INCH-POUND
MIL-M-38510/315D
27 October 2003
SUPERSEDING
MIL-M-38510/315C
17 JANUARY 1984

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, LOW-POWER SCHOTTKY TTL, COUNTERS, 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.

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

1. SCOPE

- 1.1 <u>Scope.</u> This specification covers the detail requirements for monolithic silicon, low power Schottky TTL, binary and decade counters. Two product assurance classes and a choice of case outlines/lead finish 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 For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).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 or Identifying Number (PIN). The PIN should be in accordance with MIL-PRF-38535, and as specified herein.
 - 1.2.1 Device types. The device types should be as follows:

Device type	<u>Circuit</u>
01	Decade counter
02	4-bit binary counter
03	Synchronous 4-bit decade counter (asynchronous clear)
04	Synchronous 4-bit binary counter (asynchronous clear)
05	Synchronous 4-bit up/down decade counter
06	Synchronous 4-bit up/down binary counter
07	Synchronous 4-bit up/down decade counter (with clear)
08	Synchronous 4-bit up/down binary counter (with clear)
09	Synchronous 4-bit up/down binary counter (with mode control)
10	Divide-by-twelve counter
11	Synchronous 4-bit decade counter (with synchronous clear)
12	Synchronous 4-bit binary counter (with synchronous clear)
13	Synchronous 4-bit decade counter (with mode control)

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

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, 3990 East Broad St., Columbus, OH 43216-5000, or emailed to bipolar@dscc.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

AMSC N/A FSC 5962

Terminals

Package style

1.2.3 <u>Case outlines.</u> The case outlines should be as designated in MIL-STD-1835 and as follows:

Descriptive designator

Outline letter

Outline letter	<u>Descriptive designator</u>	reminais	<u>Fackage style</u>
Α	GDFP5-F14 or CDFP6-F14	14	Flat pack
В	GDFP4-F14	14	Flat pack
C	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	
_			Flat pack
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
2	CQCC1-N20	20	Square leadless chip carrier
1.3 Absolute maximu	ım ratings.		
Supply voltage rai	nge		-0.5 V dc to 7.0 V dc
	je		
	ure range		
	dissipation, (P _D) 1/:		00 10 1 100 0
	5, 06, 07, 08		187 mW
• •	1, 02, 10		
	3, 04, 11, 12		
• •	9, 13		
	(soldering, 10 seconds)		
	ce, junction to case (θ_{JC}):		500 0
		//	Coo MIL CTD 1025)
Cases A, B, C, D			See MIL-STD-1835)
Junction temperat	ture (T _J) <u>3</u> /	······································	1/5°C
1.4 Recommended o	perating conditions. 2/		
Maximum low leve	el output current (I _{oL})	2	4 0 mA
Supply voltage (V			4.5 V dc minimum to 5.5 V dc maximum
	el input voltage (V _{IH})		
	el input voltage (V _{IL})el input voltage		
Normalized fanou			0.7 V UC
		,	10 maximum
Types 01, 02,	05, 06, 07, 08, 10		TO maximum
Types 03, 04,	09, 11, 12, 13		10
			20 maximum
Width of input cou			
Types 01, 02,			
	set		
			20 ns minimum
Width of reset pul			
Types 01, 02,	10		25 ns minimum
Count enable time			
Type 09, enab	ole	4	40 ns minimum
· •			

 $[\]underline{1}/$ Must withstand the added P_D due to short-circuit test (e.g., I_{OS}).

^{2/} A change of states on the U/D input for device types 09 and 13 is not recommended when the clock input is low. This may result in an erroneous count.

^{3/} Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions in accordance with MIL-PRF-38535.

Input clock frequency, f _{clock} Types 01, 02, 10 Input A Types 03, 04, 11, 12 Types 09, 13 Types 07, 08 Types 05, 06 Width of clock pulse, t _w (clock)	0 to 22 MHz 0 to 18 MHz 0 to 20 MHz
Types 03, 06, 09, 11, 12, 13	25 ns minimum
Types 04	30 ns minimum
Types 05	
Width of clear pulse, tw (clear)	
Types 03, 04, 05, 06, 07, 08, 11, 12	20 ns minimum
Setup time, t _(setup) Types 03, 11, 12	
Enable P	25 ns minimum
Load	
Clear (types 11 and 12 only)	
Type 04	
Enable P	35 ns minimum
Load	
Data inputs	
Types 03, 09, 11, 12, 13	20 ns minimum
Type 04	
Types 07, 08	
Type 05	
Data, L inputs	15 ns minimum
_ · · · · · · ·	
U/D input	
EP, ET inputs	15 ns minimum
Type 06	
Data, L inputs	25 ns minimum
U/D input	30 ns minimum
EP, ET, inputs	25 ns minimum
Hold time at any input, t _(hold)	
Types 09, 13	0 ns minimum
Types 07, 08	10 ns minimum
Types 05, 06	
Data, EP, ET inputs	5 ns minimum
L, U/D inputs	0 ns minimum
Types 03, 04, 11, 12	
Types 03, 04, 11, 12 t _w (clear)	
Case operating temperature range (T _c)	
Case operating temperature range (1c/	55 C to +125 C

