		36	"	"	"	"	"	"	"	"	"			"	"	4.2 V	-5.2 mA						Q6	"		"		"		
		37	"	"	"	"	"	"	"	"	"			"	"	"	"	-5.2 mA	4.2 V				Q7	"		"		"		
		38	"	"	"	"	"	"	"	"	"			"	"	"	"	"	"	4.2 V	-5.2 mA		Q8	"		"		"		
V_{OL3}	3007	39	"	20 µA	1.2 V																		Q1		0.1		0.1		0.1	
		40	"	"	"	1.2 V	20 µA																Q2		"		"		"	
		41	"	"	"	"	"	20 µA	1.2 V														Q3		"		"		"	
		42	"	"	"	"	"	"	"	1.2 V	20 µA												Q4		"		"		"	
		43	"	"	"	"	"	"	"	"	"			20 µA	1.2 V								Q5		"		"		"	
		44	"	"	"	"	"	"	"	"	"			"	"	1.2 V	20 µA						Q6		"		"		"	
		45	"	"	"	"	"	"	"	"	"			"	"	"	"	20 µA	1.2 V				Q7		"		"		"	
		46	"	"	"	"	"	"	"	"	"			"	"	"	"	"	"	1.2 V	20 µA		Q8		"		"		"	
V_{OL5}		47	"	5.2 mA	1.2 V																		Q1		0.26		0.4		0.26	
		48	"	"	"	1.2 V	5.2 mA																Q2		"		"		"	
		49	"	"	"	"	"	5.2 mA	1.2 V														Q3		"		"		"	
		50	"	"	"	"	"	"	"	1.2 V	5.2 mA												Q4		"		"		"	
		51	"	"	"	"	"	"	"	"	"			5.2 mA	1.2 V								Q5		"		"		"	
		52	"	"	"	"	"	"	"	"	"			"	"	1.2 V	5.2 mA						Q6		"		"		"	
		53	"	"	"	"	"	"	"	"	"			"	"	"	"	5.2 mA	1.2 V				Q7		"		"		"	
		54	"	"	"	"	"	"	"	"	"			"	"	"	"	"	"	1.2 V	5.2 mA		Q8		"		"		"	

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,2 / Test no.	Terminal conditions 1/ 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Measured terminal	Test limits: Subgroup 1 T_C = +25°C Min	Max	Subgroup 2 T_C = +125°C Min	Max	Subgroup 3 T_C = -55°C Min	Max	Unit
			$\overline{E}$	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8	V_{CC}								
I_{OS4}	3011	55	GND	GND	4 V	4 V	GND	GND	4 V	4 V	GND	GND	3/	GND	4 V	4 V	GND	GND	4 V	4 V	GND	4 V	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	6 V		GND	GND			GND	GND			GND		GND	GND			GND	GND		6 V	$\overline{E}$		.05		0.1			μA
		64	GND		6 V	GND			"	"			"		"	"			"	"		"	D1		"		"			
		65	"		GND	6 V			6 V	6 V			6 V		"	"			"	"		"	D2		"		"			
		66	"		"	GND			GND	GND			GND		"	"			"	"		"	D3		"		"			
		67	"		"	6 V			"	"			"		"	"			"	"		"	D4		"		"			
		68	"		"	GND			"	"			"		"	"			"	"		"	CLK		"		"			
		69	"		"	"			"	"			"		6 V	"			"	"		"	D5		"		"			
		70	"		"	"			"	"			"		GND	"			"	"		"	D6		"		"			
		71	"		"	"			"	"			"		"	"			"	"		"	D7		"		"			
		72	"		"	"			"	"			"		"	"			"	"		"	D8		"		"			
I_{IL}	3009	73	GND		6 V	6 V			6 V	6 V			6 V		6 V	6 V			6 V				$\overline{E}$		-.05		-0.1			"
		74	6 V		GND	6 V			"	"			"		"	"			"				D1		"		"			
		75	"		6 V	GND			"	"			"		"	"			"				D2		"		"			
		76	"		"	6 V			"	"			"		"	"			"				D3		"		"			
		77	"		"	"			"	"			"		"	"			"				D4		"		"			
		78	"		"	"			"	"			"		"	"			"				CLK		"		"			
		79	"		"	"			"	"			"		"	"			"				D5		"		"			
		80	"		"	"			"	"			"		"	"			"				D6		"		"			
		81	"		"	"			"	"			"		"	"			"				D7		"		"			
		82	"		"	"			"	"			"		"	"			"				D8		"		"			
																								Subgroup 4 T_C = +25°C						
C_C	3012	83	4/									GND										GND	$\overline{E}$		15					pF
C_I		84			4/	4/						"										"	D1		10					"
		85										"										"	D2		"					
		86							4/			"										"	D3		"					
		87								4/		"										"	D4		"					
C_C		88										"	4/									"	CLK		15					"
C_I		89										"			4/	4/						"	D5		10					"
		90										"							4/			"	D6		"					
		91										"								4/			"	D7		"					
		92										"										"	D8		"					
																								Subgroup 7 T_C = +25°C		Subgroup 8 T_C = +125°C		Subgroup 8 T_C = -55°C		
Truth table tests 5/ 6/	3014	93	B	X	B	B	X	X	B	B	X	"	B	X	B	B	X	X	B	B	K	4.5 V	All outputs 7/ 8/							
		94	"	L	A	A	L	L	"	"	L	"	A	L	"	"	L	L	"	"	L	"								
		95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		97	"	H	"	"	H	H	"	"	H	"	"	H	"	"	H	H	"	"	H	"									
		98	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		99	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		100	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		101	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		102	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		104	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		107	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		108	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"									
		109	"	H	"	"	H	H	"	"	H	"	"	H	"	"	H	H	"	"	H	"									

