

INCH-POUND

MIL-M-38510/175C
10 August 2004

SUPERSEDING
MIL-M-38510/175B
30 April 1984

MILITARY SPECIFICATION
MICROCIRCUITS, DIGITAL, CMOS, POSITIVE LOGIC,
FLIP-FLOPS AND MONOSTABLE MULTIVIBRATOR, MONOLITHIC SILICON

Reactivated after 10 Aug. 2004 and may be used for new and existing designs and acquisitions.

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

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

1. SCOPE

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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).

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

1.2.1 Device types. The device types are as follows:

<u>Device type</u>	<u>Circuit</u>
01	4-bit D-type register
02	Gated J – K master-slave flip-flop (noninverting J – K)
03	Gated J – K master-slave flip-flop (inverting J – K)
04	Dual monostable multivibrator
05	Hex D-type flip-flop

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

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

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

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
A	GDFP5-F14 or CDFP6-F14	14	Flat pack
C	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	Flat pack
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
N	CDFP4-F16	16	Flat pack
X <u>1/</u> <u>2/</u>	GDFP5-F14 or CDFP6-F14	14	Flat pack, except A dimension equals 0.100" (2.54 mm) max
Y <u>1/</u> <u>2/</u>	GDFP1-F14 or CDFP2-F14	14	Flat pack, except A dimension equals 0.100" (2.54 mm) max
Z <u>1/</u> <u>2/</u>	GDFP2-F16 or CDFP3-F16	16	Flat pack, except A dimension equals 0.100" (2.54 mm) max

1.3 Absolute maximum ratings.

Supply voltage range ($V_{DD} - V_{SS}$)	-0.5 V dc to +18.0 V dc
Input current (each input)	± 10 mA
Input voltage range	$(V_{SS} - 0.5 \text{ V}) \leq V_I \leq (V_{DD} + 0.5 \text{ V})$
Storage temperature range (T_{STG})	-65° to +175°C
Maximum power dissipation (P_D)	200 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction to case (θ_{JC})	See MIL-STD-1835
Junction temperature (T_J)	175°C

1.4 Recommended operating conditions.

Supply voltage range ($V_{DD} - V_{SS}$)	4.5 V dc to 15.0 V dc
Input low voltage range (V_{IL})	$V_{OL} = 10\% V_{DD}$, $V_{OH} = 90\% V_{DD}$ 0.0 V to 1.5 V dc @ $V_{DD} = 5.0$ V dc 0.0 V to 2.0 V dc @ $V_{DD} = 10.0$ V dc 0.0 V to 4.0 V dc @ $V_{DD} = 15.0$ V dc
Input high voltage range (V_{IH})	$V_{OL} = 10\% V_{DD}$, $V_{OH} = 90\% V_{DD}$ 3.5 V to 5.0 V dc @ $V_{DD} = 5.0$ V dc 8.0 V to 10.0 V dc @ $V_{DD} = 10.0$ V dc 11.0 V to 15.0 V dc @ $V_{DD} = 15.0$ V dc
Operating temperature range (T_A)	-55°C to +125°C
Minimum value of external resistance (R_X)	5 k Ω
Maximum value of external capacitance (C_X)	100 μ F

1/ As an exception to the nickel plate and undercoating paragraph of MIL-PRF-38535, appendix A, for case outlines X, Y, and Z only, the leads of bottom brazed ceramic packages (i.e., configuration 2 of case outlines A, D, and F) may have electroless nickel undercoating which is 50 to 200 microinches (1.27 to 5.08 μ m) thick provided the lead finish is hot solder dip (i.e., finish letter A) and provided that, after any lead forming, an additional hot solder dip coating is applied which extends from the outer tip of the lead to no more than 0.015 inch (0.38 mm) from the package edge.

2/ For bottom or side brazed packages, case outlines X, Y, and Z only, the S_1 dimension may go to .000 inch (.00 mm) minimum.

2. APPLICABLE DOCUMENTS

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

2.2 Government documents.

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

DEPARTMENT OF DEFENSE SPECIFICATION

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.
MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

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

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Microcircuits furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.3 and 6.4).

3.2 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

3.3 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein. Although eutectic die bonding is preferred, epoxy die bonding may be performed. However, the resin used shall be Dupont 5504 Conductive Silver Paste, or equivalent, which is cured at $200^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for a minimum of 2 hours. The use of equivalent epoxies or cure cycles shall be approved by the qualifying activity. Equivalency shall be demonstrated in data submitted to the qualifying activity for verification.

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

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

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

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

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

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

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

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

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

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

3.7.1 Radiation hardness assurance identifier. The radiation hardness assurance identifier shall be in accordance with MIL-PRF-38535 and 4.5.4 herein.

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

4. VERIFICATION

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

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

- a. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.
- b. Delete the sequence specified as interim (pre-burn-in) electrical parameters through interim (post-burn-in) electrical parameters of table IA of MIL-PRF-38535 and substitute lines 1 through 7 of table II herein.
- c. Burn-in (method 1015 of MIL-STD-883).
 - (1) Unless otherwise specified in the manufacturers QM plan for static tests (test condition A), ambient temperature (T_A) shall be +125°C minimum. Test duration for each static test shall be 24 hours minimum for class S devices and in accordance with table I of method 1015 for class B devices.
 - i. For static burn-in I, all inputs shall be connected to 0.0 V.
 - ii. For static burn-in II, all inputs shall be connected to V_{DD} . $V_{DD} = 15$ V minimum and 18 V maximum.
 - iii. Except for V_{DD} and V_{SS} , the terminal shall be connected through resistors whose value is 2 k Ω to 47 k Ω . The actual measured value of the resistor selected shall not exceed $\pm 20\%$ of its branded value due to use, heat or age.
 - iv. Output may be open or connected to $V_{DD}/2$.
 - v. Terminals 2 and 14 shall each be connected to V_{DD} through separate 2 k Ω to 47 k Ω resistors. This requirement is only applicable to device type 04.
 - (2) Unless otherwise specified in the manufacturers QM plan for dynamic test (test condition D), ambient temperature shall be +125°C minimum. Test duration shall be in accordance with table I of method 1015.
 - i. Except for V_{DD} and V_{SS} , the terminals shall be connected through resistors whose value is 2 k Ω to 47 k Ω . The actual measured value of the resistor selected shall not exceed $\pm 20\%$ of its branded value due to use, heat or age.
 - ii. Input signal requirements: Square wave, 50% duty cycle; 25 kHz < PRR < 1 MHz; t_{TLH} and $t_{THL} < 1$ μ s. Voltage level: 0 to 15 V minimum to 18 V maximum peak.
 - iii. For device type 05, positive transition of F occurs at center of F/2.
- d. Interim and final electrical test parameters shall be as specified in table II.
- e. For class S devices, post dynamic burn-in, or class B devices, post static burn-in, electrical parameter measurements may, at the manufacturer's option, be performed separately or included in the final electrical parameter requirements.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $V_{SS} = 0\text{ V}$ $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Positive clamping input to V_{DD}	$V_{IC(POS)}$	$T_A = +25^{\circ}\text{C}$, $V_{DD} = \text{GND}$ $V_{SS} = \text{Open}$, Output = Open $I_{IN} = 1\text{ mA}$	All		1.5	V dc
Negative clamping input to V_{SS}	$V_{IC(NEG)}$	$T_A = +25^{\circ}\text{C}$, $V_{DD} = \text{GND}$ $V_{SS} = \text{GND}$, Output = Open $I_{IN} = -1\text{ mA}$	All		-6.0	V dc
Quiescent supply current	I_{SS} or I_{DD}	$V_{DD} = 18\text{ V dc}$ $V_{IN} = V_{SS}$ or V_{DD} All input combinations	All		-2.5	μA
High level output voltage	V_{OH1}	$V_{DD} = 15\text{ Vdc}$, see table III $ I_O \leq 1\text{ }\mu\text{A}$	All	14.95		V dc
Low level output voltage	V_{OL1}	$V_{DD} = 15\text{ Vdc}$, see table III $ I_O \leq 1\text{ }\mu\text{A}$	All		0.05	V dc
Three-state output leakage current	I_{OC1}	$V_{DD} = 18\text{ Vdc}$ $V_O = V_{SS}$	01		100	nA
	I_{OC2}	$V_{DD} = 18\text{ Vdc}$ $V_O = V_{DD}$	01		-100	nA
Input high voltage	V_{IH1}	$V_{DD} = 5\text{ V dc}$ see table III $ I_O \leq 1\text{ }\mu\text{A}$	All	3.5		V dc
	V_{IH2}	$V_{DD} = 10\text{ V dc}$ see table III $ I_O \leq 1\text{ }\mu\text{A}$	All	7.0		V dc
	V_{IH3}	$V_{DD} = 15\text{ V dc}$ see table III $ I_O \leq 1\text{ }\mu\text{A}$	All	11.0		V dc
Input low voltage	V_{IL1}	$V_{DD} = 5\text{ V dc}$ see table III $ I_O \leq 1\text{ }\mu\text{A}$	All		1.5	V dc
	V_{IL2}	$V_{DD} = 10\text{ V dc}$ see table III $ I_O \leq 1\text{ }\mu\text{A}$	All		3.0	V dc
	V_{IL3}	$V_{DD} = 15\text{ V dc}$ see table III $ I_O \leq 1\text{ }\mu\text{A}$	All		4.0	V dc
Output high (source) current	I_{OH1}	$V_{DD} = 5\text{ V dc}$ $V_{IN} = V_{DD}$ $V_{OH} = 4.6\text{ V dc}$	All	-0.36		mA dc
	I_{OH2}	$V_{DD} = 15\text{ V dc}$ $V_{IN} = V_{DD}$ $V_{OH} = 13.5\text{ V dc}$	All	-2.4		mA dc

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions $V_{SS} = 0\text{ V}$ $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Output low (sink) current	I_{OL1}	$V_{DD} = 5\text{ V dc}$ see table III $V_{OL} = 0.4\text{ V dc}$	All	0.36		mA dc
	I_{OL2}	$V_{DD} = 15\text{ V dc}$ see table III $V_{OL} = 1.5\text{ V dc}$	All	2.4		mA dc
Input leakage <u>1</u> / current, high	I_{IH}	$V_{DD} = 18\text{ V dc}$ Measure inputs sequentially Connect all unused inputs to V_{DD} or V_{SS}	01, 02, 03, 05		45	nA
			04		100	
Input leakage <u>1</u> / current, low	I_{IL}	$V_{DD} = 18\text{ V dc}$ Measure inputs sequentially Connect all unused inputs to V_{DD} or V_{SS}	01, 02, 03, 05		-45	nA
			04		-100	
Input capacitance	C_i	$V_{DD} = 0\text{ V dc}$, $f = 1\text{ MHz}$, $T_A = 25^{\circ}\text{C}$	02, 03, 04		7.5	pF
			01, 05		15	pF
Propagation delay times, CLOCK to output, high to low level and low to high level	t_{PHL1} , t_{PLH1}	$V_{DD} = 5\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (See figure 4)	01	30	840	ns
			02, 03, 04	25	700	
			05	15	420	
		$V_{DD} = 10\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ $T_A = +25^{\circ}\text{C}$ (See figure 4)	01,02, 04	13	250	ns
			03	10	200	
			05	5	110	
Propagation delay times, RESET, SET, or CLEAR to output, high to low level and low to high level	t_{PHL2} , t_{PLH2} <u>2</u> /	$V_{DD} = 5\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (See figure 4)	01	23	645	ns
			02, 03, 05	15	420	
			04	23	630	
		$V_{DD} = 10\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ $T_A = +25^{\circ}\text{C}$ (See figure 4)	01	10	200	ns
			02, 03	8	150	
			04	13	250	
			05	5	110	

1/ Input current of one input node.2/ Device types 01 and 05 do not have a t_{PLH2} test.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions $V_{SS} = 0\text{ V}$ $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Transition times, high to low level and low to high level	t_{THL} , t_{TLH}	$V_{DD} = 5\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (See figure 4) see table III for device type 04	All	10	280	ns
		$V_{DD} = 10\text{ V dc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ $T_A = +25^{\circ}\text{C}$, (See figure 4) see table III for device type 04	All	5	100	ns
Three-state output propagation delay times, output high to high impedance	t_{PHZ}	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	01	15	420	ns
output low to high impedance	t_{PLZ}					
high impedance to output low	t_{PZL}					
high impedance to output high	t_{PZH}					
Three-state output propagation output high to high impedance	t_{PHZ}	$V_{DD} = 10.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	01	8	150	ns
output low to high impedance	t_{PLZ}					
high impedance to output low	t_{PZL}					
high impedance to output high	t_{PZH}					
Minimum CLOCK transition times, high to low level and low to high level	$t_{r(\text{CLK})}$, $t_{f(\text{CLK})}$	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	01, 02, 03, 05		15	μs
Minimum data setup times, high to low level and low to high level	t_{SHL} , t_{SLH}	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	01		280	ns
			02, 03		560	
			05		120	
Minimum data hold times, high to low level and low to high level	t_{HHL} , t_{HLH}	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	05		85	ns
Minimum pulse width, RESET	$t_{P(R)}$	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	01		170	
			02, 03		280	
Minimum pulse width, SET	$t_{P(S)}$	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	02		280	
Minimum pulse width, CLOCK	$t_{P(\text{CLK})}$	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	01, 05		280	
			02, 03		200	
Minimum pulse width, CLEAR	$t_{P(\text{CLR})}$	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	05		280	
Minimum CLOCK frequency	f_{CLK}	$V_{DD} = 5.0\text{ Vdc}$, $C_L = 50\text{ pF}$ $R_L = 200\text{ k}\Omega$ (see figure 4)	01		1000	ns
			02, 03		1400	
			05		800	

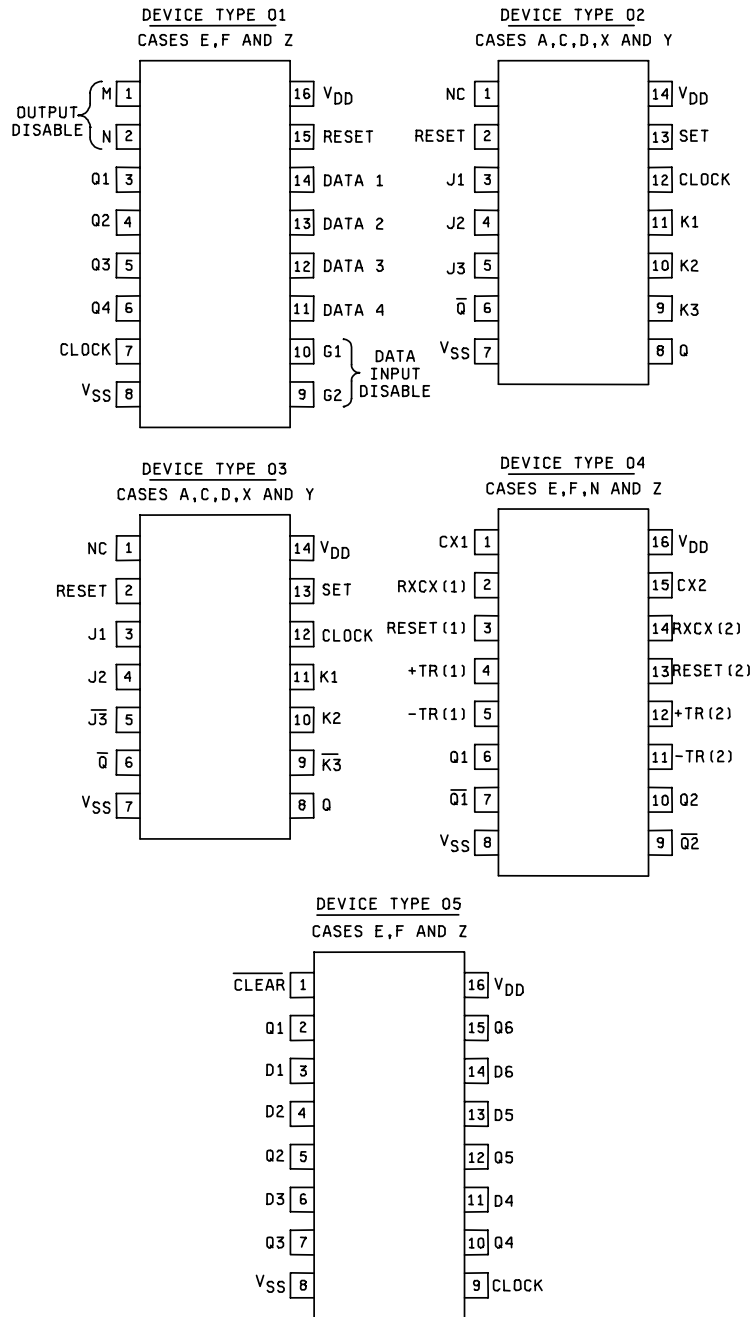


FIGURE 1. Terminal connections.

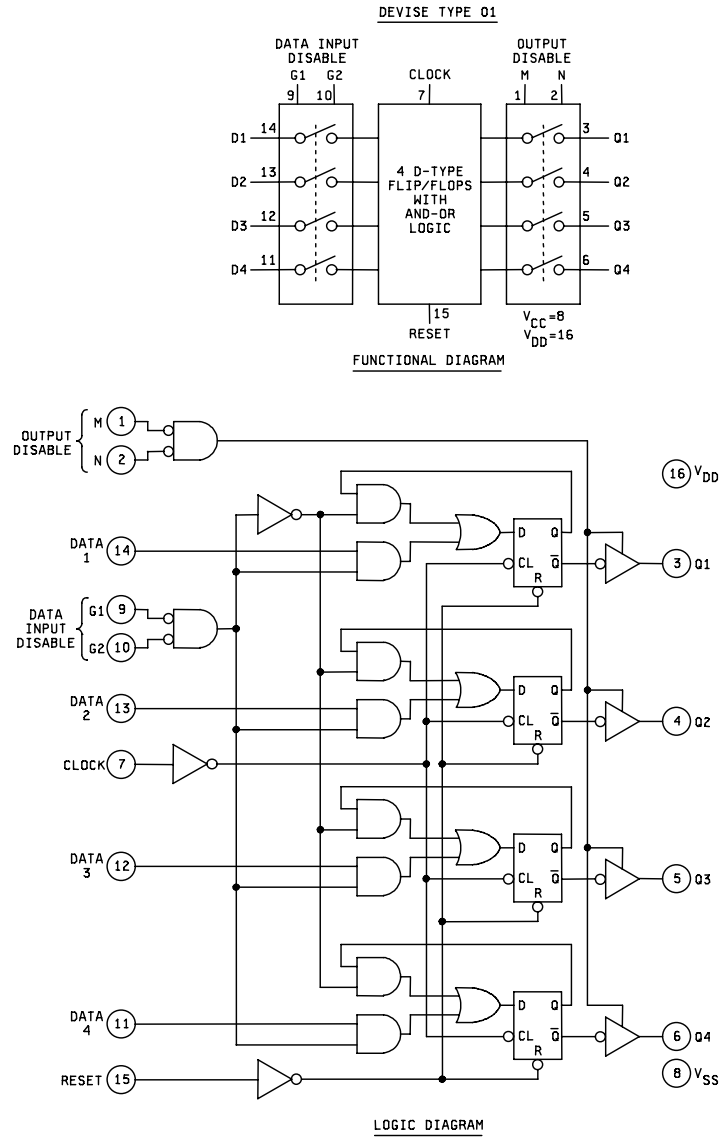
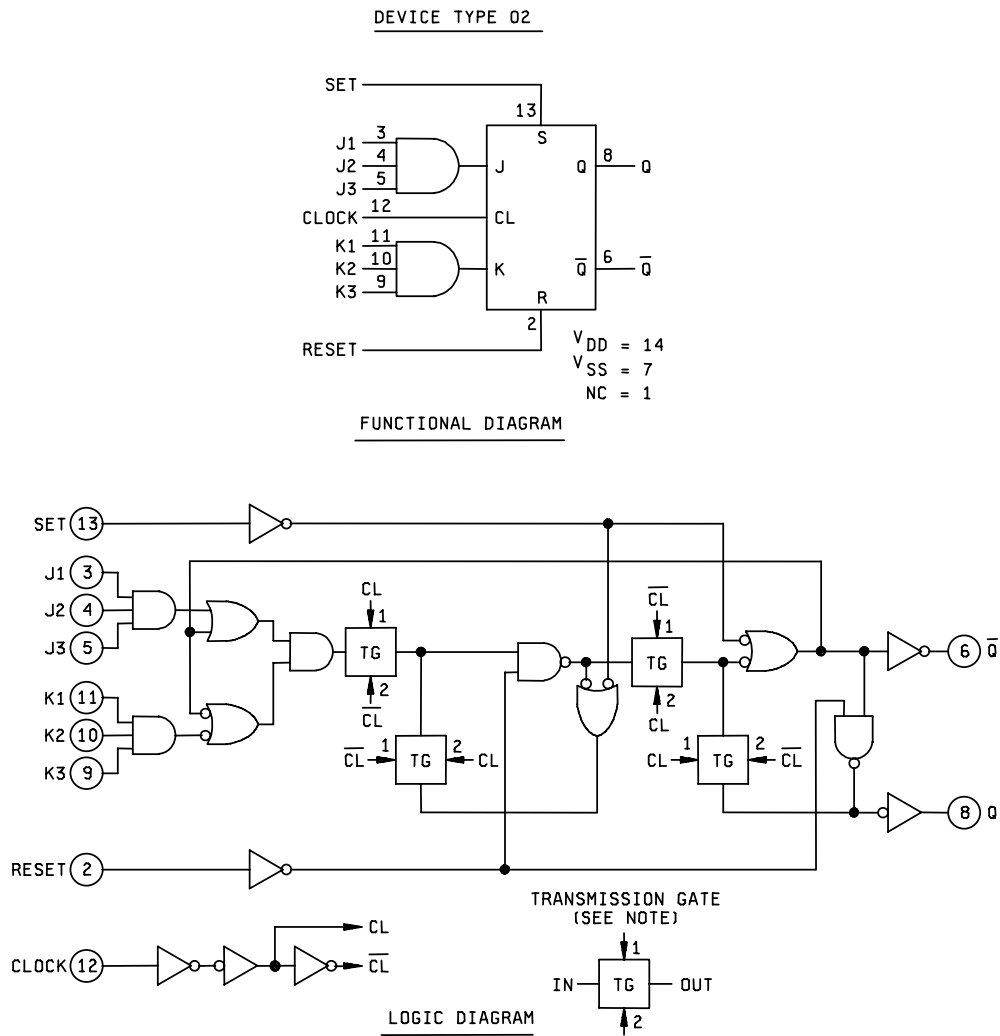


