Rochester Electronics

Datasheet

PART NUMBER

54LS113FMB-ROCV

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All re-creations are done with the approval of the Original Component Manufacturer. (OCM)

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-38535
    - Class Q Military
    - Class V Space Level

Qualified Suppliers List of Distributors (QSLD)

- Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OCM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

INCH-POUND
MIL-M-38510/301E
14 February 2003
SUPERSEDING
MIL-M-38510/301D
8 April 1988

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR LOW-POWER SCHOTTKY TTL, FLIP-FLOPS, CASCADABLE, MONOLITHIC SILICON

Inactive for new design after 18 April 1997.

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

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, low-power Schottky TTL, flip-flops, bistable logic gate microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided for each type and are reflected in the complete part number. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).

1.2 Part number. The part number shall be in accordance with MIL-PRF-38535, and as specified herein.

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

Device type	Circuit
01	Dual J-K flip-flop with clear
02	Dual D type flip-flop with clear and preset
03	Dual J-K flip-flop with clear and preset
04	Dual J-K flip-flop with preset
05	Dual J-K flip-flop with preset and common clear and common clock
06	Hex D type flip-flop with common clear and common clock
07	Quad D type flip-flop with common clear and common clock
08	Dual, J-K flip-flop with clear
09	Dual, J-$\overline{K}$ flip-flop with clear and preset
10	Dual, J-K flip-flop with clear and preset

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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, P. O. Box 3990, Columbus, OH 43216-5000, by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5962

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

Outline letter	Descriptive designator	Terminals	Package style
A	GDFP5-F14 or CDFP6-F14	14	Flat pack
B	GDFP4-14	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
X	CQCC2-N20	20	Square leadless chip carrier
2	CQCC1-N20	20	Square leadless chip carrier

1.3 Absolute maximum ratings.

Supply voltage range ..... -0.5 V dc to 7.0 V dc
Input voltage range ..... -1.5 V dc at -18 mA to 5.5 V dc
Storage temperature range ..... -65° to +150°C
Maximum power dissipation per flip-flop, (P_D) 1/ ..... 25 mW
Lead temperature (soldering, 10 seconds) ..... 300°C
Thermal resistance, junction to case (θ_{JC}):
  Cases A, B, C, D, E, F, X, and 2 ..... (See MIL-STD-1835)
Junction temperature (T_J) 2/..... 175°C

1.4 Recommended operating conditions.

Supply voltage (V_{CC}) ..... 4.5 V dc minimum to 5.5 V dc maximum
Minimum high level input voltage (V_{IH}) ..... 2.0 V dc
Maximum low level input voltage (V_{IL}) ..... 0.7 V dc
Case operating temperature range (T_C) ..... -55° to +125°C
Input set up time:
  Device types:
    01, 03, 04, 05, 08, 09, and 10 ..... 25 ns minimum
    02, 06, and 07 ..... 20 ns minimum
Input hold time:
  Device types:
    01, 03, 04, 05, 08, and 10 ..... 0 ns minimum
    02, 06, 07, and 09 ..... 5 ns minimum

1/ Must withstand the added P_D due to short-circuit test (e.g., I_{OS}).
2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions in accordance with MIL-PRF-38535.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 shall be those listed in the issue of the Departments of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

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

STANDARDS

DEPARTMENT OF DEFENSE

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

(Unless otherwise indicated, copies of the above specifications and standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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

3. REQUIREMENTS

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

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

3.3 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein.

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

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

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

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

3.3.5 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. The electrical performance characteristics are as specified in table I, and apply over the full recommended case operating temperature range, unless otherwise specified.

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

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

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 10 (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 effect 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 quality 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. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.

c. Additional screening for space level product shall be as specified in MIL-PRF-38535, appendix B.

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

4.4 Technology Conformance inspection (TCI). Technology conformance inspection shall be in accordance with MIL-PRF-38535 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table III of MIL-PRF-38535 and as follows:

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, and 6 shall be omitted.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II 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.

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.

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

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

4.5.1 Voltage and current. All voltages given are referenced to the microcircuit ground terminal. Currents given are conventional and positive when flowing into the referenced terminal.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device types	Limits		Unit
				Min	Max	
High level output voltage	V_{OH}	V_{CC} = 4.5 V, I_{OH} = -400 µA	All	2.5		V
Low level output voltage	V_{OL}	V_{CC} = 4.5 V, I_{OL} = 4 mA	All		0.4	V
Input clamp voltage	V_{IC}	V_{CC} = 4.5 V, I_{IN} = -18 mA, T_C = +25°C	All		-1.5	V
Low level input current	I_{IL1}	V_{CC} = 5.5 V, V_{IN} = 0.4 V 2/	01, 03, 04, 05, 08, 10	-.030	-.360	mA
		2/	06, 07	-.075	-.400	
	I_{IL2}	3/	02, 09	-.030	-.400	
		3/	06	-.075	-.420	
		3/	07	-.075	-.420	
	I_{IL3}	4/	01, 08	-.060	-.720	
		4/	03, 04, 10	-.060	-.760	
	I_{IL4}	5/	01, 02, 03, 04, 05, 08, 09, 10	-.060	-.800	
	I_{IL5}	6/	02	-.060	-1.20	
	I_{IL6}	4/	05	-.12	-1.52	
	I_{IL7}	6/	05	-.120	-1.60	
		6/	09	-.060	-1.60	
High level input current	I_{IH1}	V_{CC} = 5.5 V, V_{IN} = 2.7 V 7/	All		20	µA
	I_{IH2}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 7/	All		100	
	I_{IH3}	V_{CC} = 5.5 V, V_{IN} = 2.7 V 8/	02, 09		40	
	I_{IH4}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 8/	02, 09		200	
	I_{IH5}	V_{CC} = 5.5 V, V_{IN} = 2.7 V 9/	01, 02, 03, 04, 05, 08, 10		60	
	I_{IH6}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 9/	01, 02, 03, 04, 05, 08, 10		300	
	I_{IH7}	V_{CC} = 5.5 V, V_{IN} = 2.7 V 10/	01, 03, 04, 08, 09, 10		80	
	I_{IH8}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 10/	01, 03, 04, 08, 09, 10		400	
	I_{IH9}	V_{CC} = 5.5 V, V_{IN} = 2.7 V 6/	05		120	
	I_{IH10}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 6/	05		600	
	I_{IH11}	V_{CC} = 5.5 V, V_{IN} = 2.7 V 4/	05		160	
	I_{IH12}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 4/	05		800	

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Device types	Limits		Unit
				Min	Max	
Short circuit output current	I_{OS}	V_{CC} = 5.5 V 11/ V_{IN} = 0 V	01, 02, 03, 05, 06, 07, 08, 09	-15	-100	mA
			04, 10	-15	-130	
Supply current	I_{CC}	V_{CC} = 5.5 V, V_{IN} = 5.5 V	01, 02, 03, 04, 05, 08 09, 10		8	mA
			06		26	
			07		18	
Maximum clock frequency	f_{MAX}	V_{CC} = 5.0 V C_L = 50 pF ± 10% R_L = 2kΩ ± 5%	01, 03, 04 05, 06, 07 08, 10	25		MHz
			02, 09	20		
Propagation delay to high logic level (clear or preset to output)	t_{PLH1}		01, 03, 04, 05, 08, 10	5	32	ns
			02, 09	5	39	
			07	5	51	
Propagation delay to low logic level (clear or preset to output)	t_{PHL1}		01, 03, 04, 05, 08, 10	5	40	ns
			02, 09	5	59	
			06	5	52	
			07	5	55	
Propagation delay to high logic level (clock to output)	t_{PLH2}		01, 03, 04, 05, 08, 10	5	32	ns
			02, 09	5	39	
			06	5	47	
			07	5	46	
Propagation delay to low logic level (clock to output)	t_{PHL2}		01, 03, 04, 05, 08, 10	5	42	ns
			02, 09	5	59	
			06	5	52	
			07	5	55	

1/ See table III for complete terminal conditions.
2/ Input condition - J or K (device types 01, 03, 04, 05, 08, and 10); and D (device types 06 and 07).
3/ Input condition - D (device type 02); clock or clear (device types 06 and 07); and J or $\overline{K}$ (device type 09).
4/ Input condition - Clock.
5/ Input condition - Clear or preset (device types 03 and 10); clear (device types 01 and 08); preset or clock (device types 02 and 09); and preset (device types 04 and 05).
6/ Input condition - Clear.
7/ Input condition - J or K (device types 01, 03, 04, 05, 08, and 10); D (device type 02); J or $\overline{K}$ (device type 09); and D, clear, clock (device types 06 and 07).
8/ Input condition - Preset or clock.
9/ Input condition - Clear or preset (device types 03 and 10); clear (device types 01, 02, and 08); and preset (device types 04 and 05).
10/ Input condition - Clock (device type 01, 03, 04, 08, and 10); and clear (device type 09).
11/ Not more than one output should be shorted at a time.

TABLE II. Electrical test requirements.

MIL-PRF-38535 test requirements	Subgroups (see table III)	
	Class S devices	Class B devices
Interim electrical parameters	1	1
Final electrical test parameters	1*, 2, 3, 7, 9, 10, 11	1*, 2, 3, 9
Group A test requirements	1, 2, 3, 7, 8, 9, 10, 11	1, 2, 3, 7, 8, 9, 10, 11
Group C end-point electrical parameters	1, 2, 3, 9, 10, 11	1, 2, 3
Group D end-point electrical parameters	1, 2, 3	1, 2, 3

*PDA applies to subgroup 1.

5. PACKAGING

5.1 Packaging requirements. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD 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 Department'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.

Pin number	Pin symbols device type 01		Pin symbols device type 02		Pin symbols device type 03		Pin symbols device type 04		Pin symbols device type 05	
	Cases 2, X	Cases A, B, C, and D	Cases 2, X	Cases A, B, C, and D	Cases 2, X	Cases E, F	Cases 2, X	Cases A, B, C, and D	Cases 2, X	Cases A, B, C, and D
1	NC	CLK1	NC	CLR1	NC	CLK1	NC	CLK1	NC	CLR1
2	CLK1	CLR1	CLR1	1D	CLK1	1K	CLK1	1K	CLR	1K
3	CLR1	1K	1D	CLK1	1K	1J	1K	1J	1K	1J
4	1K	V_{CC}	CLK1	PS1	1J	PS1	1J	PS1	1J	PS1
5	NC	CLK2	NC	1Q	PS1	1Q	NC	1Q	NC	1Q
6	V_{CC}	CLR2	PS1	$1\overline{Q}$	NC	$1\overline{Q}$	PS1	$1\overline{Q}$	PS1	$1\overline{Q}$
7	NC	2J	NC	GND	1Q	$2\overline{Q}$	NC	GND	NC	GND
8	CLK2	$2\overline{Q}$	1Q	$2\overline{Q}$	$1\overline{Q}$	GND	1Q	$2\overline{Q}$	1Q	$2\overline{Q}$
9	CLR2	2Q	$1\overline{Q}$	2Q	$2\overline{Q}$	2Q	$1\overline{Q}$	2Q	$1\overline{Q}$	2Q
10	2J	2K	GND	PS2	GND	PS2	GND	PS2	GND	PS2
11	NC	GND	NC	CLK2	NC	2J	NC	2J	NC	2J
12	$2\overline{Q}$	1Q	$2\overline{Q}$	2D	2Q	2K	$2\overline{Q}$	2K	$2\overline{Q}$	2K
13	2Q	$1\overline{Q}$	2Q	CLR2	PS2	CLK2	2Q	CLK2	2Q	CLK
14	2K	1J	PS2	V_{CC}	2J	CLR2	PS2	V_{CC}	PS2	V_{CC}
15	NC		NC		2K	CLR1	NC		NC	
16	GND		CLK2		NC	V_{CC}	2J		2J	
17	NC		NC		CLK2		NC		NC	
18	1Q		2D		CLR2		2K		2K	
19	$1\overline{Q}$		CLR2		CLR1		CLK2		CLK	
20	1J		V_{CC}		V_{CC}		V_{CC}		V_{CC}	

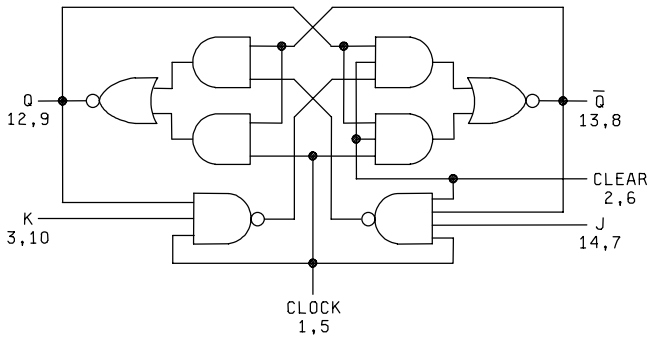
FIGURE 1. Terminal connections.

Pin number	Pin symbols device type 06		Pin symbols device type 07		Pin symbols device type 08		Pin symbols device type 09		Pin symbols device type 10	
	Cases 2, X	Cases E, F	Cases 2, X	Cases E, F	Cases 2, X	Cases A, B, C, and D	Cases 2, X	Cases E, F	Cases 2, X	Cases E, F
1	NC	CLR	NC	CLR	NC	1J	NC	1CLR	NC	1CLK
2	CLR	1Q	CLR	1Q	1J	$1\overline{Q}$	1CLR	1J	1CLK	1PS
3	1Q	1D	1Q	$1\overline{Q}$	$1\overline{Q}$	1Q	1J	$1\overline{K}$	1PS	1CLR
4	1D	2D	$1\overline{Q}$	1D	1Q	1K	$1\overline{K}$	1CLK	1CLR	1J
5	2D	2Q	1D	2D	NC	2Q	1CLK	1PS	1J	V_{CC}
6	NC	3D	NC	$2\overline{Q}$	1K	$2\overline{Q}$	NC	1Q	NC	2CLK
7	2Q	3Q	2D	2Q	NC	GND	1PS	$1\overline{Q}$	V_{CC}	2PS
8	3D	GND	$2\overline{Q}$	GND	2Q	2J	1Q	GND	2CLK	2CLR
9	3Q	CLK	2Q	CLK	$2\overline{Q}$	2CLK	$1\overline{Q}$	$2\overline{Q}$	2PS	2J
10	GND	4Q	GND	3Q	GND	2CLR	GND	2Q	2CLR	$2\overline{Q}$
11	NC	4D	NC	$3\overline{Q}$	NC	2K	NC	2PS	NC	2Q
12	CLK	5Q	CLK	3D	2J	1CLK	$2\overline{Q}$	2CLK	2J	2K
13	4Q	5D	3Q	4D	2CLK	1CLR	2Q	$2\overline{K}$	$2\overline{Q}$	GND
14	4D	6D	$3\overline{Q}$	$4\overline{Q}$	2CLR	V_{CC}	2PS	2J	2Q	$1\overline{Q}$
15	5Q	6Q	3D	4Q	NC		2CLK	2CLR	2K	1Q
16	NC	V_{CC}	NC	V_{CC}	2K		NC	V_{CC}	NC	1K
17	5D		4D		NC		$2\overline{K}$		GND	
18	6D		$4\overline{Q}$		1CLK		2J		$1\overline{Q}$	
19	6Q		4Q		1CLR		2CLR		1Q	
20	V_{CC}		V_{CC}		V_{CC}		V_{CC}		1K	

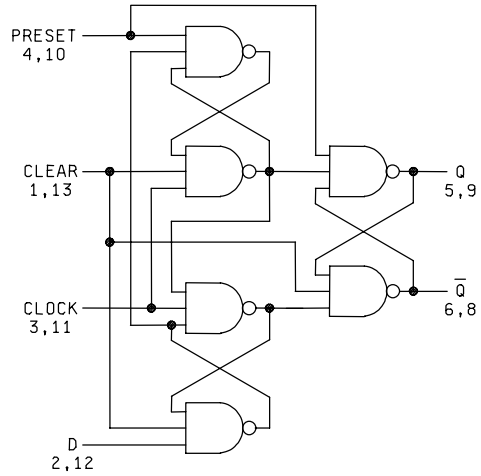
FIGURE 1. Terminal connections - Continued.

(Pin numbers shown apply to the DIP and flat packs only)

DEVICE TYPE 01



DEVICE TYPE 02



DEVICE TYPE 03

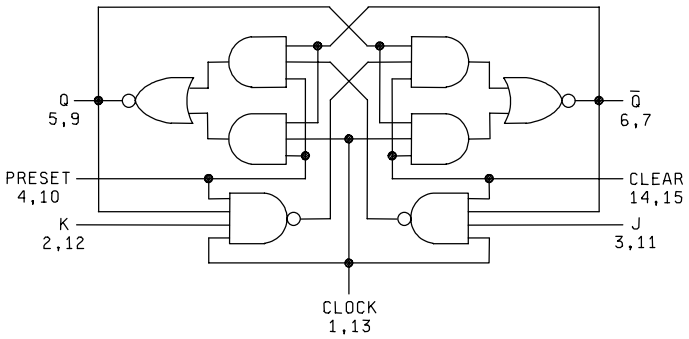
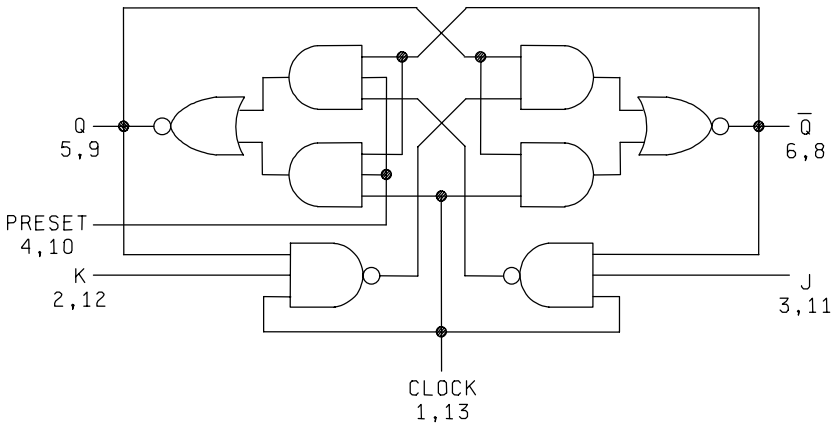


FIGURE 2. Logic Diagrams.

(Pin numbers shown apply to the DIP and flat packs only)

DEVICE TYPE 04



DEVICE TYPE 05

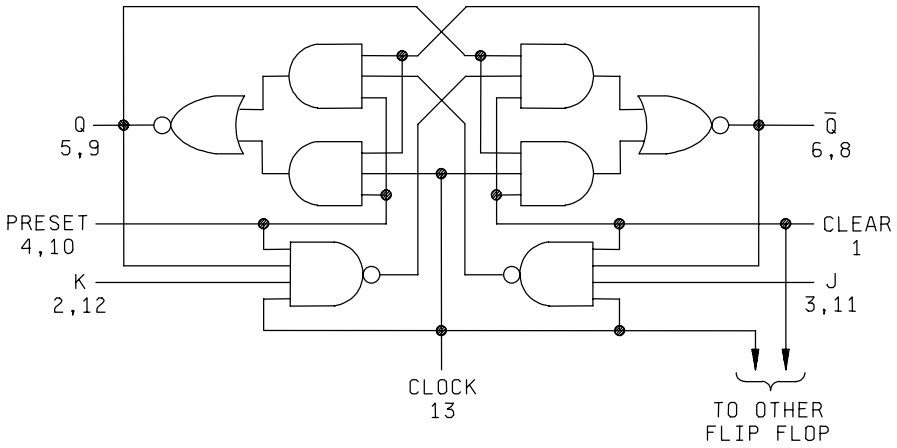


FIGURE 2. Logic Diagrams - Continued.

(Pin numbers shown apply to the DIP and flat packs only)

DEVICE TYPE 06

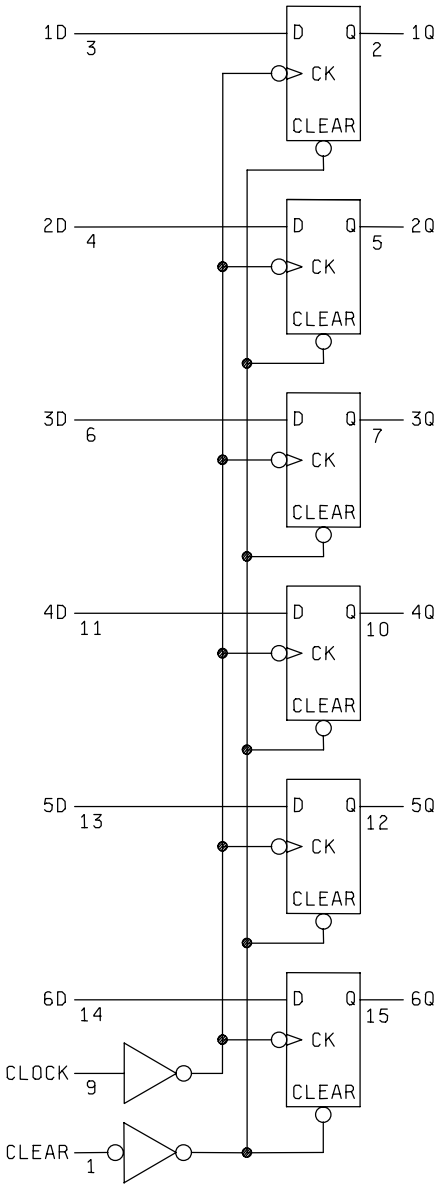
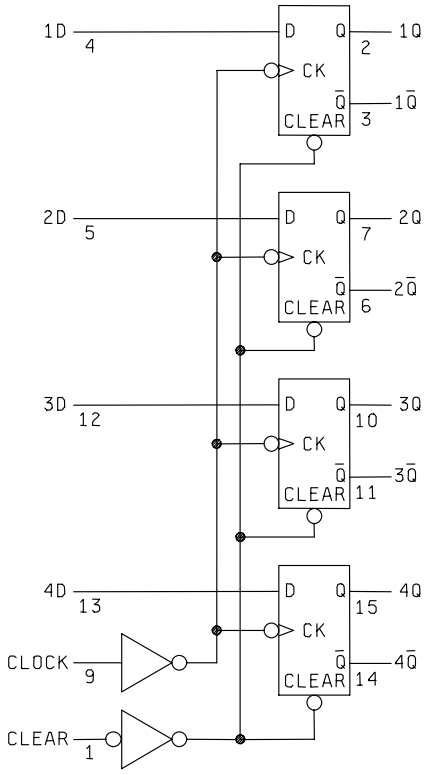


FIGURE 2. Logic Diagrams - Continued.