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases A,B / Test no.	Terminal conditions 1/ 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Measured terminal	Test limits: Subgroup 9 I_C = +25°C 10/ Min	Max	Subgroup 10 I_C = +125°C Min	Max	Subgroup 11 I_C = -55°C 10/ Min	Max	Unit
			E	Q1	D1	D2	Q2	Q3	D3	D4	Q4	GND	CLK	Q5	D5	D6	Q6	Q7	D7	D8	Q8	V_{CC}								
f_{MAX} 9/	3003	110	GND	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN	OUT	IN	IN	OUT	OUT	IN	IN	OUT	"	1Q	28		21		28		MHz
		111	"									"	"									"	2Q	"		"		"		"
		112	"									"	"									"	3Q	"		"		"		"
		113	"									"	"									"	4Q	"		"		"		"
		114	"									"	"									"	5Q	"		"		"		"
		115	"									"	"									"	6Q	"		"		"		"
		116	"									"	"									"	7Q	"		"		"		"
		117	"									"	"									"	8Q	"		"		"		"
t_{PLH2}	3003 (Fig. 4)	118	GND	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN	OUT	IN	IN	OUT	OUT	IN	IN	OUT	4.5 V	CLK to Q1		28		37		28	MHz
		119	"									"	"									"	CLK to Q2		"		"		"	"
		120	"									"	"									"	CLK to Q3		"		"		"	"
		121	"									"	"									"	CLK to Q4		"		"		"	"
		122	"									"	"									"	CLK to Q5		"		"		"	"
		123	"									"	"									"	CLK to Q6		"		"		"	"
		124	"									"	"									"	CLK to Q7		"		"		"	"
		125	"									"	"									"	CLK to Q8		"		"		"	"
t_{PHL2}		126	"	OUT	IN	IN	OUT	OUT	IN	IN	OUT	"	"	OUT	IN	IN	OUT	OUT	IN	IN	OUT	"	CLK to Q1		"		"		"	"
		127	"									"	"									"	CLK to Q2		"		"		"	"
		128	"									"	"									"	CLK to Q3		"		"		"	"
		129	"									"	"									"	CLK to Q4		"		"		"	"
		130	"									"	"									"	CLK to Q5		"		"		"	"
		131	"									"	"									"	CLK to Q6		"		"		"	"
		132	"									"	"									"	CLK to Q7		"		"		"	"
		133	"									"	"									"	CLK to Q8		"		"		"	"
t_{IHL}		134	4.5 V	OUT	IN	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	"	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	Q1		15		20		15	ns
		135	"		4.5 V	IN			4.5 V	"		"	"		"	"			IN	IN		"	Q2		"		"		"	"
		136	"		"	4.5 V			IN	"		"	"		"	"			"	"		"	Q3		"		"		"	"
		137	"		"	"			4.5 V	4.5 V		"	"		IN	IN			"	"		"	Q4		"		"		"	"
		138	"		"	"			"	IN		"	"		4.5 V	4.5 V			"	"		"	Q5		"		"		"	"
		139	"		"	"			"	4.5 V		"	"		"	"			"	"		"	Q6		"		"		"	"
		140	"		"	"			"	"		"	"		"	"			IN	IN		"	Q7		"		"		"	"
		141	"		"	"			"	"		"	"		"	"			4.5 V	"		"	Q8		"		"		"	"
t_{ILH}		142	"	OUT	IN	GND	OUT	OUT	GND	GND	OUT	"	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	Q1		"		"		"	"
		143	"		GND	IN			GND	"		"	"		"	"			"	"		"	Q2		"		"		"	"
		144	"		"	GND			IN	"		"	"		"	"			"	"		"	Q3		"		"		"	"
		145	"		"	"			GND	IN		"	"		"	IN			"	"		"	Q4		"		"		"	"
		146	"		"	"			"	GND		"	"		IN	GND			"	"		"	Q5		"		"		"	"
		147	"		"	"			"	"		"	"		GND	GND			IN	"		"	Q6		"		"		"	"
		148	"		"	"			"	"		"	"		"	"			GND	IN		"	Q7		"		"		"	"
		149	"		"	"			"	"		"	"		"	"			"	"		"	Q8		"		"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-883 method	Cases R,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.	O/E	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	1 mA									1/										GND	O/E	2/	1.5					V
		2		1 mA								"										"	D1		"					"
		3			1 mA							"										"	D2		"					"
		4				1 mA						"										"	D3		"					"
		5					1 mA					"										"	D4		"					"
		6						1 mA				"										"	D5		"					"
		7							1 mA			"										"	D6		"					"
		8								1 mA		"										"	D7		"					"
		9									1 mA	"										"	D8		"					"
		10										"	1 mA									"	CLK		"					"
V_{IC} (neg)		11	-1 mA									GND										1/	O/E		-1.5					"
		12		-1 mA								"										"	D1		"					"
		13			-1 mA							"										"	D2		"					"
		14				-1 mA						"										"	D3		"					"
		15					-1 mA					"										"	D4		"					"
		16						-1 mA				"										"	D5		"					"
		17							-1 mA			"										"	D6		"					"
		18								-1 mA		"										"	D7		"					"
		19									-1 mA	"										"	D8		"					"
		20										"	-1 mA									"	CLK		"					"
I_{CCH}	3005	21	GND	6 V	6 V	6 V	6 V	6 V	6 V	6 V	6 V	"	3/									6 V	V_{CC}		0.2		18.0			μA
I_{CCL}		22	GND	GND	GND	GND	GND	GND	GND	GND	GND	"	"									"	"		0.2		8.0			"
I_{CCZ}		23	6 V	GND	GND	GND	GND	GND	GND	GND	GND	"	"									"	"		.1		4			"
V_{OH3}	3006	24	1.2 V	4.2 V								"	"									"	Q1	5.95		5.95		5.95		V
		25	"		4.2 V							"	"							-20 μA		"	Q2	"		"		"		"
		26	"			4.2 V						"	"						-20 μA		-20 μA	"	Q3	"		"		"		"
		27	"				4.2 V					"	"					-20 μA				"	Q4	"		"		"		"
		28	"					4.2 V				"	"				-20 μA					"	Q5	"		"		"		"
		29	"						4.2 V			"	"			-20 μA						"	Q6	"		"		"		"
		30	"							4.2 V		"	"		-20 μA							"	Q7	"		"		"		"
		31	"								4.2 V	"	"	-20 μA								"	Q8	"		"		"		"
V_{OH5}		32	"	4.2 V								"	"									"	Q1	5.48		5.2		5.48		"
		33	"		4.2 V							"	"							-5.2 mA		"	Q2	"		"		"		"
		34	"			4.2 V						"	"						-5.2 mA		-5.2 mA	"	Q3	"		"		"		"
		35	"				4.2 V					"	"					-5.2 mA				"	Q4	"		"		"		"
		36	"					4.2 V				"	"				-5.2 mA					"	Q5	"		"		"		"
		37	"						4.2 V			"	"			-5.2 mA						"	Q6	"		"		"		"
		38	"							4.2 V		"	"		-5.2 mA							"	Q7	"		"		"		"
		39	"								4.2 V	"	"	-5.2 mA								"	Q8	"		"		"		"
V_{OL3}	3007	40	"	1.2 V								"	"									"	Q1		0.1		0.1		0.1	"
		41	"		1.2 V							"	"							20 μA		"	Q2		"		"		"	"
		42	"			1.2 V						"	"						20 μA		20 μA	"	Q3		"		"		"	"
		43	"				1.2 V					"	"					20 μA				"	Q4		"		"		"	"
		44	"					1.2 V				"	"				20 μA					"	Q5		"		"		"	"
		45	"						1.2 V			"	"			20 μA						"	Q6		"		"		"	"
		46	"							1.2 V		"	"		20 μA							"	Q7		"		"		"	"
		47	"								1.2 V	"	"	20 μA								"	Q8		"		"		"	"
V_{OL5}		48	"	1.2 V								"	"									"	Q1		0.26		0.4		0.26	"
		49	"		1.2 V							"	"							5.2 mA		"	Q2		"		"		"	"
		50	"			1.2 V						"	"						5.2 mA		5.2 mA	"	Q3		"		"		"	"
		51	"				1.2 V					"	"					5.2 mA				"	Q4		"		"		"	"
		52	"					1.2 V				"	"				5.2 mA					"	Q5		"		"		"	"
		53	"						1.2 V			"	"			5.2 mA						"	Q6		"		"		"	"
		54	"							1.2 V		"	"		5.2 mA							"	Q7		"		"		"	"
		55	"								1.2 V	"	"	-5.2 mA								"	Q8		"		"		"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,2 Test no.	Terminal conditions 1/ 1 O/E	2 O1	3 O2	4 O3	5 O4	6 O5	7 O6	8 O7	9 O8	10 GND	11 CLK	12 Q8	13 Q7	14 Q6	15 Q5	16 Q4	17 Q3	18 Q2	19 Q1	20 V_{CC}	Measured terminal	Test limits Subgroup 1 T_C = +25°C Min	Max	Subgroup 2 T_C = +125°C Min	Max	Subgroup 3 T_C = -55°C Min	Max	Unit
I_{OS4}	3011	56	GND	4 V								GND	3/									4 V	Q1	-10	-135	-10	-135	-10	-135	mA
		57	"		4 V							"	"									"	Q2	"	"	"	"	"	"	"
		58	"			4 V						"	"									"	Q3	"	"	"	"	"	"	"
		59	"				4 V					"	"					GND				"	Q4	"	"	"	"	"	"	"
		60	"					4 V				"	"				GND		GND			"	Q5	"	"	"	"	"	"	"
		61	"						4 V			"	"			GND						"	Q6	"	"	"	"	"	"	"
		62	"							4 V		"	"		GND							"	Q7	"	"	"	"	"	"	"
		63	"								4 V	"	"	GND								"	Q8	"	"	"	"	"	"	"
I_{IH}	3010	64	6 V	GND	GND	GND	GND	GND	GND	GND	GND	"	GND									6 V	O/C		.05		0.1			µA
		65	GND	6 V	GND	GND	"	"	"	"	"	"	"									"	D1		"		"			"
		66	"	GND	6 V	GND	6 V	"	"	"	"	"	"									"	D2		"		"			"
		67	"	"	GND	6 V	GND	6 V	"	"	"	"	"									"	D3		"		"			"
		68	"	"	"	GND	"	GND	6 V	"	"	"	"									"	D4		"		"			"
		69	"	"	"	"	6 V	"	GND	6 V	"	"	"									"	D5		"		"			"
		70	"	"	"	"	GND	6 V	"	GND	6 V	"	"									"	D6		"		"			"
		71	"	"	"	"	"	GND	6 V	"	GND	"	"									"	D7		"		"			"
		72	"	"	"	"	"	"	GND	6 V	"	"	"									"	D8		"		"			"
		73	"	"	"	"	"	"	"	GND	6 V	"	6 V									"	CLK		"		"			"
I_{IL}	3009	74	GND	6 V	6 V	6 V	6 V	6 V	6 V	6 V	6 V	"	6 V									"	O/C		-0.5		-0.1			"
		75	6 V	GND	6 V	"	"	"	"	"	"	"	"									"	D1		"		"			"
		76	"	6 V	GND	GND	"	"	"	"	"	"	"									"	D2		"		"			"
		77	"	"	6 V	"	GND	"	"	"	"	"	"									"	D3		"		"			"
		78	"	"	"	GND	6 V	GND	"	"	"	"	"									"	D4		"		"			"
		79	"	"	"	"	"	6 V	GND	"	"	"	"									"	D5		"		"			"
		80	"	"	"	"	"	"	6 V	GND	"	"	"									"	D6		"		"			"
		81	"	"	"	"	"	"	"	6 V	GND	"	"									"	D7		"		"			"
		82	"	"	"	"	"	"	"	"	6 V	"	"									"	D8		"		"			"
		83	"	"	"	"	"	"	"	"	"	"	GND									"	CLK		"		"			"
I_{DZH}		84	4.2 V	1.2 V								"	3/									"	Q1		0.1		0.2			"
		85	"		1.2 V							"	"									"	Q2		"		"			"
		86	"	"		1.2 V						"	"									"	Q3		"		"			"
		87	"	"	"		1.2 V					"	"									"	Q4		"		"			"
		88	"	"	"	"		1.2 V				"	"									"	Q5		"		"			"
		89	"	"	"	"	"		1.2 V			"	"									"	Q6		"		"			"
		90	"	"	"	"	"	"		1.2 V		"	"		6.0 V								"	Q7		"		"			"
		91	"	"	"	"	"	"	"		1.2 V	"	"	6.0 V		6.0 V		6.0 V		6.0 V		6.0 V	"	Q8		"		"			"
I_{DZL}		92	"	4.2 V								"	"									"	Q1		-0.1		-0.2			"
		93	"		4.2 V							"	"									"	Q2		"		"			"
		94	"	"		4.2 V						"	"									"	Q3		"		"			"
		95	"	"	"		4.2 V					"	"									"	Q4		"		"			"
		96	"	"	"	"		4.2 V				"	"									"	Q5		"		"			"
		97	"	"	"	"	"		4.2 V			"	"									"	Q6		"		"			"
		98	"	"	"	"	"	"		4.2 V		"	"									"	Q7		"		"			"
		99	"	"	"	"	"	"	"		4.2 V	"	"	GND		GND		GND		GND		GND	"	Q8		"		"			"
																								Subgroup 4 T_C = +25°C						
C_C	3012	100	4/									GND										GND	O/E		15					µF
C_I		101		4/	4/	4/	4/	4/	4/	4/	4/	"										"	D1		10					"
		102										"										"	D2		"					"
		103										"										"	D3		"					"
		104										"										"	D4		"					"
		105										"										"	D5		"					"
		106										"										"	D6		"					"
		107										"										"	D7		"					"
		108										"										"	D8		"					"
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,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.	O/E	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	6 V									GND		2/	2/							6 V	Q1		20				pF
		111	"									"				2/						"	Q2		"				"
		112	"									"					2/					"	Q3		"				"
		113	"									"						2/				"	Q4		"				"
		114	"									"							2/			"	Q5		"				"
		115	"									"								2/		"	Q6		"				"
		116	"									"									2/	"	Q7		"				"
		117	"									"										"	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	A	A	A	A	A	A	A	A	"	X	X	X	X	X	X	X	X	X	4.5 V	All outputs 7/	8/	8/				
		119	"	A	A	A	A	A	A	A	A	"	H	H	H	H	H	H	H	H	H	"							
		120	"	B	B	B	B	B	B	B	B	"	"	"	"	"	"	"	"	"	"	"							
		121	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"							
		122	"	"	"	"	"	"	"	"	"	"	L	L	L	L	L	L	L	L	L	"							
		123	"	A	A	A	A	A	A	A	A	"	L	L	L	L	L	L	L	L	L	"							
		124	"	A	A	A	A	A	A	A	A	"	H	H	H	H	H	H	H	H	H	"							
																								Subgroup 9 T_C = +25°C 10/		Subgroup 10 T_C = +125°C		Subgroup 10 T_C = -55°C 10/		
f_{MAX} 9/	3003	125	GND	IN	IN	IN	IN	IN	IN	IN	IN	GND	IN	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	4.5 V	Q1	33		25		33		MHz
		126	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q2	"		"		"		"
		127	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q3	"		"		"		"
		128	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q4	"		"		"		"
		129	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q5	"		"		"		"
		130	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q6	"		"		"		"
		131	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q7	"		"		"		"
		132	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Q8	"		"		"		"
t_{PHL2}	3003 (Fig. 4)	133	"	IN	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	"	"	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	CLK to Q1		32		42		32	ns
		134	"	4.5 V	IN	4.5 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q2		"		"		"	"
		135	"	"	4.5 V	IN	4.5 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q3		"		"		"	"
		136	"	"	"	4.5 V	IN	4.5 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q4		"		"		"	"
		137	"	"	"	"	4.5 V	IN	4.5 V	IN	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q5		"		"		"	"
		138	"	"	"	"	"	4.5 V	IN	4.5 V	IN	"	"	"	"	"	"	"	"	"	"	"	CLK to Q6		"		"		"	"
		139	"	"	"	"	"	"	4.5 V	IN	4.5 V	IN	"	"	"	"	"	"	"	"	"	"	CLK to Q7		"		"		"	"
		140	"	"	"	"	"	"	"	4.5 V	IN	"	"	"	"	"	"	"	"	"	"	"	CLK to Q8		"		"		"	"
t_{PLH2}		141	"	IN	GND	GND	GND	GND	GND	GND	GND	"	"	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	CLK to Q1		"		"		"	"
		142	"	GND	IN	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q2		"		"		"	"
		143	"	"	GND	IN	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q3		"		"		"	"
		144	"	"	"	GND	GND	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q4		"		"		"	"
		145	"	"	"	"	"	GND	IN	"	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q5		"		"		"	"
		146	"	"	"	"	"	"	GND	IN	"	"	"	"	"	"	"	"	"	"	"	"	CLK to Q6		"		"		"	"
		147	"	"	"	"	"	"	"	GND	IN	"	"	"	"	"	"	"	"	"	"	"	CLK to Q7		"		"		"	"
		148	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"	"	"	"	"	CLK to Q8		"		"		"	"
t_{PZH}		149	IN	4.5 V								"										"	O/E to Q1		26		35		26	"
		150	"		4.5 V							"										"	O/E to Q2		"		"		"	"
		151	"			4.5 V						"										"	O/E to Q3		"		"		"	"
		152	"				4.5 V					"										"	O/E to Q4		"		"		"	"
		153	"					4.5 V				"										"	O/E to Q5		"		"		"	"
		154	"						4.5 V			"										"	O/E to Q6		"		"		"	"
		155	"							4.5 V		"										"	O/E to Q7		"		"		"	"
		156	"								4.5 V	"										"	O/E to Q8		"		"		"	"
t_{PZL}		157	"	GND								"										"	O/E to Q1		"		"		"	"
		158	"		GND							"										"	O/E to Q2		"		"		"	"
		159	"			GND						"										"	O/E to Q3		"		"		"	"
		160	"				GND					"										"	O/E to Q4		"		"		"	"
		161	"					GND				"										"	O/E to Q5		"		"		"	"
		162	"						GND			"										"	O/E to Q6		"		"		"	"
		163	"							GND		"										"	O/E to Q7		"		"		"	"
		164	"								GND	"										"	O/E to Q8		"		"		"	"