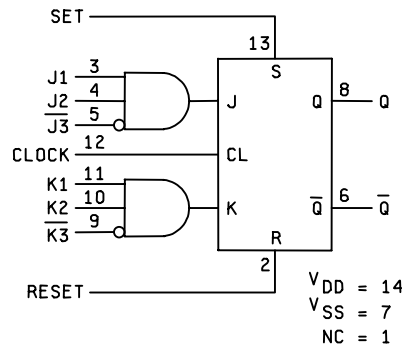
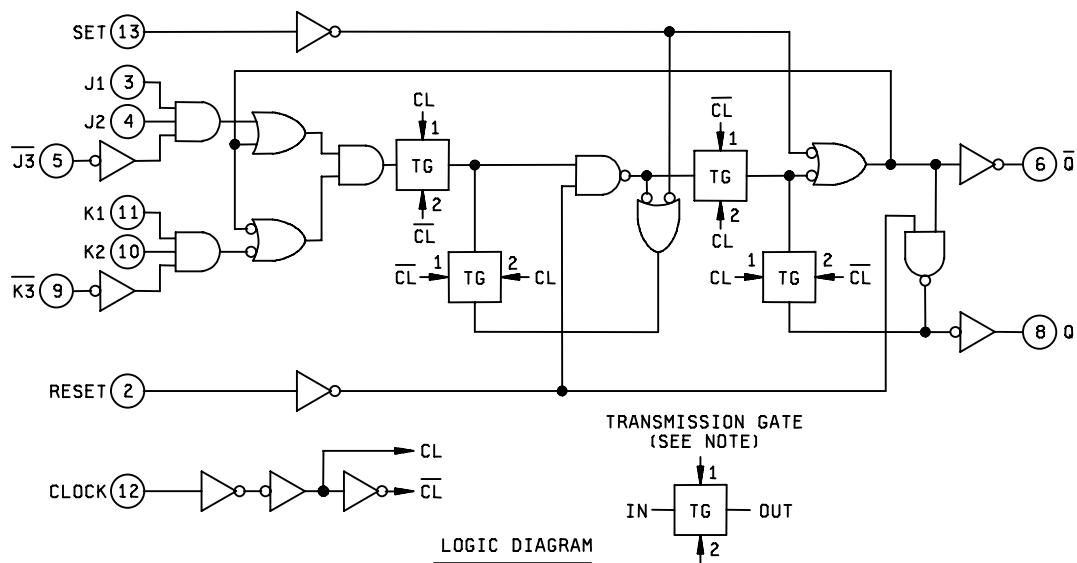
FIGURE 2. Logic diagrams.



NOTES: Input to output is:

- a. A bi-directional low impedance state exists when the control input 1 is low and the control input 2 is high.
- b. An open circuit state exists when the control input 1 is high and the control input 2 is low.

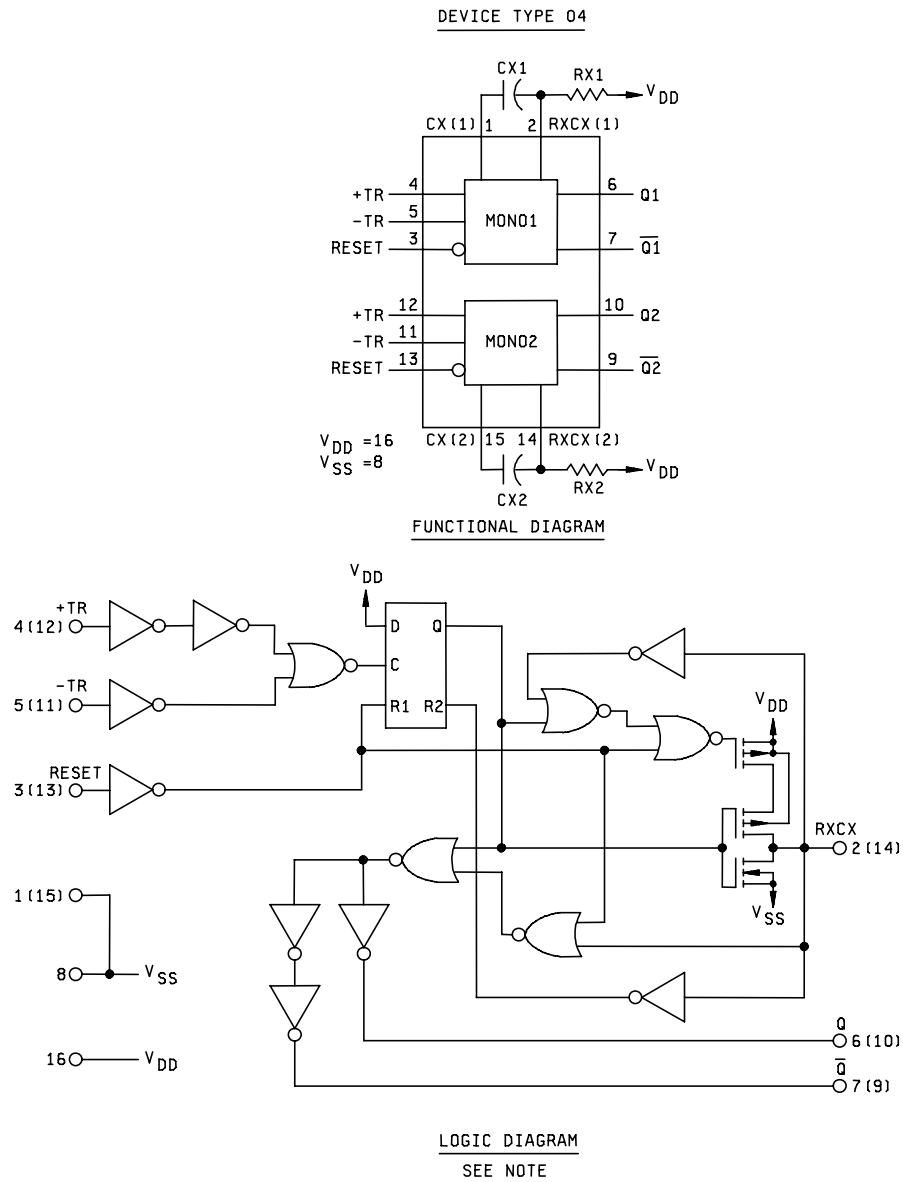
FIGURE 2. Logic diagrams – Continued.

DEVICE TYPE 03FUNCTIONAL DIAGRAM

NOTES: Input to output is:

- A bi-directional low impedance state exists when the control input 1 is low and the control input 2 is high.
- An open circuit state exists when the control input 1 is high and the control input 2 is low.

FIGURE 2. Logic diagrams – Continued.



NOTE: Schematic shown is 1/2 of the total package. Terminals 1, 8, and 15 are electrically connected internally.

FIGURE 2. Logic diagrams – Continued.

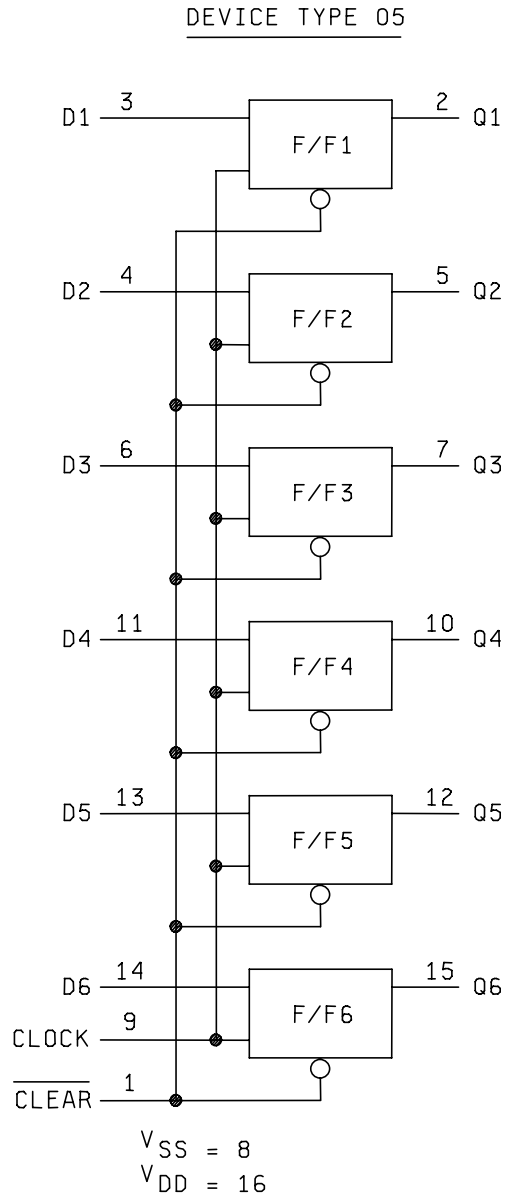


FIGURE 2. Logic diagrams – Continued.

Device type 01

Truth table						
RESE T	CLOC K	Data input disable		Data D	Output next state Q	
		G1	G2			
H	X	X	X	X	L	
L	L	X	X	X	Q	NC
L	↑	H	X	X	Q	NC
L	↑	X	H	X	Q	NC
L	↑	L	L	H	H	
L	↑	L	L	L	L	
L	H	X	X	X	Q	NC
L	↓	X	X	X	Q	NC

When either output disable M or N is high, the outputs are disabled (high impedance state); however sequential operation of the flip-flops is not affected.

H = High level voltage

L = Low level voltage

↑ = Low-to-high transition of the clock

↓ = High-to-low transition of the clock

X = Don't care

Device type 02 and 03Synchronous operation

(S = 0, R = 0)

Truth table			
Inputs before positive clock transition		Outputs after positive clock transition	
Inputs		Outputs	
J *	K *	Q	$\overline{Q}$
L	L	NC	NC
L	H	L	H
H	L	H	L
H	H	Toggles	

* Device type 02

Asynchronous operation

(J and K don't care)

Truth table			
Inputs		Outputs	
S	R	Q	$\overline{Q}$
L	L	NC	NC
L	H	L	H
H	L	H	L
H	H	L	L

For device type 02

$$J = J1 \bullet J2 \bullet J3$$

$$K = K1 \bullet K2 \bullet K3$$

For device type 03

$$J = J1 \bullet J2 \bullet \overline{J3}$$

$$K = K1 \bullet K2 \bullet \overline{K3}$$

H = high level voltage

L = Low level voltage

NC = No change

FIGURE 3. Truth tables.

Device type 04

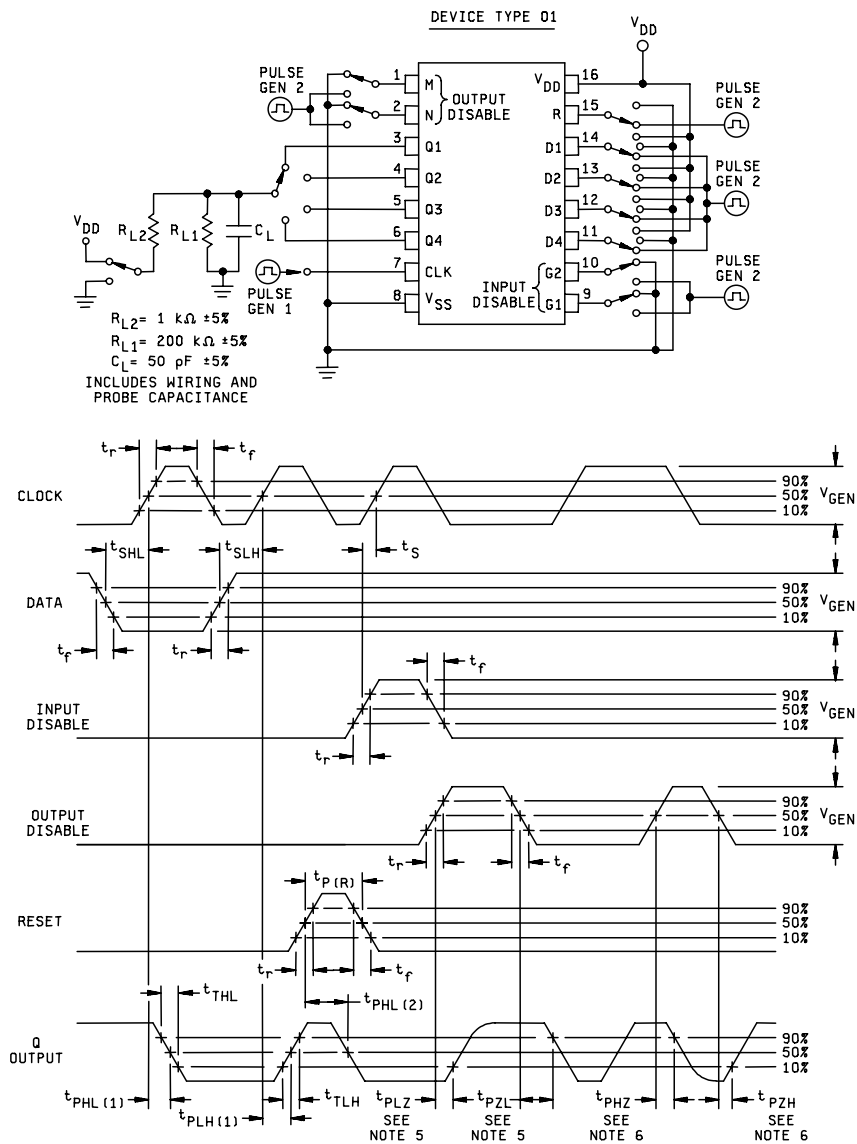
Truth table					
Inputs			Outputs		Rx-Cx
+Trigger	-Trigger	RESET	Q	$\overline{Q}$	
L	H	L	L	H	H
↑H	H	H	H	L	L
↓L	H	H	N/C	N/C	L
L	H	H	L	H	H
L	↓L	H	H	L	L
L	↑H	H	N/C	N/C	L

Device type 05

Truth table for 1 of 6 flip-flops			
Inputs			Output
CLOCK	Data	$\overline{\text{CLEAR}}$	Q
↑	L	H	L
↑	H	H	H
↓	X	H	N/C
X	X	L	L

H = High level voltage
 L = Low level voltage
 ↑ = Low-to-high transition of the clock
 ↓ = High-to-low transition of the clock
 X = Don't care
 N/C = No change

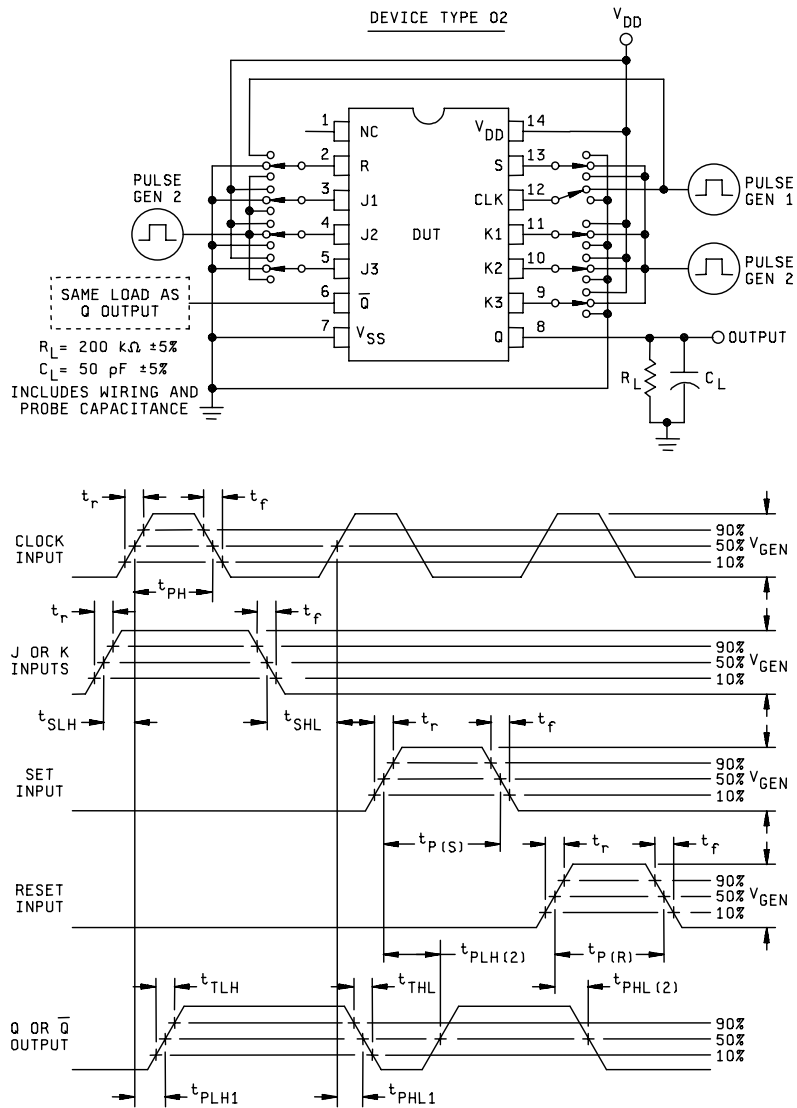
FIGURE 3. Truth tables – Continued.



NOTES:

- Pulse generator number 1 has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1\%$, $t_{PH} = 1.0 \pm 0.1 \mu s$, t_r and $t_f = 20 \pm 2 \text{ ns}$ and $PRR = 200 \text{ kHz}$.
- Pulse generators number 2 have the following characteristics:
 $V_{GEN} = V_{DD} \pm 1\%$, $t_{PH} = 1.0 \pm 0.1 \mu s$, t_r and $t_f = 20 \pm 2 \text{ ns}$ and $PRR = 100 \text{ kHz}$.
- Requirements for minimum clock frequency (f_{CL}), t_r , t_f , t_{SHL} , t_{SLH} , $t_{p(CL)}$, and $t_{p(R)}$ are established by setting the parameter to the limits given in table III and observing proper output state change.
- Complete terminal conditions are as specified in table III.
- For the t_{PLZ} and t_{PZL} measurements, the output is tied to V_{DD} through a $1 \text{ k}\Omega$ resistor.
- For the t_{PHZ} and t_{PZH} measurements, the output is tied to V_{SS} through a $1 \text{ k}\Omega$ resistor.