(Pin numbers shown apply to the DIP and flat packs only)

DEVICE TYPE 07



DEVICE TYPE 08

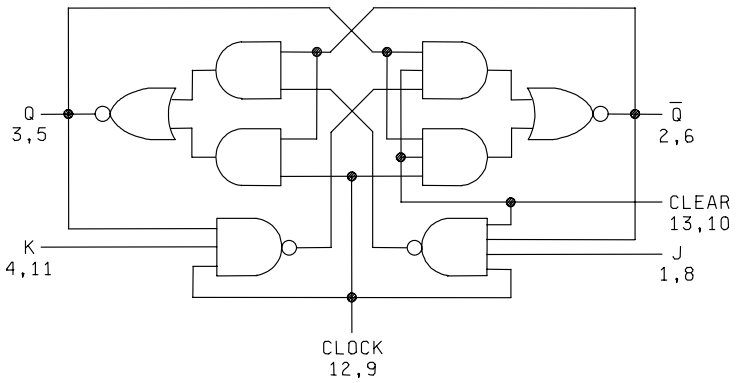
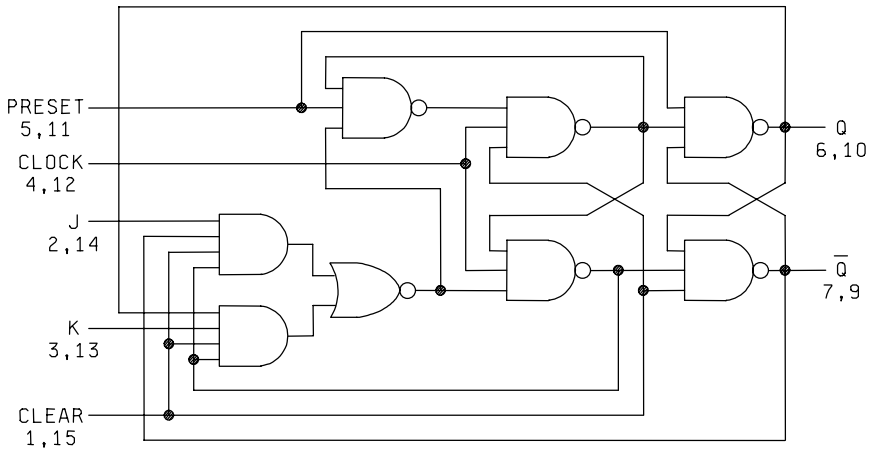


FIGURE 2. Logic Diagrams - Continued.

(Pin numbers shown apply to the DIP and flat packs only)

DEVICE TYPE 09



DEVICE TYPE 10

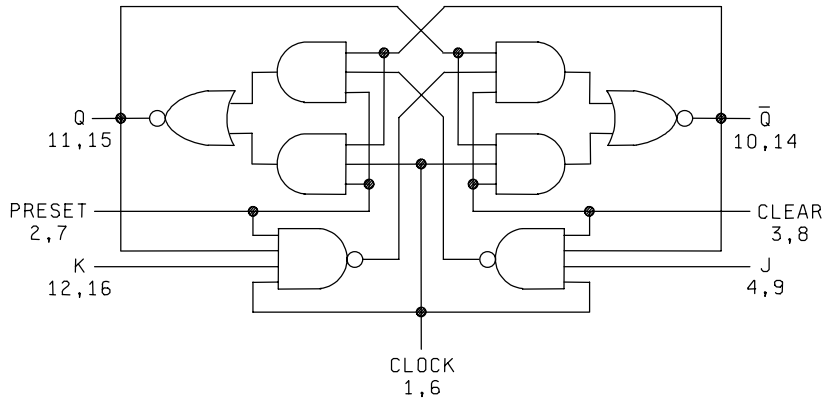


FIGURE 2. Logic Diagrams - Continued.

DEVICE TYPE 01

INPUTS				OUTPUTS	
CLEAR	CLOCK	J	K	Q	$\overline{Q}$
L	X	X	X	L	H
H	↓	L	L	Q_0	$\overline{Q}_0$
H	↓	H	L	H	L
H	↓	L	H	L	H
H	↓	H	H	TOGGLE	
H	H	X	X	Q_0	$\overline{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↓ = transition from high to low level
Q_0 = the level of Q before the indicated input conditions were established.
TOGGLE: Each output changes to the complement of its previous level on each ↓ clock transition.

DEVICE TYPE 02

INPUTS				OUTPUTS	
PRESET	CLEAR	CLOCK	D	Q	$\overline{Q}$
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H*	H*
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q_0	$\overline{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↑ = transition from low to high level
Q_0 = the level of Q before the indicated steady state input conditions were established.
* This configuration is nonstable; that is, it will not persist when preset and clear inputs return to their inactive (high) level.

FIGURE 3. Truth tables.

DEVICE TYPES 03 AND 10

INPUTS					OUTPUTS	
PRESET	CLEAR	CLOCK	J	K	Q	$\overline{Q}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	↓	L	L	Q_0	$\overline{Q}_0$
H	H	↓	H	L	H	L
H	H	↓	L	H	L	H
H	H	↓	H	H	TOGGLE	
H	H	H	X	X	Q_0	$\overline{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↓ = transition from high to low level
Q_0 = the level of Q before the indicated steady state input conditions were established.
TOGGLE: Each output changes to the complement of its previous level on each ↓ clock transition.
* This configuration is nonstable; that is, it will not persist when preset and clear inputs return to their inactive (high) level.

DEVICE TYPE 04

INPUTS				OUTPUTS	
PRESET	CLOCK	J	K	Q	$\overline{Q}$
L	H	X	X	H	L
H	↓	L	L	Q_0	$\overline{Q}_0$
H	↓	H	L	H	L
H	↓	L	H	L	H
H	↓	H	H	TOGGLE	
H	H	X	X	Q_0	$\overline{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↓ = transition from high to low level
Q_0 = the level of Q before the indicated input conditions were established.
TOGGLE: Each output changes to the complement of its previous level on each ↓ clock transition.

FIGURE 3. Truth tables - Continued.

DEVICE TYPES 05

INPUTS					OUTPUTS	
PRESET	CLEAR	CLOCK	J	K	Q	$\overline{Q}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	↓	L	L	Q_0	$\overline{Q}_0$
H	H	↓	H	L	H	L
H	H	↓	L	H	L	H
H	H	↓	H	H	TOGGLE	
H	H	H	X	X	Q_0	$\overline{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↓ = transition from high to low level
Q_0 = the level of Q before the indicated steady state input conditions were established.
TOGGLE: Each output changes to the complement of its previous level on each ↓ clock transition.
* This configuration is nonstable; that is, it will not persist when preset and clear inputs return to their inactive (high) level.

DEVICE TYPE 06

INPUTS			OUTPUT
CLEAR	CLOCK	D	Q
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q_0

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↑ = transition from low to high level
Q_0 = the level of Q before the indicated steady state input conditions were established.

FIGURE 3. Truth tables - Continued.

DEVICE TYPE 07

INPUTS			OUTPUT	
CLEAR	CLOCK	D	Q	$\overline{Q}$
L	X	X	L	H
H	↑	H	H	L
H	↑	L	L	L
H	L	X	Q_0	$\overline{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↑ = transition from low to high level
Q_0 = the level of Q before the indicated steady state input conditions were established.

DEVICE TYPE 08

INPUTS				OUTPUTS	
CLEAR	CLOCK	J	K	Q	$\overline{Q}$
L	X	X	X	L	H
H	↑	L	L	Q_0	$\overline{Q}_0$
H	↑	H	L	H	L
H	↑	L	H	L	H
H	↑	H	H	TOGGLE	

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↑ = transition from low to high level
Q_0 = the level of Q before the indicated input conditions were established.
TOGGLE: Each output changes to the complement of its previous level on each clock transition.

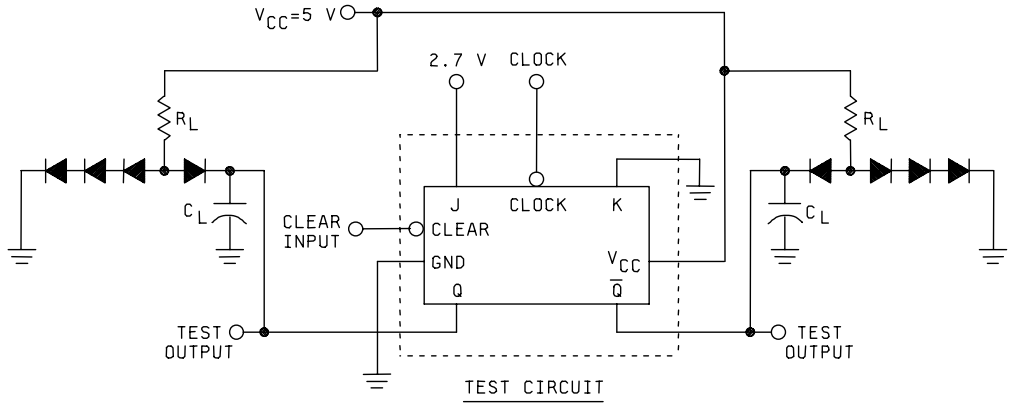
FIGURE 3. Truth tables - Continued.

DEVICE TYPE 09

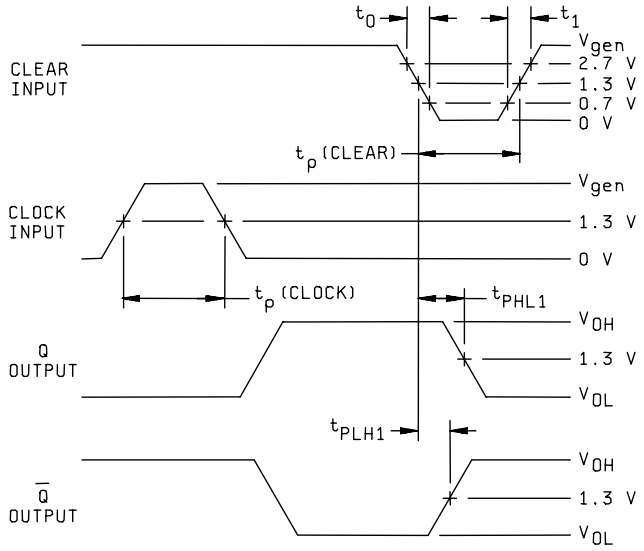
INPUTS					OUTPUTS	
PRESET	CLEAR	CLOCK	J	$\overline{K}$	Q	$\overline{Q}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	↑	L	L	L	H
H	H	↑	H	L	TOGGLE	
H	H	↑	L	H	Q_0	$\overline{Q}_0$
H	H	↑	H	H	H	L
H	H	L	X	X	Q_0	$\overline{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↑ = transition from low to high level
Q_0 = the level of Q before the indicated steady state input conditions were established.
TOGGLE: Each output changes to the complement of its previous level on each ↑ clock transition.
* This configuration is nonstable; that is, it will not persist when preset and clear inputs return to their inactive (high) level.

FIGURE 3. Truth tables - Continued.



TEST CIRCUIT

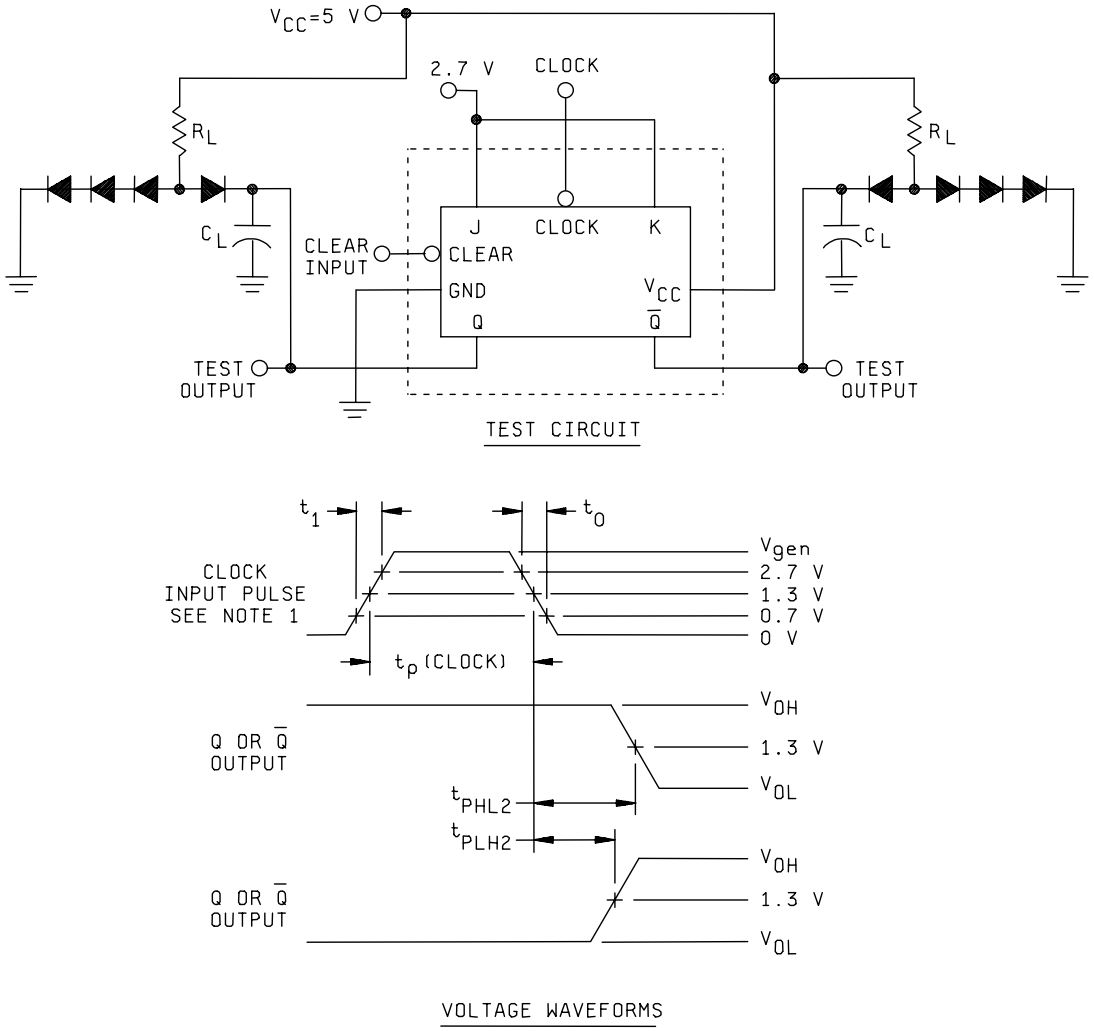


VOLTAGE WAVEFORM

NOTES:

1. Clear inputs dominate regardless of the state of clock or J-K inputs.
2. Clear input pulse characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p (clear) = 30 ns, PRR ≤ 1 MHz.
3. All diodes are 1N3064, or equivalent.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.
6. Clock input pulse characteristics: V_{gen} = 3 V, t_p(clock) = 25 ns, PRR ≤ 1 MHz.

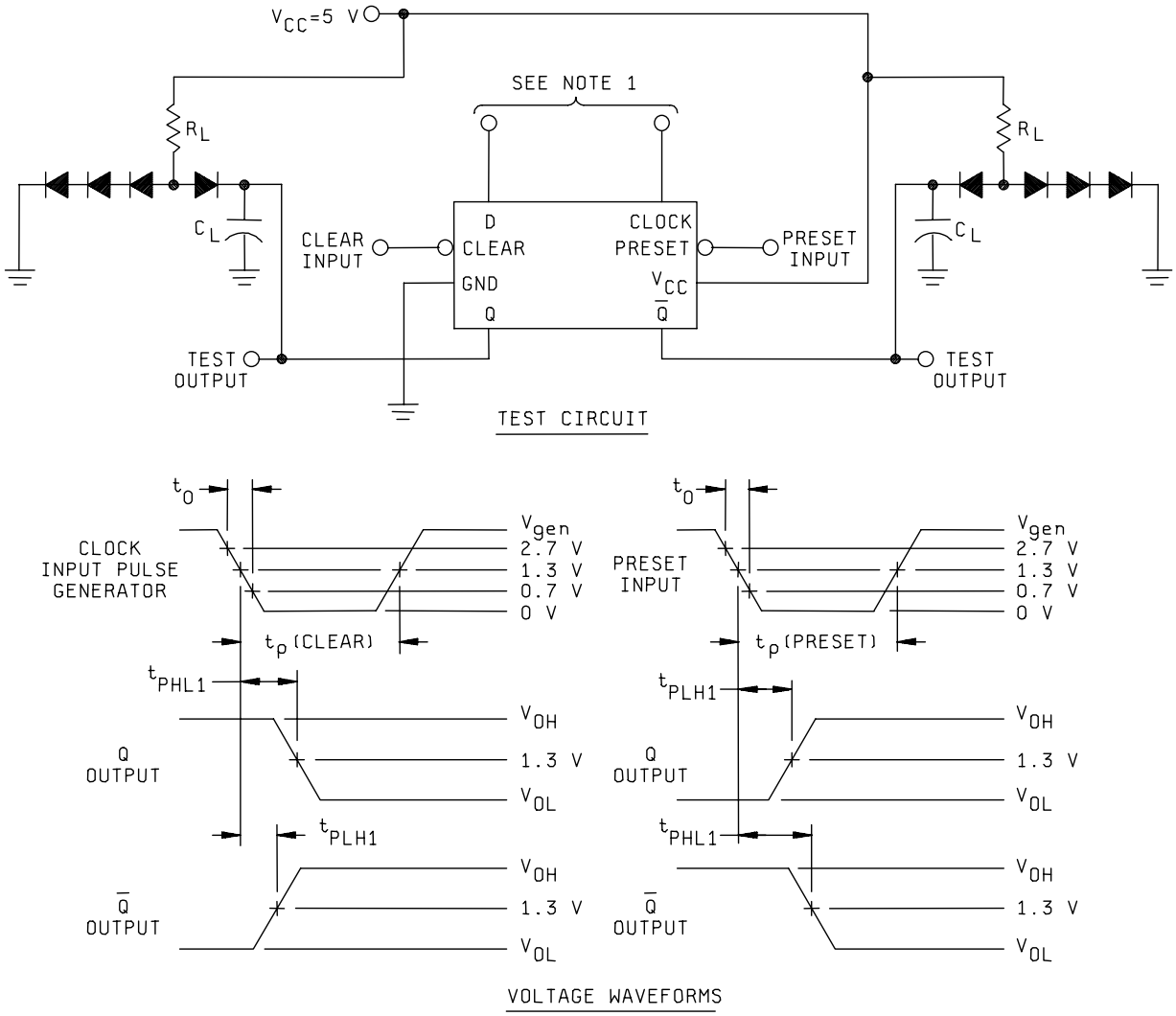
FIGURE 4. Clear switching time test circuit and waveforms for device types 01 and 08.



NOTES:

1. Clock input characteristics for t_{PLH}, t_{PHL} (clock to output), V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p (clock) = 25 ns, PRR ≤ 1 MHz. When testing f_{MAX} the clock input characteristics are V_{gen} = 3 V, $t_1 = t_0 \leq 6$ ns, t_p (clock) ≤ 25 ns, and PRR = see table III.
2. All diodes are 1N3064, or equivalent.
3. C_L = 50 pF ±10% (including jig and probe capacitance).
4. R_L = 2 kΩ ±5%.

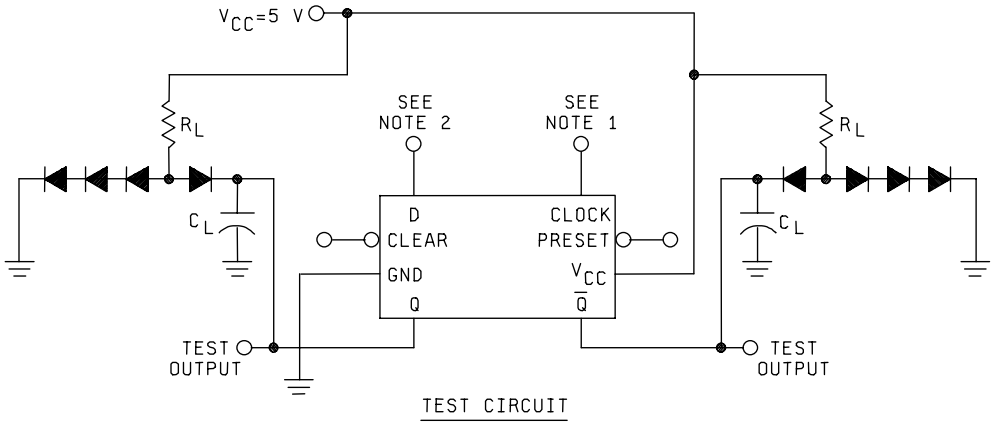
FIGURE 5. Synchronous switching test circuit for device types 01 and 08.



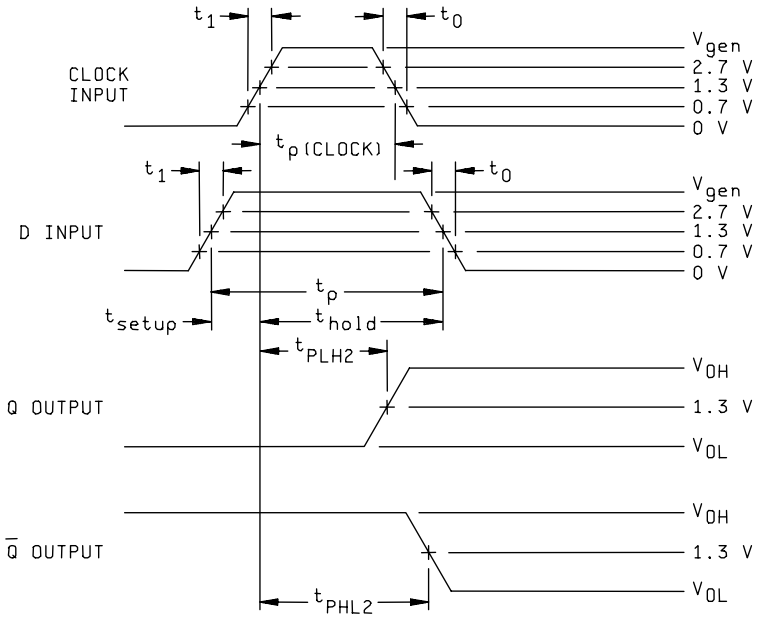
NOTES:

1. Clear and preset inputs dominate regardless of the state of clock or D inputs.
2. All diodes are 1N3064, or equivalent.
3. Clear or preset input pulse characteristics: V_{gen} = 3 V, $t_0 \leq 6$ ns, t_p (clear) = t_p (preset) = 35 ns, PRR ≤ 1 MHz.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.
6. When testing clear to output switching, preset input shall have a logical "1" voltage applied. When testing preset to output switching, clear input shall have a logical "1" voltage applied (see table III).

FIGURE 6. Clear and preset switching test circuit and waveforms for device type 02.



TEST CIRCUIT

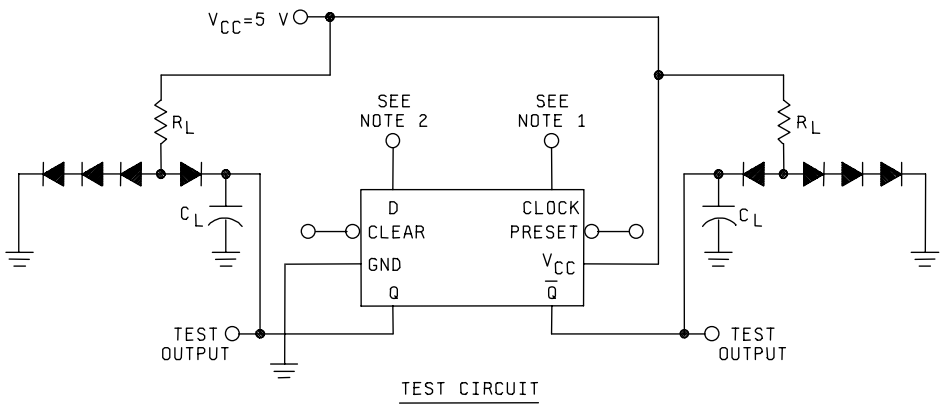


VOLTAGE WAVEFORM

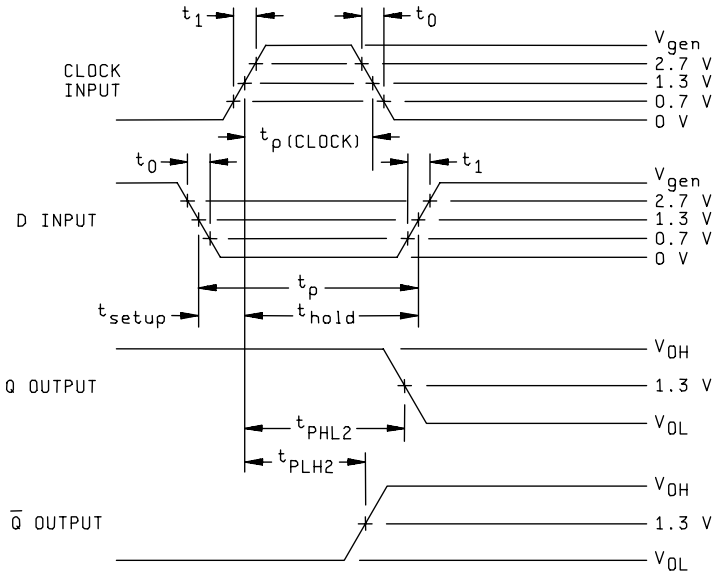
NOTES:

1. Clock input pulse has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p (clock) = 30 ns, PRR ≤ 1 MHz. When testing f_{MAX}, PRR = see table III, t_p (clock) ≤ 30 ns, and $t_0 = t_1 \leq 6$ ns.
2. D input has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_{setup} = 20 ns, t_{hold} = 5 ns, t_p = 25 ns, and PRR is 50% of the clock PRR. For f_{MAX}, $t_0 = t_1 \leq 6$ ns.
3. All diodes are 1N3064, or equivalent.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.