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

Symbol	MIL-STD-883 method	Cases A,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.	O/E	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_{PHZ}	3003 (Fig. 4)	165	IN	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	GND		OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	4.5 V	O/E to Q1		26		35		26	ns
		166	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q2		"		"		"	"
		167	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q3		"		"		"	"
		168	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q4		"		"		"	"
		169	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q5		"		"		"	"
		170	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q6		"		"		"	"
		171	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q7		"		"		"	"
		172	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q8		"		"		"	"
t_{PLZ}		173	"	GND	GND	GND	GND	GND	GND	GND	GND	"		"	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	O/E to Q1		"		"		"	ns
		174	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q2		"		"		"	"
		175	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q3		"		"		"	"
		176	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q4		"		"		"	"
		177	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q5		"		"		"	"
		178	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q6		"		"		"	"
		179	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q7		"		"		"	"
		180	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E to Q8		"		"		"	"
t_{THL}		181	GND	IN	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	GND	IN		OUT	OUT	OUT	OUT	OUT	OUT	OUT	4.5 V	Q1		12		16		12	ns
		182	"	4.5 V	IN	4.5 V	IN	"	"	"	"	"	"		"	"	"	"	"	"	"	"	Q2		"		"		"	"
		183	"	"	4.5 V	IN	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	Q3		"		"		"	"
		184	"	"	"	4.5 V	IN	IN	"	"	"	"	"		"	"	"	"	"	"	"	"	Q4		"		"		"	"
		185	"	"	"	"	4.5 V	"	IN	"	"	"	"		"	"	"	"	"	"	"	"	Q5		"		"		"	"
		186	"	"	"	"	"	IN	4.5 V	IN	"	"	"		"	"	"	"	"	"	"	"	Q6		"		"		"	"
		187	"	"	"	"	"	4.5 V	"	4.5 V	IN	"	"		"	"	"	"	"	"	"	"	Q7		"		"		"	"
		188	"	"	"	"	"	"	"	"	IN	"	"		"	"	"	"	"	"	"	"	Q8		"		"		"	"
t_{TLH}		189	"	IN	GND	GND	GND	GND	GND	GND	GND	"	"		"	"	"	"	"	"	"	"	Q1		"		"		"	"
		190	"	GND	IN	GND	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	Q2		"		"		"	"
		191	"	"	GND	IN	IN	IN	IN	IN	IN	"	"		"	"	"	"	"	"	"	"	Q3		"		"		"	"
		192	"	"	"	GND	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	Q4		"		"		"	"
		193	"	"	"	"	GND	"	GND	"	"	"	"		"	"	"	"	"	"	"	"	Q5		"		"		"	"
		194	"	"	"	"	"	GND	"	GND	"	"	"		"	"	"	"	"	"	"	"	Q6		"		"		"	"
		195	"	"	"	"	"	"	GND	"	IN	"	"		"	"	"	"	"	"	"	"	Q7		"		"		"	"
		196	"	"	"	"	"	"	"	IN	GND	"	IN		OUT	OUT	OUT	OUT	OUT	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,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.	O/E	$\overline{Q}$1	D1	D2	$\overline{Q}$2	$\overline{Q}$3	D3	D4	$\overline{Q}$4	GND	CLK	$\overline{Q}$5	D5	D6	$\overline{Q}$6	$\overline{Q}$7	D7	D8	$\overline{Q}$8	V_{CC}		Min	Max	Min	Max	Min	Max	
V_{IC} (pos)		1 2 3 4 5 6 7 8 9 10	1 mA		1 mA	1 mA			1 mA	1 mA		1/ " " " " " " " " "	1 mA		1 mA	1 mA			1 mA	1 mA		GND " " " " " " " " "	O/E 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	-1 mA		-1 mA	-1 mA			-1 mA	-1 mA		GND " " " " " " " " "	-1 mA		-1 mA	-1 mA			-1 mA	-1 mA		1/ " " " " " " " " "	O/E D1 D2 D3 D4 CLK D5 D6 D7 D8		-1.5 " " " " " " " " "					" " " " " " " " " "
I_{CCH}	3005	21	GND		GND	GND			GND	GND		"	3/		GND	GND			GND	GND		6 V	V_{CC}		0.2		8.0			µA
I_{CCL}		22	GND		6 V	6 V			6 V	6 V		"	"		6 V	6 V			6 V	6 V		"	"		0.2		8.0			"
I_{CCZ}		23	6 V		6 V	6 V			6 V	6 V		"	"		6 V	6 V			6 V	6 V		"	"		.1		4			"
V_{OH3}	3006	24 25 26 27 28 29 30 31	1.2 V " " " " " " "	-20 µA	1.2 V	1.2 V	-20 µA	-20 µA	1.2 V	1.2 V	-20 µA	" " " " " " " "	" " " " " " " "	-20 µA	1.2 V	1.2 V	-20 µA	-20 µA	1.2 V	1.2 V	-20 µA	" " " " " " " "	D1 D2 D3 D4 D5 D6 D7 D8	5.95 " " " " " " "		5.95 " " " " " " "		5.95 " " " " " " "		V " " " " " " "
V_{OH5}		32 33 34 35 36 37 38 39	" " " " " " " "	-5.2 mA	1.2 V	1.2 V	-5.2 mA	-5.2 mA	1.2 V	1.2 V	-5.2 mA	" " " " " " " "	" " " " " " " "	-5.2 mA	1.2 V	1.2 V	-5.2 mA	-5.2 mA	1.2 V	1.2 V	-5.2 mA	" " " " " " " "	D1 D2 D3 D4 D5 D6 D7 D8	5.48 " " " " " " "		5.2 " " " " " " "		5.48 " " " " " " "		" " " " " " " "
V_{OL3}	3007	40 41 42 43 44 45 46 47	" " " " " " " "	20 µA	4.2 V	4.2 V	20 µA	20 µA	4.2 V	4.2 V	20 µA	" " " " " " " "	" " " " " " " "	20 µA	4.2 V	4.2 V	20 µA	20 µA	4.2 V	4.2 V	20 µA	" " " " " " " "	D1 D2 D3 D4 D5 D6 D7 D8		0.1 " " " " " " "		0.1 " " " " " " "		0.1 " " " " " " "	" " " " " " " "
V_{OL5}		48 49 50 51 52 53 54 55	" " " " " " " "	5.2 mA	4.2 V	4.2 V	5.2 mA	5.2 mA	4.2 V	4.2 V	5.2 mA	" " " " " " " "	" " " " " " " "	5.2 mA	4.2 V	4.2 V	5.2 mA	5.2 mA	4.2 V	4.2 V	5.2 mA	" " " " " " " "	D1 D2 D3 D4 D5 D6 D7 D8		0.26 " " " " " " "		0.4 " " " " " " "		0.26 " " " " " " "	" " " " " " " "