2. APPLICABLE DOCUMENTS

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

2.2 Government documents.

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

DEPARTMENT OF DEFENSE SPECIFICATIONS

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard for Microelectronics.

MIL-STD-1835 - Interface Standard Electronic Component Case Outlines

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

2.3 <u>Order of precedence.</u> 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 <u>Item requirements</u>. 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 <u>Design, construction, and physical dimensions.</u> The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein.
- 3.3.1 <u>Terminal connections and logic diagrams</u>. The terminal connections and logic diagrams shall be as specified on figures 1 and 2.
 - 3.3.2 Truth tables. The truth tables and logic equations shall be as specified on figure 3.
- 3.3.4 <u>Schematic circuits</u>. The schematic circuits shall be _maintained by the manufacturer and made available to the qualifying activity and the preparing activity (DSCC-VAS) upon request.
 - 3.3.5 <u>Case outlines.</u> 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 <u>Electrical performance characteristics</u>. 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 <u>Electrical test requirements.</u> 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 <u>Microcircuit group assignment.</u> The devices covered by this specification shall be in microcircuit group number 12 (see MIL-PRF-38535, appendix A).

4. VERIFICATION

- 4.1 <u>Sampling and inspection.</u> 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 <u>Screening.</u> 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.

TABLE I. <u>Electrical performance characteristics</u>.

Test	Symbol	Conditions	Device	Lim	nits	Unit
		-55°C ≤ T _C ≤ +125°C unless otherwise specified	types	Min	Max	
Low-level output voltage	V _{OL}	$V_{CC} = 4.5 \text{ V}, \ V_{IH} = 2.0 \text{ V}$ $V_{IL} = 0.7 \text{ V}, \ I_{OL} = 4 \text{ mA} \ \underline{1}/$	All	-	0.4	V
High-level output voltage	V _{OH}	$V_{CC} = 4.5 \text{ V}, \ V_{IH} = 2.0 \text{ V}$ $V_{IL} = 0.7 \text{ V}, I_{OH} = -400 \text{m } \mu\text{A}$	All	2.5	-	V
Input clamp voltage	V _{IC}	$T_C = 25^{\circ}C$, $V_{CC} = 4.5 \text{ V}$ $I_{IN} = -18 \text{ mA}$	All	-	-1.5	V
Low-level input current at reset inputs	I _{IL1}	V _{CC} = 5.5 V, V _{IN} = 0.4 V	01, 02, 10	-30	-400	μΑ
Low-level input current at input A	I _{IL2}		01, 02, 10	-0.5	-2.4	mA
Low-level input current	I _{IL3}		01, 10	-0.4	-3.2	mΑ
at input B			02	-0.4	-1.6	mΑ
Low-level input current at data, clear, EnP	I _{IL4}		03, 04	-30	-400	μΑ
Low-level input current at data, EnP	I _{IL4}		01, 12	-30	-400	μΑ
Low-level input current at clear	I _{IL4}		01, 12	-30	-760	μΑ
Low-level input current at load	I _{IL5}		03, 04, 11, 12	-30	-800	μΑ
Low-level input current at EnT	I _{IL5}		03, 04, 11, 12	-30	-860	μΑ
Low-level input current at clock	I _{IL6}		03, 04, 11, 12	0	630	mA
Low-level input current	I _{IL7}		09	15	-1.08	mΑ
at EnG			13	36	-1.08	
Low-level input current at data, clock, down/up	I _{IL8}		09, 13	-120	-400	μΑ
Low-level input current at load	I _{IL8}		09, 13	-100	-400	μΑ
Low-level input current at data	I _{IL9}		07, 08	-100	-400	μΑ
Low-level input current at load	I _{IL10}		07, 08	-100	-400	μΑ
Low-level input current at clear, count up, count down	I _{IL11}		07, 08	-120	-400	μΑ
Low-level input current at data	I _{IL12}		05, 06	-3.0	-400	μΑ
Low-level input current at clock, down/up	I _{IL13}		05, 06	-135	-370	μΑ
Low-level input current at EP	I _{IL14}		05, 06	-150	-385	μΑ
Low-level input current at ET	I _{IL15}		05, 06	-280	-760	μΑ

See footnotes at end of table.