FIGURE 7. Synchronous switching test circuit (high-level data) for device type 02.



TEST CIRCUIT

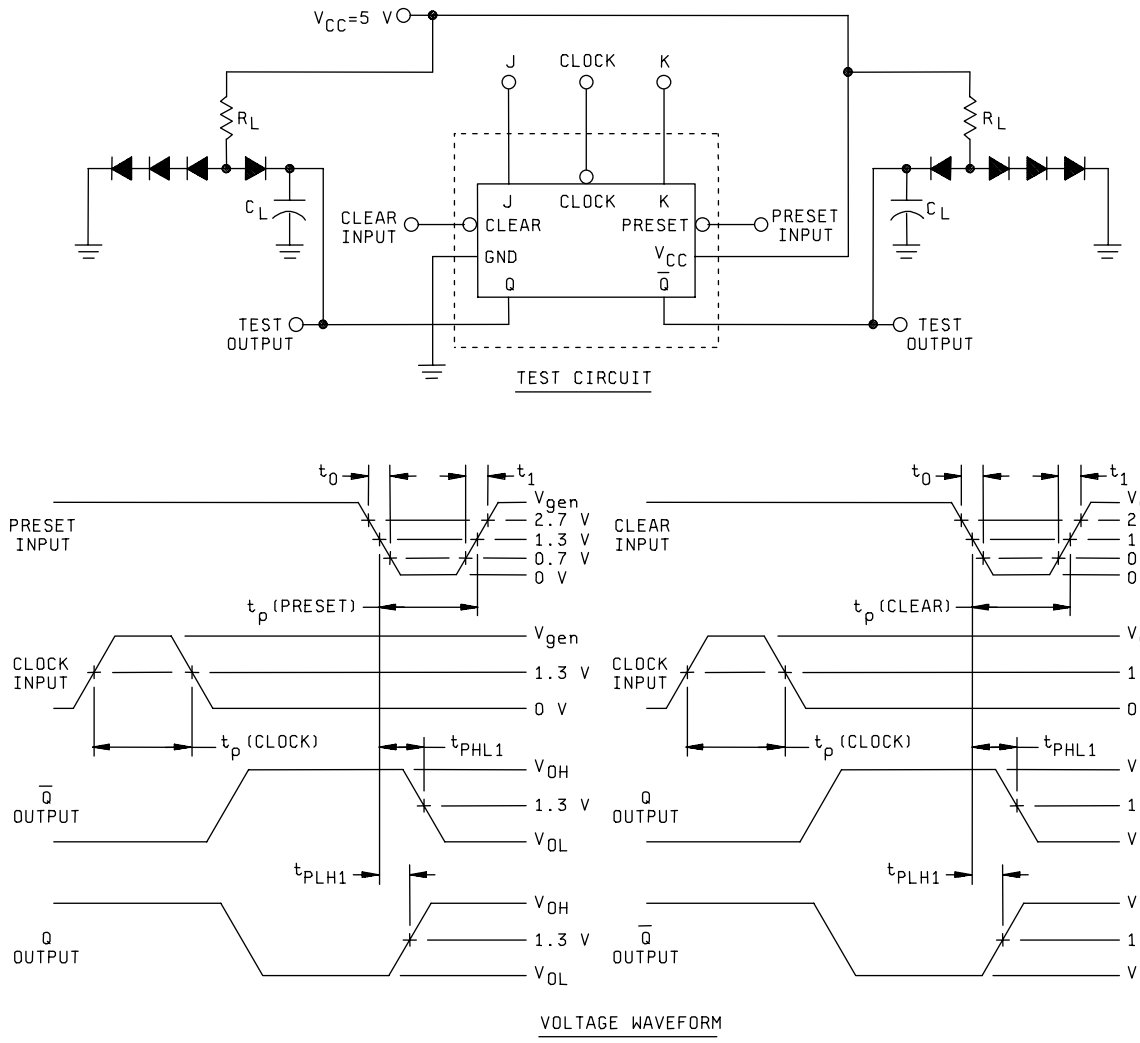


VOLTAGE WAVEFORM

NOTES:

1. Clock input pulse has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p (clock) = 30 ns, PRR ≤ 1 MHz.
2. D input has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_{setup} = 20 ns, t_{hold} = 5 ns, t_p = 25 ns, and PRR is 50% of the clock PRR.
3. All diodes are 1N3064, or equivalent.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.

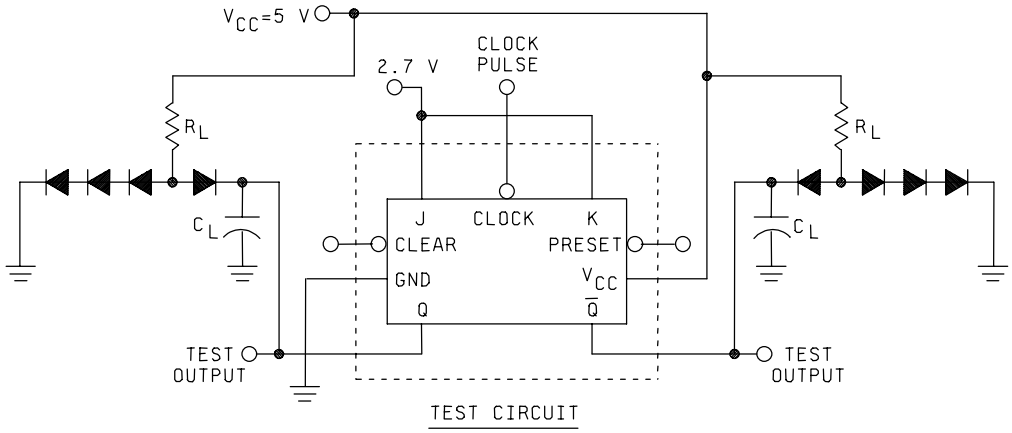
FIGURE 8. Synchronous switching test circuit (low-level data) for device type 02.



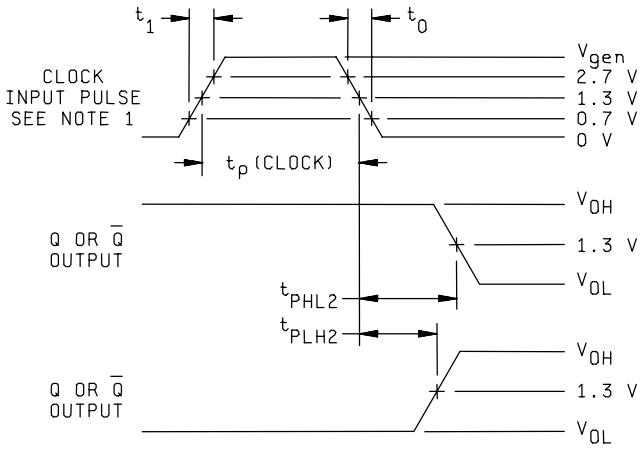
NOTES:

1. Clear or preset inputs dominate regardless of the state of clock or J-K inputs.
2. Clear or preset input has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p(clear) = t_p(preset) = 30 ns, PRR ≤ 1 MHz, and $Z_{out} \approx 50\Omega$.
3. C_L = 50 pF ±10% (including jig and probe capacitance).
4. R_L = 2 kΩ ±5%.
5. All diodes are 1N3064, or equivalent.
6. When testing clear to output switching, preset input shall have a logical "1" voltage applied. When testing preset to output switching, clear input shall have a logical "1" voltage applied. (see table III).
7. Clock input pulse characteristics: t_p(clock) ≥ 25 ns, V_{gen} = 3 V, PRR ≤ 1 MHz.

FIGURE 9. Clear and preset switching test circuit and waveforms for device types 03, 05, and 10.



TEST CIRCUIT

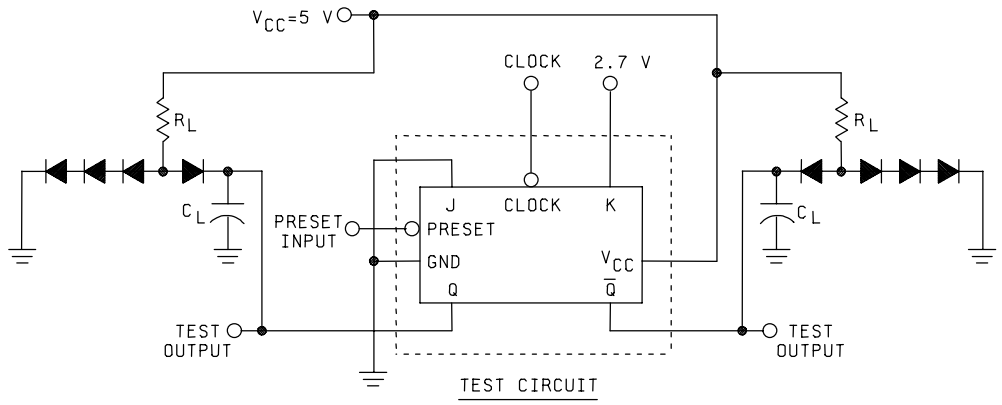


VOLTAGE WAVEFORMS

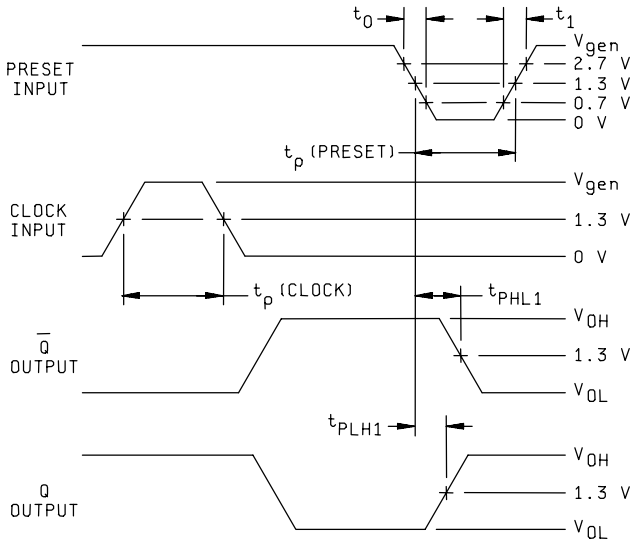
NOTES:

1. Clock input characteristics for t_{PLH}, t_{PHL} (clock to output), V_{gen} = 3 V, $t_0 \leq 6$ ns, $t_1 \leq 15$ ns, t_p(clock) = 25 ns, PRR ≤ 1 MHz. When testing f_{MAX} the clock input characteristics are V_{gen} = 3 V, $t_1 = t_0 \leq 6$ ns, t_p (clock) ≤ 25 ns, and PRR = see table III.
2. All diodes are 1N3064, or equivalent.
3. C_L = 50 pF ±10% (including jig and probe capacitance).
4. R_L = 2 kΩ ±5%.

FIGURE 10. Synchronous switching test circuit for device types 03, 05, and 10.



TEST CIRCUIT

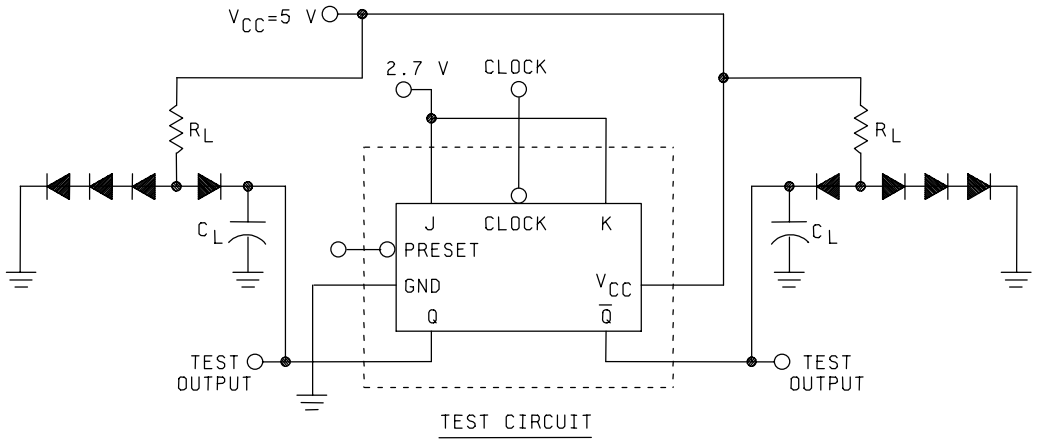


VOLTAGE WAVEFORM

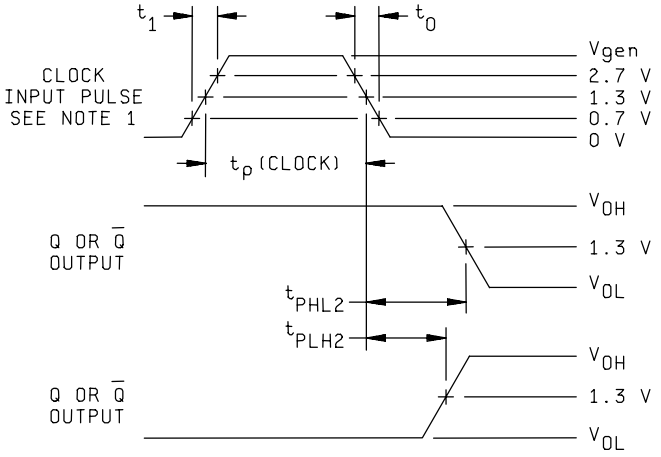
NOTES:

1. Preset inputs dominate regardless of the state of clock or J-K inputs.
2. Preset input pulse characteristics: V_{gen} = 3 V, $t_0 \leq 15$ ns, $t_1 \leq 6$ ns, t_p (preset) = 30 ns, PRR ≤ 1 MHz.
3. All diodes are 1N3064, or equivalent.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.
6. Clock input pulse characteristics: V_{gen} = 3 V, t_p(clock) ≥ 25 ns, PRR ≤ 1 MHz.

FIGURE 11. Preset switching test circuit and waveforms for device type 04.



TEST CIRCUIT

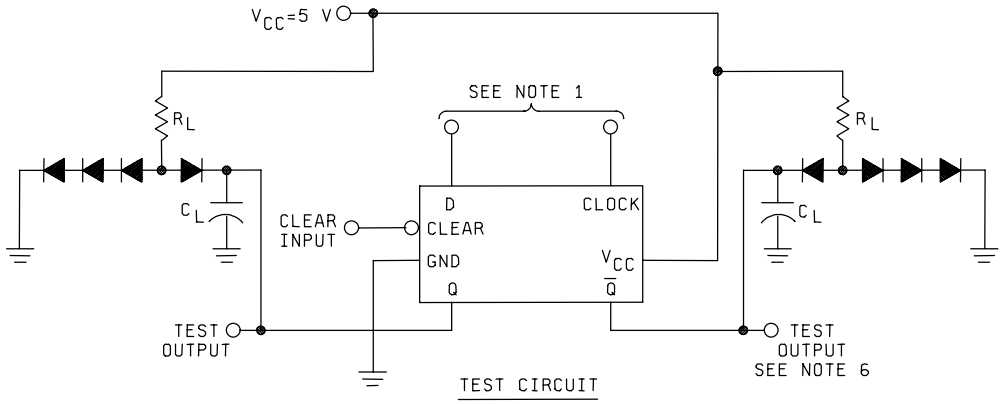


VOLTAGE WAVEFORMS

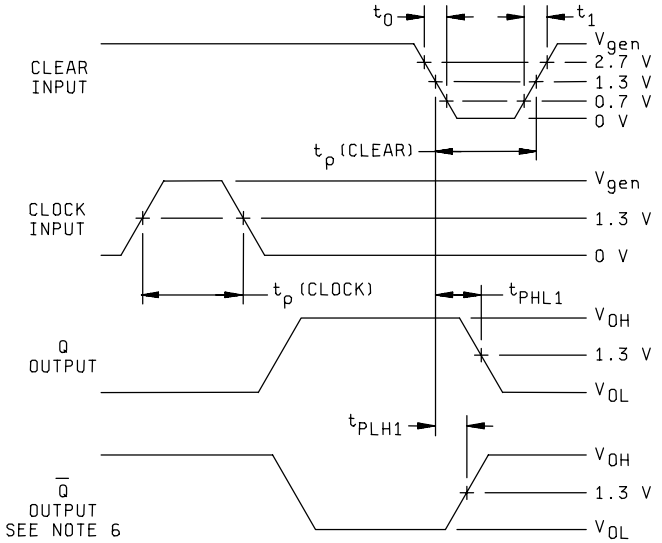
NOTES:

1. Clock input characteristics for t_{PLH}, t_{PHL} (clock to output), V_{gen} = 3 V, $t_0 \leq 6$ ns, $t_1 \leq 15$ ns,t_p(clock) = 25 ns, PRR ≤ 1 MHz. When testing f_{MAX} the clock input characteristics are V_{gen} = 3 V, $t_1 = t_0 \leq 6$ ns, t_p (clock) ≤ 25 ns, and PRR = see table III.
2. All diodes are 1N3064, or equivalent.
3. C_L = 50 pF ±10% (including jig and probe capacitance).
4. R_L = 2 kΩ ±5%.

FIGURE 12. Synchronous switching test circuit for device type 04.



TEST CIRCUIT

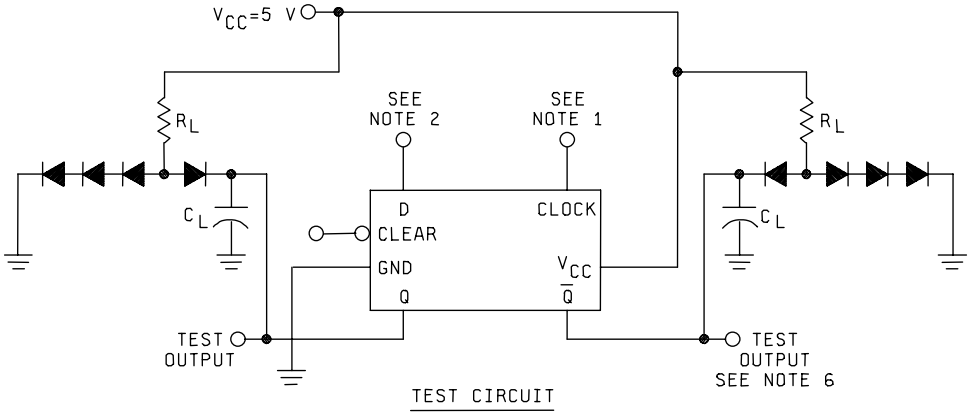


VOLTAGE WAVEFORM

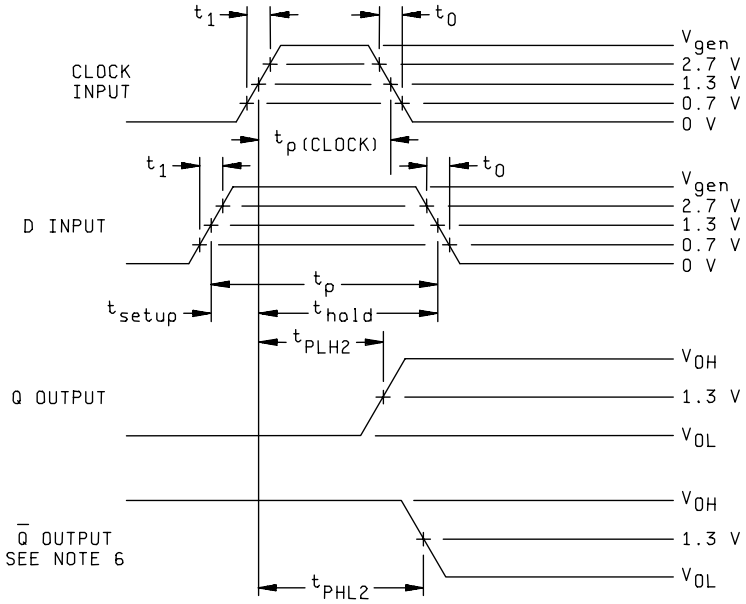
NOTES:

1. Clear input dominates regardless of the state of clock or D inputs.
2. All diodes are 1N3064, or equivalent.
3. Clear input pulse characteristics: V_{gen} = 3 V, $t_0 \leq 6$ ns, $t_1 \leq 15$ ns, t_p(clear) = 35 ns, PRR ≤ 1 MHz.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.
6. $\overline{Q}$ output applies to device type 07 only.
7. Clock input pulse characteristics: t_p (clock) ≥ 25 ns, V_{gen} = 3 V, PRR ≤ 1 MHz.

FIGURE 13. Asynchronous switching test circuit for device types 06 and 07.



TEST CIRCUIT

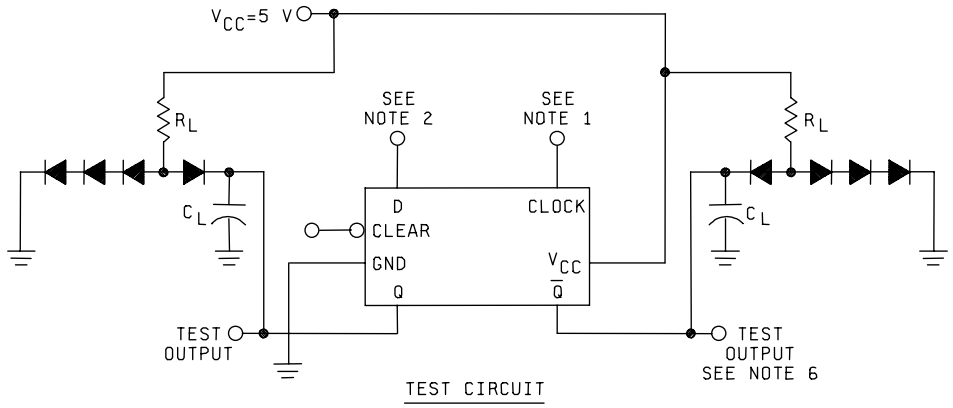


VOLTAGE WAVEFORM

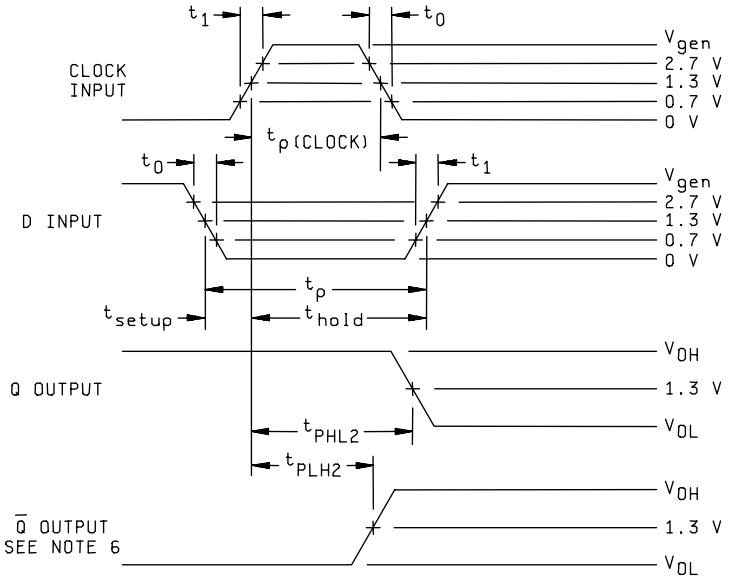
NOTES:

1. Clock input pulse has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p (clock) = 30 ns, and PRR ≤ 1 MHz. When testing f_{MAX}, PRR = see table III, t_p (clock) ≤ 30 ns, and $t_0 = t_1 \leq 6$ns.
2. D input has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_{setup} = 20 ns, t_{hold} = 5 ns, t_p = 25 ns, and PRR is 50% of the clock PRR. For f_{MAX}, $t_0 = t_1 \leq 6$ns.
3. All diodes are 1N3064, or equivalent.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.
6. $\overline{Q}$ output applies to device type 07 only.