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,2 Test no.	Terminal conditions 1/ 1 O/E	2 $\overline{Q}$1	3 D1	4 D2	5 $\overline{Q}$2	6 $\overline{Q}$3	7 D3	8 D4	9 $\overline{Q}$4	10 GND	11 CLK	12 $\overline{Q}$5	13 D5	14 D6	15 $\overline{Q}$6	16 $\overline{Q}$7	17 D7	18 D8	19 $\overline{Q}$8	20 V_{CC}	Measured terminal	Test limits: Subgroup 1 t_C = +25°C Min	Subgroup 1 t_C = +25°C Max	Subgroup 2 t_C = +125°C Min	Subgroup 2 t_C = +125°C Max	Subgroup 3 t_C = -55°C Min	Subgroup 3 t_C = -55°C Max	Unit
I_{OS4}	3011	56	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	3/	GND	GND	GND	GND	GND	GND	GND	GND	4 V	$\overline{Q}$1	-10	-135	-10	-135	-10	-135	mA
		57	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$2	"	"	"	"	"	"	"
		58	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$3	"	"	"	"	"	"	"
		59	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$4	"	"	"	"	"	"	"
		60	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$5	"	"	"	"	"	"	"
		61	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$6	"	"	"	"	"	"	"
		62	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$7	"	"	"	"	"	"	"
		63	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$8	"	"	"	"	"	"	"
I_{IH}	3010	64	6 V		"	"			"	"		"	GND		"	"			"	"		6 V	O/E		.05		0.1			µA
		65	GND		6 V	6 V			"	"		"	"		"	"			"	"		"	D1		"		"			"
		66	"		GND	GND			"	"		"	"		"	"			"	"		"	D2		"		"			"
		67	"		"	"			6 V	"		"	"		"	"			"	"		"	D3		"		"			"
		68	"		"	"			GND	6 V		"	"		"	"			"	"		"	D4		"		"			"
		69	"		"	"			"	GND		"	6 V		"	"			"	"		"	CLK		"		"			"
		70	"		"	"			"	"		"	GND		6 V	"			"	"		"	D5		"		"			"
		71	"		"	"			"	"		"	"		GND	6 V			"	"		"	D6		"		"			"
		72	"		"	"			"	"		"	"		"	GND			6 V	"		"	D7		"		"			"
		73	"		"	"			"	"		"	"		"	"			GND	6 V		"	D8		"		"			"
I_{IL}	3009	74	"		6 V	6 V			6 V	6 V		"	6 V		6 V	6 V			6 V	"		"	O/E		-.05		-0.1			"
		75	6 V		GND	6 V			"	"		"	"		"	"			"	"		"	D1		"		"			"
		76	"		6 V	GND			GND	GND		"	"		"	"			"	"		"	D2		"		"			"
		77	"		"	6 V			6 V	"		"	"		"	"			"	"		"	D3		"		"			"
		78	"		"	"			"	GND		"	"		"	"			"	"		"	D4		"		"			"
		79	"		"	"			"	6 V		"	GND		"	"			"	"		"	CLK		"		"			"
		80	"		"	"			"	"		"	6 V		GND	"			"	"		"	D5		"		"			"
		81	"		"	"			"	"		"	"		6 V	GND			"	"		"	D6		"		"			"
		82	"		"	"			"	"		"	"		"	6 V			GND	"		"	D7		"		"			"
		83	"		"	"			"	"		"	"		"	"			6 V	GND		"	D8		"		"			"
I_{OZH}		84	4.2 V	6.0 V	1.2 V	1.2 V	6.0 V	6.0 V	1.2 V	1.2 V	6.0 V	"	3/	6.0 V	1.2 V	1.2 V	6.0 V	6.0 V	1.2 V	1.2 V	6.0 V	"	$\overline{Q}$1		0.1		0.2			"
		85	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$2		"		"			"
		86	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$3		"		"			"
		87	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$4		"		"			"
		88	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$5		"		"			"
		89	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$6		"		"			"
		90	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$7		"		"			"
		91	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$8		"		"			"
I_{OZL}		92	"	GND	4.2 V	4.2 V	GND	GND	4.2 V	4.2 V	GND	"	"	GND	4.2 V	4.2 V	GND	GND	4.2 V	4.2 V	GND	"	$\overline{Q}$1		"		"			"
		93	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$2		"		"			"
		94	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$3		"		"			"
		95	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$4		"		"			"
		96	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$5		"		"			"
		97	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$6		"		"			"
		98	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$7		"		"			"
		99	"		"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}$8		"		"			"
																								Subgroup 4 t_C = +25°C						
C_C	3012	100	4/									GND										GND	O/E		15					pF
C_I		101			4/	4/						"										"	D1		10					"
		102										"										"	D2		"					"
		103							4/			"										"	D3		"					"
		104								4/		"										"	D4		"					"
C_C		105										"	4/									"	CLK		15					"
C_I		106										"			4/							"	D5		10					"
		107										"				4/						"	D6		"					"
		108										"							4/			"	D7		"					"
		109										"								4/			"	D8		"					"

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

Symbol	MIL-STD-883 method	Cases R,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				Subgroup 8 T_C = -55°C		
		Test no.	O/E	$\overline{Q}1$	D1	D2	$\overline{Q}2$	$\overline{Q}3$	D3	D4	$\overline{Q}4$	GND	CLK	$\overline{Q}5$	D5	D6	$\overline{Q}6$	$\overline{Q}7$	D7	D8	$\overline{Q}8$	V_{CC}		Min	Max	Min	Max	Min	Max	
C_O	3012	110 111 112 113 114 115 116 117	6 V	2/			2/	2/			2/	GND " " " " " " "		2/			2/	2/			2/	6 V " " " " " " "	$\overline{Q}1$ $\overline{Q}2$ $\overline{Q}3$ $\overline{Q}4$ $\overline{Q}5$ $\overline{Q}6$ $\overline{Q}7$ $\overline{Q}8$		20 " " " " " " "					pF " " " " " " "
																								Subgroup 7 T_C = +25°C		Subgroup 8 T_C = +125°C		Subgroup 8 T_C = -55°C		
Truth table tests 5/ 6/	3014	118 119 120 121 122 123 124 125 126 127 128 129 130	B " " " " " " " " " " " "	H " L " H " L " H	B A " B " A " B B	A B " A " B " A A	L " H " L " H " L	H " L " H " L " H	B A " B " A " B B	A B " A " B " A A	L " H " L " H " L	GND " " " " " " " "	A A B A A B B A B B A	H " L " H " L " H	B A " B " A " B B	A B " A " B " A A	L " H " L " H " L	H " L " H " L " H	B A " B " A " B B	A B " A " B " A A	L " H " L " H " L	4.5 V " " " " " " " "	All outputs 7/ 8/						
																								Subgroup 9 T_C = +25°C 10/		Subgroup 10 T_C = +125°C		Subgroup 11 T_C = -55°C 10/		
f_{MAX} 9/	3003	131 132 133 134 135 136 137 138	GND " " " " " " "	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND " " " " " " "	IN " " " " " " "	OUT	IN	IN	OUT	OUT	IN	IN	OUT	4.5 V " " " " " " "	$\overline{Q}1$ $\overline{Q}2$ $\overline{Q}3$ $\overline{Q}4$ $\overline{Q}5$ $\overline{Q}6$ $\overline{Q}7$ $\overline{Q}8$	33 " " " " " " "		25 " " " " " " "		33 " " " " " " "		MHz " " " " " " "
t_{PHL2}	3003 (Fig. 4)	139 140 141 142 143 144 145 146	" " " " " " " "	OUT	IN GND " " " " " "	GND IN GND " " " " "	OUT	OUT	GND GND IN GND " " " "	GND " IN GND " " " "	OUT	" " " " " " " "	" " " " " " " "	OUT	GND " " " IN GND " "	GND " " " IN GND GND	OUT	OUT	GND " " " " IN GND	GND " " " " IN " "	OUT	" " " " " " " "	CLK to $\overline{Q}1$ CLK to $\overline{Q}2$ CLK to $\overline{Q}3$ CLK to $\overline{Q}4$ CLK to $\overline{Q}5$ CLK to $\overline{Q}6$ CLK to $\overline{Q}7$ CLK to $\overline{Q}8$		32 " " " " " " "		42 " " " " " " "		32 " " " " " " "	ns " " " " " " "
t_{PLH2}		147 148 149 150 151 152 153 154	" " " " " " " "	OUT	IN 4.5 V " " " " " "	4.5 V IN 4.5 V " " " " "	OUT	OUT	4.5 V 4.5 V IN 4.5 V " " " "	4.5 V " IN 4.5 V " " " "	OUT	" " " " " " " "	" " " " " " " "	OUT	4.5 V " " " IN 4.5 V " "	4.5 V " " " IN 4.5 V 4.5 V	OUT	OUT	4.5 V " " " " IN 4.5 V	4.5 V " " " " IN " "	OUT	" " " " " " " "	CLK to $\overline{Q}1$ CLK to $\overline{Q}2$ CLK to $\overline{Q}3$ CLK to $\overline{Q}4$ CLK to $\overline{Q}5$ CLK to $\overline{Q}6$ CLK to $\overline{Q}7$ CLK to $\overline{Q}8$		" " " " " " " "		" " " " " " " "		" " " " " " " "	" " " " " " " "
t_{PZH}		155 156 157 158 159 160 161 162	IN " " " " " " "	OUT	GND	GND	OUT	OUT	GND	GND	OUT	" " " " " " " "		OUT	GND	GND	OUT	OUT	GND	GND	OUT	" " " " " " " "	O/E $\overline{Q}1$ O/E $\overline{Q}2$ O/E $\overline{Q}3$ O/E $\overline{Q}4$ O/E $\overline{Q}5$ O/E $\overline{Q}6$ O/E $\overline{Q}7$ O/E $\overline{Q}8$		31 " " " " " " "		41 " " " " " " "		31 " " " " " " "	" " " " " " " "