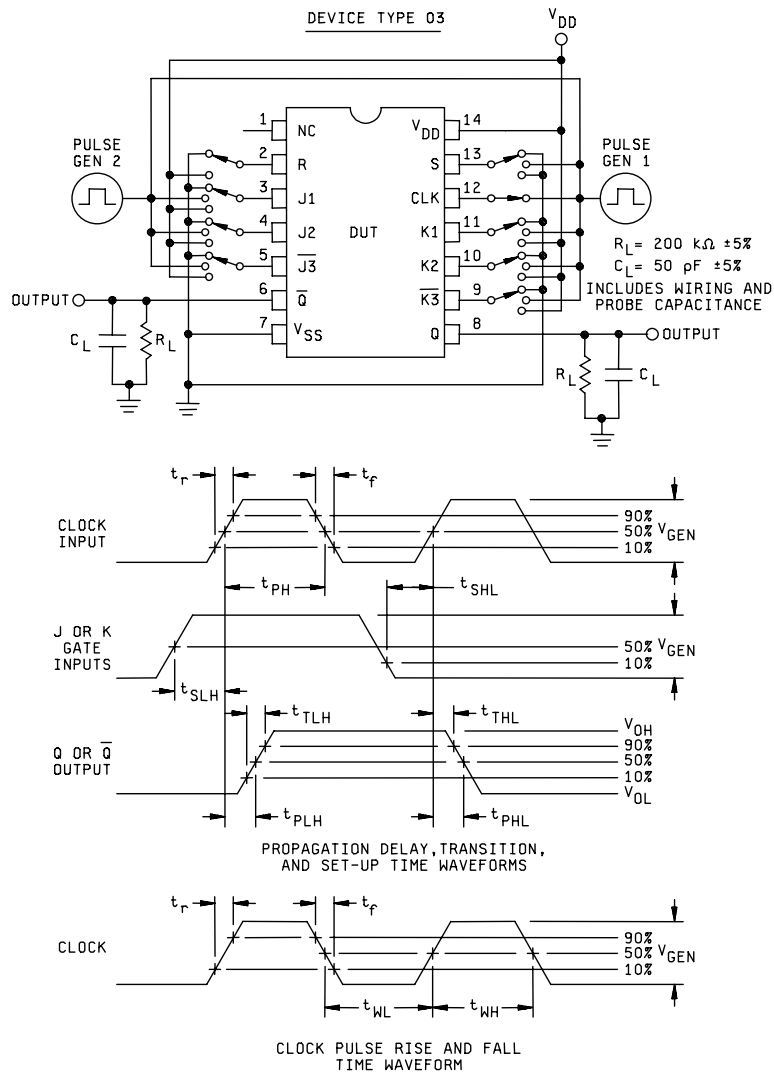
FIGURE 4. Switching waveforms and test circuit.



NOTES:

1. Pulse generator number 1 has the following characteristics:
 $V_{\text{GEN}} = V_{\text{DD}} \pm 1\%$, $t_{\text{PH}} = 1.0 \pm 0.1 \mu\text{s}$, t_r and $t_f = 20 \pm 2 \text{ ns}$ and $\text{PRR} = 200 \text{ kHz}$.
2. Pulse generators number 2 have the following characteristics:
 $V_{\text{GEN}} = V_{\text{DD}} \pm 1\%$, $t_{\text{PH}} = 1.0 \pm 0.1 \mu\text{s}$, t_r and $t_f = 20 \pm 2 \text{ ns}$ and $\text{PRR} = 100 \text{ kHz}$.
3. Requirements for minimum clock frequency (f_{CLK}), t_r , t_f , $t_{\text{p}(\text{CLK})}$, $t_{\text{p}(\text{R})}$, t_{SLH} , and t_{SHL} are established by setting the parameter to the limits given in table III and observing proper output state change.
4. Complete terminal conditions are as specified in table III.

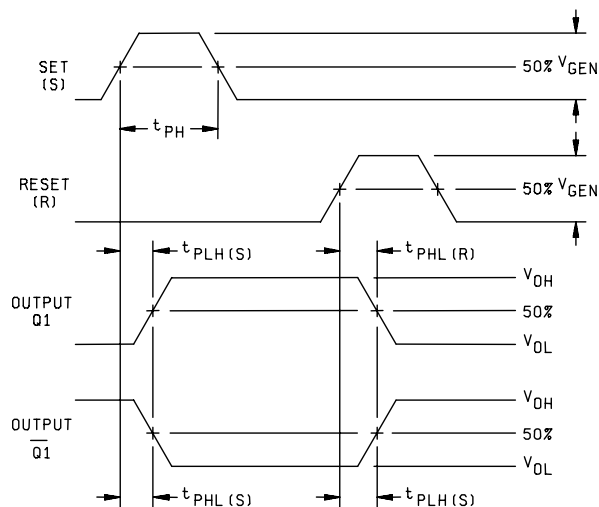
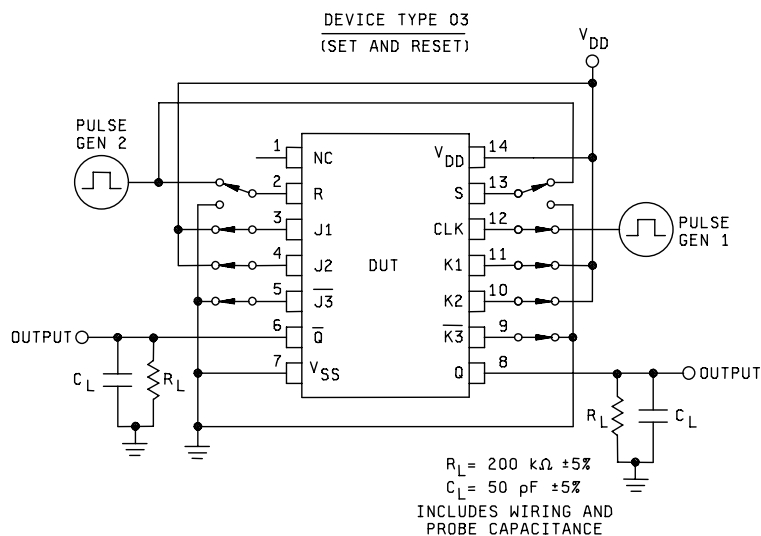
FIGURE 4. Switching waveforms and test circuit – Continued.



NOTES:

1. Pulse generator number 1 has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1\%$, $t_{PH} = 1.0 \pm 0.1 \mu s$, t_r and $t_f = 20 \pm 2 ns$, and $PRR = 200 kHz$.
2. Pulse generators number 2 have the following characteristics:
 $V_{GEN} = V_{DD} \pm 1\%$, $t_{PH} = 1.0 \pm 0.1 \mu s$, t_r and $t_f = 20 \pm 2 ns$ and $PRR = 100 kHz$.
3. Requirements for minimum clock frequency (f_{CLK}), t_r , t_f , $t_{p(CLK)}$, $t_{p(R)}$, t_{SLH} , and t_{SHL} are established by setting the parameter to the limits given in table III and observing proper output state change.
4. Complete terminal conditions are as specified in table III.

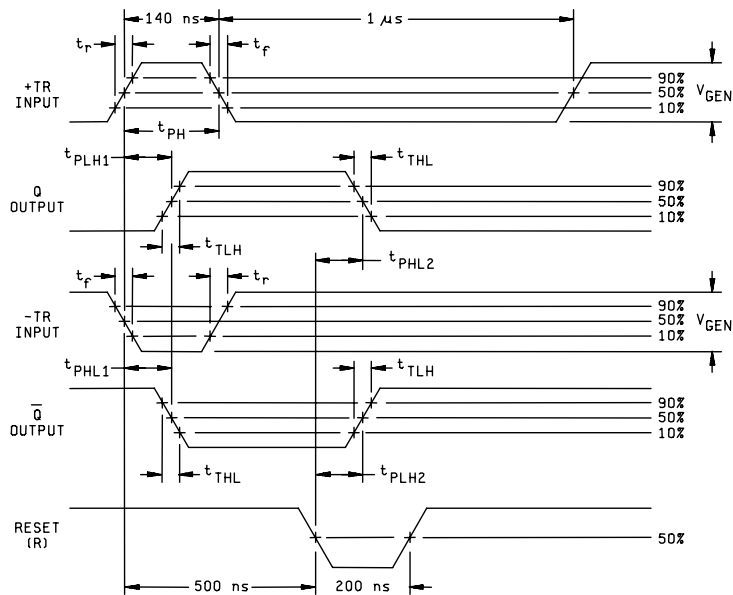
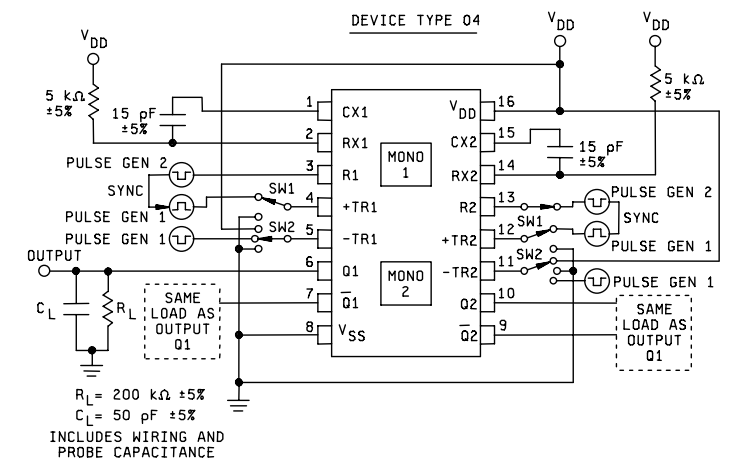
FIGURE 4. Switching waveforms and test circuit – Continued.



NOTES:

1. Pulse generator number 1 has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1.0\%$, $t_{PH} = 1.0 \pm 0.1 \mu s$, t_r and $t_f = 20 \pm 2 \text{ ns}$ and $PRR = 200 \text{ kHz}$.
2. Pulse generators number 2 have the following characteristics:
 $V_{GEN} = V_{DD} \pm 1.0\%$, $t_{PH} = 1.0 \pm 0.1 \mu s$, t_r and $t_f = 20 \pm 2 \text{ ns}$ and delayed $2.0 \mu s$ after pulse generator number 1.
3. Complete terminal conditions are as specified in table III.

FIGURE 4. Switching waveforms and test circuit – Continued.



NOTES:

- Pulse generator number 1 has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1.0\%$, t_{PH} as specified in +TR and -TR waveforms, t_r and $t_f = 20 \pm 2 \text{ ns}$ and $PRR = 877 \text{ kHz}$.
- Pulse generator number 2 has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1.0\%$, t_r and $t_f = 20 \pm 2 \text{ ns}$ and $PRR = 877 \text{ kHz}$.
- Identical switching measurements are obtained from mono 1 and mono 2.
- Complete terminal conditions are as specified in table III.

FIGURE 4. Switching waveforms and test circuit – Continued.



- FIGURE 4. Switching waveforms and test circuit – Continued.

TABLE II. Electrical test requirements.

Line no.	MIL-PRF-38535 test requirements	Class S device <u>1/</u>			Class B device <u>1/</u>		
		Ref. par.	Table III Subgroups <u>2/</u>	Table IV delta limits <u>3/</u>	Ref. par.	Table III subgroups <u>2/</u>	Table IV delta limits <u>3/</u>
1	Interim electrical parameters		1			1	
2	Static burn-in I (method 1015)	4.2c 4.5.2					
3	Same as line 1		1	Δ			
4	Static burn-in II (method 1015)	4.2c 4.5.2			4.2c 4.5.2	<u>4/</u>	
5	Same as line 1	4.2e	1*	Δ	4.2e	1*	Δ
6	Dynamic burn-in (method 1015)	4.2c 4.5.2					
7	Same as line 1	4.2e	1*	Δ			
8	Final electrical parameters (method 5004)		1*, 2, 3, 7, 9			1*, 2, 3, 7, 9, 10, 11	
9	Group A test requirements (method 5005)	4.4.1	1, 2, 3, 4, 7, 8, 9, 10, 11, 12		4.4.1	1, 2, 3, 4, 7, 9	
10	Group B test when using method 5005 QCI option	4.4.2	1, 2, 3, 9, 10, 11	Δ			
11	Group C end-point electrical parameters (method 5005)				4.4.3	1, 2, 3	Δ
12	Group D end-point electrical parameters (method 5005)	4.4.4	1, 2, 3		4.4.4	1, 2, 3	

1/ Blank spaces indicate tests are not applicable.

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

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

4/ The device manufacturer may at his option either perform delta measurements or within 24 hours after burn-in (or removal of bias) perform the final electrical parameter measurements.

4.2.1 Percent defective allowable (PDA).

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

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.

4.4 Technology Conformance inspection (TCI). Technology conformance inspection shall be in accordance with MIL-PRF-38535 and herein for groups A, B, C, 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 III of MIL-PRF-38535 and as follows:

- a. Tests shall be performed in accordance with table II herein.
- b. Subgroups 5 and 6 shall be omitted.
- c. Subgroup 4 (C_i measurement) shall be measured only for initial qualification and after process or design changes that may affect input capacitance. Capacitance shall be measured between the designated terminal and V_{SS} at a frequency of 1 MHz.
- d. Subgroup 12 shall be added to group A inspection requirements for class S devices using sample size series of 15 (acceptance 0) and consist of the procedures, test conditions, and limits specified in table III.
- e. Subgroups 9 and 11 shall be measured only for initial qualification and after process or design changes which may affect dynamic performance.

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

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

- a. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 1 of group C inspection and shall consist of tests specified in table IV herein.
- b. The steady-state life test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 method	Cases E,F,Z Symbol Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1		Subgroup 2		Subgroup 3			
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C			
																					Min	Max	Min	Max	Min		Max
V _{IC} (pos)	1	2	1 mA	1 mA														GND	M		1.5					Vdc	
"		3																"	N		"					"	
"		4								1 mA								"	CLK		"					"	
"		5									1 mA							"	G1		"					"	
"		6										1 mA						"	G2		"					"	
"		7											1 mA					"	D4		"					"	
"		8												1 mA				"	D3		"					"	
"		9													1 mA			"	D2		"					"	
"		10														1 mA		"	D1		"					"	
"																	1 mA	"	R		"					"	
V _{IC} (neg)	11	12	-1 mA	-1 mA																						"	
"		13																								"	
"		14																								"	
"		15																								"	
"		16																								"	
"		17																								"	
"		18																								"	
"		19																								"	
"		20																								"	
"																										"	
V _{OH1}	3006	21	GND	GND																							
"		22	"	"																							
"		23	"	"																							
"		24	"	"																							
V _{OL1}	3007	25	"	"																							
"		26	"	"																							
"		27	"	"																							
"		28	"	"																							
I _{SS} 2/	3005	29	"	"																							
"		30	"	"																							
"		31	"	"																							
"		32	18.0V	18.0V																							
"	3005	33	18.0V	18.0V																							
"																											
"																											
"																											
I _{OC11}		34	GND	18.0V	18.0V	18.0V	18.0V	18.0V	"	"	"	"	"	"	"	"	"	"	"	All outputs together		100					nA
I _{OC21}			18.0V	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	All outputs together		-100					"

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See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1		Subgroup 2		Subgroup 3		
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C		
Test no.																				Min	Max	Min	Max	Min	Max	
I _{OC12}	36	37	GND	18.0V	18.0V	18.0V				18.0V	GND	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	Q1							nA
		38					18.0V												Q2							
		39						18.0V											Q3	25		90		25		
									18.0V										Q4							
I _{OC22}	40	41	18.0V	GND	GND	GND													Q1							
		42					GND												Q2							
		43						GND											Q3	-25		-90		-25		
									GND										Q4							
V _{IH1}	44	45	1.5V	1.5V					1.4/		1.5V	1.5V	3.5V	1.5V	1.5V	1.5V	1.5V	5.0V	Q4	4.5		4.5		4.5		Vdc
		46												3.5V	1.5V	1.5V			Q3							
		47													3.5V	1.5V	1.5V		Q2							
		48														3.5V			Q1							
		49									3.5V		1.5V						Q4							
		50												1.5V					Q3							
		51													1.5V				Q2							
		52														1.5V			Q1							
		53									1.5V	3.5V							Q4							
		54																	Q3							
		55																	Q2							
		56															1.5V		Q1							
		57										1.5V	3.5V	3.5V	3.5V	3.5V	3.5V		Q4		0.5		0.5		0.5	
		58																	Q3							
		59																	Q2							
																			Q1							

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z Symbol Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1		Subgroup 2		Subgroup 3			
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C			
																					Min	Max	Min	Max	Min		Max
V _{IL1}		60	1.5V	1.5V					14/	GND	1.5V	1.5V	3.5V	3.5V	3.5V	3.5V	1.5V	5.0V	Q4	4.5		4.5		4.5		V _{dc}	
		61																	Q3								
		62																	Q2								
		63																	Q1								
		64											1.5V						Q4		0.5		0.5		0.5		
		65												1.5V					Q3								
		66												1.5V	1.5V				Q2								
		67												1.5V	1.5V	1.5V			Q1								
		68											3.5V	3.5V	3.5V	3.5V			Q4	4.5		4.5		4.5			
		69																	Q3								
		70																	Q2								
		71																	Q1								
		72																	Q4								
		73																	Q3								
		74																	Q2								
		75																	Q1								
		76											1.5V						Q4		0.5		0.5		0.5		
		77											3.5V	1.5V					Q3								
		78											3.5V	3.5V	1.5V				Q2								
		79											3.5V	3.5V	3.5V	1.5V			Q1								
V _{IH2}		80	3.0V	3.0V					15/		3.0V	3.0V	7.0V	3.0V	3.0V	3.0V	3.0V	10.0V	Q4	9.0		9.0		9.0			
		81												7.0V	3.0V	3.0V			Q3								
		82													7.0V	3.0V			Q2								
		83														7.0V			Q1								
		84									7.0V		3.0V						Q4								
		85												3.0V					Q3								
		86													3.0V				Q2								
		87														3.0V			Q1								
		88									3.0V	7.0V							Q4								
		89																	Q3								
		90																	Q2								
		91																	Q1								
		92											3.0V	7.0V	7.0V	7.0V	7.0V	7.0V		Q4		1.0		1.0		1.0	
		93																	Q3								
		94																	Q2								
		95																	Q1								

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Unit		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1 T _A = 25°C	Subgroup 2 T _A = 125°C	Subgroup 3 T _A = -55°C						
		M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}	Min		Max	Min	Max	Min	Max				
		Test no.																										
V _{IL2}	96	97	3.0V	3.0V					15/	GND	3.0V	3.0V	3.0V	7.0V	7.0V	7.0V	3.0V	10.0V	Q4	9.0	1.0	9.0	1.0	9.0	1.0	Vdc		
98													3.0V						Q3									
99														3.0V					Q2									
100															3.0V				Q1									
101													7.0V	7.0V						Q4	9.0	1.0	9.0	1.0	9.0	1.0		
102														7.0V						Q3								
103															7.0V					Q2								
104																7.0V				Q1								
105													3.0V	3.0V							Q4	9.0	1.0	9.0	1.0	9.0	1.0	
106														3.0V	3.0V						Q3							
107														3.0V	3.0V	3.0V					Q2							
108														3.0V	3.0V	3.0V	3.0V				Q1							
109														7.0V	7.0V	7.0V	7.0V				Q4	9.0	1.0	9.0	1.0	9.0	1.0	
110																					Q3							
111																					Q2							
112																					Q1							
113																						Q4	9.0	1.0	9.0	1.0	9.0	1.0
114																						Q3						
115																						Q2						
116																						Q1						
117																						Q4	9.0	1.0	9.0	1.0	9.0	1.0
118																						Q3						
119																						Q2						
																						Q1						