TABLE I. <u>Electrical performance characteristics.</u>

Test	Symbol	Conditions	Device	Lim	nits	Unit
		-55°C < T _C < +125°C	types	Min	Max	
High-level input current at reset inputs	I _{IH1}	unless otherwise specified $V_{CC} = 5.5 \text{ V}, V_{IN} = 2.7 \text{ V}$	01, 02 10	-	20	μΑ
High-level input current at reset inputs	I _{IH2}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 5.5 \text{ V}$	01, 02 10	-	100	μΑ
High-level input current at input A	I _{IH3}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 2.7 \text{ V}$	01, 02 10	-	80	μΑ
High-level input current at input A	I _{IH4}	$V_{CC} = 5.5 \text{ V}, \ \ V_{IN} = 5.5 \text{ V}$	01, 02, 10	-	400	μΑ
High-level input current at input B	I _{IH5}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 2.7 \text{ V}$	01 02, 10	-	160 80	μΑ
High-level input current	I _{IH6}	V _{CC} = 5.5 V, V _{IN} = 5.5 V	01	-	800	μΑ
at input B High-level input current at load, clock, EnT	I _{IH9}	$V_{CC} = 5.5 \text{ V}, V_{IN} = 2.7 \text{ V}$	02, 10 03, 04, 11, 12	-	400	μΑ
High-level input current at load, clock, EnT	I _{IH10}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 5.5 \text{ V}$	03, 04, 11, 12	-	200	μΑ
High-level input current at data, EnP	I _{IH11}	$V_{CC} = 5.5 \text{ V}, \ \ V_{IN} = 2.7 \text{ V}$	03, 04, 11, 12	-	20	μΑ
High-level input current at data, EnP	I _{IH12}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 5.5 \text{ V}$	03, 04, 11, 12	-	100	μΑ
High-level input current at clear	I _{IH13}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 2.7 \text{ V}$	03, 04, 11, 12	-	20 40	μΑ
High-level input current at clear	I _{IH14}	$V_{CC} = 5.5 \text{ V}, V_{IN} = 5.5 \text{ V}$	03, 04	-	100	μΑ
High-level input current at EnG	I _{IH15}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 2.7 \text{ V}$	09, 13	-	60	μΑ
High-level input current at EnG	I _{IH16}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 5.5 \text{ V}$	09, 13	-	300	μΑ
High-level input current at data, load, clear, count up, count down, clock, down/up	I _{IH17}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 2.7 \text{ V}$	05, 06 07, 08 09, 13	-	20	μΑ
High-level input current at data, load, clear, count up, count down, clock, down/up	I _{IH18}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 5.5 \text{ V}$	05, 06 07, 08 09, 13	-	100	μА
High-level input current at ET	I _{IH19}	$V_{CC} = 5.5 \text{ V}, \ V_{IN} = 2.7 \text{ V}$	05, 06	-	40	μΑ

See footnotes at end of table.

TABLE I. <u>Electrical performance characteristics</u> - Continued.