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,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.	O/E	$\overline{Q}1$	D1	D2	$\overline{Q}2$	$\overline{Q}3$	D3	D4	$\overline{Q}4$	GND	CLK	$\overline{Q}5$	D5	D6	$\overline{Q}6$	$\overline{Q}7$	D7	D8	$\overline{Q}8$	V_{CC}		Min	Max	Min	Max	Min	Max	
t_{PZL}	3003 (Fig. 4)	163	IN	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	GND		OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	4.5 V	O/E $\overline{Q}1$		31		41		31	ns
		164	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}2$		"		"		"	"
		165	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}3$		"		"		"	"
		166	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}4$		"		"		"	"
		167	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}5$		"		"		"	"
		168	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}6$		"		"		"	"
		169	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}7$		"		"		"	"
		170	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}8$		"		"		"	"
t_{PHZ}		171	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"		OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	O/E $\overline{Q}1$		26		36		26	"
		172	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}2$		"		"		"	"
		173	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}3$		"		"		"	"
		174	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}4$		"		"		"	"
		175	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}5$		"		"		"	"
		176	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}6$		"		"		"	"
		177	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}7$		"		"		"	"
		178	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}8$		"		"		"	"
t_{PLZ}		179	IN	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	GND		OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	O/E $\overline{Q}1$		26		36		26	ns
		180	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}2$		"		"		"	"
		181	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}3$		"		"		"	"
		182	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}4$		"		"		"	"
		183	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}5$		"		"		"	"
		184	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}6$		"		"		"	"
		185	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}7$		"		"		"	"
		186	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	O/E $\overline{Q}8$		"		"		"	"
t_{THL}		187	GND	OUT	IN	GND	OUT	OUT	GND	GND	OUT	"	IN	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	$\overline{Q}1$		12		16		12	"
		188	"	"	GND	IN			GND	IN		"	"		"	"			"	"		"	$\overline{Q}2$		"		"		"	"
		189	"	"	"	GND			IN	"		"	"		"	"			"	"		"	$\overline{Q}3$		"		"		"	"
		190	"	"	"	"			GND	IN		"	"		"	"			"	"		"	$\overline{Q}4$		"		"		"	"
		191	"	"	"	"			"	GND		"	"		IN	IN			IN	"		"	$\overline{Q}5$		"		"		"	"
		192	"	"	"	"			"	"		"	"		GND	GND			GND	"		"	$\overline{Q}6$		"		"		"	"
		193	"	"	"	"			"	"		"	"		"	"			"	"		"	$\overline{Q}7$		"		"		"	"
		194	"	"	"	"			"	"		"	"		"	"			"	IN		"	$\overline{Q}8$		"		"		"	"
t_{TLH}		195	"	OUT	IN	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	"	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	$\overline{Q}1$		"		"		"	"
		196	"	"	4.5 V	IN			4.5 V	"		"	"		"	"			"	"		"	$\overline{Q}2$		"		"		"	"
		197	"	"	"	4.5 V			IN	"		"	"		"	"			"	"		"	$\overline{Q}3$		"		"		"	"
		198	"	"	"	"			4.5 V	IN		"	"		"	"			"	"		"	$\overline{Q}4$		"		"		"	"
		199	"	"	"	"			"	4.5 V		"	"		IN	IN			IN	"		"	$\overline{Q}5$		"		"		"	"
		200	"	"	"	"			"	"		"	"		4.5 V	"			"	"		"	$\overline{Q}6$		"		"		"	"
		201	"	"	"	"			"	"		"	"		"	4.5 V			IN	"		"	$\overline{Q}7$		"		"		"	"
		202	"	"	"	"			"	"		"	"		"	"			4.5 V	IN		"	$\overline{Q}8$		"		"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 06.