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1		Subgroup 2		Subgroup 3			
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C			
			Test no.																		Min	Max	Min	Max	Min		Max
V _{IH3}		120	4.0V	4.0V					16/	GND	4.0V	4.0V	11.0V	4.0V	4.0V	4.0V	4.0V	4.0V	15.0V	Q4	13.5		13.5		13.5		Vdc
		121												11.0V	4.0V	4.0V				Q3							
		122													11.0V	4.0V				Q2							
		123														11.0V				Q1							
		124									11.0V		4.0V							Q4							
		125												4.0V						Q3							
		126													4.0V					Q2							
		127														4.0V				Q1							
		128									4.0V	11.0V								Q4							
		129																		Q3							
		130																		Q2							
		131																		Q1							
		132											4.0V	11.0V	11.0V	11.0V	11.0V	11.0V		Q4		1.5		1.5		1.5	
		133																		Q3							
		134																		Q2							
135																		Q1									
V _{IL3}	136	137											4.0V	4.0V	4.0V	4.0V	4.0V		Q4								
		138																		Q3							
		139																		Q2							
		140																		Q1							
		141												11.0V						Q4	13.5		13.5		13.5		
		142													11.0V					Q3							
		143														11.0V				Q2							
		144															11.0V			Q1							
		145											4.0V							Q4		1.5		1.5		1.5	
		146													4.0V	4.0V				Q3							
		147													4.0V	4.0V	4.0V			Q2							
		148													4.0V	4.0V	4.0V			Q1							
		149											11.0V	11.0V	11.0V	11.0V				Q4	13.5		13.5		13.5		
		150																		Q3							
		151																		Q2							
		152																		Q1							
		153																		Q4							
		154																		Q3							
		155																		Q2							
		156																		Q1							
		157																		Q4							
		158																		Q3							
		159																		Q2							
																				Q1							

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1		Subgroup 2		Subgroup 3			
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C			
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		Min	Max	Min	Max	Min	Max		
I _{IH1} 3/	3010	160	18.0V	18.0V					18.0V	GND	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	All outputs together		10						nA
I _{IH2}	"	161	18.0V	GND					GND	"	GND	GND	GND	GND	GND	GND	GND	"	M	1	"	45	"		"		
"	"	162	GND	18.0V					GND	"	GND	"	"	"	"	"	"	"	N								
"	"	163	"	GND					18.0V	"	GND	"	"	"	"	"	"	"	CLK								
"	"	164	"	"					GND	"	18.0V	"	"	"	"	"	"	"	G1								
"	"	165	"	"					"	"	GND	18.0V	"	"	"	"	"	"	G2								
"	"	166	"	"					"	"	"	GND	18.0V	"	"	"	"	"	D4								
"	"	167	"	"					"	"	"	"	GND	18.0V	"	"	"	"	D3								
"	"	168	"	"					"	"	"	"	"	GND	18.0V	"	"	"	D2								
"	"	169	"	"					"	"	"	"	"	"	GND	18.0V	"	"	D1								
"	"	170	"	"					"	"	"	"	"	"	GND	GND	18.0V	"	R								
I _{IL1} 3/	3009	171	"	"					"	"	"	"	"	"	GND	GND	GND	"	All outputs together		-10					"	
I _{IL2}	"	172	"	18.0V					18.0V	"	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	"	M	-1	"	-45	"		"		
"	"	173	18.0V	GND					18.0V	"	18.0V	"	"	"	"	"	"	"	N								
"	"	174	"	18.0V					GND	"	18.0V	"	"	"	"	"	"	"	CLK								
"	"	175	"	"					18.0V	"	GND	"	"	"	"	"	"	"	G1								
"	"	176	"	"					"	"	18.0V	GND	"	"	"	"	"	"	G2								
"	"	177	"	"					"	"	"	18.0V	GND	"	"	"	"	"	D4								
"	"	178	"	"					"	"	"	"	18.0V	GND	"	"	"	"	D3								
"	"	179	"	"					"	"	"	"	"	18.0V	GND	"	"	"	D2								
"	"	180	"	"					"	"	"	"	"	18.0V	18.0V	GND	"	"	D1								
"	"	181	"	"					"	"	"	"	"	18.0V	18.0V	18.0V	GND	"	R								

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test circuit						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 1		Subgroup 2		Subgroup 3			
			Symbol	M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R		V _{DD}	T _A = 25°C		T _A = 125°C		T _A = -55°C		
			Test no.																			Min	Max	Min	Max		Min
I _{OL1}	182	183	GND	GND	0.4V	0.4V	0.4V	GND	GND	GND	GND	GND	GND	GND	GND	5.0V	5.0V	Q1	0.51		0.36		0.64	mA			
184																		Q2									
185																			Q3								
																			Q4								
I _{OL2}	186	187			1.5V	1.5V	1.5V									15.0V	15.0V	Q1	3.4		2.4		4.2				
188																		Q2									
189																			Q3								
																			Q4								
I _{OH1}	190	191			4.6V	4.6V	4.6V	17/					5.0V	5.0V	5.0V	5.0V	GND	5.0V	Q1	-0.51		-0.36		-0.64			
192																			Q2								
193																				Q3							
																				Q4							
I _{OH2}	194	195			13.5V	13.5V	13.5V	13/					15.0V	15.0V	15.0V	15.0V		15.0V	Q1	-3.4		-2.4		-4.2			
196																				Q2							
197																						Q3					
																						Q4					
																			Subgroup 4								
																			T _A = 25°C								
																			Min	Max							
C _i	3012	198	6/	6/					GND								GND	M		15.0	pF						
		199						6/										N									
		200								6/								CLK									
		201									6/							G1									
		202																G2									
		203										6/						D4		7.5							
		204											6/					D3									
		205												6/				D2									
		206													6/			D1									
		207														6/		R		15.0							

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z Symbol Test no.	Terminal conditions 1/																Measured terminal	Test limits				Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 7 T _A = 25°C		Subgroup 8		
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		Min	Max	T _A = 125°C	T _A = -55°C	
Truth table test	3014	208	GND	GND	L	L	L	L	GND	GND	GND	GND	5.0V	5.0V	5.0V	5.0V	5.0V	5.0V	All outputs	See 4/ 5/				
	"	209	"	"	L	L	L	L	GND	"	GND	"	5.0V	5.0V	5.0V	5.0V	GND	"						
	"	210	"	"	H	H	H	H	5.0V	"	GND	"	5.0V	5.0V	5.0V	5.0V	"	"						
	"	211	"	"	"	"	"	"	GND	"	5.0V	"	GND	GND	GND	GND	"	"						
	"	212	"	"	"	"	"	"	5.0V	"	5.0V	"	"	"	"	"	"	"						
	"	213	"	"	"	"	"	"	GND	"	GND	5.0V	"	"	"	"	"	"						
	"	214	"	"	"	"	"	"	5.0V	"	GND	"	"	"	"	"	"	"						
	"	215	"	"	"	"	"	"	GND	"	5.0V	"	"	"	"	"	"	"						
	"	216	"	"	"	"	"	"	5.0V	"	5.0V	"	"	"	"	"	"	"						
	"	217	"	"	"	"	"	"	GND	"	GND	GND	"	"	"	"	"	"						
	"	218	"	"	L	L	L	L	5.0V	"	"	"	"	"	"	"	"	"						
	"	219	"	"	"	"	"	"	GND	"	"	"	"	"	"	"	"	"						
	"	220	"	"	"	"	"	"	GND	"	"	"	5.0V	5.0V	5.0V	5.0V	5.0V	"						
	"	221	"	"	"	"	"	"	5.0V	"	"	"	"	"	"	"	5.0V	"						
	"	222	"	"	"	"	"	"	GND	"	5.0V	5.0V	"	"	"	"	GND	"						
	"	223	"	"	"	"	"	"	5.0V	"	5.0V	5.0V	"	"	"	"	"	"						
	"	224	"	"	"	"	"	"	GND	"	GND	GND	"	"	"	"	"	"						
	"	225	"	"	H	H	H	H	5.0V	"	"	"	"	"	"	"	"	"						
	"	226	"	"	L	L	L	L	GND	"	"	"	"	"	"	"	5.0V	"						
	"	227	"	"	"	L	"	L	GND	"	"	"	"	GND	"	GND	GND	"						
	"	228	"	"	"	H	"	H	5.0V	"	"	"	"	GND	GND	GND	"	"						
	"	229	"	"	"	H	"	H	GND	"	"	"	GND	5.0V	GND	5.0V	"	"						
	"	230	"	"	H	L	H	L	5.0V	"	"	"	GND	5.0V	GND	5.0V	"	"						

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z Symbol Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11		
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C		
																					Min	Max	Min	Max	Min	
t _{PHL1}	3003 Fig. 4	231 232 233 234	GND	GND	OUT	OUT	OUT		IN1	GND	GND	GND	GND	GND	IN2	GND	GND	5.0V	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4	30	600	42	840	30	600	ns
t _{PLH1}		235 236 237 238			OUT	OUT	OUT						GND	GND	IN2	GND	GND		CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4							
t _{PHL2}		239 240 241 242			OUT	OUT	OUT						5.0V	5.0V	5.0V	5.0V	IN2		R to Q1 R to Q2 R to Q3 R to Q4	23	460	33	645	23	460	
t _{THL}	3004 Fig. 4	243 244 245 246			OUT	OUT	OUT								IN2	5.0V	GND		Q1 Q2 Q3 Q4	10	200	14	280	10	200	μs
t _{TLH}		247 248 249 250			OUT	OUT	OUT						5.0V	5.0V	5.0V	IN2			Q1 Q2 Q3 Q4							
t _{PHZ}	Fig. 4	251 252 253 254 255 256 257 258	IN2		OUT	OUT	OUT						5.0V						M to Q1 M to Q2 M to Q3 M to Q4 N to Q1 N to Q2 N to Q3 N to Q4	15	300	21	420	15	300	ns
t _{PLZ}	8/	259 260 261 262 263 264 265 266	IN2	GND	OUT	OUT	OUT						GND	GND	GND	GND			M to Q1 M to Q2 M to Q3 M to Q4 N to Q1 N to Q2 N to Q3 N to Q4							
t _{PZH}	7/	267 268 269 270	IN2	GND	OUT	OUT	OUT						5.0V	5.0V	5.0V	5.0V			M to Q1 M to Q2 M to Q3 M to Q4							

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 9		Subgroup 10		Subgroup 11			
			Symbol	M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R		V _{DD}	T _A = 25°C		T _A = 125°C		T _A = -55°C		
			Test no.																		Min	Max	Min	Max	Min		Max
t _{PZL} 8/	Fig. 4	271 272 273 274	GND	IN2	OUT				IN1	GND	GND	GND	GND	GND	GND	GND	GND	5.0V	N to Q1 N to Q2 N to Q3 N to Q4	15	300	21	420	15	300	ns	
t _r (CLK) 11/		275 276 277 278		GND	OUT								IN2	IN2	IN2	IN2			CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4		15			15		μs	
t _f (CLK) 11/		279 280 281 282			OUT														CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4								
t _{P(R)} 10/		283 284 285 286			OUT								5.0V	5.0V	5.0V	5.0V	IN2		R to Q1 R to Q2 R to Q3 R to Q4		120			120		ns	
t _{SHL}		287 288 289 290	GND	GND	OUT				IN1	GND	GND	GND	5.0V	5.0V	5.0V	IN2	IN2	5.0V	CLK to D1 CLK to D2 CLK to D3 CLK to D4		200			200		ns	
t _{SHL1}		291 292 293 294			OUT								5.0V	5.0V	5.0V	IN2	5.0V		D1 to CLK D2 to CLK D3 to CLK D4 to CLK								
f _{CLK} 9/		295 296 297 298			OUT								5.0V						CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4		670			670			
t _p (CLK) 10/		299 300 301 302			OUT														CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4		200			200			

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z Symbol Test no.	Terminal conditions 1/																Measured terminal	Test limits						Unit
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 12 T _A = 25°C						
			M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		Min	Max					
t _{PHL1}	3003 Fig. 4	303 304 305 306	GND GND GND GND	GND GND GND GND	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	IN1 GND GND IN2	GND GND GND GND	GND GND GND GND	GND GND GND GND	GND GND GND GND	IN2 IN2 GND GND	GND GND GND GND	GND GND GND GND	10.0 V GND GND	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4	13 250 GND GND	250 GND GND GND					ns	
t _{PLH1}		307 308 309 310	GND GND GND GND	GND GND GND GND	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	GND GND GND IN2	GND GND GND GND	GND GND GND GND	GND GND GND GND	GND GND GND GND	IN2 IN2 GND GND	GND GND GND GND	GND GND GND GND	GND GND GND GND	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4	GND GND GND GND	GND GND GND GND						
t _{PHL2}		311 312 313 314	GND GND GND GND	GND GND GND GND	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	GND GND GND GND	GND GND GND GND	GND GND GND GND	GND GND GND GND	GND GND GND GND	10.0V 10.0V 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V	R to Q1 R to Q2 R to Q3 R to Q4	10 GND GND GND	200 GND GND GND						
t _{THL}	3004 Fig. 4	315 316 317 318	GND GND GND GND	GND GND GND GND	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	GND GND GND IN2	GND GND GND 10.0V	GND GND GND 10.0V	GND GND GND 10.0V	GND GND GND 10.0V	IN2 IN2 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V	GND GND GND GND	Q1 Q2 Q3 Q4	5 GND GND GND	100 GND GND GND						
t _{TLH}		319 320 321 322	GND GND GND GND	GND GND GND GND	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	OUT OUT OUT OUT	GND GND GND IN2	GND GND GND 10.0V	GND GND GND 10.0V	GND GND GND 10.0V	GND GND GND 10.0V	IN2 IN2 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V	GND GND GND GND	Q1 Q2 Q3 Q4	GND GND GND GND	GND GND GND GND						
t _{PHZ} 7/	Fig. 4	323 324 325 326 327 328 329 330	IN2 IN2 IN2 IN2 GND GND GND GND	GND GND GND GND IN2 IN2 IN2 IN2	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	10.0V 10.0V 10.0V 10.0V 10.0V 10.0V 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V 10.0V 10.0V 10.0V 10.0V	10.0V 10.0V 10.0V 10.0V 10.0V 10.0V 10.0V 10.0V	GND GND GND GND GND GND GND GND	M to Q1 M to Q2 M to Q3 M to Q4 N to Q1 N to Q2 N to Q3 N to Q4	8 GND GND GND GND GND GND GND	150 GND GND GND GND GND GND GND						
t _{PLZ} 8/		331 332 333 334 335 336 337 338	IN2 IN2 IN2 IN2 GND GND GND GND	GND GND GND GND IN2 IN2 IN2 IN2	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	OUT OUT OUT OUT OUT OUT OUT OUT	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND	M to Q1 M to Q2 M to Q3 M to Q4 N to Q1 N to Q2 N to Q3 N to Q4	GND GND GND GND GND GND GND GND	GND GND GND GND GND GND GND GND						

See footnotes at end of device type 01.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits				Unit	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgroup 12					
		Symbol	M	N	Q1	Q2	Q3	Q4	CLK	V _{SS}	G1	G2	D4	D3	D2	D1	R	V _{DD}		T _A = 25°C					
		Test no.																		Min	Max				
t _{PZH} 7/	Fig. 4	339	IN2	GND	OUT				IN1	GND	GND	GND	10.0V	10.0V	10.0V	10.0V	GND	10.0V	M to Q1	8	150				ns
		340				OUT													M to Q2						
		341					OUT												M to Q3						
		342						OUT											M to Q4						
t _{PZL} 8/		343	GND	IN2	OUT								GND	GND	GND	GND			N to Q1						
		344				OUT													N to Q2						
		345					OUT												N to Q3						
		346						OUT											N to Q4						

1/ Pins not designated may be "high" level logic, "low" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open, I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.

4/ The truth table tests shall be performed in sequence.

5/ The truth table tests shall be performed at V_{IH} and V_{DD} ≤ 5 Vdc and ≥ 18 Vdc. "L" = V_{SS} + 0.5 V maximum and "H" = V_{DD} – 0.5 V minimum.

6/ See 4.4.1c.

7/ Pins 3, 4, 5, and 6 tied to V_{SS} through 1 kΩ resistors.

8/ Pins 3, 4, 5, and 6 tied to V_{DD} through 1 kΩ resistors.

9/ The minimum clock frequency (f_{CLK}) requirement is considered met if proper output state changes occur with the pulse repetition period set to that given in the limits column.

10/ The minimum clock or reset pulse width (t_{p(CLK)}, t_{p(R)}) requirement is considered met if proper output state changes occur with the pulse width set to that given in the limits column.

11/ Pulse repetition period = 100 μs, 50 percent duty cycle. The maximum clock rise or fall time (t_{r(CLK)}, t_{f(CLK)}) requirement is considered met if proper output state changes occur with the rise time set to that given in the limits column.

12/ 100 kΩ resistors shall be connected between pins 2 and 14 to GND.

13/ Apply clock pulse; V_{IN} = 0 to 15 Vdc.

14/ Apply clock pulse; V_{IN} = 1.5 to 3.5 Vdc.

15/ Apply clock pulse; V_{IN} = 3.0 to 7.0 Vdc.

16/ Apply clock pulse; V_{IN} = 4.0 to 11.0 Vdc.

17/ Apply clock pulse; V_{IN} = 0 to 5 Vdc.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y Symbol Test No.	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C		
			NC	R	J1	J2	J3	$\overline{Q}$	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}		Min	Max	Min	Max	Min	Max	
V _{IC} (pos) “ “ “ “ “ “ “ “	1	2 3 4 5 6 7 8 9	1	mA	1 mA	1 mA	1 mA				1 mA	1 mA	1 mA	1 mA	1 mA	GND	R J1 J2 J3 K3 K2 K1 CLK S		1.5 “ “ “ “ “ “ “					Vdc “ “ “ “ “ “ “ “
V _{IC} (neg) “ “ “ “ “ “ “ “	10	11 12 13 14 15 16 17 18	-1	mA	-1 mA	-1 mA	-1 mA		GND		-1 mA	-1 mA	-1 mA	-1 mA	-1 mA		R J1 J2 J3 K3 K2 K1 CLK S		-6.0 “ “ “ “ “ “ “					“ “ “ “ “ “ “ “
I _{SS} 2/ “ “	3005	19 20 21 22		18.0V GND	18.0V 18.0V 18.0V GND	18.0V 18.0V 18.0V GND	18.0V 18.0V 18.0V GND		“ “ “ “		18.0V 18.0V 18.0V GND	18.0V 18.0V 18.0V GND	18.0V 18.0V 18.0V GND	GND GND GND GND	18.0V GND “ “	18.0V “ “ “	V _{SS} “ “ “		-.075 “ “ “		-2.5 “ “ “			μA “ “ “
V _{OH1}	3006	23		“	15.0V	15.0V	15.0V		“		15.0V	15.0V	15.0V	10/ “	“	15.0V	Q	14.95		14.95		14.95		Vdc
V _{OL1} V _{OL1}	3007	24 25		“ “	“ “	“ “	“ “		“ “		“ “	“ “	“ “	GND 10/ Q	“ “	“ “	$\overline{Q}$ Q		0.05 0.05		0.05 0.05		0.05 0.05	“
V _{OH1}	3006	26		“	“	“	“		“		“	“	“	GND	“	“	$\overline{Q}$	14.95		14.95		14.95		“

See footnotes at end of device type 02.

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

Symbol	MIL-STD-883 method	Cases	Terminal conditions 1/														Measured terminal	Test limits						Units		
		A,C,D,X,Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 4 T _A = 25°C								
		Symbol	NC	R	J1	J2	J3	$\overline{Q}$	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}		Min	Max							
C _i	3012	61		$_$	4/												GND	R		7.5					pF	
“	“	62							“								“	J1		“					“	
“	“	63	4			4/		4/	GND	“							“	J2		“					“	
“	“	64						4/		“							“	J3		“					“	
“	“	65								“		4/					“	K3		“					“	
“	“	66								“			4/				“	K2		“					“	
“	“	67								“				4/			“	K1		“					“	
“	“	68								“				4/			“	CLK		“					“	
“	“	69								“					4/		“	S		“					“	
																		Subgroup 7 T _A = 25°C		Subgroup 8 T _A = 125°C				T _A = -55°C		
																		Min	Max	Min	Max	Min	Max			
Truth table test	3014	70			5.0V	5.0V	5.0V	L	GND	H	5.0V	5.0V	5.0V	GND	5.0V	5.0 V	All outputs	See notes 5/, 6/								
“	“	71		GND	5.0V	“	“	H	“	L	“	“	“	GND	GND	“										
“	“	72		GND	“	“	“	H	“	L	“	“	“	GND	“	“										
“	“	73			“	“	“	L	“	H	“	“	“	5.0V	“	“										
“	“	74			GND	“	“	L	“	H	“	“	“	GND	“	“										
“	“	75			“	“	“	H	“	L	“	“	“	5.0V	“	“										
“	“	76			“	“	“	H	“	L	“	“	“	GND	“	“										
“	“	77			“	“	“	H	“	L	“	“	“	5.0V	“	“										
“	“	78			“	5.0V	“	L	“	H	“	“	“	GND	5.0V	“										
“	“	79			“	GND	“	L	“	H	“	“	“	GND	GND	“										
“	“	80			“	“	“	H	“	L	“	“	“	5.0V	“	“										
“	“	81			“	“	“	H	“	L	“	“	“	GND	“	“										
“	“	82			“	“	“	H	“	L	“	“	“	5.0V	“	“										
“	“	83			“	5.0V	“	L	“	H	“	“	“	5.0V	5.0V	“										
“	“	84			“	“	GND	L	“	H	“	“	“	GND	GND	“										
“	“	85			“	“	“	H	“	L	“	“	“	5.0V	“	“										
“	“	86			“	“	“	“	“	“	“	“	“	GND	“	“										
“	“	87			“	“	“	“	“	“	“	“	GND	5.0V	“	“										
“	“	88			“	“	5.0V	“	“	“	“	“	“	GND	“	“										
“	“	89			“	“	“	L	“	H	“	“	“	5.0V	“	“										
“	“	90			“	“	“	L	“	H	“	“	“	GND	“	“										
“	“	91			“	“	“	L	“	H	“	“	GND	5.0V	“	“										
“	“	92		5.0V	“	“	“	H	“	L	“	“	“	GND	GND	“										
“	“	93		GND	“	“	“	H	“	L	“	GND	“	GND	“	“										
“	“	94		“	“	“	“	L	“	H	“	“	“	5.0V	“	“										
“	“	95		“	“	“	“	L	“	H	“	“	“	GND	“	“										
“	“	96		“	“	“	“	L	“	H	“	“	“	5.0V	“	“										

See footnotes at end of device type 02.