Test	Symbol	Conditions	Device	Lim	nits	Unit
		-55°C ≤ T _C ≤ +125°C unless otherwise specified	types	Min	Max	
High-level input current at ET	I _{IH20}	$V_{CC} = 5.5 \text{ V}, V_{IN} = 5.5 \text{ V}$	05, 06	-	200	μΑ
Short circuit output current	I _{OS}	V _{CC} = 5.5 V <u>2</u> /	All	-15	-130	mA
Supply current	Icc	V _{CC} = 5.5 V	01,02,10 05,06,07,08		15 34	mA
High-level supply current			09, 13		35	
Tilgir-level supply current	I _{CCH}	$V_{CC} = 5.5 \text{ V}, \ \underline{3}/$	03, 04, 11, 12	-	31	mA
High-level supply current	Іссн	V _{CC} = 5.5 V, <u>3</u> /	03, 04 11, 12	-	31	mA
Low-level supply current	IccL	V _{CC} = 5.5 V, <u>4</u> /	03, 04 11, 12	-	32	mA
Maximum input A, clock, or count up frequency	F _{MAX}	$V_{CC} = 5.0 \text{ V}, C_L = 50 \text{ pF}, \pm 10\%$ $R_L = 2 \text{ k}\Omega$	05, 06 01, 02, 10	25 29	-	MHz
			03, 04, 07, 08, 11, 12	22		
Propagation delay time, high to low, A to Q _C	t _{PHL1}		09, 13 01,02,10	18 3	81	ns
Propagation delay time,	t _{PLH1}	-	01, 10	3	74	ns
low to high, A to Q _C			02	3	74	
Propagation delay time, high to low, B to Q _D	t _{PHL2}		01, 10	3	56	ns
			02	3	78	
Propagation delay time, low to high, B to Q_D	t _{PLH2}		01, 10	3	52 78	ns
Propagation delay time, low to high, clock to carry	t _{PLH4}		03, 04, 11, 12	3	56	ns
Propagation delay time, high to low, clock to carry	t _{PHL4}		03, 04, 11, 12	3	56	ns

See footnotes at end of table.

TABLE I. <u>Electrical performance characteristics</u> - Continued.

Test	Symbol	Conditions	Device	Lim	nits	Unit
		-55°C ≤ T _C ≤ +125°C unless otherwise specified	types	Min	Max	
Propagation delay time, low to high, clock to Q	t _{PLH5}	$V_{CC} = 5.0 \text{ V, } C_L = 50 \text{ pF, } \pm 10\%$ $R_L = 2 \text{ k}\Omega$	03, 04, 11, 12	3	41	ns
Propagation delay time, high to high, clock to Q	t _{PHL5}		03, 04, 11, 12	3	45	ns
Propagation delay time, low to high, clock to Q	t _{PLH5}		05, 06	3	26	ns
Propagation delay time, high to low, clock to Q	t _{PHL5}		05	3	26	ns
_			06	3	36	
Propagation delay time, low to high, clock (data) to Q	t _{PLH6}		03, 04, 11, 12	3	42	ns
Propagation delay time, high to low, clock (data) to Q	t _{PHL6}		03, 04, 11, 12	3	48	ns
Propagation delay time, low to high, EnT to carry	t _{PLH7}		03, 04, 11, 12	3	28	ns
Propagation delay time, high to low, EnT to carry	t _{PHL7}		03, 04, 11, 12	3	28	ns
Propagation delay time,	t _{PLH7}	1	05	3	18	ns
low to high, ET to RC			06	3	28	
Propagation delay time,	t _{PHL7}		05	3	28	ns
high to low, ET to RC			06	3	32	
Propagation delay time, high to low, clear to Q	t _{PHL8}		03, 04, 11, 12	3	46	ns
Propagation delay time, low to high, load to Q	t _{PLH8}		07, 08	3	63	ns
Propagation delay time, high to low, load to Q	t _{PHL10}	-	07, 08	3	63	ns
Propagation delay time,	t _{PLH9}	-	07, 08	3	60	ns
low to high, counts up and down to Q, U/\overline{D} to RC			05	3	26	
and down to Q, U/D to RC			06	3	32	

TABLE I. <u>Electrical performance characteristics</u> - Continued.

Test	Symbol	Conditions	Device	Lim	nits	Unit
	,	-55°C ≤ T _C ≤ +125°C unless otherwise specified	types	Min	Max	
Propagation delay time, high to low, counts up	t _{PHL11}	$V_{CC} = 5.0 \text{ V}, C_L = 50 \text{ pF}, \pm 10\%$	07, 08	3	73	ns
and down to Q, U/D to RC		$R_L = 2 k\Omega$	05	3	33	
·			06	3	37	
Propagation delay time, high to low, clear to Q	t _{PHL12}		07, 08	3	56	ns
Propagation delay time, low to high, load to Q	t _{PLH10}		09, 13	3	53	ns
Propagation delay time, high to low, load to Q	t _{PHL13}		09, 13	3	77	ns
Propagation delay time, low to high, clock to Q	t _{PLH11}		09, 13	3	41	ns
Propagation delay time, high to low, clock to Q	t _{PHL14}		09, 13	3	57	ns
Propagation delay time, low to high, clock to Max Min	t _{PLH12}		09, 13	3	66	ns
Propagation delay time,	t _{PLH12}		05	3	35	ns
low to high, clock to ripple carry			06	3	38	
Propagation delay time, high to low, clock to Max Min	t _{PHL15}		09, 13	3	80	ns
Propagation delay time,	t _{PHL15}		05	3	37	ns
high to low, clock to ripple carry			06	3	40	

 $[\]underline{1}$ / Use $I_{OL} + I_{IL3(Max)}$ for V_{OL} test on Q_A .