FIGURE 14. Synchronous switching test circuit (high-level data) for device types 06 and 07.



TEST CIRCUIT

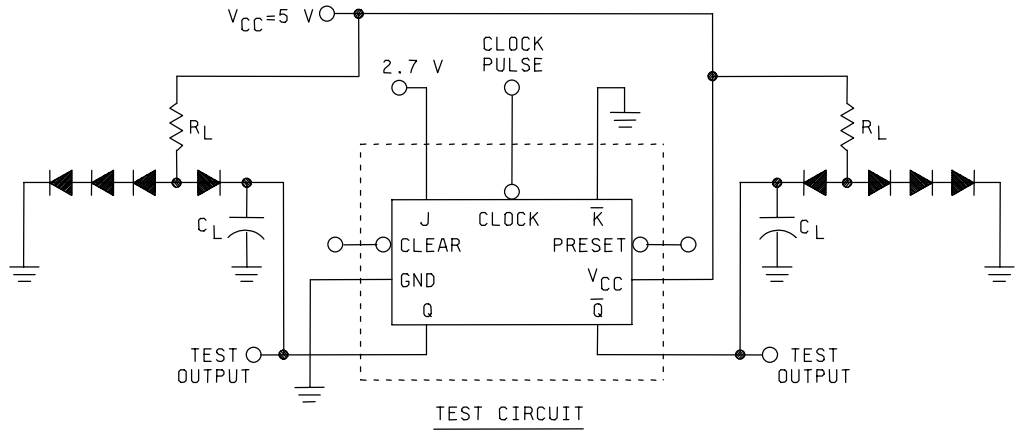


VOLTAGE WAVEFORM

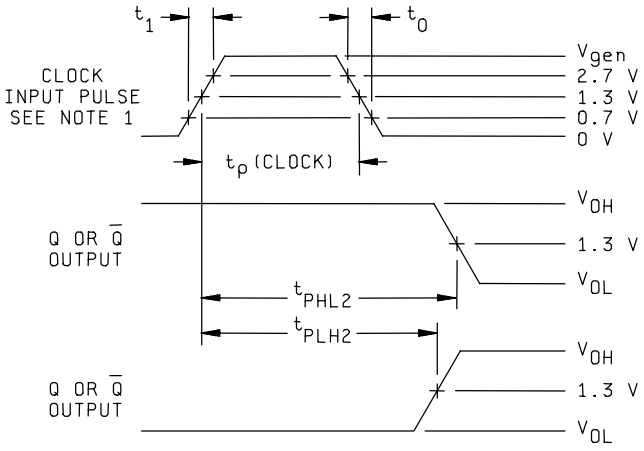
NOTES:

1. Clock input pulse has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p (clock) = 30 ns, and PRR $\leq$ 1 MHz.
2. D input has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_{setup} = 20 ns, t_{hold} = 5 ns, t_p = 25 ns, and PRR is 50% of the clock PRR.
3. All diodes are 1N3064, or equivalent.
4. C_L = 50 pF ±10% (including jig and probe capacitance).
5. R_L = 2 kΩ ±5%.
6. $\overline{Q}$ output applies to device type 07 only.

FIGURE 15. Synchronous switching test circuit (low-level data) for device types 06 and 07.



TEST CIRCUIT

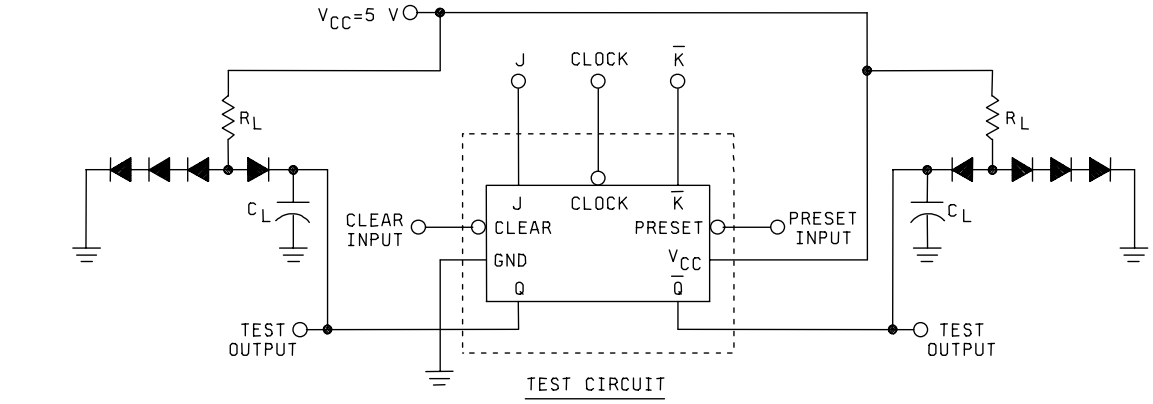


VOLTAGE WAVEFORMS

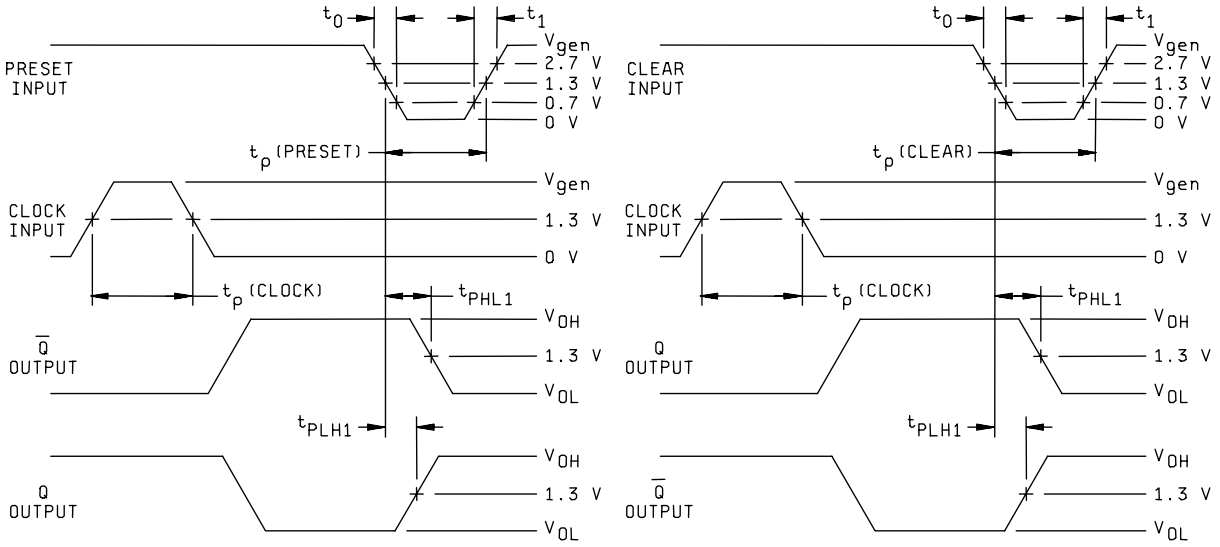
NOTES:

1. Clock input characteristics for t_{PLH}, t_{PHL} (clock to output), V_{gen} = 3 V, $t_0 \leq 6$ ns, $t_1 \leq 15$ ns, t_p (clock) = 25 ns, and PRR ≤ 1 MHz. When testing f_{MAX}, the clock input characteristics are V_{gen} = 3 V, $t_0 = t_1 \leq 6$ns, t_p (clock) ≤ 25 ns, and PRR = see table III,.
2. All diodes are 1N3064, or equivalent.
3. C_L = 50 pF ±10% (including jig and probe capacitance).
4. R_L = 2 kΩ ±5%.

FIGURE 16. Synchronous switching test circuit for device type 09.



TEST CIRCUIT



VOLTAGE WAVEFORM

NOTES:

1. Clear or preset inputs dominate regardless of the state of clock or J-$\overline{K}$ inputs.
2. Clear or preset input has the following characteristics: V_{gen} = 3 V, $t_1 \leq 15$ ns, $t_0 \leq 6$ ns, t_p(clear) = t_p(preset) = 30 ns, PRR ≤ 1 MHz, and $Z_{out} \approx 50\Omega$.
3. C_L = 50 pF ±10% (including jig and probe capacitance).
4. R_L = 2 kΩ ±5%.
5. All diodes are 1N3064, or equivalent.
6. When testing clear to output switching, preset input shall have a logical "1" voltage applied. When testing preset to output switching, clear input shall have a logical "1" voltage applied. (see table III).
7. Clock input pulse characteristics: t_p(clock) ≥ 25 ns, V_{gen} = 3 V, PRR ≤ 1 MHz.

FIGURE 17, Clear and preset switching test circuit and waveforms for device type 09.

TABLE III. Group A inspection for device type 01 and 08.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X Case A,B,C,D Test no.	* 2 ** 18 * 1 ** 12 CLK1	3 19 2 13 CLR1	4 6 3 4 K1	6 20 4 14 V_{CC}	8 13 5 9 CLK2	9 14 6 10 CLR2	10 12 7 8 J2	12 9 8 6 $\overline{Q}2$	13 8 9 5 Q2	14 16 10 11 K2	16 10 11 7 GND	18 4 12 3 Q1	19 3 13 2 $\overline{Q}1$	20 2 14 1 J1	Measured terminal	Limits Min	Limits Max	Unit
1	V_{OH}	3006	1	2.0 V	0.7 V	2.0 V	4.5 V							GND		-.4 mA	2.0 V	$\overline{Q}1$	2.5		V
Tc = 25°C		"	2	2/	2.0 V	2.0 V	"							"		-.4 mA	0.7 V	$\overline{Q}1$	"		"
		"	3	2/	2.0 V	0.7 V	"							"	-.4 mA		2.0 V	Q1	"		"
		"	4				"	2.0 V	0.7 V	2.0 V	-.4 mA		2.0 V	"				$\overline{Q}2$	"		"
		"	5				"	2/	2.0 V	0.7 V	-.4 mA		2.0 V	"				$\overline{Q}2$	"		"
		"	6				"	"	"	2.0 V		-.4 mA	0.7 V	"				Q2	"		"
	V_{OL}	3007	7				"	"	"	2.0 v	4 mA		0.7 V	"				$\overline{Q}2$		0.4	"
		"	8				"	"	"	0.7 V		4 mA	2.0 V	"				Q2		"	"
		"	9				"	2.0 V	0.7 V	2.0 V		4 mA	2.0 V	"				Q2		"	"
		"	10	2.0 V	0.7 V	2.0 V	"							"	4 mA		2.0 V	Q1		"	"
		"	11	2/	2.0 V	2.0 V	"							"	4 mA		0.7 V	Q1		"	
		"	12	2/	2.0 V	0.7 V	"							"		4 mA	2.0 V	$\overline{Q}1$		"	
	V_{IC}		13	-18 mA			"							"				CLK1		-1.5	"
			14		-18 mA		"							"				CLR1		"	"
			15			-18mA	"							"				K1		"	"
			16				"	-18mA						"				CLK2		"	"
			17				"		-18mA					"				CLR2		"	"
			18				"			-18mA				"				J2		"	"
			19				"						-18mA	"				K2		"	"
			20				"							"			-18mA	J1		"	"
	I_{IL1}	3009	21	3/	4.5 V	0.4 V	5.5 V							"			4.5 V	K1	4/	4/	mA
		"	22	4.5 V	3/	4.5 V	"							"			0.4 V	J1	"	"	"
		"	23				"	4.5 V	3/	0.4 V			4.5 V	"				J2	"	"	"
		"	24				"	3/	4.5 V	4.5 V			0.4 V	"				K2	"	"	"
	I_{IL3}	"	25	0.4 V	3/	4.5 V	"							"			4.5 V	CLK1	"	"	"
		"	26				"	0.4 V	3/	4.5 V			4.5 V	"				CLK2	"	"	"
	I_{IL4}	"	27	4.5 V	0.4 V	4.5 V	"							"			4.5 V	CLR1	"	"	"
		"	28				"	4.5 V	0.4 V	4.5 V			4.5 V	"				CLR2	"	"	"
	I_{IH1}	3010	29	GND	GND	2.7 V	"							"			4.5 V	K1		20	µA
		"	30	GND	GND	4.5 V	"							"			2.7 V	J1		"	"
		"	31				"	GND	GND	2.7 V			4.5 V	"				J2		"	"
		"	32				"	GND	GND	4.5 V			2.7 V	"				K2		"	"
	I_{IH2}	"	33				"	GND	GND	4.5 V			5.5 V	"				K2		100	"
		"	34				"	GND	GND	5.5 V			4.5 V	"				J2		"	"
		"	35	GND	GND	5.5 V	"							"			4.5 V	K1		"	"
		"	36	GND	GND	4.5 V	"							"			5.5 V	J1		"	"
	I_{IH5}	"	37	GND	2.7 V	4.5 V	"							"			GND	CLR1		60	"
		"	38				"	GND	2.7 V	GND			4.5 V	"				CLR2		60	"
	I_{IH6}	"	39				"	GND	5.5 V	GND			4.5 V	"				CLR2		300	"
		"	40	GND	5.5 V	4.5 V	"							"			GND	CLR1		300	"

See footnotes at end of device types 01 and 08.

TABLE III. Group A inspection for device type 01 and 08 – Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X Case A,B,C,D Test no.	* 2 ** 18 * 1 ** 12 CLK1	3 19 2 13 CLR1	4 6 3 4 K1	6 20 4 14 V_{CC}	8 13 5 9 CLK2	9 14 6 10 CLR2	10 12 7 8 J2	12 9 8 6 $\overline{Q}2$	13 8 9 5 Q2	14 16 10 11 K2	16 10 11 7 GND	18 4 12 3 Q1	19 3 13 2 $\overline{Q}1$	20 2 14 1 J1	Measured terminal	Limits Min	 Max	Unit
1 Tc = 25°C	I_{IH7}	3010	41	2.7 V	GND	GND	5.5 V							GND			GND	CLK1		80	µA
		"	42				"	2.7 V	GND	GND			GND	"				CLK2		80	"
	I_{IH8}	"	43				"	5.5 V	GND	GND			GND	"				CLK2		400	"
		"	44	5.5 V	GND	GND	"							"			GND	CLK1		400	"
	I_{OS}	3011	45	GND	GND	4.5 V	"							"		GND	GND	$\overline{Q}1$	-15	-100	mA
		"	46	2/	4.5 V	GND	"							"	2.25 V	GND	4.5 V	Q1	5/	5/	"
		"	47				"	GND	GND	GND	GND		4.5 V	"				$\overline{Q}2$	-15	-100	"
		"	48				"	2/	4.5 V	4.5 V	GND	2.25 V	GND	"				Q2	5/	5/	"
	I_{CC}	3005	49	GND	GND	GND	"	GND	GND	GND			GND	"			GND	V_{CC}		8.0	"
	I_{CC}	3005	50	2/	5.5 V	GND	"	2/	5.5 V	5.5 V			GND	"			5.5 V	V_{CC}		8.0	"
2	Same tests, terminal conditions and limits as for subgroup 1, except T_C = +125° C, and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions and limits as for subgroup 1, except T_C = -55° C, and V_{IC} tests are omitted.																				
7 6/, 7/	Truth table tests	3014	51	B	B	B	4.5 V	B	B	B	H	L	B	GND	L	H	A	All outputs	See 8/		
		"	52	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	53	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	54	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	55	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	56	B	"	"	"	"	"	"	"	"	"	"	H	L	"	"	"		
		"	57	B	"	A	"	"	"	"	"	"	"	"	"	"	B	"	"		
		"	58	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	59	B	"	"	"	"	"	"	"	"	"	"	L	H	"	"	"		
		"	60	"	B	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	61	"	"	"	"	"	A	A	"	"	"	"	"	"	"	"	"		
		"	62	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		
		"	63	"	"	"	"	B	"	"	L	H	"	"	"	"	"	"	"		
		"	64	"	"	"	"	B	"	B	"	"	A	"	"	"	"	"	"		
		"	65	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		
		"	66	"	"	"	"	B	"	"	H	L	"	"	"	"	"	"	"		
		"	67	"	"	"	"	"	B	"	"	"	B	"	"	"	"	"	"		
		"	68	"	A	"	"	"	A	"	"	"	"	"	"	"	"	"	"		
		"	69	A	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		
		"	70	B	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
		"	71	B	"	A	"	B	"	A	"	"	A	"	"	"	A	"	"		
		"	72 9/	A	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		
		"	73	B	"	"	"	B	"	"	L	H	"	"	H	L	"	"	"		
		"	74	B	"	B	"	B	"	B	"	"	B	"	"	"	B	"	"		
		"	75	A	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		
		"	76	B	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
		"	77	B	"	A	"	B	"	A	"	"	A	"	"	"	A	"	"		
		"	78 9/	A	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		
		"	79	B	"	"	"	B	"	"	H	L	"	"	L	H	"	"	"		
8 6/, 7/	Repeat subgroup 7 at T_C = +125°C and T_C = -55° C.																				

See footnotes at end of device types 01 and 08.

TABLE III. Group A inspection for device type 01 and 08 – Continued.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

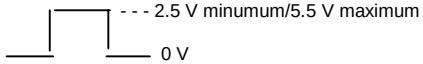
Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	* 2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			** 18	19	6	20	13	14	12	9	8	16	10	4	3	2				
			Case A,B,C,D	* 1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			** 12	13	4	14	9	10	8	6	5	11	7	3	2	1				
			Test no.	CLK1	CLR1	K1	V_{CC}	CLK2	CLR2	J2	$\overline{Q}2$	Q2	K2	GND	Q1	$\overline{Q}1$	J1		Min	Max	
9	f_{MAX}	Fig. 4	80	IN	2.7 V	2.7 V	5.0 V							GND	OUT		2.7 V	Q1	25		MHz
T_C = 25°C	10/	"	81	IN	2.7 V	2.7 V	"							"		OUT	2.7 V	$\overline{Q}1$	"		"
		"	82				"	IN	2.7 V	2.7 V	OUT		2.7 V	"				$\overline{Q}2$	"		"
		"	83				"	IN	2.7 V	2.7 V		OUT	2.7 V	"				Q2	"		"
	t_{PLH1}	3003	84				"	IN	IN	2.7 V	OUT		GND	"				CLR2 to $\overline{Q}2$	5	21	ns
		Fig.4	85	IN	IN	GND	"							"		OUT	2.7 V	CLR1 to $\overline{Q}1$	"	21	"
	t_{PHL1}	"	86	IN	IN	GND	"							"	OUT		2.7 V	CLR1 to Q1	"	28	"
		"	87				"	IN	IN	2.7 V		OUT	GND	"				CLR2 to Q2	"	28	"
	t_{PLH2}	3003	88				"	IN	2.7 V	2.7 V		OUT	2.7 V	"				CLK2 to Q2	"	22	"
		Fig.5	89				"	IN	2.7 V	2.7 V	OUT		2.7 V	"				CLK2 to $\overline{Q}2$	"	"	"
		"	90	IN	2.7 V	2.7 V	"							"	OUT		2.7 V	CLK1 to Q1	"	"	"
		"	91	"	"	"	"							"		OUT	2.7 V	CLK1 to $\overline{Q}1$	"	"	"
	t_{PHL2}	3003	92	"	"	"	"							"		OUT	2.7 V	CLK1 to $\overline{Q}1$	"	30	"
		Fig.5	93	"	"	"	"							"	OUT		2.7 V	CLK1 to Q1	"	"	"
		"	94				"	IN	2.7 V	2.7 V	OUT		2.7 V	"				CLK2 to $\overline{Q}2$	"	"	"
		"	95				"	IN	2.7 V	2.7 V		OUT	2.7 V	"				CLK2 to Q2	"	"	"
10	f_{MAX}	Fig. 4	96 - 99																25		MHz
T_C = +125°C	10/																				"
	t_{PLH1}	3003 Fig. 4	100 - 101	Same tests and terminal conditions as for subgroup 9, except T_C = +125°C															5	32	ns
	t_{PHL1}	3003 Fig. 4	102 - 103																5	40	"
	t_{PLH2}	3003 Fig. 5	104 - 107																5	32	"
	t_{PHL2}	3003 Fig. 5	108 - 111																5	42	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C																				

* Terminal numbers for device type 01.

** Terminal numbers for device type 08.

1/ Case X and 2 pins not referenced are NC.

2/



3/

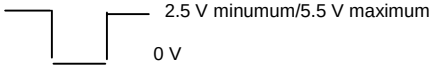


TABLE III. Group A inspection for device type 01 and 08 – Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

4/ I_{IL} limits in mA are as follows:

I_{IL1}	Min/Max limits for CKT				
	A	B	C	D	E
	-.075/-.250	-.03/-.30	-.11/-.25	-.12/-.36	-.12/-.36

I_{IL3}	Min/Max limits for CKT				
	A	B	C	D	E
	-.15/-.60	-.06/-.60	-.15/-.56	-.29/-.72	-.24/-.72

I_{IL4}	Min/Max limits for CKT				
	A	B	C	D	E
	-.16/-.70	-.06/-.70	-.29/-.65	-.20/-.80	-.12/-.72

5/ I_{OS} limits are as follows:

Test nos. 46 and 48: CKT's A, B, C - -7.5/-50
CKT D - -15/-100

6/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volts maximum.

7/ Tests shall be performed in sequence, attributes data only.

8/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.