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

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Units									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 7 T _A = 25°C		Subgroup 8													
		Symbol	NC	R	J1	J2	J3	$\overline{Q}$	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}				T _A = 125°C		T _A = -55°C											
		Test No.																							Min	Max	Min	Max	Min	Max			
Truth table test	3014	97		5.0V	5.0V	5.0V	5.0V	H	GND	L	GND	5.0V	5.0V	GND	GND	5.0V	All outputs	See notes 5/, 6/															
"	"	98		GND	"	"	"	H	"	L	"	"	"	GND	"	"																	
"	"	99		"	"	"	"	L	"	H	"	"	"	5.0V	"	"																	
"	"	100		"	"	"	"	"	"	"	"	"	"	GND	"	"																	
"	"	101		"	"	"	"	"	"	"	"	"	"	5.0V	"	"																	
"	"	102		"	GND	GND	GND	"	"	"	"	GND	GND	GND	"	"																	
"	"	103		"	"	"	"	"	"	"	"	"	"	5.0V	"	"																	
"	"	104		"	"	"	"	"	"	"	"	"	"	GND	"	"																	
"	"	105		"	"	"	"	"	"	"	"	"	"	5.0V	"	"	"																
																	Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C												
																	Min	Max	Min	Max	Min	Max											
t _{PHL1}	3003	106	GND	"	5.0V	5.0V	5.0V	OUT	GND	OUT	5.0V	5.0V	5.0V	IN1	GND	5.0V	CLK to Q	25	500	35	700	25	500	ns									
t _{PHL1}	Fig. 4	107			"	"	"		"	OUT	"	OUT	"	"	"	"	"	"	CLK to Q	"	"	"	"	"	"								
t _{PLH1}	"	108			"	"	"		"	"	OUT	"	"	"	"	"	"	"	CLK to Q	"	"	"	"	"	"								
t _{PLH1}	"	109			"	"	"		"	OUT	"	OUT	GND	GND	GND	GND	IN2	"	S to Q	15	300	21	420	15	300	"							
t _{PHL2}	"	110			IN1	GND	GND		GND	"	OUT	"	GND	GND	GND	GND	IN2	"	S to Q	"	"	"	"	"	"	"							
t _{PHL2}	"	111			"	"	"		"	OUT	"	OUT	"	"	"	"	GND	"	R to Q	"	"	"	"	"	"	"							
t _{PLH2}	"	112			"	"	"		"	"	OUT	"	OUT	"	"	"	"	"	R to Q	"	"	"	"	"	"	"							
t _{PLH2}	"	113	"	"	"	"	OUT	"	OUT	"	"	"	"	"	"	Q	10	200	14	280	10	200	"										
t _{THL}	3004	114	GND	5.0V	5.0V	5.0V	OUT	"	OUT	5.0V	5.0V	5.0V	IN1	"	"	"	Q	1000	1000	1400	1400	1000	1000	"									
t _{THL}	Fig. 4	115															Q								"	"	"	"					
t _{TLH}	"	116															Q								"	"	"	"					
t _{TLH}	"	117															Q								"	"	"	"					
f _{CLK 7/}	Fig. 4	118															Q								"	"	"	CLK to Q	"	1000	1400	1000	"
f _{CLK 7/}		119															"								"	"	CLK to Q	"	1000	1400	1000	"	
t _{p(CLK) 8/}	Fig. 4	120															GND								"	5.0V	5.0V	5.0V	OUT	"	OUT	5.0V	5.0V
t _{ps 8/}	"	121	"	"	"	"	OUT	"	OUT	"	"	"	IN2	"	"	CLK to Q			140	200		140	"										
t _{ps 8/}	"	122	"	"	"	"	OUT	"	OUT	"	"	"	IN2	"	"	S to Q			200	200		140	"										
t _{ps 8/}	"	123	"	"	"	"	OUT	"	OUT	"	"	"	IN2	"	"	S to Q			"	"		"	"										
t _{pr 8/}	"	124	"	IN2	"	"	"	OUT	"	OUT	"	"	"	GND	"	R to Q			"	280		200	"	"									
t _{pr 8/}	"	125	"	IN2	"	"	OUT	"	OUT	"	"	"	"	"	"	R to Q			"	"	"	"	"	"									
t _{r(CLK) 9/}	"	126	GND	"	"	"	"	OUT	"	OUT	"	"	"	"	"	"		CLK to Q		15	"	"	"	μs									
t _{r(CLK) 9/}	"	127															CLK to Q	"	"	"	"	"											
t _{i(CLK) 9/}	"	128															CLK to Q		"	15	"	15	"	"									
t _{i(CLK) 9/}	"	129	"	"	"	"	OUT	"	OUT	"	"	"	"	"	"	"	CLK to Q		"	"	"	"	"										

See footnotes at end of device type 02.

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

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Units	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C			
		Symbol	NC	R	J1	J2	J3	$\overline{Q}$	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}		Min	Max	Min	Max	Min	Max		
		Test No.																							
t _{SHL1}	Fig. 4	130 131 132 133 134 135	GND	"	IN2 5.0V	5.0V IN2 5.0V	5.0V IN2 5.0V	GND	"	OUT	5.0V	5.0V	5.0V	IN1	GND	5.0V	CLK to J1 CLK to J2 CLK to J3 CLK to K3 CLK to K2 CLK to K1	400	560	400	"	"	ns		
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
t _{SLH1}	"	136 137 138 139 140 141	"	"	IN2 5.0V	IN2 5.0V	IN2 5.0V	"	"	"	"	"	5.0V	"	"	"	J1 to CLK J2 to CLK J3 to CLK K3 to CLK K2 to CLK K1 to CLK	"	"	"	"	"	"		
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
"	"	"			"	"	"			"	"	"	"	"	"	"	"							"	"
																	Subgroup 12 T _A = 25°C								
																	Min	Max	Min	Max	Min	Max			
t _{PHL1}	3003 Fig. 4	142 143	GND	"	10.0V	10.0V	10.0V	OUT	GND	OUT	10.0V	10.0V	10.0V	IN1	GND	10.0V	CLK to Q CLK to Q	13	250					ns	
t _{PLH1}	"	144 145			"	"	"	"	"	OUT	"	OUT	"	"	"	"	"	CLK to Q CLK to Q	"	"					
t _{PHL2}	"	146 147	"	IN1	GND	GND	GND	OUT	"	OUT	GND	GND	GND	IN2	"	"	S to Q S to Q	8	150				"		
t _{PLH2}	"	148 149	"	"	"	"	"	OUT	"	OUT	"	"	"	GND	"	"	R to Q R to Q	"	"				"		
t _{THL}	3004 Fig. 4	150 151	GND	"	10.0V	10.0V	10.0V	OUT	"	OUT	10.0V	10.0V	10.0V	IN1	"	10.0V	Q Q	5	100				"		
t _{TLH}	"	152 153			"	"	"	"	"	OUT	"	OUT	"	"	"	"	"	Q Q	"	"				"	

1/ Pins not designated may be "high" level logic, "low" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.

4/ See 4.4.1c.

5/ The truth table tests shall be performed in sequence.

6/ The truth table tests shall be performed at V_{IH} and V_{DD} ≤ 5 Vdc and ≥ 18 Vdc. "L" = V_{SS} + 0.5 V maximum and "H" = V_{DD} - 0.5 V minimum.

7/ The minimum clock frequency (f_{CLK}) requirement is considered met if proper output state changes occur with the pulse repetition period set to that given in the limits column.

8/ The minimum clock, reset, or set pulse width (t_{p(CLK)}, t_{p(R)}, t_{p(S)}) requirement is considered met if proper output state changes occur with the pulse width set to that given in the limits column.

9/ Pulse repetition period = 100 μs, 50 percent duty cycle. The maximum clock rise or fall time (t_{r(CLK)}, t_{f(CLK)}) requirement is considered met if proper output state changes occur with the rise time set to that given in the limits column.

10/ Apply clock pulse; V_{IN} = 0 to 15 Vdc.

11/ Apply clock pulse; V_{IN} = 0 to 5 Vdc.

12/ The input/output conditions and timing sequence shall apply:

Input/output conditions					
Test	V _{DD}	Input levels		Output levels	
		1	0	1	0
V _{IL1}	5.0V		1.5V	<u>Min</u> 4.5V	<u>Max</u> 0.5V
V _{IH1}	"	3.5V		"	"
V _{IL2}	10.0V		3.0V	9.0V	1.0V
V _{IH2}	"	7.0V		"	"
V _{IL3}	15.0V		4.0V	13.5V	1.5V
V _{IH3}	"	11.0V		"	"

* Time slot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
I N P U T S	{	R	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	
		J ₁	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
		J ₂	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
		J ₃	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
		K ₃	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
		K ₂	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		K ₁	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
		CLK	0	0	0	1	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	1	0
S	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
O U T P U T S	{	$\overline{Q}$	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0
		Q	1	0	0	1	1	0	0	1	1	0	0	0	1	1	0	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	1	1	1

* Tests are to be run in sequence.

TABLE III. Group A inspection for device type 03.

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y Symbol Test No.	Terminal conditions 1/														Measured terminal	Test limits						Units	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C			
			NC	R	J1	J2	J3	Q̄	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}		Min	Max	Min	Max	Min	Max		
V _{IC} (pos)	1	2	1	mA	1 mA	1 mA	1 mA				1 mA	1 mA	1 mA	1 mA	1 mA	GND	R		1.5					Vdc	
3		J1																							
4		J2																							
5		J3																							
6		K3																							
7		K2																							
8		K1																							
9		CLK																							
		S																							
V _{IC} (neg)	10	11	-1	mA	-1 mA	-1 mA	-1 mA		GND		-1 mA	-1 mA	-1 mA	-1 mA	-1 mA		R		-6.0						
12		J1																							
13		J2																							
14		J3																							
15		K3																							
16		K2																							
17		K1																							
18		CLK																							
		S																							
I _{SS}	3005	19	GND	18.0V	18.0V	18.0V	GND			GND	18.0V	18.0V	GND	18.0V	18.0V	V _{SS}		-0.75		-2.5			μA		
2/	20	18.0V			18.0V	GND	GND				GND	GND													
	21	18.0V			18.0V	GND	GND				GND	GND													
	22	GND			GND	18.0V	GND				GND	GND													
V _{OH1}	3006	23			15V	15V	GND				GND	15V	15V	10/		15V	Q	14.95		14.95		14.95		Vdc	
V _{OL1}	3007	24												GND			Q		0.05		0.05		0.05		
V _{OL1}		25												10/			Q		0.05						
V _{OH1}	3006	26												GND			Q	14.95		14.95		14.95			
V _{IL1}		27	12	—/	12/	12/	12/	12/	GND	12/	12/	12/	12/	12/	12/	12/	All Outputs	12/	12/	12/	12/	12/	12/		
V _{IL2}		28																							
V _{IL3}		29																							
V _{IH1}		30																							
V _{IH2}		31																							
V _{IH3}		32																							
I _{OH1}		33	GND		5.0V	5.0V	GND	4.6V		4.6V	GND	5.0V	5.0V	11/	GND	5.0V	Q	-0.51		-0.36		-0.64		mA	
		34														11/		Q		-0.51					
I _{OL1}		35	GND					0.4V		0.4V				GND			Q	0.51		0.36		0.64			
		36														11/		Q		0.51					
I _{OH2}		38			15.0V	15.0V		13.5V		13.5V		15.0V	15.0V	10/		15.0V	Q	-3.4		-2.4		-4.2			
																		10/				Q			-3.4
I _{OL2}		39						1.5V		1.5V				GND			Q	3.4		2.4		4.2			
		40															10/			Q		3.4			

See footnotes at end of device type 03.

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

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y Symbol Test No.	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C		
			NC	R	J1	J2	J3	$\overline{Q}$	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}		Min	Max	Min	Max	Min	Max	
I _{IH1} 3/	3010	41		18.0V	18.0V	18.0V	18.0V		GND		18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	All inputs together		9					nA
I _{IH2}	"	42		18.0V	GND	GND	GND					GND	GND	GND	GND	"	R	1		45				"
"	"	43		GND	18.0V	GND	GND		"		"	"	"	"	"	"	J1							
"	"	44			GND	18.0V	GND	"		GND	"	"	"	"	"	"	J2							
"	"	45				GND	18.0V		"		"	"	"	"	"	"	J3							
"	"	46					GND		"	18.0V	"	"	"	"	"	"	K3							
"	"	47							"	GND	18.0V	"	"	"	"	"	K2							
"	"	48							"		GND	18.0V	"	"	"	"	K1							
"	"	49							"			GND	18.0V	"	"	"	CLK							
"	"	50							"				GND	18.0V	"	"	S						"	
I _{IL1} 3/	3009	51		"	"	"	"		"		"	"	GND	GND	GND	"	All inputs together		-9					"
I _{IL2}	3009	52		18.0V	18.0V	18.0V	18.0V				18.0V	18.0V	18.0V	18.0V	18.0V	18.0V	R	-1		-45				nA
"	"	53	GND	"	GND	18.0V	18.0V	GND	"		"	"	"	"	"	"	J1							
"	"	54		"	18.0V	GND	18.0V		"		"	"	"	"	"	"	J2							
"	"	55		"		18.0V	GND	"	"		"	"	"	"	"	"	J3							
"	"	56		"			18.0V		"	GND	"	"	"	"	"	"	K3							
"	"	57		"					"	18.0V	GND	"	"	"	"	"	K2							
"	"	58		"					"		18.0V	GND	"	"	"	"	K1							
"	"	59		"					"		18.0V	18.0V	GND	"	"	"	CLK							
"	"	60		"					"			18.0V	18.0V	18.0V	GND	"	S						"	
																	Subgroup 4 T _A = 25°C							
																	Min	Max						
C _i	3012	61		—	6/	6/	6/		GND	"		6/	6/	6/	6/	GND	R		7.5					pF
"	"	62							"						"	"	J1		"					"
"	"	63	6		6/	6/	6/	GND	"		6/	6/	6/	6/	"	"	J2		"					"
"	"	64							"						"	"	J3		"					"
"	"	65							"		6/	6/	6/	6/	"	"	K3		"					"
"	"	66							"			6/	6/	6/	"	"	K2		"					"
"	"	67							"				6/	6/	"	"	K1		"					"
"	"	68							"					6/	"	"	CLK		"					"
"	"	69							"					6/	"	"	S		"					"

See footnotes at end of table 03.

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

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 7		Subgroup 8				
		Symbol	NC	R	J1	J2	J3	Q	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C		
		Test No.																Min	Max	Min	Max	Min	Max	
Truth table test	3014	70	GND	5.0V	5.0V	5.0V	GND	L	GND	H	GND	5.0V	5.0V	GND	5.0V	5.0V	All outputs	See 4/, 5/						
“	“	71			“	“	“	H	“	L	“	“	“	“	GND	GND			“					
“	“	72	GND	“	“	“	“	H	“	L	“	“	“	GND	“	“								
“	“	73			“	“	“	L	“	H	“	“	“	5.0V	“	“								
“	“	74	GND	“	“	“	“	L	“	H	“	“	“	GND	“	“								
“	“	75			“	“	“	H	“	L	“	“	“	5.0V	“	“								
“	“	76	“	“	“	“	“	H	“	L	“	“	“	GND	“	“								
“	“	77			“	“	“	“	“	L	“	“	“	5.0V	“	“								
“	“	78	“	“	5.0V	“	“	L	“	H	“	“	“	GND	5.0V	“								
“	“	79				“	“	GND	L	“	H	“	“	“		GND	GND		“					
“	“	80	“	“	“	“	“	H	“	L	“	“	“	5.0V	“	“								
“	“	81						“	“	“	“	H	“	L		“	“		GND	“	“			
“	“	82	“	“	“	“	“	H	“	L	“	“	“	5.0V	“	“								
“	“	83						“	“	5.0V	L	“	H	“		“	“		GND	5.0V	“			
“	“	84	“	“	“	5.0V	“	L	“	H	“	“	“	GND	GND	“								
“	“	85						“	“	“	“	H	“	L		“	“		5.0V	“	“			
“	“	86	“	“	“	“	“	H	“	L	“	“	“	GND	“	“								
“	“	87						“	“	“	“	H	“	L		“	“		GND	5.0V	“			
“	“	88	“	“	“	GND	“	H	“	L	“	“	“	GND	“	“								
“	“	89						“	“	“	“	L	“	H		“	“		GND	5.0V	“			
“	“	90	“	“	“	“	“	L	“	H	“	“	“	GND	“	“								
“	“	91						“	“	“	“	L	“	H		“	“		5.0V	“	“			
“	“	92	5.0V	“	“	“	“	H	“	L	“	“	“	GND	“	“								
“	“	93						GND	“	“	“	H	“	L		“	GND		“	“	“			
“	“	94	“	“	“	“	“	L	“	H	“	“	“	5.0V	“	“								
“	“	95						“	“	“	“	L	“	H		“	“		GND	“	“			
“	“	96	“	“	“	“	“	L	“	H	“	“	“	5.0V	“	“								
“	“	97						5.0V	“	“	“	H	“	L		5.0V	5.0V		“	GND	“			
“	“	98	GND	“	“	“	“	H	“	L	“	“	“	GND	“	“								
“	“	99						GND	“	“	“	L	“	H		“	“		5.0V	“	“			
“	“	100	GND	“	“	“	“	L	“	H	“	“	“	GND	“	“								
“	“	101						“	“	“	“	L	“	H		“	“		5.0V	“	“			
“	“	102	GND	“	GND	GND	5.0V	“	“	“	“	“	GND	GND	“	“								
“	“	103						“	“	“	“	“	“	“		“	“		5.0V	“	“			
“	“	104	“	“	“	“	“	“	“	“	“	“	“	GND	“	“								
“	“	105						“	“	“	“	“	“	“		“	“		5.0V	“	“			

See footnotes at end of device type 03.