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

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,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.	O/E	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 57 58 59 60 61 62 63	GND " " " " " " "	GND	GND	GND	GND	GND	GND	GND	GND	GND " " " " " " "	3/ " " " " " " "	4 V	4 V	4 V	4 V	4 V	4 V	4 V	4 V	4 V " " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8	-10 " " " " " " "	-135 " " " " " " "	-10 " " " " " " "	-135 " " " " " " "	-10 " " " " " " "	-135 " " " " " " "	mA " " " " " " "
I_{IH}	3010	64 65 66 67 68 69 70 71 72 73	6 V GND " " " " " " " "	GND 6 V GND " " " " " " "	GND GND 6 V GND " " " " " "	GND " 6 V GND " " " " " "	GND " " 6 V GND " " " " "	GND " " " 6 V GND " " " "	GND " " " " 6 V GND " " "	GND " " " " " 6 V GND GND "	GND " " " " " " 6 V GND "	" " " " " " " " " "	GND 6 V " " " " " " " "	" " " " " " " " " "								6 V " " " " " " " " "	D/E D1 D2 D3 D4 D5 D6 D7 D8 CLK		.05 " " " " " " " " "		0.1 " " " " " " " " "			µA " " " " " " " " "
I_{IL}	3009	74 75 76 77 78 79 80 81 82 83	" 6 V " " " " " " " "	6 V GND 6 V " " " " " " "	6 V 6 V GND 6 V " " " " " "	6 V " GND " " " " " " "	6 V " " GND " " " " " "	6 V " " " GND " " " " "	6 V " " " " GND " " " "	6 V " " " " " GND GND " "	6 V " " " " " " GND GND "	" " " " " " " " " "	" " " " " " " " GND "	" " " " " " " " " "								" " " " " " " " " "	D/E D1 D2 D3 D4 D5 D6 D7 D8 CLK		-.05 " " " " " " " " "		-0.1 " " " " " " " " "			" " " " " " " " " "
I_{OZH}		84 85 86 87 88 89 90 91	4.2 V " " " " " " "	1.2 V " " " " " " "	1.2 V " " " " " " "	1.2 V " " " " " " "	1.2 V " " " " " " "	1.2 V " " " " " " "	1.2 V " " " " " " "	1.2 V " " " " " " "	1.2 V " " " " " " "	" " " " " " " " " "	3/ " " " " " " "	16.0 V	6.0 V	6.0 V	6.0 V	6.0 V	6.0 V	6.0 V	6.0 V	16.0 V	" " " " " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8		0.1 " " " " " " " "		0.2 " " " " " " " "			" " " " " " " " " "
I_{OZL}		92 93 94 95 96 97 98 99	" " " " " " " "	4.2 V " " " " " " "	4.2 V " " " " " " "	4.2 V " " " " " " "	4.2 V " " " " " " "	4.2 V " " " " " " "	4.2 V " " " " " " "	4.2 V " " " " " " "	4.2 V " " " " " " "	" " " " " " " " " "	" " " " " " " " " "	GND	GND	GND	GND	GND	GND	GND	GND	GND	" " " " " " " " " "	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8		-0.1 " " " " " " " "		-0.2 " " " " " " " "			" " " " " " " " " "
																							Subgroup 4 T_C = +25°C						
C_C	3012	100	4/									GND										GND	D/E		15				pF
C_I		101 102 103 104 105 106 107 108		4/	4/	4/	4/	4/	4/	4/	4/	" " " " " " " "										" " " " " " " "	D1 D2 D3 D4 D5 D6 D7 D8		10 " " " " " " "					" " " " " " " "
C_I		109										"	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,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.	O/E	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	$\overline{Q}8$	$\overline{Q}7$	$\overline{Q}6$	$\overline{Q}5$	$\overline{Q}4$	$\overline{Q}3$	$\overline{Q}2$	$\overline{Q}1$	V_{CC}		Min	Max	Min	Max	Min	Max	
C_O	3012	110	6 V									GND		2/	2/	2/	2/	2/	2/	2/	2/	6 V	$\overline{Q}8$		20				pF
		111	"									"										"	$\overline{Q}7$		"				"
		112	"									"										"	$\overline{Q}6$		"				"
		113	"									"										"	$\overline{Q}5$		"				"
		114	"									"										"	$\overline{Q}4$		"				"
		115	"									"										"	$\overline{Q}3$		"				"
		116	"									"										"	$\overline{Q}2$		"				"
		117	"									"										"	$\overline{Q}1$		"				"
																								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	"	"	X	X	X	X	X	X	X	X	4.5 V	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	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"							
		122	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"							
		123	"	B	B	B	B	B	B	B	B	"	B	"	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	"							
																								Subgroup 9 T_C = +25°C 10/		Subgroup 10 T_C = +125°C		Subgroup 10 T_C = -55°C 10/		
f_{MAX} 9/	3003	125	GND	IN	IN	IN	IN	IN	IN	IN	IN	GND	IN	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	4.5 V	All outputs 7/	33		25		33		MHz
		126	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		127	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		128	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		129	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		130	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		131	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
		132	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"								
t_{PHL2}	3003 (Fig. 4)	133	"	IN	GND	GND	GND	GND	GND	GND	GND	GND	"	"								"	CLK to $\overline{Q}1$		31		41		31	ns
		134	"	GND	IN	GND	IN	"	"	"	"	"	"	"								"	CLK to $\overline{Q}2$		"		"		"	"
		135	"	"	GND	IN	GND	IN	"	"	"	"	"	"								"	CLK to $\overline{Q}3$		"		"		"	"
		136	"	"	"	GND	"	GND	IN	"	"	"	"	"								"	CLK to $\overline{Q}4$		"		"		"	"
		137	"	"	"	"	IN	"	GND	IN	"	"	"	"								"	CLK to $\overline{Q}5$		"		"		"	"
		138	"	"	"	"	GND	IN	"	GND	IN	"	"	"								"	CLK to $\overline{Q}6$		"		"		"	"
		139	"	"	"	"	"	GND	IN	"	GND	IN	"	"								"	CLK to $\overline{Q}7$		"		"		"	"
		140	"	"	"	"	"	"	GND	IN	"	GND	IN	"								"	CLK to $\overline{Q}8$		"		"		"	"
t_{PLH2}		141	"	IN	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	"	"								"	CLK to $\overline{Q}1$		"		"		"	"
		142	"	4.5 V	IN	4.5 V	"	"	"	"	"	"	"	"								"	CLK to $\overline{Q}2$		"		"		"	"
		143	"	"	4.5 V	IN	4.5 V	"	"	"	"	"	"	"								"	CLK to $\overline{Q}3$		"		"		"	"
		144	"	"	"	4.5 V	"	IN	"	"	"	"	"	"								"	CLK to $\overline{Q}4$		"		"		"	"
		145	"	"	"	"	4.5 V	"	IN	"	"	"	"	"								"	CLK to $\overline{Q}5$		"		"		"	"
		146	"	"	"	"	"	4.5 V	"	IN	"	"	"	"								"	CLK to $\overline{Q}6$		"		"		"	"
		147	"	"	"	"	"	"	4.5 V	"	IN	"	"	"								"	CLK to $\overline{Q}7$		"		"		"	"
		148	"	"	"	"	"	"	"	4.5 V	"	IN	"	"								"	CLK to $\overline{Q}8$		"		"		"	"
t_{PZH}		149	IN	GND	GND	GND	GND	GND	GND	GND	GND	"	"									"	O/E to $\overline{Q}1$		26		35		26	"
		150	"	"	"	"	"	"	"	"	"	"	"	"								"	O/E to $\overline{Q}2$		"		"		"	"
		151	"	"	"	"	"	"	"	"	"	"	"	"								"	O/E to $\overline{Q}3$		"		"		"	"
		152	"	"	"	"	"	"	"	"	"	"	"	"								"	O/E to $\overline{Q}4$		"		"		"	"
		153	"	"	"	"	"	"	"	"	"	"	"	"								"	O/E to $\overline{Q}5$		"		"		"	"
		154	"	"	"	"	"	"	"	"	"	"	"	"								"	O/E to $\overline{Q}6$		"		"		"	"
		155	"	"	"	"	"	"	"	"	"	"	"	"								"	O/E to $\overline{Q}7$		"		"		"	"
		156	"	"	"	"	"	"	"	"	"	"	"	"								"	O/E to $\overline{Q}8$		"		"		"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases R,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.	O/E	D1	D2	D3	D4	D5	D6	D7	D8	GND	CLK	$\overline{Q}8$	$\overline{Q}7$	$\overline{Q}6$	$\overline{Q}5$	$\overline{Q}4$	$\overline{Q}3$	$\overline{Q}2$	$\overline{Q}1$	V_{CC}		Min	Max	Min	Max	Min	Max	
t_{PZL}	3003 (Fig. 4)	157	IN	4.5 V	4.5 V							GND											I0/E to O1		26		35		26	ns
		158	"	"	"	4.5 V						"											I0/E to O2		"		"		"	"
		159	"	"	"	"	4.5 V					"											I0/E to O3		"		"		"	"
		160	"	"	"	"	"	4.5 V				"											I0/E to O4		"		"		"	"
		161	"	"	"	"	"	"	4.5 V			"											I0/E to O5		"		"		"	"
		162	"	"	"	"	"	"	"	4.5 V		"											I0/E to O6		"		"		"	"
		163	"	"	"	"	"	"	"	"	4.5 V	"											I0/E to O7		"		"		"	"
		164	"	"	"	"	"	"	"	"	"	"			OUT	OUT	OUT	OUT	OUT	OUT	OUT	4.5 V	I0/E to O8		"		"		"	"
t_{PHZ}		165	"	GND	GND	GND	GND	GND	GND	GND	GND	"											I0/E to O1		"		"		"	"
		166	"	"	"	"	"	"	"	"	"	"											I0/E to O2		"		"		"	"
		167	"	"	"	"	"	"	"	"	"	"											I0/E to O3		"		"		"	"
		168	"	"	"	"	"	"	"	"	"	"											I0/E to O4		"		"		"	"
		169	"	"	"	"	"	"	"	"	"	"											I0/E to O5		"		"		"	"
		170	"	"	"	"	"	"	"	"	"	"											I0/E to O6		"		"		"	"
		171	"	"	"	"	"	"	"	"	"	"											I0/E to O7		"		"		"	"
		172	"	"	"	"	"	"	"	"	"	"			OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	I0/E to O8		"		"		"	"
t_{PLZ}		173	"	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	"											I0/E to O1		"		"		"	"
		174	"	"	"	"	"	"	"	"	"	"											I0/E to O2		"		"		"	"
		175	"	"	"	"	"	"	"	"	"	"											I0/E to O3		"		"		"	"
		176	"	"	"	"	"	"	"	"	"	"											I0/E to O4		"		"		"	"
		177	"	"	"	"	"	"	"	"	"	"											I0/E to O5		"		"		"	"
		178	"	"	"	"	"	"	"	"	"	"											I0/E to O6		"		"		"	"
		179	"	"	"	"	"	"	"	"	"	"											I0/E to O7		"		"		"	"
		180	"	"	"	"	"	"	"	"	"	"			OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	I0/E to O8		"		"		"	"
t_{THL}		181	GND	IN	GND	GND	GND	GND	GND	GND	GND	GND	IN										O1		12		16		12	ns
		182	"	GND	IN	GND	"	"	"	"	"	"	"										O2		"		"		"	"
		183	"	"	GND	IN	IN	"	"	"	"	"	"										O3		"		"		"	"
		184	"	"	"	GND	GND	IN	"	"	"	"	"										O4		"		"		"	"
		185	"	"	"	"	"	GND	IN	"	"	"	"										O5		"		"		"	"
		186	"	"	"	"	"	"	GND	IN	"	"	"										O6		"		"		"	"
		187	"	"	"	"	"	"	"	GND	IN	"	"										O7		"		"		"	"
		188	"	"	"	"	"	"	"	"	GND	"	"		OUT	OUT	OUT	OUT	OUT	OUT	OUT	4.5 V	O8		"		"		"	"
t_{TLH}		189	"	IN	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	4.5 V	"	IN										I0		"		"		"	"
		190	"	4.5 V	IN	4.5 V	"	"	"	"	"	"	"										I1		"		"		"	"
		191	"	"	4.5 V	IN	IN	"	"	"	"	"	"										I2		"		"		"	"
		192	"	"	"	4.5 V	4.5 V	IN	"	"	"	"	"										I3		"		"		"	"
		193	"	"	"	"	"	4.5 V	IN	"	"	"	"										I4		"		"		"	"
		194	"	"	"	"	"	"	4.5 V	IN	"	"	"										I5		"		"		"	"
		195	"	"	"	"	"	"	"	4.5 V	IN	"	"										I6		"		"		"	"
		196	"	"	"	"	"	"	"	"	4.5 V	"	"		OUT	OUT	OUT	OUT	OUT	OUT	OUT	4.5 V	I7		"		"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 52.

Symbol	MIL-STD-883 method	Case R	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.	O/E	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	1 mA		1 mA							1/										GND	O/E	2/	1.5					V
		2				1 mA						"										"	D1		"					"
		3							1 mA			"										"	D2		"					"
		4								1 mA		"										"	D3		"					"
		5										"	1 mA		1 mA							"	D4		"					"
		6										"				1 mA						"	CLK		"					"
		7										"							1 mA			"	D5		"					"
		8										"								1 mA			"	D6		"					"
		9										"										"	D7		"					"
		10										"										"	D8		"					"
V_{IC} (neg)		11	-1 mA									GND										1/	O/E		-1.5					"
		12			-1 mA							"										"	D1		"					"
		13				-1 mA						"										"	D2		"					"
		14							-1 mA			"										"	D3		"					"
		15								-1 mA		"										"	D4		"					"
		16										"	-1 mA		-1 mA							"	CLK		"					"
		17										"				-1 mA						"	D5		"					"
		18										"							-1 mA			"	D6		"					"
		19										"								-1 mA			"	D7		"					"
		20										"										"	D8		"					"
I_{CCH}	3005	21	GND		5.5 V	5.5 V			5.5 V	5.5 V		"	3/		5.5 V	5.5 V			5.5 V	5.5 V		5.5 V	V_{CC}		0.2		8.0			μA
I_{CCL}		22	GND		GND	GND			GND	GND		"	"		GND	GND			GND	GND		"	"		0.2		8.0			"
I_{CCZ}		23	5.5 V		GND	GND			GND	GND		"	"		GND	GND			GND	GND		"	"		0.1		4.0			"
V_{OH3}	3006	24	0.8 V	-20 μA	2.0 V							"	"									"	Q1	5.90		5.90		5.90		V
		25	"			2.0 V	-20 μA					"	"									"	Q2	"		"		"		"
		26	"					-20 μA	2.0 V			"	"									"	Q3	"		"		"		"
		27	"							2.0 V	-20 μA	"	"									"	Q4	"		"		"		"
		28	"									"	"	-20 μA								"	Q5	"		"		"		"
		29	"									"	"		2.0 V	2.0 V	-20 μA	-20 μA	2.0 V			"	Q6	"		"		"		"
		30	"									"	"							2.0 V	-20 μA	"	Q7	"		"		"		"
		31	"									"	"									"	Q8	"		"		"		"
V_{OH5}		32	"	-6.0 mA	2.0 V							"	"									"	Q1	5.48		5.2		5.48		"
		33	"			2.0 V	-6.0 mA					"	"									"	Q2	"		"		"		"
		34	"					-6.0 mA	2.0 V			"	"									"	Q3	"		"		"		"
		35	"							2.0 V	-6.0 mA	"	"									"	Q4	"		"		"		"
		36	"									"	"	-6.0 mA								"	Q5	"		"		"		"
		37	"									"	"		2.0 V	2.0 V	-6.0 mA	-6.0 mA	2.0 V			"	Q6	"		"		"		"
		38	"									"	"							2.0 V	-6.0 mA	"	Q7	"		"		"		"
		39	"									"	"									"	Q8	"		"		"		"
V_{OL3}	3007	40	"	20 μA	0.8 V							"	"									"	Q1		0.1		0.1		0.1	"
		41	"			0.8 V	20 μA					"	"									"	Q2		"		"		"	"
		42	"					20 μA	0.8 V			"	"									"	Q3		"		"		"	"
		43	"							0.8 V	20 μA	"	"									"	Q4		"		"		"	"
		44	"									"	"	20 μA								"	Q5		"		"		"	"
		45	"									"	"		0.8 V	0.8 V	20 μA	20 μA	0.8 V			"	Q6		"		"		"	"
		46	"									"	"							0.8 V	20 μA	"	Q7		"		"		"	"
		47	"									"	"									"	Q8		"		"		"	"
V_{OL5}		48	"	6.0 mA	0.8 V							"	"									"	Q1		0.26		0.4		0.26	"
		49	"			0.8 V	6.0 mA					"	"									"	Q2		"		"		"	"
		50	"					6.0 mA	0.8 V			"	"									"	Q3		"		"		"	"
		51	"							0.8 V	6.0 mA	"	"									"	Q4		"		"		"	"
		52	"									"	"	6.0 mA								"	Q5		"		"		"	"
		53	"									"	"		0.8 V	0.8 V	6.0 mA	6.0 mA	0.8 V			"	Q6		"		"		"	"
		54	"									"	"							0.8 V	6.0 mA	"	Q7		"		"		"	"
		55	"									"	"									"	Q8		"		"		"	"