9/ These tests may be performed as shown in table III or alternately as follows:

Test no.	CLK1	CLR1	K1	V_{CC}	CLK2	CLR2	J2	$\overline{Q}2$	Q2	K2	GND	Q1	$\overline{Q}1$	J1
72A	A	A	A	4.5 V	B	A	A	H	L	A	GND	L	H	A
72B	B	"	"	"	B	"	"	H	L	"	"	H	L	"
72C	B	"	"	"	A	"	"	H	L	"	"	H	L	"
78A	A	"	"	"	B	"	"	L	H	"	"	H	L	"
78B	B	"	"	"	B	"	"	L	H	"	"	L	H	"
78C	B	"	"	"	A	"	"	L	H	"	"	L	H	"

10/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 02.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR1	D1	CLK1	PR1	Q1	$\overline{Q}$1	GND	$\overline{Q}$2	Q2	PR2	CLK2	D2	CLR2	V_{CC}		Min	Max	
1	V_{OH}	3006	1	0.7 V	2.0 V	GND	2.0 V		-.4 mA	GND							4.5 V	$\overline{Q}$1	2.5		V
Tc = 25°C		"	2	2.0 V	"	GND	0.7 V	-.4 mA		"							"	Q1	"		"
		"	3	"	"	2/	2.0 V	-.4 mA		"							"	Q1	"		"
		"	4	"	0.7 V	2/	2.0 V		-.4 mA	"							"	$\overline{Q}$1	"		"
		"	5							"		-.4 mA	0.7 V	GND	2.0 V	2.0 V	"	Q2	"		"
		"	6							"	-.4 mA		2.0 V	GND	2.0 V	0.7 V	"	$\overline{Q}$2	"		"
		"	7							"	-.4 mA		"	2/	0.7 V	2.0 V	"	$\overline{Q}$2	"		"
		"	8							"		-.4 mA	"	2/	2.0 V	2.0 V	"	Q2	"		"
	V_{OL}	3007	9	2.0 V	0.7 V	2/	2.0 V	4 mA		"							"	Q1		0.4	"
		"	10	"	2.0 V	2/	2.0 V		4 mA	"							"	$\overline{Q}$1		"	"
		"	11	"	"	GND	0.7 V		4 mA	"							"	$\overline{Q}$1		"	"
		"	12	0.7 V	"	GND	2.0 V	4 mA		"							"	Q1		"	"
		"	13							"		4 mA	2.0 V	2/	0.7 V	2.0 V	"	Q2		"	"
		"	14							"	4 mA		2.0 V	2/	2.0 V	"	"	$\overline{Q}$2		"	"
		"	15							"	4 mA		0.7 V	GND	"	"	"	$\overline{Q}$2		"	"
		"	16							"		4 mA	2.0 V	GND	"	0.7 V	"	Q2		"	"
	V_{IC}		17	-18 mA						"							"	CLR1		-1.5	"
			18		-18 mA					"							"	D1		"	"
			19			-18 mA				"							"	CLK1		"	"
			20				-18 mA			"							"	PR1		"	"
			21							"			-18 mA				"	PR2		"	"
			22							"				-18 mA			"	CLK2		"	"
			23							"					-18 mA		"	D2		"	"
			24							"						-18 mA	"	CLR2		"	"
	I_{IL2}	3009	25	4.5 V	0.4 V	4.5 V	GND			"							5.5 V	D1	3/	3/	mA
		"	26							"			GND	4.5 V	0.4 V	4.5 V	"	D2	"	"	"
	I_{IL4}	"	27	4.5 V	GND	0.4 V	GND			"							"	CLK1	"	"	"
		"	28	GND	GND	GND	0.4 V			"							"	PR1	"	"	"
		"	29							"			0.4 V	GND	GND	GND	"	PR2	"	"	"
		"	30							"			GND	0.4 V	GND	4.5 V	"	CLK2	"	"	"

See footnotes at end of device type 02.

TABLE III. Group A inspection for device type 02 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR1	D1	CLK1	PR1	Q1	$\overline{Q}$1	GND	$\overline{Q}$2	Q2	PR2	CLK2	D2	CLR2	V_{CC}		Min	Max	
1 Tc = 25°C	I_{IL5}	3009	31	0.4 V	4.5 V	4.5 V	GND			GND							5.5 V	CLR1	3/	3/	mA
		"	32							"			GND	4.5 V	4.5 V	0.4 V	"	CLR2	3/	3/	mA
	I_{IH1}	3010	33	GND	2.7 V	4.5 V	4.5 V			"							"	D1		20	µA
		"	34							"			4.5 V	4.5 V	2.7 V	GND	"	D2		20	"
	I_{IH2}	"	35							"			4.5 V	4.5 V	5.5 V	GND	"	D2		100	"
		"	36	GND	5.5 V	4.5 V	4.5 V			"							"	D1		100	"
	I_{IH3}	"	37	GND	4.5 V	2.7 V	4.5 V			"							"	CLK1		40	"
		"	38	4.5 V	4.5 V	4/	2.7 V			"							"	PR1		"	"
		"	39							"			2.7 V	4/	4.5 V	4.5 V	"	PR2		"	"
		"	40							"			4.5 V	2.7 V	4.5 V	GND	"	CLK2		"	"
	I_{IH4}	"	41							"			4.5 V	5.5 V	4.5 V	GND	"	CLK2		200	"
		"	42							"			5.5 V	4/	4.5 V	4.5 V	"	PR2		"	"
		"	43	4.5 V	4.5 V	4/	5.5 V			"							"	PR1		"	"
		"	44	GND	4.5 V	5.5 V	4.5 V			"							"	CLK1		"	"
	I_{IH5}	"	45	2.7 V	GND	4/	4.5 V			"							"	CLR1		60	"
		"	46							"			4.5 V	4/	GND	2.7 V	"	CLR2		60	"
	I_{IH6}	"	47							"			4.5 V	4/	GND	5.5 V	"	CLR2		300	"
		"	48	5.5 V	GND	4/	4.5 V			"							"	CLR1		300	"
	I_{OS}	3011	49	GND					GND	"							"	$\overline{Q}$1	-15	-100	mA
		"	50				GND	GND		"							"	Q1	"	"	"
		"	51							"		GND	GND				"	Q2	"	"	"
		"	52							"	GND					GND	"	$\overline{Q}$2	"	"	"
	I_{CC}	3005	53	5.5 V	GND	GND	GND			"			GND	GND	GND	5.5 V	"	V_{CC}		8.0	"
		3005	54	GND	GND	GND	5.5 V			"			5.5 V	GND	GND	GND	"	V_{CC}		8.0	"
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
7 5/, 6/ Tc = 25°C	Truth table tests	3014	55	B	B	B	B	H	H	GND	H	H	B	B	B	B	4.5 V	All outputs	See 7/		
		"	56	B	"	"	A	L	"	"	"	L	A	"	"	B	"	"	"		
		"	57	A	"	"	A	L	"	"	"	L	A	"	"	A	"	"	"		
		"	58	"	"	"	B	H	L	"	L	H	B	"	"	"	"	"	"		
		"	59	"	"	A	"	"	L	"	L	"	"	A	"	"	"	"	"		
		"	60	B	"	"	"	"	H	"	H	"	"	"	"	B	"	"	"		
		"	61	B	A	"	"	"	H	"	H	"	"	"	A	B	"	"	"		

See footnotes at end of device type 02.

TABLE III. Group A inspection for device type 02 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

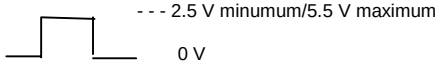
Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR1	D1	CLK1	PR1	Q1	$\overline{Q1}$	GND	$\overline{Q2}$	Q2	PR2	CLK2	D2	CLR2	V_{CC}		Min	Max	
7 5/, 6/ Tc = 25°C	Truth table tests	3014	62	B	A	A	A	L	H	GND	H	L	A	A	A	B	4.5 V	All outputs	See 7/		
		"	63	A	"	"	A	L	H	"	H	L	A	"	"	A	"	"	"		
		"	64	"	"	"	B	H	L	"	L	H	B	"	"	"	"	"	"		
		"	65	"	"	"	A	"	"	"	"	"	A	"	"	"	"	"	"		
		"	66	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"		
		"	67	"	B	B	"	"	"	"	"	"	"	B	B	"	"	"	"		
		"	68	"	"	A	"	L	H	"	H	L	"	A	"	"	"	"	"		
		"	69	"	"	"	B	H	L	"	L	H	B	"	"	"	"	"	"		
		"	70	B	A	"	"	"	H	"	H	"	"	"	A	B	"	"	"		
		"	71	"	B	"	"	"	"	"	"	"	"	"	B	"	"	"	"		
		"	72	"	"	"	A	L	"	"	"	L	A	"	"	"	"	"	"		
		"	73	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	74	"	A	B	"	"	"	"	"	"	"	B	A	"	"	"	"		
		"	75	"	"	A	"	H	L	"	L	H	"	A	"	"	"	"	"		
		"	76	"	"	"	B	"	"	"	"	"	B	"	"	"	"	"	"		
		"	77	"	"	"	A	"	"	"	"	"	A	"	"	"	"	"	"		
		"	78	B	"	"	"	L	H	"	H	L	"	"	"	B	"	"	"		
		"	79	A	"	"	"	L	H	"	H	L	"	"	"	A	"	"	"		
		"	80	"	B	"	B	H	L	"	L	H	B	"	B	"	"	"	"		
		"	81	"	B	"	A	H	L	"	L	H	A	"	B	"	"	"	"		
8 4/, 5/	Repeat subgroup 7 at T_C = +125°C and T_C = -55°C																				
9 Tc = 25°C	f_{MAX}	Fig. 8 8/	82	2.7 V	IN	IN	2.7 V	OUT		GND							5.0 V	Q1	20		MHz
			83	2.7 V	IN	IN	2.7 V		OUT	"							"	$\overline{Q1}$	"		"
		"	84							"	OUT		2.7 V	IN	IN	2.7 V	"	$\overline{Q2}$	"		"
		"	85							"		OUT	2.7 V	IN	IN	2.7 V	"	Q2	"		"
	t_{PLH1}	3003 Fig. 6	86							"		OUT	IN			IN	"	PR2 to Q2	5	30	ns
			87							"	OUT		IN			IN	"	CLR2 to $\overline{Q2}$	"	"	"
		"	88	IN			IN		OUT	"							"	CLR1 to $\overline{Q1}$	"	"	"
		"	89	IN			IN	OUT		"								PR1 TO Q1	"	"	"
	t_{PHL1}	"	90	IN			IN	OUT		"							"	CLR1 to Q1	"	46	"
		"	91	IN			IN		OUT	"							"	PR1 to $\overline{Q1}$	"	"	"
		"	92							"	OUT		IN			IN	"	PR2 to $\overline{Q2}$	"	"	"
		"	93							"		OUT	IN			IN	"	CLR2 to Q2	"	"	"
	t_{PLH2}	3003 Fig. 7	94							"		OUT	2.7 V	IN	IN	2.7 V	"	CLK2 to Q2	"	30	"
		3003 Fig. 8	95							"	OUT		2.7 V	IN	IN	2.7 V	"	CLK2 to $\overline{Q2}$	"	"	"
		3003 Fig. 7	96	2.7 V	IN	IN	2.7 V	OUT		"							"	CLK1 to Q1	"	"	"
		3003 Fig. 8	97	2.7 V	IN	IN	2.7 V		OUT	"							"	CLK1 to $\overline{Q1}$	"	"	"
	t_{PHL2}	3003 Fig. 7	98	2.7 V	IN	IN	2.7 V		OUT	"							"	CLK1 to $\overline{Q1}$	"	46	"
		3003 Fig. 8	99	2.7 V	IN	IN	2.7 V	OUT		"							"	CLK1 to Q1	"	"	"
		3003 Fig. 7	100							"	OUT		2.7 V	IN	IN	2.7 V	"	CLK2 to $\overline{Q2}$	"	"	"
		3003 Fig. 8	101							"		OUT	2.7 V	IN	IN	2.7 V	"	CLK2 to Q2	"	"	"

See footnotes at end of device type 02.

TABLE III. Group A inspection for device type 02 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR1	D1	CLK1	PR1	Q1	$\overline{Q1}$	GND	$\overline{Q2}$	Q2	PR2	CLK2	D2	CLR2	V_{CC}		Min	Max	
10	f_{MAX} 8/	Fig. 8	102-105																20		MHz
	t_{PLH1}	3003 Fig.6	106-109																5	39	ns
	t_{PHL1}	3003 Fig. 6	110-113																"	59	"
	t_{PLH2}	3003 Fig. 7	114																"	39	"
		3003 Fig. 8	115	Same tests and terminal conditions as for subgroup 9, except T_C = +125°C															"	"	"
		3003 Fig. 7	116																"	"	"
		3003 Fig. 8	117																"	"	"
	t_{PHL2}	3003 Fig. 7	118																"	59	"
		3003 Fig. 8	119																"	"	"
		3003 Fig. 7	120																"	"	"
		3003 Fig. 8	121																"	"	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C																				

1/ Case X and 2 pins not referenced are NC.

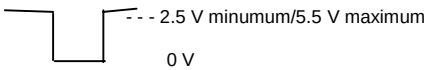
2/ 

3/ I_{IL} limits in mA are as follows:

I_{IL2}	Min/Max limits for CKT					
	A	B	C	D	E	F
	-.075/-.250	-.030/-.300	-.095/-.210	-.097/-.207	-.135/-.370	-160/-.400

I_{IL4}	Min/Max limits for CKT					
	A	B	C	D	E	F
	-.150/-.500 for tests 27, 30 -.200/-.800 for tests 28, 29	-.060/-.700	-.160/-.400 for tests 27, 30 -.350/-.760 for tests 28, 29	-.160/-.400 for tests 27, 30 -.355/-.759 for tests 28, 29	-.120/-.360 for tests 27, 30 -.280/-.760 for tests 28, 29	-.320/-.800 (All)

I_{IL5}	Min/Max limits for CKT					
	A	B	C	D	E	F
	-.200/-.800	-.060/-.700	-.350/-.760	-.480/-1.200	-.280/-.760	-.480/-1.200

4/ 

5/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volt maximum.
6/ Tests shall be performed in sequence, attributes data only.
7/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.
8/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 04.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLK1	K1	J1	PR1	Q1	$\overline{Q1}$	GND	$\overline{Q2}$	Q2	PR2	J2	K2	CLK2	V_{CC}		Min	Max	
1 Tc = 25°C	V_{OH}	3006	1	2.0 V	2.0 V	2.0 V	0.7 V	-.4 mA		GND							4.5 V	Q1	2.5		V
		"	2	2/	2.0 V	0.7 V	2.0 V		-.4 mA	"							"	$\overline{Q1}$	"		"
		"	3	2/	0.7 V	2.0 V	2.0 V	-.4 mA		"							"	Q1	"		"
		"	4							"	-.4 mA		2.0 V	0.7 V	2.0 V	2/	"	$\overline{Q2}$	"		"
		"	5							"		-.4 mA	2.0 V	2.0 V	0.7 V	2/	"	Q2	"		"
		"	6							"		-.4 mA	0.7 V	"	2.0 V	2.0 V	"	Q2	"		"
	V_{OL}	3007	7							"	4 mA		0.7 V	"	2.0 V	2.0 V	"	$\overline{Q2}$		0.4	"
		"	8							"	4 mA		2.0 V	"	0.7 V	2/	"	$\overline{Q2}$		"	"
		"	9							"		4 mA	2.0 V	0.7 V	2.0 V	2/	"	Q2		"	"
		"	10	2.0 V	2.0 V	2.0 V	0.7 V		4 mA	"							"	$\overline{Q1}$		"	"
		"	11	2/	0.7 V	2.0 V	2.0 V		4 mA	"							"	$\overline{Q1}$		"	"
		"	12	2/	2.0 V	0.7 V	2.0 V	4 mA		"							"	Q1		"	"
	V_{IC}		13	-18 mA						"							"	CLK1		-1.5	"
			14		-18 mA					"							"	K1		"	"
			15			-18 mA				"							"	J1		"	"
			16				-18 mA			"							"	PR1		"	"
			17							"			-18 mA				"	PR2		"	"
			18							"				-18 mA			"	J2		"	"
			19							"					-18 mA		"	K2		"	"
			20							"						-18 mA	"	CLK2		"	"
	I_{IL1}	3009	21	4.5 V	0.4 V	GND	3/			"							5.5 V	K1	4/	4/	mA
		"	22	3/	4.5 V	0.4 V	4.5 V			"							"	J2	"	"	"
		"	23							"			3/	GND	0.4 V	4.5 V	"	K2	"	"	"
		"	24							"			4.5 V	0.4 V	4.5 V	3/	"	J2	"	"	"
	I_{IL3}	"	25							"			3/	4.5 V	4.5 V	0.4 V	"	CLK2	"	"	"
		"	26	0.4 V	4.5 V	4.5 V	3/			"							"	CLK1	"	"	"
	I_{IL4}	"	27	4.5 V	4.5 V	4.5 V	0.4 V			"							"	PR1	"	"	"
		"	28							"			0.4 V	4.5 V	4.5 V	4.5 V	"	PR2	"	"	"
	I_{IH1}	3010	29	GND	2.7 V	GND	GND			"							"	K1		20	µA
		"	30	2/	GND	2.7 V	4.5 V			"							"	J1		"	"
		"	31							"			4.5 V	2.7 V	GND	2/	"	J2		"	"
		"	32							"			GND	GND	2.7 V	GND	"	K2		"	"
	I_{IH2}	"	33							"			GND	GND	5.5 V	GND	"	K2		100	"
		"	34							"			4.5 V	5.5 V	GND	2/	"	J2		"	"
		"	35	2/	GND	5.5 V	4.5 V			"							"	J1		"	"
		"	36	GND	5.5 V	GND	GND			"							"	K1		"	"

See footnotes at end of device type 04.

TABLE III. Group A inspection for device type 04 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLK1	K1	J1	PR1	Q1	$\overline{Q}$1	GND	$\overline{Q}$2	Q2	PR2	J2	K2	CLK2	V_{CC}		Min	Max	
1 Tc = 25°C	I_{IH5}	3010	37	GND	GND	4.5 V	2.7 V	5/		GND							5.5 V	PR1		60	µA
		"	38							"		5/	2.7 V	4.5 V	GND	GND	"	PR2		60	"
	I_{IH6}	"	39							"		5/	5.5 V	4.5 V	GND	GND	"	PR2		300	"
		"	40	GND	GND	4.5 V	5.5 V	5/		"							"	PR1		300	"
	I_{IH7}	"	41	2.7 V	GND	GND	GND			"							"	CLK1		80	"
		"	42							"			GND	GND	GND	2.7 V	"	CLK2		80	"
	I_{IH8}	"	43							"			GND	GND	GND	5.5 V	"	CLK2		400	"
		"	44	5.5 V	GND	GND	GND			"							"	CLK1		400	"
	I_{OS}	3011	45				GND	GND		"							"	Q1	-15	-100	mA
		"	46	2/	4.5 V	GND	4.5 V	GND	GND 6/	"							"	$\overline{Q}$1	6/	6/	"
		"	47							"		GND	GND				"	Q2	-15	-100	"
		"	48							"	GND 6/	GND	4.5 V	GND	4.5 V	2/	"	$\overline{Q}$2	6/	6/	"
	I_{CC}	3005	49	2/	5.5 V	GND	5.5 V			"			5.5 V	GND	5.5 V	2/	"	V_{CC}		8.0	"
		3005	50	5.5 V	5.5 V	5.5 V	GND			"			GND	5.5 V	5.5 V	5.5 V	"	V_{CC}		8.0	"
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted																				
7 7/, 8/	Truth table tests	3014	51	B	A	B	B	H	L	GND	L	H	B	B	B	B	4.5 V	All	See 9/		
		"	52	A	"	"	"	"	"	"	"	"	"	"	"	"	"	outputs	"		
		"	53	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	54	B	"	"	A	"	"	"	"	"	"	"	"	"	"	"	"		
		"	55	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	56	B	"	"	"	L	H	"	"	"	"	"	"	"	"	"	"		
		"	57	B	B	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	58	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	59	B	"	"	"	H	L	"	"	"	"	"	"	"	"	"	"		
		"	60	"	"	B	B	"	"	"	"	"	"	"	A	"	"	"	"		
		"	61	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"		
		"	62	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	63	"	"	"	"	"	"	"	H	L	"	"	"	B	"	"	"		
		"	64	"	"	"	"	"	"	"	"	"	"	A	B	B	"	"	"		
		"	65	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	66	"	"	"	"	"	"	"	L	H	"	"	"	B	"	"	"		
		"	67	"	"	"	"	"	"	"	"	"	B	B	"	"	"	"	"		
		"	68	"	"	"	A	"	"	"	"	"	A	"	"	"	"	"	"		
		"	69	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	70	B	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"		
		"	71	B	A	A	"	"	"	"	"	"	"	A	A	B	"	"	"		
		"	72	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	73	B	"	"	"	L	H	"	H	L	"	"	"	B	"	"	"		
		"	74	B	B	B	"	"	"	"	"	"	"	B	B	B	"	"	"		
		"	75	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	76	B	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"		
		"	77	B	A	A	"	"	"	"	"	"	"	A	A	B	"	"	"		
		"	78	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	79	B	"	"	"	H	L	"	L	H	"	"	"	B	"	"	"		
8 5, 7/	Repeat subgroup 7 at T_C = +125°C and T_C = -55°C.																				

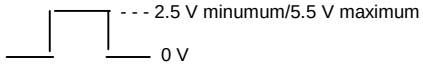
See footnotes at end of device type 04.

TABLE III. Group A inspection for device type 04 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLK1	K1	J1	PR1	Q1	$\overline{Q1}$	GND	$\overline{Q2}$	Q2	PR2	J2	K2	CLK2	V_{CC}		Min	Max	
9 Tc = 25°C	f_{MAX} 8/	Fig. 11	80	IN	2.7 V	2.7 V	2.7 V	OUT		GND							5.0 V	Q1	25		MHz
		"	81	IN	2.7 V	2.7 V	2.7 V		OUT	"							"	$\overline{Q1}$	"		"
		"	82							"	OUT		2.7 V	2.7 V	2.7 V	IN	"	$\overline{Q2}$	"		"
		"	83							"		OUT	2.7 V	2.7 V	2.7 V	IN	"	Q2	"		"
	t_{PLH1}	3003	84							"		OUT	IN	GND	2.7 V	IN	"	PR2 to Q2	5	21	ns
		Fig. 11	85	IN	2.7 V	GND	IN	OUT		"							"	PR1 to Q1	"	21	"
	t_{PHL1}	"	86	IN	2.7 V	GND	IN		OUT	"							"	PR1 to $\overline{Q1}$	"	28	"
		"	87							"	OUT		IN	GND	2.7 V	IN	"	PR2 to $\overline{Q2}$	"	"	"
	t_{PLH2}	3003	88							"		OUT	2.7 V	2.7 V	2.7 V	IN	"	CLK2 to Q2	"	22	"
		Fig. 12	89							"	OUT		2.7 V	2.7 V	2.7 V	IN	"	CLK2 to $\overline{Q2}$	"	"	"
		"	90	IN	2.7 V	2.7 V	2.7 V		OUT	"							"	CLK1 to $\overline{Q1}$	"	"	"
		"	91	"	"	"	"	OUT		"							"	CLK1 to Q1	"	"	"
	t_{PHL2}	"	92	"	"	"	"	OUT		"							"	CLK1 to Q1	"	30	"
		"	93	"	"	"	"		OUT	"							"	CLK1 to $\overline{Q1}$	"	"	"
		"	94							"	OUT		2.7 V	2.7 V	2.7 V	IN	"	CLK2 to $\overline{Q2}$	"	"	"
		"	95							"		OUT	2.7 V	2.7 V	2.7 V	IN	"	CLK2 to Q2	"	"	"
	f_{MAX} 10/	Fig. 11	96-99	Same tests and terminal conditions, and limits as for subgroup 9, except T_C = +125°C.															25		MHz
	t_{PLH1}	3003 Fig. 11	100-101																5	32	ns
	t_{PHL1}	3003 Fig. 11	102-103																"	40	"
	t_{PLH2}	3003 Fig. 12	104-107																"	32	"
	t_{PHL2}	3003 Fig. 12	108-111																"	42	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C.																				

1/ Case X and 2 pins not referenced are NC.