MIL-M-38510/175C

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

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Units
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C		
		Symbol	NC	R	J1	J2	J3	Q	V _{SS}	Q	K3	K2	K1	CLK	S	V _{DD}		Min	Max	Min	Max	Min	Max	
		Test No.																						
t _{PHL1} “	3003 Fig. 4	106 107	“	“	5.0V “	5.0V “	GND “	OUT “	GND “	OUT “	GND “	5.0V “	5.0V “	IN1 “	GND “	5.0V “	CLK to Q CLK to Q	25 “	500 “	35 “	700 “	25 “	500 “	ns “
t _{PLH1} “	“	108 109	“	“	“	“	“	OUT “	“	OUT “	“	“	“	“	“	“	CLK to Q CLK to Q	“	“	“	“	“	“	“
t _{PHL2} “	“	110 111	“	IN1 “	GND “	GND “	5.0V “	OUT “	“	OUT “	5.0V “	GND “	GND “	GND “	IN2 IN2	“	S to Q S to Q	15 “	300 “	21 “	420 “	15 “	300 “	“
t _{PLH2} “	“	112 113	“	“	“	“	“	OUT “	“	OUT “	“	“	“	“	GND “	“	R to Q R to Q	“	“	“	“	“	“	“
t _{THL} “	3004 Fig. 4	114 115	“	“	5.0V “	5.0V “	GND “	OUT “	“	OUT “	GND “	5.0V “	5.0V “	IN1 “	“	“	Q Q	10 “	200 “	14 “	280 “	10 “	200 “	“
t _{TLH} “	“	116 117	“	“	“	“	“	OUT “	“	OUT “	“	“	“	“	“	“	Q Q	“	“	“	“	“	“	“
f _{CLK} 7/	Fig. 4 “	118 119	“	“	“	“	“	OUT “	“	OUT “	“	“	“	“	“	“	CLK to Q CLK to Q	“	1000 1000	“	1400 “	“	1000 “	“
t _{p(CLK)} 8/	“	120 121	“	“	“	“	“	OUT “	“	OUT “	“	“	“	“	“	“	CLK to Q CLK to Q	“	140 140	1400 200	“	1000 140	“	“
t _{p(S)} 8/	“	122 123	“	“	“	“	“	OUT “	“	OUT “	“	“	“	“	IN2 IN2	“	S to Q S to Q	“	200 200	200 “	“	140 “	“	“
t _{p(R)} 8/	“	124 125	“	IN2 IN2	“	“	“	OUT “	“	OUT “	“	“	“	“	GND GND	“	R to Q R to Q	“	“	280 “	“	200 “	“	“
t _{r(CLK)} 9/	“	126 127	“	“	5.0V “	5.0V “	GND “	OUT “	GND “	OUT “	GND “	5.0V “	5.0V “	IN1 “	GND “	5.0V “	CLK to Q CLK to Q	“	15 “	“	“	“	“	μs “
t _{r(CLK)} 9/	“	128 129	“	“	“	“	“	OUT “	“	OUT “	“	“	“	“	“	“	CLK to Q CLK to Q	“	“	15 “	“	15 “	“	“
t _{SHL1} “	“	130 131	“	“	IN2 5.0V	IN2 5.0V	“	“	“	OUT “	“	“	“	“	“	“	CLK to J1 CLK to J2	“	400 “	“	“	“	“	ns “
“	“	132	“	“	“	“	IN2 GND	“	“	“	“	“	“	“	“	“	CLK to J3 CLK to K3	“	“	560 “	“	400 “	“	“
“	“	133	“	“	“	“	“	“	“	“	“	“	“	“	“	“	CLK to K2 CLK to K1	“	“	“	“	“	“	“
“	“	134	“	“	“	“	“	“	“	“	“	IN2 5.0V	IN2 “	“	“	“	“	“	“	“	“	“	“	“
“	“	135	“	“	“	“	“	“	“	“	“	“	IN2 “	IN2 “	“	“	“	“	“	“	“	“	“	“
t _{SLH1} “	“	136 137	“	“	IN2 5.0V	“	“	“	“	“	“	“	5.0V “	“	“	“	J1 to CLK J2 to CLK	“	“	“	“	“	“	“
“	“	138	“	“	“	“	IN2 5.0V	“	“	“	“	“	“	“	“	“	J3 to CLK J3 to CLK	“	“	“	“	“	“	“
“	“	139	“	“	“	“	GND GND	“	“	“	“	“	“	“	“	“	K3 to CLK K3 to CLK	“	“	“	“	“	“	“
“	“	140	“	“	“	“	GND GND	“	“	“	“	IN2 5.0V	“	“	“	“	K2 to CLK K2 to CLK	“	“	“	“	“	“	“
“	“	141	“	“	“	“	GND	“	“	“	“	“	IN2 “	“	“	“	K1 to CLK K1 to CLK	“	“	“	“	“	“	“

See footnotes at end of device type 03.

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

Symbol	MIL-STD-883 method	Cases A,C,D,X,Y	Terminal conditions 1/														Measured terminal	Test limits						Units
		Symbol	NC	R	J1	J2	J3	Q	VSS	Q	K3	K2	K1	CLK	S	VDD		Subgroup 12 TA = 25°C						
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max					
tPHL1	3003	142	GND	"	10.0V	10.0V	GND	OUT	GND	OUT	GND	10.0V	10.0V	IN1	GND	10.0V	CLK to Q	10	200					ns
"	Fig. 4	143			"	"	"		"	"	"	"	"	"	"	"	"	"	CLK to Q	"	"			
tPLH1	"	144	"	"	"	"	"	OUT	"	OUT	"	"	"	"	"	"	CLK to Q	"	"					"
"	"	145			"	"	"		"	"	"	"	"	"	"	"	"	"	"	CLK to Q	"	"		
tPHL2	"	146	"	IN1	GND	GND	10.0V	OUT	"	OUT	10.0V	GND	GND	GND	IN2	"	S to Q	8	150					"
"	"	147			GND	GND	10.0V		10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	"	S to Q	8	150		
tPLH2	3003	148	"	IN1	GND	GND	10.0V	OUT	GND	OUT	10.0V	GND	GND	GND	GND	10.0V	R to Q	8	150					ns
"	Fig. 4	149			GND	GND	10.0V		10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	10.0V	"	R to Q	8	150		
tTHL	3004	150	GND	"	10.0V	10.0V	GND	OUT	"	OUT	GND	10.0V	10.0V	IN1	"	"	Q	5	100					"
"	Fig. 4	151			"	"	"		"	"	"	"	"	"	"	"	"	"	"	Q	"	"		
tTLH	"	152	"	"	"	"	"	OUT	"	OUT	"	"	"	"	"	"	Q	"	"					"
"	"	153			"	"	"		"	"	"	"	"	"	"	"	"	"	"	Q	"	"		

1/ Pins not designated may be "high" level logic, "low" level logic or open. Exceptions are as follows: $V_{IC(POS)}$ tests, the V_{SS} terminals shall be open; $V_{IC(NEG)}$ tests, the V_{DD} terminal shall be open, I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.

4/ The truth table tests shall be performed in sequence.

5/ The truth table tests shall be performed at V_{IH} and $V_{DD} \leq 5 \text{ Vdc}$ and $\geq 18 \text{ Vdc}$. "L" = $V_{SS} + 0.5 \text{ V}$ maximum and "H" = $V_{DD} - 0.5 \text{ V}$ minimum.

6/ See 4.4.1c.

7/ The minimum clock frequency (f_{CLK}) requirement is considered met if proper output state changes occur with the pulse repetition period set to that given in the limits column.

8/ The minimum clock, reset, or set pulse width ($t_{p(CLK)}$, $t_{p(R)}$, $t_{p(S)}$) requirement is considered met if proper output state changes occur with the pulse width set to that given in the limits column.

9/ Pulse repetition period = 100 μs , 50 percent duty cycle. The maximum clock rise or fall time ($t_{r(CLK)}$, $t_{f(CLK)}$) requirement is considered met if proper output state changes occur with the rise time set to that given in the limits column.

10/ Apply clock pulse; $V_{IN} = 0$ to 15 Vdc.

11/ Apply clock pulse; $V_{IN} = 0$ to 5 Vdc.

12/ The input/output conditions and timing sequence shall apply:

Input/output conditions					
Test	V _{DD}	Input levels		Output levels	
		1	0	1	0
V _{IL1}	5.0V	3.5V	1.5V	Min	Max
V _{IH1}	"			4.5V	0.5V
V _{IL2}	10.0V	7.0V	3.0V	9.0V	1.0V
V _{IH2}	"			"	"
V _{IL3}	15.0V	11.0V	4.0V	13.5V	1.5V
V _{IH3}	"			"	"

* Time slot 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

I N P U T S	{	R	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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O U T P U T S	Q	—	0	1	1	0	0	1	1	1	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0
			1	0	0	1	1	0	0	0	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	1

* Tests are to be run in sequence.

TABLE III. Group A inspection for device type 04.

Symbol	MIL-STD-883 method	Cases E,F,N,Z Symbol	Terminal conditions 1/																Measured terminal	Test limits						Units			
			CX1	RC1	R1	+TR1	-TR1	Q1	$\overline{Q1}$	V _{SS}	$\overline{Q2}$	Q2	-TR2	+TR2	R2	RC2	CX2	V _{DD}		Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max				
V _{IC} (pos) " " " " " "	1	2 3 4 5 6 7 8		1mA	1mA	1mA	1mA						1mA	1mA	1mA	1mA		GND	" " " " " " " " " " "	RC1 R1 +TR1 -TR1 -TR2 +TR2 R2 RC2		1.5 " " " " " " "							Vdc
V _{IC} (neg) " " " " " "	9	10 11 12 13 14 15 16		-1mA	-1mA	-1mA	-1mA			GND			-1mA	-1mA	-1mA	-1mA			RC1 R1 +TR1 -TR1 -TR2 +TR2 R2 RC2		-6.0 " " " " " " "								"
I _{SS} " " " " " "	3005	17 18 19 20 21 22 23	8	/ " " " " "	GND 18.0V 18.0V GND 18.0V 18.0V GND	GND GND 18.0V GND GND GND	GND 18.0V "		" " " " " "	" " " " "			GND 18.0V "	GND GND 18.0V GND GND GND	GND 18.0V 18.0V GND 18.0V 18.0V GND	8/ "		18.0V " " " " "	V _{SS} " " " " "		-.075 " " " " "		-2.5 " " " " "				μA		

See footnotes at end of device type 04.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
			Symbol	CX1	RC1	R1	+TR1	-TR1	Q1	$\overline{Q1}$	V _{SS}	$\overline{Q2}$	Q2	-TR2	+TR2	R2	RC2	CX2		V _{DD}	Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C	
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
V _{OH1} V _{OH1}	3006 3006	24 25			GND	GND	15.0V			GND			15.0V	GND	GND			15.0V	$\overline{Q1}$ Q2	14.95 14.95		14.95 14.95		14.95 14.95		Vdc
V _{OL1} V _{OL1}	3007 3007	26 27																	Q1 Q2		0.05 0.05		0.05 0.05		0.05 0.05	
V _{OH1} V _{OH1}	3006 3006	28 29		$\overline{7}$	15.0V	15.0V								15.0V	15.0V	$\overline{7}$			Q1 Q2	14.95 14.95		14.95 14.95		14.95 14.95		
V _{OL1} V _{OL1}	3007 3007	30 31	$\overline{7}$																$\overline{Q1}$ Q2		0.05 0.05		0.05 0.05		0.05 0.05	
V _{IL1} V _{IL2} V _{IL3}		33 34	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$			$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	5.0 V 10.0V 15.0V	All outputs	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	$\overline{10}$	
V _{IH1} V _{IH2} V _{IH3}	32	35 36 37																5.0 V 10.0V 15.0V								
I _{OL1} " " " "	38	39 40 41 42 43		5.0V 5.0V $\overline{8}$	GND GND GND	GND GND GND	GND GND 5.0V	0.4V				0.4V	GND GND 5.0V	GND GND GND	GND GND 5.0V	5.0V 5.0V $\overline{8}$		5.0V	Q1 Q2 None None Q1 Q2	0.51		0.36		0.64	mA	
I _{OH1} " " " "	44	45 46 47 48		4.6V 5.0V 5.0V $\overline{8}$	GND GND GND GND	GND GND GND GND	GND GND GND 5.0V		4.6V		4.6V		GND GND GND 5.0V	GND GND GND GND	GND GND GND GND	5.0V 5.0V 5.0V $\overline{8}$			RC1 Q1 Q2 RC2 None	-0.51		-0.36		-0.64		

See footnotes at end of device type 04.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z Symbol Test No.	Terminal conditions 1/																Measured terminal	Test limits						Units	
																					Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C		
			CX1	RC1	R1	+TR1	-TR1	Q1	$\overline{Q1}$	V _{SS}	$\overline{Q2}$	Q2	-TR2	+TR2	R2	RC2	CX2	V _{DD}		Min	Max	Min	Max	Min	Max		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16									
I _{OH1} “ “ “		50 51	8	/ 8/ 8/	5.0V 5.0V 5.0V	GND 5.0V 5.0V	5.0V 5.0V 5.0V	4.6V		GND “ “		4.6V	5.0V 5.0V 5.0V	GND 5.0V 5.0V	5.0V “ “	8/ 8/ 8/		5.0V 5.0V 5.0V	None Q1 Q2	-0.51 “ “		-0.36 “ “		-0.64 “ “		mA “ “	
I _{OL2} “ “ “ “	49 52	53 54 55 56 57		15.0V 15.0V 8/ “ “ “	GND GND GND 15.0V 15.0V	GND “ “ “ 15.0V	GND “ “ “ 15.0V	1.5V		“ “ “ “ 1.5V		1.5V	GND GND 15.0V 15.0V	GND “ “ 15.0V 15.0V	GND “ 15.0V 15.0V	15.0V 8/ “ “		15.0V “ “ “ “	Q1 Q2 None None Q1 Q2	3.4 “ “ “ “ “ “		2.4 “ “ “ “ “ “		4.2 “ “ “ “ “ “		“ “ “ “ “ “	
I _{OH2} “ “ “ “ “ “	58	59 60 61 62 63 64 65		13.5V 15.0V 15.0V 8/ “ “ “	GND “ “ “ “ 15.0V 15.0V	GND “ “ “ “ “ 15.0V	GND “ “ 15.0V 15.0V		13.5V	“ “ “ “ “ “ “		13.5V	GND “ “ “ 15.0V “	GND “ “ “ “ 15.0V 15.0V	GND “ “ “ “ 15.0V 15.0V	15.0V 15.0V 13.5V 8/ “ “		“ “ “ “ “ “ “	RC1 Q1 Q2 RC2 None None Q1 Q2	-3.4 “ “ “ “ “ “ “		-2.4 “ “ “ “ “ “ “		-4.2 “ “ “ “ “ “ “		“ “ “ “ “ “ “	
I _{IH1} 3/	3010	66			18.0V	18.0V	18.0V			“			18.0V	18.0V	18.0V			18.0V	All input together		600					nA	
I _{IH2} “ “ “ “ “	“ “ “ “ “	67 68 69 70 71 72			18.0V GND “ “ “ “	GND 18.0V GND 18.0V GND “	GND GND 18.0V GND “ “			“ “ “ “ “ “			GND GND GND 18.0V GND	GND “ “ “ 18.0V GND	GND “ “ “ “ 18.0V			“ “ “ “ “ “	R1 +TR1 -TR1 -TR2 +TR2 R2		100 “ “ “ “ “		100 “ “ “ “ “		“ “ “ “ “ “		
I _{IL1} 3/	3009	73			“	“	“			“			GND	GND	GND			“	All inputs together		-600					“	

See footnotes at end of device type 04.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z Symbol	Terminal conditions <u>1</u> /																Measured terminal	Test limits						Units		
			CX1	RC1	R1	+TR1	-TR1	Q1	$\overline{Q1}$	V _{SS}	$\overline{Q2}$	Q2	-TR2	+TR2	R2	RC2	CX2	V _{DD}		Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C				
			Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	Min	Max	Min	Max	Min		Max	
I _{IL2}	3009	74 75 76 77 78 79			GND 18.0V GND 18.0V GND 18.0V 18.0V	18.0V 18.0V GND 18.0V 18.0V 18.0V 18.0V			GND			18.0V 18.0V 18.0V GND 18.0V 18.0V	18.0V “ “ “ GND 18.0V	18.0V “ “ “ GND 18.0V			18.0V	R1 +TR1 -TR1 -TR2 +TR2 R2	-100	“ “ “ “ “ “	-100	“ “ “ “ “ “			nA			
																			Subgroup 4 T _A = 25°C									
																			Min	Max								
C _i	3012	80 81 82 83 84 85			<u>6</u> /	<u>6</u> /	<u>6</u> /			GND								GND	R1 +TR1 -TR1 -TR2 +TR2 R2		7.5					pF		
																			Subgroup 7 T _A = 25°C		Subgroup 8 T _A = 125°C				T _A = -55°C			
																			Min	Max	Min	Max	Min	Max				
Truth table tests	3014	86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102A 103A 104A 105A 106A 107A 108A 109A		L L L H L L L H L L L L L L L L L L L L L L L L	L H H H H H H H L L L L L L L L L L L L L L	L L L L L L L L L L L L L L L L L L L L L L L L	H H H H H H H H H H H H H H H H H H H H H H H H	L H L H L H L H L H L H L H L H L H L H L H L H	H H L L H H H H H H H H H H H H H H H H H H	GND “																		

See footnotes at end of device type 04.

MIL-M-38510/175C

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z Symbol Test No.	Terminal conditions 1/																Measured terminal	Test limits						Units	
																					Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C		
			CX1	RC1	R1	+TR1	-TR1	Q1	$\overline{Q1}$	V _{SS}	$\overline{Q2}$	Q2	-TR2	+TR2	R2	RC2	CX2	V _{DD}		Min	Max	Min	Max	Min	Max		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16									
t _{PLH1} " " "	3003 Fig. 4 " "	102 103 104 105	 9 " "	 / " " "	5.0V " " "	IN GND GND GND	5.0V 5.0V IN 5.0V	OUT " OUT "	 " " "	GND " " "	 " " "	OUT " " "	5.0V 5.0V 5.0V IN	GND IN GND GND	5.0V " " "	9/ " " "	 " " "	5.0V " " "	+TR1 to Q1 +TR2to Q2 -TR1 to Q1 -TR2 to Q2	25 " " "	500 " " "	35 " " "	700 " " "	25 " " "	500 " " "	ns " " "	
t _{PHL1} " " "	" " " "	106 107 108 109	 " " "	" " " "	" " "	IN GND GND GND	5.0V 5.0V IN 5.0V	 " OUT "	OUT " OUT "	" " " "	 " OUT "	 " " "	5.0V 5.0V 5.0V IN	GND IN GND GND	" " " "	" " " "	 " " "	" " " "	+TR1 to <u>Q1</u> +TR2to <u>Q2</u> -TR1 to <u>Q1</u> -TR2 to <u>Q2</u>	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	" " " "	
t _{PHL2} t _{PHL2}	" "	110 111	 "	 "	IN "	IN "	5.0V "	OUT "	 "	" "	 "	 "	5.0V "	IN "	IN "	" "	 "	" "	R1 to Q1 R2 to Q2	23 "	450 "	32 "	630 "	23 "	450 "	" "	
t _{PLH2} t _{PLH2}	" "	112 113	" "	" "	" "	" "	" "	 "	OUT "	" "	 "	OUT "	" "	" "	" "	" "	" "	" "	R1 to <u>Q1</u> R2 to Q2	" "	" "	" "	" "	" "	" "	" "	
t _{TLH1} t _{TLH1}	3004 Fig. 4	114 115	 "	 "	5.0V "	" "	" "	OUT "	 "	" "	 "	 "	OUT "	" "	5.0V "	" "	 "	" "	Q1 Q2	10 "	200 "	14 "	280 "	10 "	200 "	" "	
t _{THL1} t _{THL1}	" "	116 117	" "	" "	" "	" "	" "	 "	OUT "	" "	 "	OUT "	" "	" "	" "	" "	" "	" "	<u>Q1</u> Q2	" "	" "	" "	" "	" "	" "	" "	
t _{THL2} " " " "	" " " "	118 119 120 121 122	 " " "	 " "	IN " "	" " "	" "	OUT OUT OUT	 "	" "	 "	 "	" "	" "	IN " "	" "	 "	" "	Q1 Q1 Q1 Q2 Q2	" 15 25 10 15	" 300 500 200 300	" 21 35 14	" 420 700 280 420	" 15 25 10 15	" 300 500 200 300	" " " "	

See footnotes at end of device type 04.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z Symbol	Terminal conditions 1/																Measured terminal	Test limits						Units
			CX1	RC1	R1	+TR1	-TR1	Q1	$\overline{Q1}$	V _{SS}	$\overline{Q2}$	Q2	-TR2	+TR2	R2	RC2	CX2	V _{DD}		Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
t _{THL2}	3004 Fig. 4	123		9/	IN	IN	5.0V			GND		OUT	5.0V	IN	IN	9/		5.0V	Q2	25	500	35	700	25	700	ns
t _{TLH2}	"	124		"	5.0V	"	"		OUT	"			"	"	5.0V	"		"	$\overline{Q1}$	10	200	14	280	10	200	"
"	"	125		"	"	"	"		OUT	"			"	"	"	"		"	$\overline{Q1}$	15	300	21	420	15	300	"
"	"	126		"	"	"	"		OUT	"			"	"	"	"		"	$\overline{Q1}$	25	500	35	700	25	500	"
"	"	127		"	"	"	"			"	OUT		"	"	"	"		"	$\overline{Q2}$	10	200	14	280	10	200	"
"	"	128		"	"	"	"			"	OUT		"	"	"	"		"	$\overline{Q2}$	15	300	21	420	15	300	"
"	"	129		"	"	"	"			"	OUT		"	"	"	"		"	$\overline{Q2}$	25	500	35	700	25	500	"
																				Subgroup 12 T _A = 25°C						
																				Min	Max	Min	Max	Min	Max	
t _{PLH1}	3003 Fig. 4	130		/	10.0V	IN	10.0V	OUT		GND		OUT	10.0V	GND	10.0V	9/		10.0V	+TR1 to Q1	13	250					ns
"	"	131		"	"	GND	10.0V	IN	OUT	"		OUT	10.0V	IN	GND	"	"	"	+TR2 to Q2	"	"					"
"	"	132	9	"	"	"	IN	10.0V		"		OUT	10.0V	GND	GND	"	"	"	-TR1 to Q1	"	"					"
"	"	133		"	"	"	10.0V			"		OUT	IN	GND	"	"	"	"	-TR2 to Q2	"	"					"
t _{PHL1}	"	134		"	"	IN	10.0V		OUT	"			10.0V	GND	"	"	"	"	+TR1 to $\overline{Q1}$	"	"					"
"	"	135		"	"	GND	10.0V		OUT	"	OUT		10.0V	IN	GND	"	"	"	+TR2 to $\overline{Q2}$	"	"					"
"	"	136		"	"	"	IN			"	OUT		10.0V	GND	"	"	"	"	-TR1 to $\overline{Q1}$	"	"					"
"	"	137		"	"	"	10.0V			"	OUT		IN	GND	"	"	"	"	-TR2 to Q2	"	"					"
t _{PHL2}	"	138			IN	IN	10.0V	OUT		"			10.0V	IN	IN	"		"	R1 to Q1	"	"					"
t _{PHL2}	"	139		"	"	"	"			"		OUT	"	"	"	"	"	"	R2 to Q2	"	"					"
t _{PLH2}	"	140	"	"	"	"	"		OUT	"			"	"	"	"	"	"	R1 to $\overline{Q1}$	"	"					"
t _{PLH2}	"	141		"	"	"	"			"	OUT		"	"	"	"	"	"	R2 to $\overline{Q2}$	"	"					"
t _{TLH1}	3004 Fig. 4	142			10.0V	"	"	OUT		"			"	"	10.0V	"		"	Q1	5	100					μs
t _{TLH1}	"	143		"	"	"	"			"		OUT	"	"	"	"		"	Q2	"	"					"
t _{THL1}	"	144	"	"	"	"	"		OUT	"			"	"	"	"	"	"	$\overline{Q1}$	"	"					"
t _{THL1}	"	145		"	"	"	"			"	OUT		"	"	"	"	"	"	$\overline{Q2}$	"	"					"

See footnotes at end of device type 04.