See footnotes at end of table.

Symbol	MIL-STD-883 method	Case R	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.	D/E	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	4 V							GND	3/									4 V	Q1	-10	-135	-10	-135	10	-135	mA
		57	"			4 V	GND		4 V			"	"									"	Q2	"	"	"	"	"	"	
		58	"			"	"	GND	"			"	"		4 V							"	Q3	"	"	"	"	"	"	
		59	"			"	"	"	"	4 V	GND	"	"		"	4 V						"	Q4	"	"	"	"	"	"	
		60	"			"	"	"	"	"	"	"	"		"	"	GND					"	Q5	"	"	"	"	"	"	
		61	"			"	"	"	"	"	"	"	"		"	"	"	GND				"	Q6	"	"	"	"	"	"	
		62	"			"	"	"	"	"	"	"	"		"	"	"	"	GND	4 V		"	Q7	"	"	"	"	"	"	
		63	"			"	"	"	"	"	"	"	"		"	"	"	"	"	"	4 V	GND	"	Q8	"	"	"	"	"	"	
I_{IH}	3010	64	5.5 V		GND	GND			GND	GND			GND		GND	GND			GND	GND		5.5 V	O/E		.05		0.1			µA
		65	GND		5.5 V	GND			"	"			"		"	"			"	"		"	D1		"		"			
		66	"		GND	5.5 V			"	"			"		"	"			"	"		"	D2		"		"			
		67	"		"	GND			5.5 V	"			"		"	"			"	"		"	D3		"		"			
		68	"		"	"			GND	5.5 V			"		"	"			"	"		"	D4		"		"			
		69	"		"	"			"	GND			5.5 V		"	"			"	"		"	CLK		"		"			
		70	"		"	"			"	"			GND		5.5 V	"			"	"		"	D5		"		"			
		71	"		"	"			"	"			"		GND	5.5 V			"	"		"	D6		"		"			
		72	"		"	"			"	"			"		"	GND			5.5 V	"		"	D7		"		"			
		73	"		"	"			"	"			"		"	"			GND	5.5 V		"	D8		"		"			
I_{IL}	3009	74	"		5.5 V	5.5 V			5.5 V	5.5 V			5.5 V		5.5 V	5.5 V			5.5 V	"		"	O/E		-.05		-0.1			"
		75	5.5 V		GND	5.5 V			"	"			"		"	"			"	"		"	D1		"		"			
		76	"		5.5 V	GND			"	"			"		"	"			"	"		"	D2		"		"			
		77	"		"	5.5 V			GND	"			"		"	"			"	"		"	D3		"		"			
		78	"		"	"			5.5 V	GND			"		"	"			"	"		"	D4		"		"			
		79	"		"	"			"	5.5 V			GND		"	"			"	"		"	CLK		"		"			
		80	"		"	"			"	"			5.5 V		GND	GND			"	"		"	D5		"		"			
		81	"		"	"			"	"			"		5.5 V	5.5 V			"	"		"	D6		"		"			
		82	"		"	"			"	"			"		"	"			GND	"		"	D7		"		"			
		83	"		"	"			"	"			"		"	"			5.5 V	GND		"	D8		"		"			
I_{OZH}		84	2.0 V	2.0 V	0.8 V		2.0 V						3/										Q1		0.1		0.2			"
		85	"			0.8 V	"	2.0 V	0.8 V				"										Q2		"		"			
		86	"			"	"	"	"	0.8 V			"										Q3		"		"			
		87	"			"	"	"	"	"	2.0 V		"										Q4		"		"			
		88	"			"	"	"	"	"	"		"										Q5		"		"			
		89	"			"	"	"	"	"	"		"										Q6		"		"			
		90	"			"	"	"	"	"	"		"										Q7		"		"			
		91	"			"	"	"	"	"	"		"										Q8		"		"			
I_{OZL}		92	"										"										Q1		-0.1		-0.2			"
		93	"	GND	2.0 V	2.0 V	GND						"										Q2		"		"			
		94	"			"	"	GND	2.0 V				"										Q3		"		"			
		95	"			"	"	"	"	2.0 V			"										Q4		"		"			
		96	"			"	"	"	"	"	GND		"										Q5		"		"			
		97	"			"	"	"	"	"	"		"										Q6		"		"			
		98	"			"	"	"	"	"	"		"										Q7		"		"			
		99	"			"	"	"	"	"	"		"										Q8		"		"			
																								Subgroup 4 T_C = +25°C						
C_C	3012	100	2/									GND										GND	O/E		15					pF
C_I		101			2/	2/			2/	2/		"										"	D1		10					"
		102										"										"	D2		"					"
		103										"										"	D3		"					"
		104										"										"	D4		"					"
C_C		105										"	2/									"	CLK		15					"
C_I		106										"			2/							"	D5		10					"
		107										"			"	2/						"	D6		"					"
		108										"			"	"			2/			"	D7		"					"
		109										"			"	"			"	2/		"	D8		"					"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Case R	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.	O/E	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	6 V	2/								GND										6 V	Q1		20					pF
		111					2/					"										"	Q2		"					"
		112						2/				"										"	Q3		"					"
		113									2/	"										"	Q4		"					"
		114										"		2/								"	Q5		"					"
		115										"					2/					"	Q6		"					"
		116										"						2/				"	Q7		"					"
		117										"									2/	"	Q8		"					"
																								Subgroup 7 T_C = +25°C		Subgroup 8 T_C = +125°C		Subgroup 8 T_C = -55°C		
Truth table tests 4/ 5/	3014	118	B	X	A	A	X	X	A	A	X	GND	B	X	A	A	X	X	A	A	X	4.5 V	All outputs 7/ 8/							
		119	"	H	B	B	H	H	B	B	H	"	A	H	B	B	H	H	A	B	H	"								
		120	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"									
		121	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"									
		122	"	L	A	A	L	L	A	A	L	"	B	L	A	A	L	L	A	A	L	"									
		123	"	L	B	B	L	L	B	B	L	"	A	L	B	B	L	L	B	B	L	"									
		124	"	H	A	A	H	H	A	A	H	"	B	H	A	A	H	H	A	A	H	"									
																								Subgroup 9 T_C = +25°C 10/		Subgroup 10 T_C = +125°C		Subgroup 11 T_C = -55°C 10/		
f_{MAX} 9/	3003	125	GND	OUT	IN	IN	OUT	OUT	IN	IN	OUT	GND	IN	OUT	IN	IN	OUT	OUT	IN	IN	OUT	4.5 V	Q1	28		21		28		MHz
		126	"									"	"									"	Q2	"		"		"		"
		127	"									"	"									"	Q3	"		"		"		"
		128	"									"	"									"	Q4	"		"		"		"
		129	"									"	"									"	Q5	"		"		"		"
		130	"									"	"									"	Q6	"		"		"		"
		131	"									"	"									"	Q7	"		"		"		"
		132	"									"	"									"	Q8	"		"		"		"
t_{PHL2}	3003 (Fig. 4)	133	"	OUT	IN	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	"	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	CLK to Q1		32		42		32	ns
		134	"		4.5 V	IN			4.5 V	"		"	"		"	"			"	"		"	CLK to Q2		"		"		"	"
		135	"		"	4.5 V			IN			"	"		"							"	CLK to Q3		"		"		"	"
		136	"		"	"			4.5 V	IN		"	"		"	IN						"	CLK to Q4		"		"		"	"
		137	"		"	"			"	4.5 V		"	"		"	4.5 V						"	CLK to Q5		"		"		"	"
		138	"		"	"			"	"		"	"		"	"						"	CLK to Q6		"		"		"	"
		139	"		"	"			"	"		"	"		"	IN			IN			"	CLK to Q7		"		"		"	"
		140	"		"	"			"	"		"	"		"	4.5 V			4.5 V	IN	OUT	"	CLK to Q8		"		"		"	"
t_{PLH2}		141	"	OUT	IN	GND	OUT	OUT	GND	GND	OUT	"	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	CLK to Q1		"		"		"	"
		142	"		GND	IN			GND	"		"	"		"	"			"	"		"	CLK to Q2		"		"		"	"
		143	"		"	GND			IN			"	"		"							"	CLK to Q3		"		"		"	"
		144	"		"	"			GND	IN		"	"		"	IN						"	CLK to Q4		"		"		"	"
		145	"		"	"			"	GND		"	"		"	GND						"	CLK to Q5		"		"		"	"
		146	"		"	"			"	"		"	"		"	IN						"	CLK to Q6		"		"		"	"
		147	"		"	"			"	"		"	"		"	GND			IN			"	CLK to Q7		"		"		"	"
		148	"		"	"			"	"		"	"		"	"			GND	IN	OUT	"	CLK to Q8		"		"		"	"
t_{PZH}		149	IN	OUT	4.5 V		OUT					"										"	IO/E to Q1		31		41		31	"
		150	"			4.5 V		OUT	4.5 V			"										"	IO/E to Q2		"		"		"	"
		151	"							4.5 V	OUT	"			4.5 V		OUT					"	IO/E to Q3		"		"		"	"
		152	"									"						OUT				"	IO/E to Q4		"		"		"	"
		153	"									"							4.5 V			"	IO/E to Q5		"		"		"	"
		154	"									"								4.5 V		"	IO/E to Q6		"		"		"	"
		155	"									"									OUT	"	IO/E to Q7		"		"		"	"
		156	"									"										"	IO/E to Q8		"		"		"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Case R	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.	O/E	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. 4)	157	IN	OUT	GND	GND	OUT	OUT	GND	GND	OUT	GND		OUT	GND	GND	OUT	OUT	GND	GND	OUT	4.5 V	IO/E to Q1		31		41		31	ns
		158	"									"										"	IO/E to Q2		"		"		"	"
		159	"									"										"	IO/E to Q3		"		"		"	"
		160	"									"										"	IO/E to Q4		"		"		"	"
		161	"									"										"	IO/E to Q5		"		"		"	"
		162	"									"										"	IO/E to Q6		"		"		"	"
		163	"									"										"	IO/E to Q7		"		"		"	"
		164	"									"										"	IO/E to Q8		"		"		"	"
t_{PHZ}		165	"	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"		OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	IO/E to Q1		"		"		"	"
		166	"									"										"	IO/E to Q2		"		"		"	"
		167	"									"										"	IO/E to Q3		"		"		"	"
		168	"									"										"	IO/E to Q4		"		"		"	"
		169	"									"										"	IO/E to Q5		"		"		"	"
		170	"									"										"	IO/E to Q6		"		"		"	"
		171	"									"										"	IO/E to Q7		"		"		"	"
		172	"									"										"	IO/E to Q8		"		"		"	"
t_{PLZ}		173	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"		OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	IO/E to Q1		"		"		"	"
		174	"									"										"	IO/E to Q2		"		"		"	"
		175	"									"										"	IO/E to Q3		"		"		"	"
		176	"									"										"	IO/E to Q4		"		"		"	"
		177	"									"										"	IO/E to Q5		"		"		"	"
		178	"									"										"	IO/E to Q6		"		"		"	"
		179	"									"										"	IO/E to Q7		"		"		"	"
		180	"									"										"	IO/E to Q8		"		"		"	"
t_{THL}	3004	181	GND	OUT	IN	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	IN	OUT	4.5 V	4.5 V	OUT	OUT	4.5 V	4.5 V	OUT	"	Q1		12		16		12	"
		182	"		4.5 V	IN			4.5 V	"		"	"		"	"			"	"		"	Q2		"		"		"	"
		183	"		"	4.5 V			IN	"		"	"		"	"			"	"		"	Q3		"		"		"	"
		184	"		"	"			4.5 V	IN		"	"		"	IN			"	"		"	Q4		"		"		"	"
		185	"		"	"			"	4.5 V		"	"		"	"			"	"		"	Q5		"		"		"	"
		186	"		"	"			"	"		"	"		"	4.5 V			"	"		"	Q6		"		"		"	"
		187	"		"	"			"	"		"	"		"	"			IN	"		"	Q7		"		"		"	"
		188	"		"	"			"	"		"	"		"	"			4.5 V	IN		"	Q8		"		"		"	"
t_{TLH}		189	"	OUT	IN	GND	OUT	OUT	GND	GND	OUT	"	"	OUT	GND	GND	OUT	OUT	GND	GND	OUT	"	Q1		"		"		"	"
		190	"		GND	IN			GND	"		"	"		"	"			"	"		"	Q2		"		"		"	"
		191	"		"	GND			IN	"		"	"		"	"			"	"		"	Q3		"		"		"	"
		192	"		"	"			GND	IN		"	"		"	"			"	"		"	Q4		"		"		"	"
		193	"		"	"			"	GND		"	"		IN	"			"	"		"	Q5		"		"		"	"
		194	"		"	"			"	"		"	"		GND	IN			"	"		"	Q6		"		"		"	"
		195	"		"	"			"	"		"	"		"	GND			IN	"		"	Q7		"		"		"	"
		196	"		"	"			"	"		"	"		"	GND			GND	IN		"	Q8		"		"		"	"