2/



3/

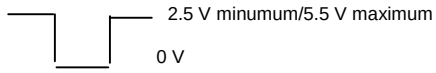


TABLE III. Group A inspection for device type 04 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

4/ I_{IL} limits in mA are as follows:

Min/Max limits for CRT					
Symbol	A	B	C	D and F	E
I_{IL1}	-.075/-.250	-.03/-.300	-.110/-.250	-.120/-.360	-.120/-.360
I_{IL2}	-.175/-.550	-.060/-.600	-.150/-.560	-.240/-.720	-.280/-.760
I_{IL3}	-.200/-.800	-.060/-.700	-.290/-.650	-.120/-.720	-.320/-.800

5/ Momentary GND, then open.

6/ I_{OS} limits in mA are as follows:

Test no.	A	B	C	D and E	F
46, 48	-7.5/-50	-7.5/-50	-30/-130	-15/-130	-7.5/-50
46, 48 Q1, Q2	2.25 V	2.25 V	- - -	- - -	2.25 V

7/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volts maximum.

8/ Tests shall be performed in sequence, attributes data only.

9/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.

10/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 05.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR	K1	J1	PR1	Q1	$\overline{Q1}$	GND	$\overline{Q2}$	Q2	PR2	J2	K2	CLK	V_{CC}		Min	Max	
1	V_{OH}	3006	1	2.0 V	0.7 V	2.0 V	0.7 V	-.4 mA		GND						2.0 V	4.5 V	Q1	2.5		V
Tc = 25°C		"	2	0.7 V	"	"	2.0 V		-.4 mA	"						2.0 V	"	$\overline{Q1}$	"		"
		"	3	2.0 V	"	"	"	-.4 mA		"						2/	"	Q1	"		"
		"	4	"	2.0 V	0.7 V	"		-.4 mA	"						"	"	$\overline{Q1}$	"		"
		"	5	"						"	-.4 mA		2.0 V	0.7 V	2.0 V	"	"	$\overline{Q2}$	"		"
		"	6	"						"		-.4 mA	"	2.0 V	0.7 V	"	"	Q2	"		"
		"	7	0.7 V						"	-.4 mA		"	"	"	2.0 V	"	$\overline{Q2}$	"		"
		"	8	2.0 V						"		-.4 mA	0.7 V	"	"	"	"	Q2	"		"
	V_{OL}	3007	9	2.0 V						"	4 mA		0.7 V	"	"	"	"	$\overline{Q2}$		0.4	"
		"	10	0.7 V						"		4 mA	2.0 V	"	"	"	"	Q2		"	"
		"	11	2.0 V						"	4 mA		"	"	"	2/	"	$\overline{Q2}$		"	"
		"	12	"						"		4 mA	"	0.7 V	2.0 V	"	"	Q2		"	"
		"	13	"	0.7 V	2.0 V	2.0 V		4 mA	"						"	"	$\overline{Q1}$		"	"
		"	14	"	2.0 V	0.7 V	2.0 V	4 mA		"						"	"	Q1		"	"
		"	15	"	"	"	0.7 V		4 mA	"						2.0 V	"	$\overline{Q1}$		"	"
		"	16	0.7 V	"	"	2.0 V	4 mA		"						2.0 V	"	Q1		"	"
	V_{IC}		17	-18 mA						"							"	CLR		-1.5	"
			18		-18 mA					"							"	K1		"	"
			19			-18 mA				"							"	J1		"	"
			20				-18 mA			"							"	PR1		"	"
			21							"			-18 mA				"	PR2		"	"
			22							"				-18 mA			"	J2		"	"
			23							"					-18 mA		"	K2		"	"
			24							"						-18 mA	"	CLK		"	"
	I_{IL1}	3009	25	4.5 V	0.4 V	GND	3/			"						4.5 V	5.5 V	K1	4/	4/	mA
		"	26	3/	GND	0.4 V	4.5 V			"						"	"	J1	"	"	"
		"	27	3/						"			4.5 V	0.4 V	4.5 V	"	"	J2	"	"	"
		"	28	4.5 V						"			3/	4.5 V	0.4 V	"	"	K2	"	"	"
	I_{IL4}	"	29							"			0.4 V	4.5 V	4.5 V	"	"	PR2	"	"	"
		"	30		4.5 V	4.5 V	0.4 V			"						"	"	PR1	"	"	"
	I_{IL6}	"	31	3/	"	"	4.5 V			"			4.5 V	4.5 V	4.5 V	0.4 V	"	CLK	"	"	"
		"	32	4.5 V	"	"	3/			"			3/		4.5 V	0.4 V	"	CLK	"	"	"
	I_{IL7}	"	33	0.4 V	4.5 V	4.5 V	4.5 V			"			4.5 V	4.5 V	4.5 V	4.5 V	"	CLR	"	"	"
	I_{IH1}	3010	34	GND	2.7 V	GND	GND			"						GND	"	K1		20	µA
		"	35	"	GND	2.7 V	GND			"						"	"	J1		"	"
		"	36	"						"			GND	2.7 V	GND	"	"	J2		"	"
		"	37	"						"			"	GND	2.7 V	"	"	K2		"	"

See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 05 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR	K1	J1	PR1	Q1	$\overline{Q}$1	GND	$\overline{Q}$2	Q2	PR2	J2	K2	CLK	V_{CC}		Min	Max	
1 Tc = 25°C	I_{IH2}	3010	38	GND						GND			GND	GND	5.5 V	GND	5.5 V	K2		100	µA
		"	39	"						"			GND	5.5 V	GND	"	"	J2		"	"
		"	40	"	GND	5.5 V	GND			"						"	"	J1		"	"
		"	41	"	5.5 V	GND	GND			"						"	"	K1		"	"
	I_{IH5}	"	42	"	GND	GND	2.7 V			"						"	"	PR1		60	"
		"	43	"						"			2.7 V	GND	GND	"	"	PR2		60	"
	I_{IH6}	"	44	"						"			5.5 V	GND	GND	"	"	PR2		300	"
		"	45	"	GND	GND	5.5 V			"						"	"	PR1		300	"
	I_{IH9}	"	46	2.7 V	"	"	GND			"			GND	GND	GND	"	"	CLR		120	"
	I_{IH10}	"	47	5.5 V	"	"	"			"			"	"	"	"	"	CLR		600	"
	I_{IH11}	"	48	GND	"	"	"			"			"	"	"	2.7 V	"	CLK		160	"
	I_{IH12}	"	49	"	"	"	"			"			"	"	"	5.5 V	"	CLK		800	"
	I_{OS}	3011	50	"			4.5 V		GND	"							"	$\overline{Q}$1	-15	-100	mA
		"	51	"						"	GND		4.5 V				"	$\overline{Q}$2	"	"	"
		"	52	4.5 V						"		GND	GND				"	Q2	"	"	"
		"	53	4.5 V			GND	GND		"							"	Q1	"	"	"
	I_{CC}	3005	54	GND	5.5 V	5.5 V	5.5 V			"			5.5 V	5.5 V	5.5 V	GND	"	V_{CC}		8.0	"
			55	5.5 V	5.5 V	5.5 V	GND			"			GND	5.5 V	5.5 V	GND	"	V_{CC}		8.0	"
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
7 5/, 6/ Tc = 25°C	Truth table tests	3014	56	B	B	A	A	L	H	GND	H	L	A	A	B	A	4.5 V	All outputs	See 7/		
		"	57	"	"	"	"	"	"	"	"	"	"	"	"	B	"		"		
		"	58	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	59	A	"	"	"	"	"	"	L	H	B	B	"	A	"	"	"		
		"	60	"	"	"	"	H	L	"	"	"	"	"	"	B	"	"	"		
		"	61	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	62	"	"	B	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	63	"	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"		
		"	64	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	65	"	A	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	66	"	"	"	"	L	H	"	"	"	"	"	"	B	"	"	"		
		"	67	"	"	"	"	L	H	"	"	"	"	"	"	A	"	"	"		
		"	68	"	"	"	B	H	L	"	"	"	"	"	"	A	"	"	"		
		"	69	"	"	"	B	H	L	"	"	"	"	"	"	B	"	"	"		
		"	70	B	B	"	A	L	H	"	H	L	A	A	"	A	"	"	"		
		"	71	A	"	"	B	H	L	"	H	L	"	"	"	A	"	"	"		
		"	72	"	"	"	"	"	"	"	L	H	"	"	"	B	"	"	"		
		"	73	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	74	"	"	"	"	"	"	"	"	"	"	B	"	A	"	"	"		
		"	75	"	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"		

See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 05 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

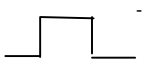
Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR	K1	J1	PR1	Q1	$\overline{Q}$1	GND	$\overline{Q}$2	Q2	PR2	J2	K2	CLK	V_{CC}		Min	Max	
7 5/, 6/ Tc = 25°C	Truth table tests	3014	76	A	B	B	B	H	L	GND	L	H	A	B	B	A	4.5 V	All	See 7/		
		"	77	"	"	"	"	"	"	"	"	"	"	"	A	A	"	outputs	"		
		"	78	"	"	"	"	"	"	"	H	L	"	"	"	B	"	"	"		
		"	79	"	"	"	"	"	"	"	H	L	"	"	"	A	"	"	"		
		"	80	"	"	"	"	"	"	"	L	H	B	"	"	A	"	"	"		
		"	81	"	"	"	"	"	"	"	L	"	"	"	"	B	"	"	"		
		"	82	B	A	A	"	"	H	"	H	"	"	A	"	A	"	"	"		
		"	83	B	B	B	A	L	"	"	"	L	A	B	B	"	"	"	"		
		"	84	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
		"	85	"	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"		
		"	86	"	A	A	"	"	"	"	"	"	"	A	A	B	"	"	"		
		"	87	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	88	"	"	"	"	H	L	"	L	H	"	"	"	B	"	"	"		
		"	89	"	B	B	"	"	"	"	"	"	"	B	B	B	"	"	"		
		"	90	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	91	"	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"		
		"	92	"	A	A	"	"	"	"	"	"	"	A	A	B	"	"	"		
		"	93	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
		"	94	"	"	"	"	L	H	"	H	L	"	"	"	B	"	"	"		
8 4/, 5/	Repeat subgroup 7 at T_C = 125°C and T_C = -55°C																				
9 Tc = 25°C	f_{MAX} 7/	Fig. 9	95	5.0 V	2.7 V	2.7 V	2.7 V	OUT		GND						IN	5.0 V	Q1	25		MHz
		"	96	"	2.7 V	2.7 V	2.7 V		OUT	"						"	"	$\overline{Q}$1	"		"
		"	97	"						"	OUT		2.7 V	2.7 V	2.7 V	"	"	$\overline{Q}$2	"		"
		"	98	"						"		OUT	2.7 V	2.7 V	2.7 V	"	"	Q2	"		"
	t_{PLH1}	3003	99	IN	GND	2.7 V	2.7 V		OUT	"						"	"	CLR to $\overline{Q}$1	5	21	ns
		Fig. 9	100	IN						"	OUT		2.7 V	2.7 V	GND	"	"	CLR to $\overline{Q}$2	"	"	"
		"	101	2.7 V						"		OUT	IN	GND	2.7 V	"	"	PR2 to Q2	"	"	"
		"	102	"	2.7 V	GND	IN	OUT		"						"	"	PR1 to Q1	"	"	"
	t_{PHL1}	"	103	"	2.7 V	GND	IN		OUT	"						"	"	PR1 to $\overline{Q}$1	"	28	"
		"	104	"						"	OUT		IN	GND	2.7 V	"	"	PR2 to $\overline{Q}$2	"	"	"
		"	105	IN						"		OUT	2.7 V	2.7 V	GND	"	"	CLR to Q2	"	"	"
		"	106	IN	GND	2.7 V	2.7 V	OUT		"						"	"	CLR to Q1	"	"	"
	t_{PLH2}	3003	107	2.7 V	2.7 V	2.7 V	2.7 V	OUT		"						"	"	CLK to Q1	"	22	"
		Fig. 10	108	"	2.7 V	2.7 V	2.7 V		OUT	"						"	"	CLK to $\overline{Q}$1	"	"	"
		"	109	"						"	OUT		2.7 V	2.7 V	2.7 V	"	"	CLK to $\overline{Q}$2	"	"	"
		"	110	"						"		OUT	2.7 V	2.7 V	2.7 V	"	"	CLK to Q2	"	"	"
	t_{PHL2}	"	111	"						"		OUT	2.7 V	2.7 V	2.7 V	"	"	CLK to Q2	"	30	"
		"	112	"						"	OUT		2.7 V	2.7 V	2.7 V	"	"	CLK to $\overline{Q}$2	"	"	"
		"	113	"	2.7 V	2.7 V	2.7 V		OUT	"						"	"	CLK to $\overline{Q}$1	"	"	"
		"	114	"	2.7 V	2.7 V	2.7 V	OUT		"						"	"	CLK to Q1	"	"	"

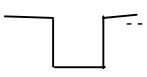
See footnotes at end of device type 05.

TABLE III. Group A inspection for device type 05 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal	Limits		Unit
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test no.	CLR	K1	J1	PR1	Q1	$\overline{Q1}$	GND	$\overline{Q2}$	Q2	PR2	J2	K2	CLK	V_{CC}		Min	Max	
10	f_{MAX} 8/	Fig. 9	115-118	Same tests and terminal conditions as for subgroup 9, except T_C = +125°C.															25		MHz
	t_{PLH1}	3003 Fig. 9	119-122																5	32	ns
	t_{PHL1}	3003 Fig. 9	123-126																"	40	"
	t_{PLH2}	3003 Fig. 10	127-130																"	32	"
	t_{PHL2}	3003 Fig. 10	131-134																"	42	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C.																				

1/ Case X and 2 pins not referenced are NC.

2/ 

3/ 

4/ I_{IL} limits in mA are as follows:

I_{IL1}	Min/Max limits for CKT				
	A	B	C	D	E
	-.075/-.250	-.030/-.300	-.110/-.250	-.120/-.360	-.120/-.360

I_{IL4}	Min/Max limits for CKT				
	A	B	C	D	E
	-.200/-.800	-.060/-.700	-.290/-.650	-.120/-.720	-.320/-.800

I_{IL6}	Min/Max limits for CKT				
	A	B	C	D	E
	-.300/-1.000	-.120/-1.000	-.300/-1.120	-.240/-1.440	-.560/-1.520

I_{IL7}	Min/Max limits for CKT				
	A	B	C	D	E
	-.450/-1.300	-.120/-1.000	-.580/-1.300	-.120/-1.500	-.640/-1.600

5/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volt maximum.
6/ Tests shall be performed in sequence, attributes data only.
7/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.
8/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 03 and 10.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open). 1/

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	* 2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
				** 2	20	5	3	19	18	13	17	14	9	12	15	8	10	4	7				
			Cases E, F	* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
				** 1	16	4	2	15	14	10	13	11	7	9	12	6	8	3	5				
			Test no.	CLK1	K1	J1	PR1	Q1	$\overline{Q}1$	$\overline{Q}2$	GND	Q2	PR2	J2	K2	CLK2	CLR2	CLR1	V_{CC}		Min	Max	
1	V_{OH}	3006	1	2.0 V	2.0 V	2.0 V	2.0 V		-.4 mA		GND							0.7 V	4.5 V	$\overline{Q}1$	2.5		V
Tc = 25°C		"	2	2.0 V	"	2.0 V	0.7 V	-.4 mA			"							2.0 V	"	Q1	"		"
		"	3	3/	"	0.7 V	2.0 V		-.4 mA		"							"	"	$\overline{Q}1$	"		"
		"	4	3/	0.7 V	2.0 V	2.0 V	-.4 mA			"							"	"	Q1	"		"
		"	5								"	-.4 mA	0.7 V	2.0 V	2.0 V	2.0 V	2.0 V		"	Q2	"		"
		"	6							-.4 mA	"		2.0 V	"	2.0 V	2.0 V	0.7 V		"	$\overline{Q}2$	"		"
		"	7								"	-.4 mA	"	"	0.7 V	3/	2.0 V		"	Q2	"		"
		"	8							-.4 mA	"		"	0.7 V	2.0 V	"	"		"	$\overline{Q}2$	"		"
	V_{OL}	3007	9								"	4 mA	"	0.7 V	2.0 V	"	"		"	Q2		0.4	"
		"	10							4 mA	"		"	2.0 V	0.7 V	"	"		"	$\overline{Q}2$		"	"
		"	11								"	4 mA	"	2.0 V	2.0 V	2.0 V	0.7 V		"	Q2		"	"
		"	12							4 mA	"		0.7 V	2.0 V	2.0 V	2.0 V	2.0 V		"	$\overline{Q}2$		"	"
		"	13	2.0 V	2.0 V	2.0 V	2.0 V	4 mA			"							0.7 V	"	Q1		"	"
		"	14	2.0 V	"	2.0 V	0.7 V		4 mA		"							2.0 V	"	$\overline{Q}1$		"	"
		"	15	3/	"	0.7 V	2.0 V	4 mA			"							"	"	Q1		"	"
		"	16	3/	0.7 V	2.0 V	2.0 V		4 mA		"							"	"	$\overline{Q}1$		"	"
	V_{IC}		17	-18 mA							"								"	CLK1		-1.5	"
			18		-18 mA						"								"	K1		"	"
			19			-18 mA					"								"	J1		"	"
			20				-18 mA				"								"	PR1		"	"
			21								"		-18 mA						"	PR2		"	"
			22								"			-18 mA					"	J2		"	"
			23								"				-18 mA				"	K2		"	"
			24								"					-18 mA			"	CLK2		"	"
			25								"						-18 mA		"	CLR2		"	"
			26								"							-18 mA	"	CLR1		"	"
	I_{IL1}	3009	27	4.5 V	0.4 V	4.5 V	4/				"							4.5 V	5.5 V	K1	5/	5/	mA
		"	28	4.5 V	4.5 V	0.4 V	4.5 V				"							4/	"	J1	"	"	"
		"	29								"		4.5 V	0.4 V	4.5 V	4.5 V	4/		"	J2	"	"	"
		"	30								"		4/	4.5 V	0.4 V	4.5 V	4.5 V		"	K2	"	"	"
	I_{IL3}	"	31								"		4/	4.5 V	4.5 V	0.4 V	4.5 V		"	CLK2	"	"	"
		"	32								"		4.5 V	4.5 V	4.5 V	0.4 V	4/		"	CLK2	"	"	"
		"	33	0.4 V	4.5 V	4.5 V	4.5 V				"							4/	"	CLK1	"	"	"
		"	34	0.4 V	4.5 V	4.5 V	4/				"							4.5 V	"	CLK1	"	"	"
	I_{IL4}	"	35	4.5 V	4.5 V	4.5 V	0.4 V				"							4.5 V	"	PR1	"	"	"
		"	36	4.5 V	4.5 V	4.5 V	4.5 V				"							0.4 V	"	CLR1	"	"	"
		"	37								"		4.5 V	4.5 V	4.5 V	4.5 V	0.4 V		"	CLR2	"	"	"
		"	38								"		0.4 V	4.5 V	4.5 V	4.5 V	4.5 V		"	PR2	"	"	"
	I_{IH1}	3010	39								"		GND	4.5 V	2.7 V	GND	4.5 V		"	K2		20	µA
		"	40								"		4.5 V	2.7 V	4.5 V	GND	GND		"	J2		"	"
		"	41	GND	4.5 V	2.7 V	4.5 V				"							GND	"	J1		"	"
		"	42	GND	2.7 V	4.5 V	GND				"							4.5 V	"	K1		"	"

See footnotes at end of device types 03 and 10.

TABLE III. Group A inspection for device type 03 and 10.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open). 1/

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	* 2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
				** 2	20	5	3	19	18	13	17	14	9	12	15	8	10	4	7				
			Cases E, F	* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
				** 1	16	4	2	15	14	10	13	11	7	9	12	6	8	3	5				
			Test no.	CLK1	K1	J1	PR1	Q1	$\overline{Q}$1	$\overline{Q}$2	GND	Q2	PR2	J2	K2	CLK2	CLR2	CLR1	V_{CC}		Min	Max	
1	I_{IH2}	3010	43	GND	5.5 V	4.5 V	GND				GND							4.5 V	5.5 V	K1		100	µA
Tc = 25°C	"	"	44	GND	4.5 V	5.5 V	4.5 V				"							GND	"	J1		"	"
	"	"	45								"		4.5 V	5.5 V	4.5 V	GND	GND		"	J2		"	"
	"	"	46								"		GND	4.5 V	5.5 V	"	4.5 V		"	K2		"	"
	I_{IH5}	"	47								"		4/	GND	4.5 V	"	2.7 V		"	CLR2		60	"
	"	"	48								"		2.7 V	4.5 V	GND	"	4/		"	PR2		"	"
	"	"	49	GND	4.5 V	GND	4/				"							2.7 V	"	CLR1		"	"
	"	"	50	GND	GND	4.5 V	2.7 V				"							4/	"	PR1		"	"
	I_{IH6}	"	51	GND	GND	4.5 V	5.5 V				"							4/	"	PR1		300	"
	"	"	52	GND	4.5 V	GND	4/				"							5.5 V	"	CLR1		"	"
	"	"	53								"		5.5 V	4.5 V	GND	GND	4/		"	PR2		"	"
	"	"	54								"		4/	GND	4.5 V	GND	5.5 V		"	CLR2		"	"
	I_{IH7}	"	55								"		GND	GND	GND	2.7 V	GND		"	CLK2		80	"
	"	"	56	2.7 V	GND	GND	GND				"							GND	"	CLK1		80	"
	I_{IH8}	"	57	5.5 V	GND	GND	GND				"							GND	"	CLK1		400	"
	"	"	58								"		GND	GND	GND	5.5 V	GND		"	CLK2		400	"
	I_{OS}	3011	59	GND	GND	GND	GND	GND			"							4.5 V	"	Q1	-15	-100	mA
	"	"	60	GND	GND	GND	4.5 V		GND		"							GND	"	$\overline{Q}$1	"	"	"
	"	"	61								"	GND	GND	GND	GND	GND	4.5 V		"	Q2	"	"	"
	"	"	62							GND	"		4.5 V	"	"	"	GND		"	$\overline{Q}$2	"	"	"
	I_{CC}	3005	63	GND	GND	GND	GND				"		GND	"	"	"	5.5 V	5.5 V	"	V_{CC}		8.0	"
		3005	64	GND	GND	GND	5.5 V				"		5.5 V	"	"	"	GND	GND	"	V_{CC}		8.0	"
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																						
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																						
7 6/, 7/	Truth	3014	65	B	B	A	A	L	H	H	GND	L	A	A	B	B	B	B	4.5 V	All	See 8/		
Tc = 25°C	table	"	66	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"	outputs	"		
	tests	"	67	B	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"		
		"	68	B	A	B	B	H	L	L	"	H	B	B	A	B	A	A	"	"	"		
		"	69	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"		
		"	70	B	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"		
		"	71	"	B	"	A	L	H	H	"	L	A	"	B	"	B	B	"	"	"		
		"	72	"	"	"	"	"	"	"	"	"	"	"	"	"	A	A	"	"	"		
		"	73	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"		
		"	74	B	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"		
		"	75	"	"	"	B	H	L	L	"	H	B	"	"	"	"	"	"	"	"		
		"	76	"	"	"	A	"	"	"	"	"	A	"	"	"	"	"	"	"	"		
		"	77	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"	"	"		
		"	78	B	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"	"		
		"	79	"	"	A	"	L	H	H	"	L	"	A	"	"	B	B	"	"	"		
		"	80	"	"	"	"	"	"	"	"	"	"	"	"	"	A	A	"	"	"		

See footnotes at end of device types 03 and 10.

TABLE III. Group A inspection for device type 03 and 10.