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

Symbol	MIL-STD-883 method	Cases E,F,N,Z	Terminal conditions 1/																Measured terminal	Test limits						Units	
			Symbol	CX1	RC1	R1	+TR1	-TR1	Q1	$\overline{Q1}$	V _{SS}	$\overline{Q2}$	Q2	-TR2	+TR2	R2	RC2	CX2		V _{DD}	Subgroup 12 T _A = 25°C						
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max		
t _{THL2}	3004 Fig. 4	146 147 148 149 150 151	9	$\underline{\hspace{0.5cm}}$	IN	IN	10.0V	OUT OUT OUT	GND				10.0V	IN	IN	$\underline{\hspace{0.5cm}}$		10.0V	Q1 Q1 Q1 Q2 Q2 Q2	5 8 15 5 8 15	100 150 300 100 150 300					ns	
t _{TLH2}		152 153 154 155 156 157			10.0V				OUT OUT OUT						10.0V				$\overline{Q1}$ $\overline{Q1}$ $\overline{Q1}$ $\overline{Q2}$ $\overline{Q2}$ $\overline{Q2}$	5 8 15 5 8 15	100 150 300 100 150 300						

1/ Pins not designated may be "high" level logic, "low" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open, I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.

4/ The truth table tests shall be performed in sequence.

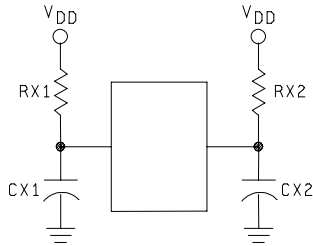
5/ The truth table tests shall be performed at V_{DD} ≤ 5 V and ≥ 18 V. See footnote 10/ which contains complete tabulation of input/output voltage levels.

6/ See 4.4.1c.

7/ For tests 28 through 31, terminals 2 and 14 are each connected through separate 22 kΩ ±10% resistors to V_{SS}.

8/ Terminals 2 and 14 are each connected through separate 22 kΩ ±10% resistors to V_{SS}.

9/ Connect RX1, CX1, RX2, and CX2 using the values in the table below:



Test	RX1, 2	CX1, 2
	$K\Omega \pm 10\%$	$pF \pm 10\%$
t_{PLH1}	10	100
t_{PHL1}	10	100
t_{PLH2}^*	10	100
t_{PHL2}^*	10	100
t_{TLH1}	10	100
t_{THL1}	10	100
t_{THL2}	10	0.01 μF
t_{THL2}	10	0.1 μF
t_{THL2}	10	1.0 μF
t_{TLH2}	10	0.01 μF
t_{TLH2}	10	0.1 μF
t_{TLH2}	10	1.0 μF

* Reset pulse shall be applied before the RXCX times out.

10/ The following terminal conditions shall apply. The tests shall be performed using the logical timing sequence of test numbers 86 through 109. The parenthetical terminal conditions are used for the "truth table test". The nonparenthetical terminal conditions are used for the " V_{IH1} , 2, 3/ V_{IL1} , 2, 3" tests. The RX1, RX2 terminal conditions are for both of these tests.

Input/output conditions

V _{DD}	Input levels		Output levels		RX1, RX2 Input levels	
	H	L	H	L	H	L
(≤ 5.0 V) 5.0 V	<u>Max</u>	<u>Min</u> 1.5V (V _{SS})	<u>Min</u> (V _{DD} – 0.5 V) 4.5V	<u>Max</u> (V _{SS} = 0.8 V) 0.5V	V _{DD} Through 22 kΩ ±10%	V _{SS} Through 22 kΩ ±10%
	(V _{DD}) 3.5 V					
10.0V		3.0V	9.0V	1.0V		
	7.0V					
15.0V (≥ 18.0 V)		4.0V (V _{SS})	13.5V (V _{DD} – 0.5 V)	1.5V (V _{SS} + 0.5 V)		
	(V _{DD}) 11.0V					

TABLE III. Group A inspection for device type 05.

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
																					Subgroup 1		Subgroup 2		Subgroup 3	
		Symbol	$\overline{C}$	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C		
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
V _{IC} (pos)		1	1mA		1mA	1mA											GND	$\overline{C}$		1.5					Vdc	
"		2															"	D1	"	"					"	
"		3															"	D2	"	"					"	
"		4						1mA									"	D3	"	"					"	
"		5								1mA							"	CLK	"	"					"	
"		6									1mA						"	D4	"	"					"	
"		7										1mA			1mA		"	D5	"	"					"	
"		8												1mA			"	D6	"	"					"	
V _{IC} (neg)		9	-1mA		-1mA	-1mA			GND								$\overline{C}$		-6.0					"		
"		10							"								D1	"	"					"		
"		11							"								D2	"	"					"		
"		12						-1mA	"								D3	"	"					"		
"		13							"	-1mA							CLK	"	"					"		
"		14							"		-1mA						D4	"	"					"		
"		15							"				-1mA				D5	"	"					"		
"		16							"					-1mA			D6	"	"					"		
I _{SS}	3005	17	GND		18.0V	18.0V		18.0V			GND		18.0V		18.0V	18.0V	V _{SS}		-.075		-2.5			μA		
"	"	18	18.0V		18.0V	18.0V		18.0V	"		7/		18.0V		18.0V	18.0V	"	"	"		"			"		
"	"	19	18.0V		GND	GND		GND	"	"	7/		GND		GND	GND	"	"	"		"			"		
"	"	20	18.0V		GND	GND		GND	"	"	GND		GND		GND	GND	"	"	"		"			"		
V _{OH1}	3006	21	15.0V		15.0V	15.0V		15.0V			8/		15.0V		15.0V	15.0V	Q1	14.95		14.95		14.95		Vdc		
"	"	22	"		"	"		"	"		15.0V		"		"	"	Q2	"		"		"		"		
"	"	23	"		"	"		"	"		"		"		"	"	Q3	"		"		"		"		
"	"	24	"		"	"		"	"		"		"		"	"	Q4	"		"		"		"		
"	"	25	"		"	"		"	"		"		"		"	"	Q5	"		"		"		"		
"	"	26	"		"	"		"	"		"		"		"	"	Q6	"		"		"		"		

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units	
			Symbol	$\overline{C}$	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6		V _{DD}	Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C		
																					Min	Max	Min	Max	Min		Max
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Q1	Q2	Q3	Q4	Q5	Q6		
V _{OL1}	3007	27	15.0V		GND	GND			8/15.0V									15.0V	Q1		0.05		0.05		0.05	Vdc	
		28					GND		GND										Q2								
		29																	Q3								
		30																	Q4								
		31																	Q5								
		32																	Q6								
		33	GND		15.0V	15.0V		15.0V		8/15.0V		15.0V		15.0V	15.0V	15.0V			Q1								
		34																	Q2								
		35																	Q3								
		36																	Q4								
		37																	Q5								
		38																	Q6								
V _{IL1}			13/	13/	13/	13/	13/	13/	13/		13/	13/	13/	13/	13/	13/	13/	All outputs	13/	13/	13/	13/	13/	13/			
V _{IL2}		40																									
V _{IL3}		41																									
V _{IH1}	39	42																									
V _{IH2}		43																									
V _{IH3}		44																									
I _{OL1}			5.0V	0.4V	GND	GND	0.4V	GND		9/5.0V		GND		GND	GND		5.0V	Q1	0.51		0.36		0.64				
		46																Q2									
		47							0.4V									Q3									
	45	48									0.4V							Q4									
		49										0.4V						Q5									
		50														0.4V		Q6									
I _{OH1}		51		4.6V	5.0V	5.0V		5.0V		9/		5.0V		5.0V	5.0V			Q1	-0.51		-0.36		-0.64				

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions <u>1/</u>																Measured terminal	Test limits						Units
																				Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C		
		Symbol	$\overline{\text{C}}$	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6	V _{DD}		Min	Max	Min	Max	Min	Max	
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16								
I _{OH1}	52		5.0V		5.0V	5.0V	4.6V	5.0V		GND	5.0V		5.0V		5.0V	5.0V		5.0V	Q2	-0.51		-0.36		-0.64		mA
“		53	“	“	“	“	“	4.6V	“	“	“	“	“	“	“	“	“	“	Q3	“	“	“	“	“	“	
“		54	“	“	“	“	“	“	“	“	4.6V	“	“	“	“	“	“	“	Q4	“	“	“	“	“	“	
“		55	“	“	“	“	“	“	“	“	“	“	4.6V	“	“	“	“	“	Q5	“	“	“	“	“	“	
“		56	“	“	“	“	“	“	“	“	“	“	“	4.6V	“	“	4.6V	“	Q6	“	“	“	“	“	“	
I _{OL2}	57		15.0V	1.5V	GND	GND	1.5V	GND		“	8/ 15.0V		GND		GND	GND		15.0V	Q1	3.4		2.4		4.2		“
“		58	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q2	“	“	“	“	“	“	
“		59	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q3	“	“	“	“	“	“	
“		60	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q4	“	“	“	“	“	“	
“		61	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q5	“	“	“	“	“	“	
“	62	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	1.5V	“	Q6	“	“	“	“	“	“	
I _{OH2}	63		“	13.5V	15.0V	15.0V	13.5V	15.0V		“	8/ 15.0V		15.0V		15.0V	15.0V		“	Q1	-3.4		-2.4		-4.2		“
“		64	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q2	“	“	“	“	“	“	
“		65	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q3	“	“	“	“	“	“	
“		66	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q4	“	“	“	“	“	“	
“		67	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	Q5	“	“	“	“	“	“	
“	68	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	13.5V	“	Q6	“	“	“	“	“	“	
I _{IH1} <u>3/</u>	3010	69	18.0V		18.0V	18.0V		18.0V		“	18.0V		18.0V		18.0V	18.0V		18.0V	All inputs together		8					nA
I _{IH2}	“	70	18.0V		GND	GND		GND		“	GND		GND		GND	GND		“	$\overline{\text{C}}$		1		45			“
“	“	71	GND		18.0V	GND		GND		“	“		“		“	“		“	D1		“		“		“	
“	“	72	“		GND	GND		GND		“	“		“		“	“		“	D2		“		“		“	
“	“	73	“		GND	GND		GND		“	“		“		“	“		“	D3		“		“		“	
“	“	74	“		“	“		18.0V		“	“		“		“	“		“	CLK		“		“		“	
“	“	75	“		“	“		“		“	18.0V		“		“	“		“	D4		“		“		“	
“	“	76	“		“	“		“		“	“		“		“	18.0V		“	D5		“		“		“	
“	“	77	“		“	“		“		“	“		“		“	GND	18.0V	“	D6		“		“		“	

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions <u>1/</u>																Measured terminal	Test limits						Units
			Symbol	$\overline{C}$	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6		V _{DD}	Subgroup 1 T _A = 25°C		Subgroup 2 T _A = 125°C		Subgroup 3 T _A = -55°C	
				Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	Min	Max	Min	Max	Min
I _{IL1} <u>3/</u>	3009	78	GND		GND	GND		GND	GND		GND		GND		GND	GND		18.0V	All inputs together							nA
I _{IL2}	"	79	GND		18.0V	18.0V		18.0V		"	18.0V		18.0V		18.0V	18.0V		"	$\overline{C}$	-8	-1		-45			"
"	"	80	18.0V		GND	"		18.0V		"	"		"		"	"		"	D1							"
"	"	81	"		18.0V	GND		18.0V		"	"		"		"	"		"	D2							"
"	"	82	"		"	18.0V		GND		"	"		"		"	"		"	D3							"
"	"	83	"		"	"		18.0V		"	GND		"		"	"		"	CLK							"
"	"	84	"		"	"		"		"	18.0V		GND		"	"		"	D4							"
"	"	85	"		"	"		"		"	18.0V		18.0V		GND	"		"	D5							"
"	"	86	"		"	"		"		"	18.0V		18.0V		18.0V	GND		"	D6							"
																			Subgroup 4 T _A = 25°C							
																			Min	Max						
C _i	3012	87	<u>6/</u>		<u>6/</u>					GND								GND	$\overline{C}$		15					pF
"	"	88			<u>6/</u>					"								"	D1		7.5					"
"	"	89			<u>6/</u>					"								"	D2		"					"
"	"	90						<u>6/</u>		"		<u>6/</u>						"	D3		"					"
"	"	91								"	<u>6/</u>							"	CLK		"					"
"	"	92								"			<u>6/</u>					"	D4		"					"
"	"	93								"				<u>6/</u>				"	D5		"					"
"	"	94								"					<u>6/</u>			"	D6		"					"
																			Subgroup 7 T _A = 25°C		Subgroup 8					
																			T _A = 25°C		T _A = 125°C		T _A = -55°C			
																			Min	Max						
Truth table test	3014	95	GND	L	5.0V	5.0V	L	5.0V	L	GND	GND	L	5.0V	L	5.0V	5.0V	L	5.0V	All outputs	} See notes <u>4/</u> , <u>5/</u>						
"	"	96	5.0V	L	"	"	L	"	L	"	GND	L	"	L	"	"	L	"	"							
"	"	97	5.0V	H	"	"	H	"	H	"	5.0V	H	"	H	"	"	H	"	"							
"	"	98	5.0V	H	"	"	H	"	H	"	GND	H	"	H	"	"	H	"	"							
"	"	99	GND	L	"	"	L	"	L	"	GND	L	"	L	"	"	L	"	"							

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
																				Subgroup 7		Subgroup 8				
		Symbol	C	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6	V _{DD}		T _A = 25°C		T _A = 125°C		T _A = -55°C		
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max	
Truth table test	3014	100	GND	L	5.0V	5.0V	L	5.0V	L	GND	5.0V	L	5.0V	L	5.0V	5.0V	L	5.0V	All outputs	See notes 4/, 5/						
"	"	101	5.0V	L	5.0V	5.0V	L	5.0V	L	"	GND	L	5.0V	L	5.0V	5.0V	L	"								
"	"	102	"	H	5.0V	5.0V	H	5.0V	H	"	5.0V	H	5.0V	H	5.0V	5.0V	H	"								
"	"	103	"	H	GND	GND	H	GND	H	"	GND	H	GND	H	GND	GND	H	"								
"	"	104	"	L	GND	GND	L	GND	L	"	5.0V	L	GND	L	GND	GND	L	"								
"	"	105	"	L	5.0V	5.0V	L	5.0V	L	"	GND	L	5.0V	L	5.0V	5.0V	L	"								
"	"	106	"	H	5.0V	5.0V	H	5.0V	H	"	5.0V	H	5.0V	H	5.0V	5.0V	H	"								
"	"	107	GND	L	5.0V	5.0V	L	5.0V	L	"	5.0V	L	5.0V	L	5.0V	5.0V	L	"								
"	"	108	GND	L	GND	GND	L	GND	L	"	GND	L	GND	L	GND	GND	L	"								
																			Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C			
																			Min	Max	Min	Max	Min	Max		
t _{PHL1}	3003 Fig. 4	109	5.0V	OUT	IN2	GND	OUT	GND	OUT	GND	IN1	OUT	GND	OUT	GND	GND	OUT	5.0V	CLK to Q1	15	300	21	420	15	300	ns
"	"	110	"	"	GND	IN2	OUT	GND	OUT	"	"	OUT	GND	OUT	"	"	OUT	"	CLK to Q2	"	"	"	"	"	"	"
"	"	111	"	"	"	GND	OUT	IN2	OUT	"	"	OUT	GND	OUT	"	"	OUT	"	CLK to Q3	"	"	"	"	"	"	"
"	"	112	"	"	"	"	OUT	GND	OUT	"	"	OUT	GND	OUT	"	"	OUT	"	CLK to Q4	"	"	"	"	"	"	"
"	"	113	"	"	"	"	OUT	GND	OUT	"	"	OUT	GND	OUT	"	"	OUT	"	CLK to Q5	"	"	"	"	"	"	"
"	"	114	"	"	"	"	OUT	GND	OUT	"	"	OUT	GND	OUT	"	"	OUT	"	CLK to Q6	"	"	"	"	"	"	"
t _{PHL2}	"	115	IN2	OUT	5.0V	"	OUT	"	OUT	"	"	OUT	"	"	GND	OUT	"	"	C to Q1	15	300	21	420	15	300	"
"	"	116	"	"	GND	5.0V	OUT	"	OUT	"	"	OUT	"	"	"	OUT	"	"	C to Q2	"	"	"	"	"	"	"
"	"	117	"	"	"	GND	OUT	5.0V	OUT	"	"	OUT	"	"	"	OUT	"	"	C to Q3	"	"	"	"	"	"	"
"	"	118	"	"	"	"	OUT	GND	OUT	"	"	OUT	"	"	"	OUT	"	"	C to Q4	"	"	"	"	"	"	"
"	"	119	"	"	"	"	OUT	"	OUT	"	"	OUT	"	"	5.0V	OUT	"	"	C to Q5	"	"	"	"	"	"	"
"	"	120	"	"	"	"	OUT	"	OUT	"	"	OUT	"	"	GND	OUT	"	"	C to Q6	"	"	"	"	"	"	"
t _{PLH1}	"	121	5.0V	OUT	IN2	"	OUT	"	OUT	"	IN1	OUT	"	"	GND	OUT	"	"	CLK to Q1	15	300	21	420	15	300	"
"	"	122	5.0V	"	GND	IN2	OUT	"	OUT	"	IN1	OUT	"	"	GND	OUT	"	"	CLK to Q2	15	300	21	420	15	300	"
"	"	123	5.0V	"	GND	GND	OUT	IN2	OUT	"	IN1	OUT	"	"	GND	OUT	"	"	CLK to Q3	15	300	21	420	15	300	"