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:

a. $V_{IC(pos)}$ tests, the GND terminal shall be open.
b. $V_{IC(neg)}$ tests, the V_{CC} terminal shall be open.
c. 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.

5/ Tests performed in sequence.

6/ A = 2.4 V; B = 0.4 V.

7/ X = Indeterminate output voltage.

8/ Output shall be: High ≥ 1.5 V; Low ≤ 1.5 V. $|I_{OUT}|$ = 20 mA.

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.

4.5.2 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.

4.5.4 Radiation hardness assurance (RHA) testing. The RHA testing shall be performed in accordance with test procedures and sampling specified in table V of method 5005 of MIL-STD-883 and herein:

a. Before irradiation, selected samples shall be assembled in qualified packages and pass the governing electrical parameters (group A, subgroup 1 at +25°C) and also be subjected to the threshold-voltage test in table V in order to calculate the delta threshold (ΔV_T) after irradiation.

b. The devices shall be subjected to a total radiation dose as specified in MIL-M-38510 for the radiation hardness assurance (RHA) level being tested, and meet the end point electrical parameters as defined in table VI at +25°C, after exposure. The start and completion of the end point electrical parameter measurements shall not exceed 2 hours following irradiation.

c. Threshold-voltage test circuit conditions shall be as specified in table V and figure 5. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VII and bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.

d. After irradiation, the devices shall pass the truth table test as specified in subgroup 7 in table III or if subgroup 7 is not required, then an equivalent truth table test shall be performed.

TABLE V. Threshold-voltage test circuit conditions.

Device type	GND	5 V	V_{TN} measured at	GND	-5.0 V	V_{TP} measured at
			-10 µA supply			10 µA supply
01,02,03, 05,52	1	20	3,4,7,8,10,11,13 14,17,18	1	3,4,7,8,10,11,13 14,17,18	20
04,06	1	20	2-11	1	2-11	20

TABLE VI. Radiation hardening end-point electrical parameters at +25°C.

Parameter	All device types	V_{CC} Device types 01-06	V_{CC} Device type 52
V_{TN}	-0.2 V min	5 V	5 V
V_{TP}	2.8 V max	5 V	5 V
ΔV_T	1.0 V max	5 V	5 V
I_{CC}	100 x max limit	6 V	5.5 V
t_{PLH}	1.35 x max limit	4.5 V	4.5 V
t_{PHL}	1.35 x max limit	4.5 V	4.5 V

TABLE VII. Bias during exposure to radiation.

Device type	Pin connections		
	V_{CC} = 4.5 V dc (through a 30- to 60-kilohm resistor)	GND	V_{CC} = 4.5 V dc
01,02,03,05,52	1, 3, 4, 7, 8, 11, 13, 14, 17, 18	10	20
04,06	1-9, 11	10	20

Pins not designated are open or connected to 4.5 V dc through a 30- to 60-kilohms resistor.

4.6 Data reporting. When specified in the purchase order or contract, a copy of the following data, as applicable, shall 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 3.5).

b. A copy of each radiograph.

c. The quality conformance inspection data (see 4.4).

d. Parameter distribution data on parameters evaluated during burn-in (see 3.5).

e. Final electrical parameters data (see 4.2c).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

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

6.2 Ordering data. The acquisition document should specify the following:

a. Complete part number (see 1.2).

b. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.

c. Requirements for certificate of compliance, if applicable.

d. Requirements for notification of change of product or process to the contracting activity in addition to notification to the qualifying activity, if applicable.

e. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action and reporting of results, if applicable.

f. Requirements for product assurance options.

g. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements shall not apply to direct purchase by, or direct shipment to the Government.

h. Requirements for "JAN" marking.

i. Requirements for total dose radiation testing (see 3.6.1 and 4.5.4), if applicable.

6.3 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-M-38510, MIL-STD-1331, and as follows:

C_i	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.

6.4 Logistic support. Lead materials and finishes (see 3.3) 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 finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

6.5 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 shall 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-M-38510.

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

6.6 Handling. MOS devices must be handled with certain precautions to avoid damage due to accumulation of static charge. Input protective devices have been designed in the chip to minimize the effect of this static build up. However, the following handling practices are recommended:

a. Devices should be handled on benches with conductive and grounded surface.

b. Ground test equipment, tools, and operator.

c. Do not handle devices by the leads.

d. Store devices in conductive foam or carriers.

e. Avoid use of plastic, rubber, or silk in MOS areas.

f. Maintain relative humidity above 50 percent, if practical.

Custodians:
Army - ER
Navy - EC
Air Force - 17
NASA - NA

Review activities:
Army - AR, MI
Air Force - 11, 19, 85, 99
DLA - ES

User activities:
Army - SM
Navy - AS, CG, OC, MC, SH

Preparing activity:
Air Force - 17

Agent:
DLA - ES

(Project 5962-0849)