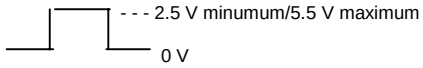
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open). 1/

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	* 2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
				** 2	20	5	3	19	18	13	17	14	9	12	15	8	10	4	7				
			Cases E, F	* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
				** 1	16	4	2	15	14	10	13	11	7	9	12	6	8	3	5				
			Test no.	CLK1	K1	J1	PR1	Q1	$\overline{Q}$1	$\overline{Q}$2	GND	Q2	PR2	J2	K2	CLK2	CLR2	CLR1	V_{CC}		Min	Max	
7 6/, 7/ Tc = 25°C	Truth table tests	3014	81	A	B	A	A	L	H	H	GND	L	A	A	B	A	A	A	4.5 V	All outputs	See 8/		
		"	82	B	"	"	"	H	L	L	"	H	"	"	"	B	"	"	"		"		
		"	83	"	A	B	B	"	"	"	"	"	B	B	A	"	"	"	"		"		
		"	84	"	"	"	A	"	"	"	"	"	A	"	"	"	"	"	"		"		
		"	85	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		"		
		"	86	B	"	"	"	L	H	H	"	L	"	"	"	B	"	"	"		"		
		"	87	A	"	A	B	H	"	"	"	H	B	A	"	A	B	B	"		"		
		"	88	B	"	"	A	L	"	"	"	L	A	"	"	B	B	B	"		"		
		"	89	B	"	"	"	"	"	"	"	"	"	"	"	B	A	A	"		"		
		"	90	A	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		"		
		"	91	B	"	"	"	H	L	L	"	H	"	"	"	B	"	"	"		"		
		"	92	A	"	"	"	H	L	L	"	H	"	"	"	A	"	"	"		"		
		"	93	B	"	"	"	L	H	H	"	L	"	"	"	B	"	"	"		"		
8 6/, 7/	Repeat subgroup 7 at T_C = +125°C and T_C = -55°C.																						
9 Tc = 25°C	f_{MAX}	Fig. 9	94	IN	2.7 V	2.7 V	2.7 V	OUT			GND							2.7 V	5.0 V	Q1	25		MHz
	9/	"	95	IN	2.7 V	2.7 V	2.7 V		OUT		"							2.7 V	"	$\overline{Q}$1	"		"
		"	96							OUT	"		2.7 V	2.7 V	2.7 V	IN	2.7 V		"	$\overline{Q}$2	"		"
		"	97								"	OUT	2.7 V	2.7 V	2.7 V	IN	2.7 V		"	Q2	"		"
	t_{PLH1}	3003	98 10/	IN	GND	2.7 V	2.7 V		OUT		"							IN	"	CLR1 to $\overline{Q}$1	5	21	ns
		Fig. 9	99	IN	2.7 V	GND	IN	OUT			"							2.7 V	"	PR1 to Q1	"	"	"
		"	100							OUT	"		2.7 V	2.7 V	GND	IN	IN		"	CLR2 to $\overline{Q}$2	"	"	"
		"	101								"	OUT	IN	GND	2.7 V	IN	2.7 V		"	PR2 to Q2	"	"	"
	t_{PHL1}	"	102 10/								"	OUT	2.7 V	2.7 V	GND	IN	IN		"	CLR2 to Q2	"	28	"
		"	103							OUT	"		IN	GND	2.7 V	IN	2.7 V		"	PR2 to $\overline{Q}$2	"	"	"
		"	104	IN	GND	2.7 V	2.7 V	OUT			"							IN	"	CLR1 to Q1	"	"	"
		"	105	IN	2.7 V	GND	IN		OUT		"							2.7 V	"	PR1 to $\overline{Q}$1	"	"	"
	t_{PLH2}	3003	106	IN	2.7 V	2.7 V	2.7 V		OUT		"							2.7 V	"	CLK1 to $\overline{Q}$1	"	22	"
		Fig. 10	107	IN	2.7 V	2.7 V	2.7 V	OUT			"							2.7 V	"	CLK1 to Q1	"	"	"
		"	108							OUT	"		2.7 V	2.7 V	2.7 V	IN	2.7 V		"	CLK2 to $\overline{Q}$2	"	"	"
		"	109								"	OUT	2.7 V	2.7 V	2.7 V	IN	2.7 V		"	CLK2 to Q2	"	"	"
	t_{PHL2}	"	110								"	OUT	2.7 V	2.7 V	2.7 V	IN	2.7 V		"	CLK2 to Q2	"	30	"
		"	111							OUT	"		2.7 V	2.7 V	2.7 V	IN	2.7 V		"	CLK2 to $\overline{Q}$2	"	"	"
		"	112	IN	2.7 V	2.7 V	2.7 V	OUT			"							2.7 V	"	CLK1 to Q1	"	"	"
		"	113	IN	2.7 V	2.7 V	2.7 V		OUT		"							2.7 V	"	CLK1 to $\overline{Q}$1	"	"	"
10	f_{MAX}	Fig. 9	114-117	Same tests and terminal conditions as for subgroup 9, except T_C = +125°C																	25		MHz
	t_{PLH1}	3003 Fig. 9	118-121																		5	32	ns
	t_{PHL1}	3003 Fig. 9	122-125																		"	40	"
	t_{PLH2}	3003 Fig. 10	126-129																		"	32	"
	t_{PHL2}	3003 Fig. 10	130-133																		"	42	"
11	Same tests and terminal conditions as for subgroup 10, except T_C = -55°C																						

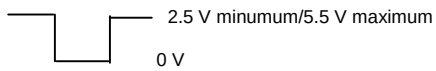
See footnotes at end of device types 03 and 10.

TABLE III. Group A inspection for device type 03 and 10.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open). 1/

* Terminal numbers for device type 03.
** Terminal numbers for device type 10.
1/ See 6.4 for special applications note.
2/ Case X and 2 pins not referenced are NC.
3/



4/



5/ I_{IL} limits in mA are as follows:

I_{IL1}	Min/Max limits for CKT				
	A	B	C	D	E
	-.075/-.250	-.030/-.300	-.150/-.560	-.120/-.360	-.120/-.360

I_{IL3}	Min/Max limits for CKT				
	A	B	C	D	E
	-.150/-.500	-.060/-.600	-.250/-.560	-.240/-.720	-.280/-.760

I_{IL4}	Min/Max limits for CKT				
	A	B	C	D	E
	-.200/-.800	-.060/-.700	-.290/-.650	-.120/-.720	-.320/-.800

6/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volts maximum.

7/ Tests shall be performed in sequence, attributes data only.

8/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.

9/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

10/ These tests may be performed as shown in table III or alternately as follows:

Test no.	CLK1	K1	J1	PR1	Q1	$\overline{Q}_1$	$\overline{Q}_2$	GND	Q2	PR2	J2	K2	CLK2	CLR2	CLR1	V_{CC}
98A	2.7 V	2.7 V	2.7 V	2/		OUT		GND							IN	5.0 V
99A	2.7 V	2.7 V	2.7 V	IN	OUT			"							2/	"
100A							OUT	"		2/	2.7 V	2.7 V	2.7 V	IN		"
101A								"	OUT	IN	2.7 V	2.7 V	2.7 V	2/		"
102A								"	OUT	2/	2.7 V	2.7 V	2.7 V	IN		"
103A							OUT	"		IN	2.7 V	2.7 V	2.7 V	2/		"
104A	2.7 V	2.7 V	2.7 V	2/	OUT			"							IN	"
105A	2.7 V	2.7 V	2.7 V	IN		OUT		"							2/	"

TABLE III. Group A inspection for device type 06.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR	Q1	D1	D2	Q2	D3	Q3	GND	CLK	Q4	D4	Q5	D5	D6	Q6	V_{CC}		Min	Max	
1	V_{OH}	3006	1	2.0 V	-.4 mA	2.0 V					GND	2/							4.5 V	Q1	2.5		V
Tc = 25°C		"	2	"			2.0 V	-.4 mA			"	"							"	Q2	"		"
		"	3	"					2.0 V	-.4 mA	"	"							"	Q3	"		"
		"	4	"							"	"	-.4 mA	2.0 V					"	Q4	"		"
		"	5	"							"	"			-.4 mA	2.0 V			"	Q5	"		"
		"	6	"							"	"					2.0 V	-.4 mA	"	Q6	"		"
	V_{OL}	3007	7	"							"	"					0.7V	4 mA	"	Q6		0.4	"
		"	8	"							"	"			4 mA	0.7 V			"	Q5		"	"
		"	9	"							"	"	4 mA	0.7 V					"	Q4		"	"
		"	10	"					0.7 V	4 mA	"	"							"	Q3		"	"
		"	11	"			0.7 V	4 mA			"	"							"	Q2		"	"
		"	12	"	4 mA	0.7 V					"	"							"	Q1		"	"
		"	13	0.7 V	4 mA						"								"	Q1		"	"
		"	14	"				4 mA			"								"	Q2		"	"
		"	15	"						4 mA	"								"	Q3		"	"
		"	16	"							"		4 mA						"	Q4		"	"
		"	17	"							"				4 mA				"	Q5		"	"
		"	18	"							"							4 mA	"	Q6		"	"
	V_{IC}		19	-18 mA							"								"	CLR		-1.5	"
			20			-18 mA					"								"	D1		"	"
			21				-18 mA				"								"	D2		"	"
			22						-18 mA		"								"	D3		"	"
			23								"	-18 mA							"	CLK		"	"
			24								"			-18 mA					"	D4		"	"
			25								"					-18 mA			"	D5		"	"
			26								"						-18 mA		"	D6		"	"
	I_{IL1}	3009	27								"						0.4 V		5.5 V	D6	3/	3/	mA
		"	28								"					0.4 V			"	D5	"	"	"
		"	29								"			0.4 V					"	D4	"	"	"
		"	30						0.4 V		"								"	D3	"	"	"
		"	31				0.4 V				"								"	D2	"	"	"
		"	32			0.4 V					"								"	D1	"	"	"
	I_{IL2}	"	33	0.4 V							"								"	CLR	"	"	"
		"	34								"	0.4 V							"	CLK	"	"	"
	I_{IH1}	3010	35	2.7 V							"								"	CLR		20	µA
		"	36			2.7 V					"								"	D1		"	"
		"	37				2.7 V				"								"	D2		"	"
		"	38						2.7 V		"								"	D3		"	"
		"	39								"	2.7 V							"	CLK		"	"
		"	40								"			2.7 V					"	D4		"	"
		"	41								"					2.7 V			"	D5		"	"
		"	42								"						2.7 V		"	D6		"	"
	I_{IH2}	"	43								"						5.5 V		"	D6		100	"
		"	44								"					5.5 V			"	D5		"	"
		"	45								"			5.5 V					"	D4		"	"
		"	46								"	5.5 V							"	CLK		"	"
		"	47						5.5 V		"								"	D3		"	"
		"	48				5.5 V				"								"	D2		"	"
		"	49			5.5 V					"								"	D1		"	"
		"	50	5.5 V							"								"	CLR		"	"

See footnotes at end of device types 06.

TABLE III. Group A inspection for device type 06 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR	Q1	D1	D2	Q2	D3	Q3	GND	CLK	Q4	D4	Q5	D5	D6	Q6	V_{CC}		Min	Max	
1	I_{OS}	3011	51	4.5 V	GND	4.5 V					GND	4/							5.5 V	Q1	-15	-100	µA
Tc = 25°C		"	52	"			4.5 V	GND			"	"							"	Q2	"	"	"
		"	53	"					4.5 V	GND	"	"							"	Q3	"	"	"
		"	54	"							"	"	GND	4.5 V					"	Q4	"	"	"
		"	55	"							"	"			GND	4.5 V			"	Q5	"	"	"
		"	56	"							"	"					4.5 V	GND	"	Q6	"	"	"
	I_{CC}	3005	57	5.5 V		5.5 V	5.5 V		5.5 V		"	"		5.5 V		5.5 V	5.5 V		"	V_{CC}		26	"
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																						
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																						
7 5/, 6/	Truth	3014	58	B	L	A	A	L	A	L	GND	A	L	A	L	A	A	L	4.5 V	All	See 7/		
Tc = 25°C	table	"	59	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	outputs	"		
	tests	"	60	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"		
		"	61	A	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	"	"		
		"	62	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"		
		"	63	"	H	"	"	H	"	H	"	A	H	"	H	"	"	H	"	"	"		
		"	64	"	"	B	B	"	B	"	"	A	"	B	"	B	B	"	"	"	"		
		"	65	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"		
		"	66	"	L	"	"	L	"	L	"	A	L	"	L	"	"	L	"	"	"		
		"	67	"	L	A	A	L	A	L	"	B	L	A	L	A	A	L	"	"	"		
		"	68	"	H	"	"	H	"	H	"	A	H	"	H	"	"	H	"	"	"		
		"	69	"	H	"	"	H	"	H	"	B	H	"	H	"	"	H	"	"	"		
		"	70	B	L	"	"	L	"	L	"	B	L	"	L	"	"	L	"	"	"		
8	Repeat subgroup 7 at T_C = +125°C and T_C = -55°C.																						
9	f_{MAX}	Fig. 13	71	2.7 V	OUT	IN					GND	IN							5.0 V	Q1	25		MHz
Tc = 25°C		"	72	"			IN	OUT			"	"							"	Q2	"		
		"	73	"					IN	OUT	"	"							"	Q3	"		
		"	74	"							"	"	OUT	IN					"	Q4	"		
		"	75	"							"	"			OUT	IN			"	Q5	"		
		"	76	"							"	"					IN	OUT	"	Q6	"		
	t_{PHL1}	3003	77	IN							"	"					2.7 V	OUT	"	CLR to Q6	5	42	ns
		Fig. 13	78	"							"	"			OUT	2.7 V			"	CLR to Q5	"	"	"
		"	79	"							"	"	OUT	2.7 V					"	CLR to Q4	"	"	"
		"	80	"					2.7 V	OUT	"	"							"	CLR to Q3	"	"	"
		"	81	"			2.7 V	OUT			"	"							"	CLR to Q2	"	"	"
		"	82	"	OUT	2.7 V					"	"							"	CLR to Q1	"	"	"
	t_{PLH2}	3003	83	2.7 V	OUT	IN					"	"							"	CLK to Q1	"	37	"
		Fig. 14	84	"			IN	OUT			"	"							"	CLK to Q2	"	"	"
		"	85	"					IN	OUT	"	"							"	CLK to Q3	"	"	"
		"	86	"							"	"	OUT	IN					"	CLK to Q4	"	"	"
		"	87	"							"	"			OUT	IN			"	CLK to Q5	"	"	"
		"	88	"							"	"					IN	OUT	"	CLK to Q6	"	"	"
	t_{PHL2}	3003	89	"							"	"					IN	OUT	"	CLK to Q6	"	40	"
		Fig. 15	90	"							"	"			OUT	IN			"	CLK to Q5	"	"	"
		"	91	"							"	"	OUT	IN					"	CLK to Q4	"	"	"
		"	92	"					IN	OUT	"	"							"	CLK to Q3	"	"	"
		"	93	"			IN	OUT			"	"							"	CLK to Q2	"	"	"
		"	94	"	OUT	IN					"	"							"	CLK to Q1	"	"	"

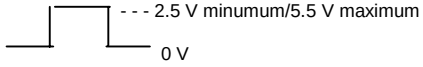
See footnotes at end of device types 06.

TABLE III. Group A inspection for device type 06 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR	Q1	D1	D2	Q2	D3	Q3	GND	CLK	Q4	D4	Q5	D5	D6	Q6	V_{CC}		Min	Max	
10	f_{MAX} 8/	Fig. 13	95-100	Same tests and terminal conditions as for subgroup 9, except T_C. T_C = +125°C																	25		MHz
	t_{PHL1}	3003 Fig. 13	101-106																		5	52	ns
	t_{PLH2}	3003 Fig. 14	107-112																		"	47	"
	t_{PHL2}	3003 Fig. 15	113-118																		"	52	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C.																						

1/ Case X and 2 pins not referenced are NC.

2/

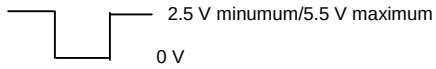


3/ I_{IL} limits in mA are as follows:

I_{IL1}	Min/Max limits for CKT						
	A	B	C	D	E	F	G
	-.085/-.270	-.100/-.340	-.075/-.250	-.075/-.250	-.120/-.360	-.160/-.400	-.075/-.250

I_{IL2}	Min/Max limits for CKT						
	A	B	C	D	E	F	G
	-.115/-.350	-.150/-.420	-.125/-.275 for test 33 -.160/-.400 for test 34	-.120/-.360	-.120/-.360	-.150/-.380 for test 33 -.160/-.400 for test 34	-.075/-.250 for test 33 -.120/-.360 for test 34

4/



5/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volts maximum.

6/ Tests shall be performed in sequence, attributes data only.

7/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.

8/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 07.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR	Q1	$\overline{Q}$ 1	D1	D2	$\overline{Q}$ 2	Q2	GND	CLK	Q3	$\overline{Q}$ 3	D3	D4	$\overline{Q}$ 4	Q4	V_{CC}		Min	Max	
1	V_{OH}	3006	1	0.7 V		-.4 mA					GND								4.5 V	$\overline{Q}$ 1	2.5		V
Tc = 25°C		"	2	"					-.4 mA		"								"	$\overline{Q}$ 2	"		"
		"	3	"							"			-.4 mA					"	$\overline{Q}$ 3	"		"
		"	4	"							"						-.4 mA		"	$\overline{Q}$ 4	"		"
		"	5	2.0 V							"	2/				2.0 V		-.4 mA	"	Q4	"		"
		"	6	"							"	"	-.4 mA		2.0 V				"	Q3	"		"
		"	7	"				2.0 V		-.4 mA	"	"							"	Q2	"		"
		"	8	"	-.4 mA		2.0 V				"	"							"	Q1	"		"
		"	9	"		-.4 mA	0.7 V				"	"							"	$\overline{Q}$ 1	"		"
		"	10	"				0.7 V	-.4 mA		"	"							"	$\overline{Q}$ 2	"		"
		"	11	"							"	"		-.4 mA	0.7 V				"	$\overline{Q}$ 3	"		"
		"	12	"							"	"				0.7 V	-.4 mA		"	$\overline{Q}$ 4	"		"
	V_{OL}	3007	13	0.7 V	4 mA						"								"	Q1		0.4 V	"
		"	14	"						4 mA	"								"	Q2		"	"
		"	15	"							"		4 mA						"	Q3		"	"
		"	16	"							"	2/						4 mA	"	Q4		"	"
		"	17	2.0 V							"	"				2.0 V	4 mA		"	$\overline{Q}$ 4		"	"
		"	18	"							"	"		4 mA	2.0 V				"	$\overline{Q}$ 3		"	"
		"	19	"				2.0 V	4 mA		"	"							"	$\overline{Q}$ 2		"	"
		"	20	"		4 mA	2.0 V				"	"							"	$\overline{Q}$ 1		"	"
		"	21	"	4 mA		0.7 V				"	"							"	Q1		"	"
		"	22	"				0.7 V		4 mA	"	"							"	Q2		"	"
		"	23	"							"	"	4 mA		0.7 V				"	Q3		"	"
		"	24	"							"	"				0.7 V		4 mA	"	Q4		"	"
	V_{IC}		25	-18 mA							"								"	CLR		-1.5 V	"
			26				-18 mA				"								"	D1		"	"
			27					-18 mA			"								"	D2		"	"
			28								"	-18 mA							"	CLK		"	"
			29								"				-18 mA				"	D3		"	"
			30								"					-18 mA			"	D4		"	"
	I_{IL1}	3009	31								"					0.4 V			5.5 V	D4	3/	3/	mA
		"	32								"				0.4 V				"	D3	"	"	"
		"	33					0.4 V			"								"	D2	"	"	"
		"	34				0.4 V				"								"	D1	"	"	"
	I_{IL2}	"	35	0.4 V							"								"	CLR	"	"	"
		"	36								"	0.4 V							"	CLK	"	"	"
	I_{IH1}	3010	37	2.7 V							"								"	CLR		20	µA
		"	38				2.7 V				"								"	D1		"	"
		"	39					2.7 V			"								"	D2		"	"
		"	40								"	2.7 V							"	CLK		"	"
		"	41								"				2.7 V				"	D3		"	"
		"	42								"					2.7 V			"	D4		"	"

See footnotes at end of device type 07.

TABLE III. Group A inspection for device type 07 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR	Q1	$\overline{Q}$ 1	D1	D2	$\overline{Q}$ 2	Q2	GND	CLK	Q3	$\overline{Q}$ 3	D3	D4	$\overline{Q}$ 4	Q4	V_{CC}		Min	Max	
1	I_{IH2}	3010	43								GND					5.5 V			5.5 V	D4		100	µA
Tc = 25°C		"	44								"				5.5 V				"	D3		"	"
		"	45								"	5.5 V							"	CLK		"	"
		"	46					5.5 V			"								"	D2		"	"
		"	47				5.5 V				"								"	D1		"	"
		"	48	5.5 V							"								"	CLR		"	"
	I_{OS}	3011	49	GND		GND					"								"	$\overline{Q}$ 1	-15	-100	mA
		"	50	"					GND		"								"	$\overline{Q}$ 2	"	"	"
		"	51	"							"			GND					"	$\overline{Q}$ 3	"	"	"
		"	52	"							"						GND		"	$\overline{Q}$ 4	"	"	"
		"	53	4.5 V							"	4/				4.5 V		GND	"	Q4	"	"	"
		"	54	"							"	"	GND		4.5 V				"	Q3	"	"	"
		"	55	"				4.5 V		GND	"	"							"	Q2	"	"	"
		"	56	"	GND		4.5 V				"	"							"	Q1	"	"	"
	I_{CC}	3005	57	5.5 V			5.5 V	5.5 V			"				5.5 V	5.5 V			"	V_{CC}		18	"
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																						
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																						
7 5/, 6/	Truth	3014	58	B	L	H	A	A	H	L	GND	B	L	H	A	A	H	L	4.5 V	All	See 7/		
T_C = 25°C	table	"	59	"	"	"	"	"	"	"	"	A	"	"	"	"	"	"	"	outputs	"		
	tests	"	60	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"		
		"	61	A	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"		
		"	62	"	H	L	"	"	L	H	"	A	H	L	"	"	L	H	"	"	"		
		"	63	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"		
		"	64	"	"	"	B	B	"	"	"	B	"	"	B	B	"	"	"	"	"		
		"	65	"	L	H	"	"	H	L	"	A	L	H	"	"	H	L	"	"	"		
		"	66	"	"	"	"	"	"	"	"	B	"	"	"	"	"	"	"	"	"		
		"	67	"	"	"	A	A	"	"	"	B	"	"	A	A	"	"	"	"	"		
		"	68	"	H	L	"	"	L	H	"	A	H	L	"	"	L	H	"	"	"		
		"	69	"	H	L	"	"	L	H	"	B	H	L	"	"	L	H	"	"	"		
		"	70	B	L	H	"	"	H	L	"	B	L	H	"	"	H	L	"	"	"		
8 4/, 5/	Repeat subgroup 7 at T_C = +125°C and T_C = -55°C.																						
9	f_{MAX}	Fig. 13	71	2.7 V	OUT		IN				GND	IN							5.0 V	Q1	25		MHz
T_C = 25°C	9/	"	72	"		OUT	IN				"	"							"	$\overline{Q}$ 1	"		"
		"	73	"				IN	OUT		"	"							"	$\overline{Q}$ 2	"		"
		"	74	"				IN		OUT	"	"							"	Q2	"		"
		"	75	"							"	"	OUT		IN				"	Q3	"		"
		"	76	"							"	"		OUT	IN				"	$\overline{Q}$ 3	"		"
		"	77	"							"	"				IN	OUT		"	$\overline{Q}$ 4	"		"
		"	78	"							"	"				IN		OUT	"	Q4	"		"
	t_{PLH1}	3003	79	IN							"	"				2.7 V	OUT		"	CLR to $\overline{Q}$ 4	5	32	ns
		Fig. 13	80	"							"	"		OUT	2.7 V				"	CLR to $\overline{Q}$ 3	"	"	"
		"	81	"				2.7 V	OUT		"	"							"	CLR to $\overline{Q}$ 2	"	"	"
		"	82	"		OUT	2.7 V				"	"							"	CLR to $\overline{Q}$ 1	"	"	"

See footnotes at end of device type 07.