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units
																					Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C	
		Symbol	C	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6	V _{DD}		Min	Max	Min	Max	Min	Max	
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16								
t _{PLH1}	3003 Fig. 4	124 125 126	5.0V 5.0V 5.0V		GND GND GND	GND “ “		“ “ GND	“ “ “	IN1 “ “	OUT “ “	IN2 GND “	OUT “ “	GND IN2 GND	GND GND IN2		5.0V “ “	CLK to Q4 CLK to Q5 CLK to Q6	15 15 15	300 300 300	21 21 21	420 420 420	15 15 15	300 300 300	ns “ “	
t _{THL}	3004 Fig. 4	127 128 129 130 131 132	5.0V “ “ “ “ “	OUT “ “ “ “ “	IN2 GND “ “ “ “	“ IN2 GND “ “ “	OUT “ “ “ “ “	“ “ IN2 GND “ “	“ “ OUT “ “ “	“ “ “ “ “ “	“ “ OUT “ “ “	“ “ IN2 GND “ “	“ “ OUT “ “ “	“ “ “ “ IN2 GND	GND “ “ “ “ “ IN2		“ “ “ “ “ “	Q1 Q2 Q3 Q4 Q5 Q6	10 “ “ “ “ “ “	200 “ “ “ “ “ “	14 “ “ “ “ “ “	280 “ “ “ “ “ “	10 “ “ “ “ “ “	200 “ “ “ “ “ “	“ “ “ “ “ “ “	
t _{TLH}	“	133 134 135 136 137 138	“ “ “ “ “ “	OUT “ “ “ “ “	IN2 GND “ “ “ “	IN2 GND “ “ “ “	OUT “ “ “ “ “	“ “ IN2 GND “ “	“ “ OUT “ “ “	“ “ “ “ “ “	“ “ OUT “ “ “	“ “ IN2 GND “ “	“ “ OUT “ “ “	“ “ “ “ IN2 GND	GND “ “ “ “ “ IN2		“ “ “ “ “ “	Q1 Q2 Q3 Q4 Q5 Q6	“ “ “ “ “ “	“ “ “ “ “ “	“ “ “ “ “ “	“ “ “ “ “ “	“ “ “ “ “ “	“ “ “ “ “ “	“ “ “ “ “ “	
f _{CLK} 10/	Fig. 4	139 140 141 142 143 144	“ “ “ “ “ “	OUT “ “ “ “ “	IN2 GND “ “ “ “	“ IN2 GND “ “ “	OUT “ “ “ “ “	“ “ IN2 GND GND GND	“ “ OUT “ “ “	“ “ “ “ “ “	“ “ OUT “ “ “	“ “ IN2 GND GND	“ “ OUT “ “ “	“ “ “ “ IN2 GND	GND “ “ “ “ “ IN2		“ “ “ “ “ “	CLK to Q1 CLK to Q2 CLK to Q3 CLK to Q4 CLK to Q5 CLK to Q6	“ 570 “ “ “ “	“ “ 800 “ “ “	“ “ “ “ “ “	“ “ “ “ “ “	“ 570 “ “ “ “	“ “ “ “ “ “		

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units	
																				Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C			
			Symbol	$\overline{C}$	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6		V _{DD}	Min	Max	Min	Max	Min		Max
			Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16							
t _{p(CLK)} 11/	Fig. 4	145	5.0V	OUT	IN2	GND		GND		GND	IN1		GND		GND	GND		5.0V	CLK to Q1						ns		
		146			GND	IN2		GND					GND						CLK to Q2								
		147				GND		IN2		OUT			GND						CLK to Q3	200		280		200			
		148						GND				OUT	IN2						CLK to Q4								
		149						GND					GND	OUT	IN2				CLK to Q5								
		150						GND					GND		IN2	OUT			CLK to Q6								
t _{p(CLR)} 11/		151	IN2	OUT	5.0V	5.0V		5.0V					5.0V		5.0V	5.0V			$\overline{C}$ to Q1								
		152																	$\overline{C}$ to Q2								
		153					OUT												$\overline{C}$ to Q3								
		154										OUT							$\overline{C}$ to Q4								
		155												OUT					$\overline{C}$ to Q5								
		156														OUT			$\overline{C}$ to Q6								
t _{SLH}		157	5.0V		IN2	GND									GND				D1 to CLK								
		158			GND	IN2		GND						GND					D2 to CLK								
		159				GND								GND					D3 to CLK	80		120		80			
		160																	D4 to CLK								
		161																	D5 to CLK								
		162													GND	IN2			D6 to CLK								
t _{SHL}		163			IN2											GND			CLK to D1								
		164			GND	IN2													CLK to D2								
		165				GND													CLK to D3								
		166																	CLK to D4								
		167																	CLK to D5								
		168													GND	IN2			CLK to D6								
t _{HHL}		169			IN2														CLK to D1		60						
t _{HHL}		170			GND	IN2										GND			CLK to D2		60		85		60		
t _{HHL}		171			GND	GND		IN2								GND			CLK to D3		60		85		60		

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z Symbol Test No.	Terminal conditions 1/																Measured terminal	Test limits						Units
																				Subgroup 9 T _A = 25°C		Subgroup 10 T _A = 125°C		Subgroup 11 T _A = -55°C		
			C	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6	V _{DD}		Min	Max	Min	Max	Min	Max	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16								
t _{HHL}	Fig. 4	172	5.0V			GND				IN1		IN2		GND		5.0V	CLK to D4		60					ns		
t _{HHL}		173		GND			GND		GND			GND		GND	IN2	GND	CLK to D5									
t _{HHL}		174													IN2	IN2	CLK to D6			85		60				
t _{HLH}		175			IN2										GND		D1 to CLK									
		176			GND	IN2											D2 to CLK									
		177				GND		IN2									D3 to CLK									
		178						GND					IN2				D4 to CLK									
		179											GND		IN2		D5 to CLK									
		180													GND	IN2	D6 to CLK									
t _{r(CLK)}		181		OUT	IN2										GND		CLK to Q1							μs		
<u>12/</u>		182			GND	IN2	OUT										CLK to Q2									
		183				GND		IN2	OUT								CLK to Q3	15		15		15				
		184						GND				OUT	IN2				CLK to Q4									
		185											GND	OUT	IN2		CLK to Q5									
		186													IN2	OUT	CLK to Q6									
t _{r(CLK)}		187		OUT	IN2										GND		CLK to Q1									
<u>12/</u>		188			GND	IN2	OUT										CLK to Q2									
		189				GND		IN2	OUT								CLK to Q3									
		190						GND				OUT	IN2				CLK to Q4									
		191						GND					GND	OUT	IN2		CLK to Q5									
		192						GND					GND		IN2	OUT	CLK to Q6									

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units	
			Symbol	$\overline{C}$	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6		V _{DD}	Subgroup 12 T _A = 25°C						
				Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	Min	Max	Min	Max		Min
t _{PHL1}	3003 Fig. 4	193	10.0V	OUT	IN2	GND	OUT	GND	OUT	GND	IN1	OUT	GND	OUT	GND	GND	OUT	10.0V	CLK to Q1	5	110				ns		
“	“	194	“	“	GND	IN2	“	GND	“	“	“	“	GND	“	“	“	“	“	CLK to Q2	“	“				“		
“	“	195	“	“	“	GND	“	IN2	“	“	“	“	GND	“	“	“	“	“	CLK to Q3	“	“				“		
“	“	196	“	“	“	“	“	GND	“	“	“	OUT	IN2	“	“	“	“	“	CLK to Q4	“	“				“		
“	“	197	“	“	“	“	“	“	“	“	“	“	GND	OUT	IN2	“	“	“	CLK to Q5	“	“				“		
“	“	198	“	“	“	“	“	“	“	“	“	“	“	“	GND	IN2	OUT	“	CLK to Q6	“	“				“		
t _{PHL2}	“	199	IN2	OUT	10.0V	“	OUT	“	“	“	“	“	“	“	“	GND	“	“	$\overline{C}$ to Q1	“	“				“		
“	“	200	“	“	GND	10.0V	“	“	“	“	“	“	“	“	“	“	“	“	$\overline{C}$ to Q2	“	“				“		
“	“	201	“	“	“	GND	“	10.0V	OUT	“	“	“	“	“	“	“	“	“	$\overline{C}$ to Q3	“	“				“		
“	“	202	“	“	“	“	“	GND	“	“	“	OUT	10.0V	“	“	“	“	“	$\overline{C}$ to Q4	“	“				“		
“	“	203	“	“	“	“	“	“	“	“	“	“	OUT	10.0V	“	“	“	“	$\overline{C}$ to Q5	“	“				“		
“	“	204	“	“	“	“	“	“	“	“	“	“	“	GND	10.0V	10.0V	OUT	“	$\overline{C}$ to Q6	“	“				“		
t _{PLH1}	“	205	10.0V	OUT	IN2	“	OUT	“	“	“	“	“	“	“	“	GND	“	“	CLK to Q1	“	“				“		
“	“	206	“	“	GND	IN2	“	“	“	“	“	“	“	“	“	“	“	“	CLK to Q2	“	“				“		
“	“	207	“	“	“	GND	“	IN2	OUT	“	“	“	“	“	“	“	“	“	CLK to Q3	“	“				“		
“	“	208	“	“	“	“	“	GND	“	“	“	OUT	IN2	“	“	“	“	“	CLK to Q4	“	“				“		
“	“	209	“	“	“	“	“	“	“	“	“	“	GND	OUT	IN2	“	“	“	CLK to Q5	“	“				“		
“	“	210	“	“	“	“	“	“	“	“	“	“	“	GND	IN2	OUT	“	“	CLK to Q6	“	“				“		
t _{THL}	3004 Fig. 4	211	“	OUT	IN2	IN2	OUT	“	“	“	“	“	“	“	GND	“	“	“	Q1	“	100				μs		
“	“	212	“	“	GND	GND	“	IN2	OUT	“	“	“	“	“	GND	“	“	“	Q2	“	“				“		
“	“	213	“	“	GND	GND	“	“	“	“	“	“	“	“	GND	“	“	“	Q3	“	“				“		

See footnotes at end of device type 05.

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

Symbol	MIL-STD-883 method	Cases E,F,Z	Terminal conditions 1/																Measured terminal	Test limits						Units			
																				Subgroup 12									
		Symbol	C	Q1	D1	D2	Q2	D3	Q3	V _{SS}	CLK	Q4	D4	Q5	D5	D6	Q6	V _{DD}		T _A = 25°C									
		Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Min	Max	Min	Max	Min	Max				
t _{THL}	3004 Fig. 4	214	10.0V	OUT	GND	GND	OUT	GND	OUT	IN1	OUT	IN2	OUT	GND	GND	OUT	10.0V	Q4	5	100					μs				
t _{THL}		215			GND									GND	OUT		IN2	GND				Q5							
t _{THL}		216			GND												GND	OUT	IN2	GND			Q6						
t _{TLH}		217			IN2														GND				Q1						
		218			GND	IN2		OUT															Q2						
		219				GND					IN2	OUT											Q3						
		220									GND						OUT	IN2					Q4						
		221									GND							GND	OUT	IN2			Q5						
	222						GND					GND		IN2	OUT		Q6												

1/ Pins not designated may be "high" level logic, "low" level logic or open. Exceptions are as follows: V_{IC(pos)} tests, the V_{SS} terminals shall be open; V_{IC(neg)} tests, the V_{DD} terminal shall be open; I_{SS} tests, the output terminals shall be open.

2/ The I_{SS} measurements shall be performed in sequence.

3/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.

4/ The truth table tests shall be performed in sequence.

5/ The truth table tests shall be performed at V_{IH} and V_{DD} ≤ 5 Vdc and ≥ 18 Vdc. "L" = V_{SS} + 0.5 V maximum and "H" = V_{DD} - 0.5 V minimum.

6/ See 4.4.1c.

7/ Apply clock pulse V_{IN} = 0 to 18 Vdc.

8/ Apply clock pulse V_{IN} = 0 to 15 Vdc.

9/ Apply clock pulse V_{IN} = 0 to 5 Vdc.

10/ The minimum clock frequency (f_{CLK}) requirement is considered met if proper output state changes occur with the pulse repetition period set to that given in the limits column.

11/ The minimum clock, or clear pulse width (t_{pH(CLK)}, and t_{pH(CLR)}) requirement is considered met if proper output changes occur with the pulse width set to that given in the limits column.

12/ Pulse repetition period = 100 μs, 50 percent duty cycle. The maximum clock transition time (t_{r(CLK)}, t_{f(CLK)}) requirement is considered met if proper output state changes occur with rise time set to that given in the limits column.

13/ The following timing sequence and input/output conditions shall apply:

Test	V _{DD}	Input/output conditions			
		Input levels		Output levels	
		1	0	1	0
V _{IL1} V _{IH1}	5.0 V	3.5 V	1.5 V	Min 4.5 V	Max 0.5 V
V _{IL2} V _{IH2}	10.0 V	7.0 V	3.0 V	9.0 V	1.0 V
V _{IL3} V _{IH3}	15.0 V	11.0 V	4.0 V	13.5 V	1.5 V

* Time slot		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\overline{C}$	0	1	1	1	0	0	1	1	1	1	1	1	0	0
I	D1	1	1	1	1	1	1	1	1	0	0	1	1	1	0
N	D2	1	1	1	1	1	1	1	1	0	0	1	1	1	0
P	D3	1	1	1	1	1	1	1	1	0	0	1	1	1	0
U	CLK	0	0	1	0	0	1	0	1	0	1	0	1	1	0
T	D4	1	1	1	1	1	1	1	1	0	0	1	1	1	0
S	D5	1	1	1	1	1	1	1	1	0	0	1	1	1	0
	D6	1	1	1	1	1	1	1	1	0	0	1	1	1	0
O	Q1	0	0	1	1	0	0	0	1	1	0	0	1	0	0
U	Q2	0	0	1	1	0	0	0	1	1	0	0	1	0	0
T	Q3	0	0	1	1	0	0	0	1	1	0	0	1	0	0
P	Q4	0	0	1	1	0	0	0	1	1	0	0	1	0	0
U	Q5	0	0	1	1	0	0	0	1	1	0	0	1	0	0
T	Q6	0	0	1	1	0	0	0	1	1	0	0	1	0	0
S															

* Test shall be run in sequence.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table V of MIL-PRF-38535. End-point electrical parameters shall be as specified in table II herein.

4.4.5 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.7 herein). RHA levels for device classes B and S shall be as specified in MIL-PRF-38535 and 4.5.4 herein.

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

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

4.5.2 Burn-in and life test cool down procedures. When the burn-in and life tests are completed and prior to removal of bias voltages, the devices under test (DUT) shall be cooled to a temperature of $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$; then, electrical parameter end-point measurements shall be performed.

TABLE IV. Delta limits at 25°C .

Parameter <u>1/</u>	Device types				
	01	02	03	04	05
I_{SS}	$\pm 10 \text{ nA}$	$\pm 10 \text{ nA}$	$\pm 10 \text{ nA}$	$\pm 10 \text{ nA}$	$\pm 10 \text{ nA}$
I_{OL1}	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$
I_{OH1}	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$

1/ Each of the above parameters shall be recorded before and after the required burn-in and life tests to determine delta (Δ).

4.5.3 Quiescent supply current (I_{SS} test). When performing quiescent supply current measurements (I_{SS}), 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 MIL-PRF-38535 and herein.

- 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 VII in order to calculate the delta threshold (ΔV_T) after irradiation.
- The devices shall be subjected to a total radiation dose as specified in MIL-PRF-38535 for the radiation hardness assurance level being tested, and meet the end-point electrical parameters as defined in table V at 25°C , after exposure. The start and completion of the end-point electrical parameter measurements shall not exceed 2 hours following irradiation.
- Threshold-voltage test circuit conditions shall be as specified in table VII and on figure 5. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VI and the bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.
- 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. Radiation hardened end-point electrical parameters at 25°C.

Parameter	All device types	V _{DD}
V _{TN}	0.3 V min	10 V
V _{TP}	2.8 V max	10 V
ΔV _T	1.4 V max	10 V
I _{SS}	100 x max limit	18 V
t _{PLH}	1.35 x max limit	5 V
t _{PHL}	1.35 x max limit	5 V

TABLE VI. Bias during exposure to radiation.

Device type	Pin connections <u>1/</u>		
	V _{DD} = 10 V dc (through a 30 kΩ to 60 kΩ resistor)	V _{SS} = GND	V _{DD} = 10 V dc
01	1, 2, 7, 9, 10, 11, 12, 13, 14, 15	8	16
02	2, 3, 4, 5, 9, 10, 11, 12, 13	7	14
03	2, 3, 4, 5, 9, 10, 11, 12, 13	7	14
04	3, 4, 5, 11, 12, 13	8	16
05	1, 3, 4, 6, 9, 11, 13, 14	8	16

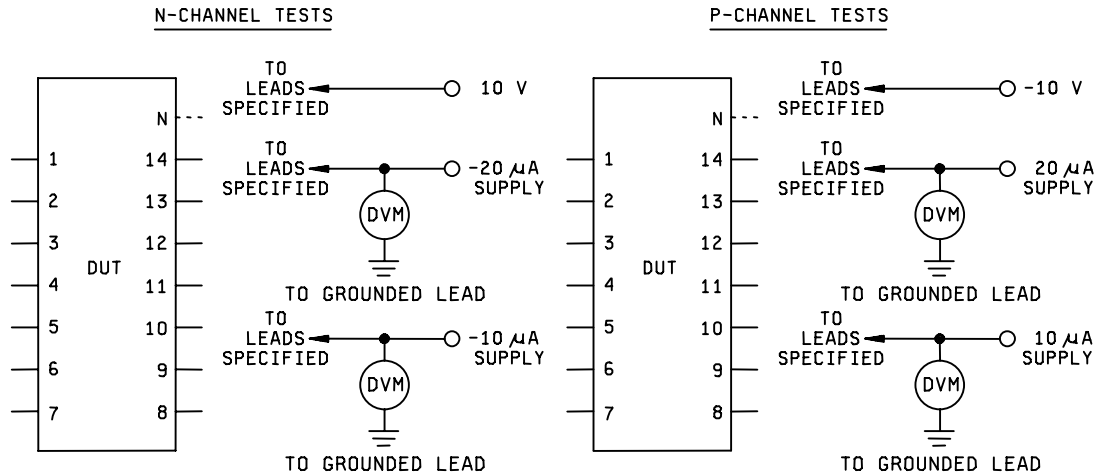
1/ Pins not designated are open, or tied to 10 V dc through a 30 kΩ to 60 kΩ resistor.

5. PACKAGING

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

6. NOTES

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

FIGURE 5. Threshold-voltage test circuit.TABLE VII. Threshold-voltage test circuit conditions.

Device type	GND	10 V	V _{TN} measured at		GND	-10 V	V _{TP} measured at	
			-20 μA supply	-10 μA supply			20 μA supply	10 μA supply
01	7	1, 2, 9-16		8	7	1, 2, 8-15		16
02	12	14		2-5, 7, 9-11, 13	12	2-5, 7, 9-11, 13		14
03	12	14		2-5, 7, 9-11, 13	12	2-5, 7, 9-11, 13		14
04	4	5, 11, 12, 16		1, 3, 8, 13, 15	4	1, 3, 8, 13, 15		5, 11, 12, 16
05	3	1, 4, 6, 9, 11, 13, 14, 16		8	3	8		1, 4, 6, 9, 11, 13, 14, 16

6.2 Acquisition requirements. Acquisition documents should specify the following:

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

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

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

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

C _I	Input terminal-to-GND capacitance.
GND	Ground zero voltage potential.
I _{OC}	Three-state output leakage current.
I _{SS}	Quiescent supply current.
T _A	Free air temperature.
V _{DD}	Positive supply voltage.
V _{SS}	Negative supply voltage.

6.6 Logistic support. Lead materials and finishes (see 3.4) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class S for National Aeronautics and Space Administration or class B for Department of Defense (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.

6.7 Data reporting. When specified in the purchase order or contract, a copy of the following data, as applicable, will be supplied.

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

6.8 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges, post irradiation performance or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

Military device type	Generic-industry type
01	4076B
02	4095B
03	4096B
04	4098B
05	40174B

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

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

Preparing activity:
 DLA - CC
 (Project 5962-2042)

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

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