TABLE III. Group A inspection for device type 07 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

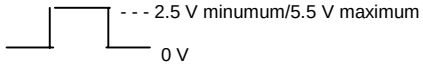
Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR	Q1	$\overline{Q}$ 1	D1	D2	$\overline{Q}$ 2	Q2	GND	CLK	Q3	$\overline{Q}$ 3	D3	D4	$\overline{Q}$ 4	Q4	V_{CC}		Min	Max	
9	t_{PHL1}	3003	83	IN	OUT		2.7 V				GND	IN							5.0 V	CLR to Q1	5	45	ns
Tc = 25°C		Fig. 13	84	"				2.7 V		OUT	"	"							"	CLR to Q2	"	"	"
		"	85	"							"	"	OUT		2.7 V				"	CLR to Q3	"	"	"
		"	86	"							"	"				2.7 V		OUT	"	CLR to Q4	"	"	"
	t_{PLH2}	3003	87	2.7 V							"	"				IN		OUT	"	CLK to Q4	"	35	"
		Fig. 14	88	"							"	"	OUT		IN				"	CLK to Q3	"	"	"
		"	89	"				IN		OUT	"	"							"	CLK to Q2	"	"	"
		"	90	"	OUT		IN				"	"							"	CLK to Q1	"	"	"
		3003	91	"		OUT	IN				"	"							"	CLK to $\overline{Q}$ 1	"	"	"
		Fig. 15	92	"				IN	OUT		"	"							"	CLK to $\overline{Q}$ 2	"	"	"
		"	93	"							"	"		OUT	IN				"	CLK to $\overline{Q}$ 3	"	"	"
		"	94	"							"	"				IN	OUT		"	CLK to $\overline{Q}$ 4	"	"	"
	t_{PHL2}	3003	95	"							"	"				IN	OUT		"	CLK to $\overline{Q}$ 4	"	40	"
		Fig. 14	96	"							"	"		OUT	IN				"	CLK to $\overline{Q}$ 3	"	"	"
		"	97	"				IN	OUT		"	"							"	CLK to $\overline{Q}$ 2	"	"	"
		"	98	"		OUT	IN				"	"							"	CLK to $\overline{Q}$ 1	"	"	"
		3003	99	"	OUT		IN				"	"							"	CLK to Q1	"	"	"
		Fig. 15	100	"				IN		OUT	"	"							"	CLK to Q2	"	"	"
		"	101	"							"	"	OUT		IN				"	CLK to Q3	"	"	"
		"	102	"							"	"				IN		OUT	"	CLK to Q4	"	"	"
10	f_{MAX} 3/	Fig. 13	103-110	Same tests and terminal conditions as for subgroup 9, except T_C = +125°C																	25		ns
	t_{PLH1}	3003 Fig. 13	111-114																		5	51	"
	t_{PHL1}	3003 Fig. 13	115-118																		"	55	"
	t_{PLH2}	3003 Fig. 14	119-122																		"	46	"
	t_{PLH2}	3003 Fig. 15	123-126																		"	46	"
	t_{PHL2}	3003 Fig. 14	127-130																		"	55	"
	t_{PHL2}	3003 Fig.15	131-134																		"	55	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C.																						

See footnotes at end of device type 07.

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

1/ Case X and 2 pins not referenced are NC.

2/

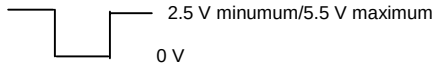


3/ I_{IL} limits in mA are as follows:

I_{IL1}	Min/Max limits for CKT						
	A	B	C	D	E	F	G
	-.075/-.250	-.100/-.340	-.075/-.250	-.075/-.250	-.120/-.360	-.160/-.400	-.075/-.250

I_{IL2}	Min/Max limits for CKT						
	A	B	C	D	E	F	G
	-.085/-.270 for test 35 -.135/-.400 for test 36	-.150/-.420	-.125/-.275 for test 35 -.160/-.400 for test 36	-.120/-.400 for test 35 -.120/-.360 for test 36	-.120/-.400	-.105/-.380 for test 35 -.160/-.400 for test 36	-.075/-.250 for test 35 -.120/-.360 for test 36

4/



5/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volts maximum.

6/ Tests shall be performed in sequence, attributes data only.

7/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.

8/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 09.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR1	J1	$\overline{K}$ 1	CLK1	PR1	Q1	$\overline{Q}$ 1	GND	$\overline{Q}$ 2	Q2	PR2	CLK2	$\overline{K}$ 2	J2	CLR2	V_{CC}		Min	Max	
1	V_{OH}	3006	1	0.7 V	0.7 V	0.7 V	GND	2.0 V		-4 mA	GND								4.5 V	$\overline{Q}$ 1	2.5		V
Tc = 25°C		"	2	2.0 V	"	"	GND	0.7 V	-.4 mA		"								"	Q1	"		"
		"	3	"	"	"	2/	2.0 V		-.4 mA	"								"	$\overline{Q}$ 1	"		"
		"	4	"	2.0 V	2.0 V	2/	2.0 V	-.4 mA		"								"	Q1	"		"
		"	5								"	-.4 mA		2.0 V	GND	0.7 V	0.7 V	0.7 V	"	$\overline{Q}$ 2	"		"
		"	6								"		-.4 mA	0.7 V	GND	"	"	2.0 V	"	Q2	"		"
		"	7								"	-.4 mA		2.0 V	2/	"	"	"	"	$\overline{Q}$ 2	"		"
		"	8								"		-.4 mA	"	2/	2.0 V	2.0 V	"	"	Q2	"		"
	V_{OL}	3007	9								"		4 mA	"	GND	0.7 V	0.7 V	0.7 V	"	Q2		0.4	"
		"	10								"	4 mA		0.7 V	GND	"	"	2.0 V	"	$\overline{Q}$ 2		"	"
		"	11								"		4 mA	2.0 V	2/	"	"	"	"	Q2		"	"
		"	12								"	4 mA		2.0 V	2/	2.0 V	2.0 V	"	"	$\overline{Q}$ 2		"	"
		"	13	0.7 V	0.7 V	0.7 V	GND	2.0 V	4 mA		"								"	Q1		"	"
		"	14	2.0 V	"	"	GND	0.7 V		4 mA	"								"	$\overline{Q}$ 1		"	"
		"	15	"	"	"	2/	2.0 V	4 mA		"								"	Q1		"	"
		"	16	"	2.0 V	2.0 V	2/	2.0 V		4 mA	"								"	$\overline{Q}$ 1		"	"
	V_{IC}		17	-18 mA							"								"	CLR1		-1.5	"
			18		-18 mA						"								"	J1		"	"
			19			-18 mA					"								"	$\overline{K}$ 1		"	"
			20				-18 mA				"								"	CLK1		"	"
			21					-18 mA			"								"	PR1		"	"
			22								"			-18 mA					"	PR2		"	"
			23								"				-18 mA				"	CLK2		"	"
			24								"					-18 mA			"	$\overline{K}$ 2		"	"
			25								"						-18 mA		"	J2		"	"
			26								"							-18 mA	"	CLR2		"	"
	I_{IL2}	3009	27	3/	0.4 V	4.5 V	GND	4.5 V			"								5.5 V	J1	4/	4/	mA
		"	28	4.5 V	4.5 V	0.4 V	GND	3/			"								"	$\overline{K}$ 1	"	"	"
		"	29								"			3/	GND	0.4 V	4.5 V	4.5 V	"	$\overline{K}$ 2	"	"	"
		"	30								"			4.5 V	GND	4.5 V	0.4 V	3/	"	J2	"	"	"
	I_{IL4}	"	31								"			4.5 V	0.4 V	"	4.5 V	3/	"	CLK2	"	"	"
		"	32								"			3/	0.4 V	"	"	4.5 V	"	CLK2	"	"	"
		"	33								"			0.4 V	4.5 V	"	"	GND	"	PR2	"	"	"
		"	34	GND	4.5 V	4.5 V	4.5 V	0.4 V			"								"	PR1	"	"	"
		"	35	4.5 V	"	"	0.4 V	3/			"								"	CLK1	"	"	"
		"	36	3/	"	"	0.4 V	4.5 V			"								"	CLK1	"	"	"
	I_{IL7}	"	37	0.4 V	"	"	4.5 V	GND			"								"	CLR1	"	"	"
		"	38								"			GND	4.5 V	4.5 V	4.5 V	0.4 V	"	CLR2	"	"	"

See footnotes at end of type 09.

TABLE III. Group A inspection for device type 09.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR1	J1	$\overline{K}$ 1	CLK1	PR1	Q1	$\overline{Q}$ 1	GND	$\overline{Q}$ 2	Q2	PR2	CLK2	$\overline{K}$ 2	J2	CLR2	V_{CC}		Min	Max	
1	I_{IH1}	3010	39	GND	2.7 V	GND	4.5 V	4.5 V			GND								5.5 V	J1		20	µA
Tc = 25°C	"	"	40	GND	GND	2.7 V	4.5 V	GND			"								"	$\overline{K}$ 1		"	"
	"	"	41								"			GND	4.5 V	2.7 V	GND	GND	"	$\overline{K}$ 2		"	"
	"	"	42								"			4.5 V	"	GND	2.7 V	"	"	J2		"	"
	I_{IH2}	"	43								"			4.5 V	"	GND	5.5 V	"	"	J2		100	"
	"	"	44								"			GND	"	5.5 V	GND	"	"	$\overline{K}$ 2		"	"
	"	"	45	GND	GND	5.5 V	4.5 V	GND			"								"	$\overline{K}$ 1		"	"
	"	"	46	GND	5.5 V	GND	4.5 V	4.5 V			"								"	J1		"	"
	I_{IH3}	"	47	GND	4.5 V	4.5 V	2.7 V	GND			"								"	CLK1		40	"
	"	"	48	4.5 V	4.5 V	4.5 V	GND	2.7 V			"								"	PR1		"	"
	"	"	49								"			2.7 V	GND	4.5 V	4.5 V	4.5 V	"	PR2		"	"
	"	"	50								"			GND	2.7 V	"	"	GND	"	CLK2		"	"
	I_{IH4}	"	51								"			GND	5.5 V	"	"	GND	"	CLK2		200	"
	"	"	52								"			5.5 V	GND	"	"	4.5 V	"	PR2		"	"
	"	"	53	4.5 V	4.5 V	4.5 V	GND	5.5 V			"								"	PR1		"	"
	"	"	54	GND	4.5 V	4.5 V	5.5 V	GND			"								"	CLK1		"	"
	I_{IH7}	"	55	2.7 V	4.5 V	4.5 V	GND	4.5 V			"								"	CLR1		80	"
	"	"	56								"			4.5 V	GND	4.5 V	4.5 V	2.7 V	"	CLR2		80	"
	I_{IH8}	"	57								"			4.5 V	GND	4.5 V	4.5 V	5.5 V	"	CLR2		400	"
	"	"	58	5.5 V	4.5 V	4.5 V	GND	4.5 V			"								"	CLR1		400	"
	I_{OS}	3011	59	GND				4.5 V		GND	"								"	$\overline{Q}$ 1	-15	-100	mA
	"	"	60	4.5 V				GND	GND		"								"	Q1	"	"	"
	"	"	61								"		GND	GND				4.5 V	"	Q2	"	"	"
	"	"	62								"	GND		4.5 V				GND	"	$\overline{Q}$ 2	"	"	"
	I_{CC}	3005	63	GND			GND	5.5 V			"			5.5 V	GND			GND	"	V_{CC}		8.0	"
		3005	64	5.5 V			GND	GND			"			GND	GND			5.5 V	"	V_{CC}		8.0	"
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																						
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																						
7 5/, 6/	Truth	3014	65	A	A	A	B	B	H	L	GND	L	H	B	B	A	A	A	4.5 V	All	See 7/		
Tc = 25°C	table	"	66	"	"	"	B	A	"	"	"	"	"	A	B	"	"	"	"	outputs	"		
	tests	"	67	"	"	"	A	"	"	"	"	"	"	"	A	"	"	"	"	"	"		
	"	"	68	"	"	B	A	"	"	"	"	"	"	"	A	B	"	"	"	"	"		
	"	"	69	"	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"	"		
	"	"	70	"	"	"	A	"	L	H	"	H	L	"	A	"	"	"	"	"	"		
	"	"	71	"	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"	"		
	"	"	72	B	"	"	"	"	"	"	"	"	"	"	"	"	"	B	"	"	"		
	"	"	73	A	"	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
	"	"	74	"	"	"	A	"	H	L	"	L	H	"	A	"	"	"	"	"	"		
	"	"	75	"	"	"	B	"	H	L	"	L	H	"	B	"	"	"	"	"	"		
	"	"	76	"	"	"	A	"	L	H	"	H	L	"	A	"	"	"	"	"	"		
	"	"	77	"	"	"	B	"	L	H	"	H	L	"	B	"	"	"	"	"	"		
	"	"	78	"	"	"	B	B	H	L	"	L	H	B	B	"	"	"	"	"	"		
	"	"	79	"	"	"	A	B	"	"	"	"	"	B	A	"	"	"	"	"	"		
	"	"	80	"	"	"	A	A	"	"	"	"	"	A	A	"	"	"	"	"	"		
	"	"	81	"	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"	"		
	"	"	82	"	"	"	A	"	L	H	"	H	L	"	A	"	"	"	"	"	"		
	"	"	83	"	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"	"		
	"	"	84	B	B	"	"	"	"	"	"	"	"	"	"	"	B	B	"	"	"		
	"	"	85	A	"	"	"	"	"	"	"	"	"	"	"	"	"	A	"	"	"		
	"	"	86	"	"	"	A	"	"	"	"	"	"	"	A	"	"	"	"	"	"		

See footnotes at end of device type 09.

TABLE III. Group A inspection for device type 09.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR1	J1	$\overline{K}$ 1	CLK1	PR1	Q1	$\overline{Q}$ 1	GND	$\overline{Q}$ 2	Q2	PR2	CLK2	$\overline{K}$ 2	J2	CLR2	V_{CC}		Min	Max	
7 5/, 6/ Tc = 25°C	Truth table tests	3014	87	A	A	B	A	A	L	H	GND	H	L	A	A	B	A	A	4.5 V	All	See 7/		
		"	88	"	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	outputs	"		
		"	89	"	"	"	"	B	H	L	"	L	H	B	"	"	"	"	"	"	"		
		"	90	"	"	"	"	A	H	L	"	L	H	A	"	"	"	"	"	"	"		
		"	91	"	"	"	A	"	L	H	"	H	L	"	A	"	"	"	"	"	"		
		"	92	"	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"	"		
		"	93	B	"	"	B	"	"	"	"	"	"	"	B	"	"	B	"	"	"		
		"	94	B	"	"	A	"	"	"	"	"	"	"	A	"	"	B	"	"	"		
		"	95	A	"	"	A	"	"	"	"	"	"	"	A	"	"	A	"	"	"		
		"	96	"	"	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"	"		
		"	97	"	B	A	B	"	"	"	"	"	"	"	B	A	B	"	"	"	"		
		"	98	"	B	"	A	"	"	"	"	"	"	"	A	"	B	"	"	"	"		
		"	99	"	A	"	"	B	H	L	"	L	H	B	"	"	A	"	"	"	"		
		"	100	"	"	"	"	A	H	L	"	L	H	A	"	"	"	"	"	"	"		
		"	101	B	"	"	"	A	L	H	"	H	L	A	"	"	"	B	"	"	"		
		"	102	A	B	B	B	B	H	L	"	L	H	B	B	B	B	A	"	"	"		
		"	103	A	"	"	"	A	H	L	"	L	H	A	"	"	"	A	"	"	"		
		"	104	B	"	"	"	A	L	H	"	H	L	A	"	"	"	B	"	"	"		
8	Repeat subgroup 7 at T_C = +125°C and T_C = -55°C.																						
9 Tc = 25°C	f_{MAX} 8/	Fig. 16	105	2.7 V	2.7 V	GND	IN	2.7 V	OUT		GND								5.0 V	Q1	20		MHz
		"	106	2.7 V	2.7 V	GND	IN	2.7 V		OUT	"								"	$\overline{Q}$ 1	"		"
		"	107								"	OUT		2.7 V	IN	GND	2.7 V	2.7 V	"	$\overline{Q}$ 2	"		"
		"	108								"		OUT	2.7 V	IN	GND	2.7 V	2.7 V	"	Q2	"		"
	t_{PLH1}	3003	109	IN	2.7 V	2.7 V	IN	2.7 V		OUT	"								"	CLR1 to $\overline{Q}$ 1	5	20	ns
		Fig. 17	110	2.7 V	GND	GND	IN	IN	OUT		"								"	PR1 to Q1	"	"	"
		"	111								"		OUT	IN	IN	GND	GND	2.7 V	"	PR2 to Q2	"	"	"
		"	112								"	OUT		2.7 V	IN	2.7 V	2.7 V	IN	"	CLR2 to $\overline{Q}$ 2	"	"	"
	t_{PHL1}	"	113								"		OUT	2.7 V	IN	2.7 V	2.7 V	IN	"	CLR2 to Q2	"	32	"
		"	114								"	OUT		IN	IN	GND	GND	2.7 V	"	PR2 to $\overline{Q}$ 2	"	"	"
		"	115	2.7 V	GND	GND	IN	IN		OUT	"								"	PR1 to $\overline{Q}$ 1	"	"	"
		"	116	IN	2.7 V	2.7 V	IN	2.7 V	OUT		"								"	CLR1 to Q1	"	"	"
	t_{PLH2}	3003	117	2.7 V	2.7 V	GND	IN	2.7 V	OUT		"								"	CLK1 to Q1	"	24	"
		Fig. 16	118	2.7 V	2.7 V	GND	IN	2.7 V		OUT	"								"	CLK1 to $\overline{Q}$ 1	"	"	"
		"	119								"	OUT		2.7 V	IN	GND	2.7 V	2.7 V	"	CLK2 to $\overline{Q}$ 2	"	"	"
		"	120								"		OUT	2.7 V	IN	GND	2.7 V	2.7 V	"	CLK2 to Q2	"	"	"
	t_{PHL2}	"	121								"		OUT	2.7 V	IN	GND	2.7 V	2.7 V	"	CLK2 to Q2	"	35	"
		"	122								"	OUT		2.7 V	IN	GND	2.7 V	2.7 V	"	CLK2 to $\overline{Q}$ 2	"	"	"
		"	123	2.7 V	2.7 V	GND	IN	2.7 V		OUT	"								"	CLK1 to $\overline{Q}$ 1	"	"	"
		"	124	2.7 V	2.7 V	GND	IN	2.7 V	OUT		"								"	CLK1 to Q1	"	"	"

See footnotes at end of device type 09.

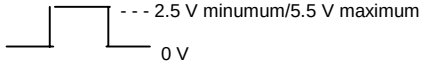
TABLE III. Group A inspection for device type 09.

Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases 1/ 2, X	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal	Limits		Unit
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
			Test no.	CLR1	J1	$\overline{K}$ 1	CLK1	PR1	Q1	$\overline{Q}$ 1	GND	$\overline{Q}$ 2	Q2	PR2	CLK2	$\overline{K}$ 2	J2	CLR2	V_{CC}		Min	Max	
10	f_{MAX} 8/	Fig. 16	125-128	Same tests and terminal conditions as for subgroup 9, except T_C = +125°C.																	20		MHz
	t_{PLH1}	3003 Fig. 17	129-132																		5	39	ns
	t_{PHL1}	3003 Fig. 17	133-136																		"	59	"
	t_{PLH2}	3003 Fig. 16	137-140																		"	39	"
	t_{PHL2}	3003 Fig. 16	141-144																		"	59	"
11	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																						

1/ Case X and 2 pins not referenced are NC.

2/



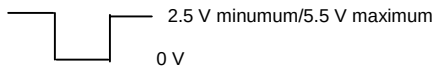
3/ I_{IL} limits in mA are as follows:

I_{IL2}	Min/Max limits for CKT					
	A	B	C	D	E	F
	-.075/-.250	-.030/-.300	-.095/-.210	-.160/-.400	-.135/-.370	-.160/-.400

I_{IL4}	Min/Max limits for CKT					
	A	B	C	D	E	F
	-.150/-.500 for tests 31, 32, 35, 36 -.200/-.800 for tests 33, 34	-.060/-.700	-.160/-.400 for tests 31, 32, 35, 36 -.350/-.760 for tests 33, 34	-.320/-.800	-.120/-.360 for tests 31, 32, 35, 36 -.350/-.760 for tests 33, 34	-.320/-.800

I_{IL7}	Min/Max limits for CKT					
	A	B	C	D	E	F
	-.200/-.800	-.060/-.700	-.350/-.760	-.560/-1.600	-.280/-.760	-.560/-1.600

4/



5/ Input voltages shown are A = 2.0 volts minimum and B = 0.7 volts maximum.

6/ Tests shall be performed in sequence, attributes data only.

7/ Output voltages shall be H ≥ 1.5 V and L < 1.5 V.

8/ f_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

6. NOTES

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

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of the specification.

b. Complete part number (see 1.2).

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

d. Requirements for certificate of compliance, if applicable.

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

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

g. Requirements for product assurance options.

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

j. Requirements for "JAN" marking.

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 contractor's 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, 3990 E. Broad Street, Columbus, Ohio 43123-1199.

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:

GND ..... Ground zero voltage potential
I_{IN} ..... Current flowing into an input terminal
V_{IC} ..... Input clamp voltage
V_{IN} ..... Voltage level at an input terminal

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 B (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming shall not affect the part number.

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

Military device type	Generic-industry type
01	54LS73
02	54LS74A
03	54LS112
04	54LS113
05	54LS114
06	54LS174
07	54LS175
08	54LS107
09	54LS109
10	54LS76A

6.8 Manufacturers' designation. Manufacturers' circuits, which form a part of this specification, are designated as shown in table IV herein.

TABLE IV. Manufacturers' designation.

Manufacturers							
Device type	Texas Instruments Inc.	Signetics Corporation	National Semiconductor Corp	Raytheon Company	Motorola Inc	Fairchild Semiconductor	Advanced Micro Devices
01	A	B	C	D	E	- - -	- - -
02	A	B	C	D	E	F	- - -
03	A	B	C	C	D	E	- - -
04	A	B	C	C	F	E	D
05	A	- - -	C	C	D	E	- - -
06	A	B	C	E	F	G	D
07	A	B	C	E	F	G	D
08	A	B	C	D	E	- - -	- - -
09	A	B	C	- - -	E	F	- - -
10	A	B	C	C	D	E	- - -

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

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

Preparing activity:
DLA - CC

(Project 5962-1946)

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

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-M-38510/301E	2. DOCUMENT DATE *(YYYYMMDD)* 2003-02-14

3. DOCUMENT TITLE
MICROCIRCUITS, DIGITAL, BIPOLAR LOW-POWER SCHOTTKY TTL, FLIP-FLOPS,CASCADABLE, MONOLITHIC SILICON

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) DSN *(If applicable)*	7. DATE SUBMITTED *(YYYYMMDD)*

8. PREPARING ACTIVITY

a. NAME Defense Supply Center, Columbus	b. TELEPHONE *(Include Area Code* (1) Commercial 614-692-0536 (2) DSN 850-0536
c. ADDRESS *(Include Zip Code)* DSCC-VA P. O. Box 3990 Columbus, Ohio 43216-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6221 Telephone (703)767-6888 DSN 427-6888