^{2/} Not more than one output should be shorted at a time.

^{3/} I_{CCH} is measured: (a) With the load input high; and (b) Then again with the load input low with all other inputs high and all outputs open.

^{4/} I_{CCL} is measured: (a) With the clock input high; and (b) Then again with the clock input low with all other inputs low and all outputs open.

TABLE II. Electrical test requirements.

	Subgroups	(see table III)
MIL-PRF-38535 test requirements	Class S	Class B
	devices	devices
Interim electrical parameters	1	1
Final electrical test parameters	1*, 2, 3, 7,	1*, 2, 3,
	9, 10, 11	7, 9
Group A test requirements	1, 2, 3, 7, 8,	1, 2, 3, 7, 8,
	9, 10, 11	9, 10, 11
Group B test when using the method 5005	1, 2, 3, 7	N/A
QCI option	8, 9, 10, 11	
Group C end-point electrical		1, 2, 3
parameters	1, 2, 3, 7, 8	
	9, 10, 11	
Group D end-point electrical parameters	1, 2, 3	1, 2, 3

^{*}PDA applies to subgroup 1.

- 4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.
- 4.4 <u>Technology Conformance inspection (TCI)</u>. 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 <u>Group D inspection.</u> 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 <u>Voltage and current.</u> All voltages given are referenced to the microcircuit ground terminal. Currents given are conventional and positive when flowing into the referenced terminal.

	Device	type 01	Device	type 02	Device	type 03	Device	type 04
				CASE	S			
Pin	A, B, C,	2	A, B, C,	2	E,F	2	E,F	2
number	and D		and D					
1	BD INPUT	N/C	INPUT B	N/C	CLEAR	N/C	CLEAR	N/C
2	$R_0^{(1)}$	BD INPUT	R _{O(1)}	INPUT B	CLOCK	CLEAR	CLOCK	CLEAR
3	R _O ⁽²⁾	$R_0^{(1)}$	R _{O(2)}	R ₀ ⁽¹⁾	INPUT A	CLOCK	INPUT A	CLOCK
4	NC	Ro ⁽²⁾	NC	Ro ⁽²⁾	INPUT B	INPUT A	INPUT B	INPUT A
5	V_{CC}	N/C	V_{CC}	N/C	INPUT C	INPUT B	INPUT C	INPUT B
6	R ₉₍₁₎	N/C	NC	N/C	INPUT D	N/C	INPUT D	N/C
7	R ₉₍₂₎	N/C	NC	N/C	ENABLE P	INPUT C	ENABLE P	INPUT C
8	OUTPUT C	V_{CC}	OUTPUT C	V _{CC}	GND	INPUT D	GND	INPUT D
9	OUTPUT B	R ₉ ⁽¹⁾	OUTPUT B	N/C	LOAD	ENABLE P	LOAD	ENABLE P
10	GND	R ₉ ⁽²⁾	GND	N/C	ENABLE T	GND	ENABLE T	GND
11	OUTPUT D	N/C	OUTPUT D	N/C	Q_D	N/C	Q_D	N/C
12	OUTPUT A	OUTPUT C	OUTPUT A	OUTPUT C	Q_C	LOAD	Qc	LOAD
13	NC	OUTPUT B	NC	OUTPUT B	Q _B	Т	Q _B	Т
14	INPUT A	GND	INPUT A	GND	Q_A	Q_D	Q_A	Q_D
15		N/C		N/C	CARRY	Q_{C}	CARRY	Q_{C}
					OUTPUT		OUTPUT	
16		OUTPUT D		OUTPUT D	V _{CC}	N/C	V _{CC}	N/C
17		N/C		N/C		Q_B		Q_B
18		OUTPUT A		OUTPUT A		Q_A		Q_A
19		N/C		N/C		CARRY		CARRY
						OUTPUT		OUTPUT
20		INPUT A		INPUT A		V _{CC}		V _{CC}

FIGURE 1. Terminal connections.

	Device	type 05	Device	type 06	Device	type 07	Device	type 08
				CA	SES			
Pin number	E, F	2	E, F	2	E, F	2	E, F	2
1	U/D	N/C	U/D	N/C	DATA B INPUT	N/C	DATA B INPUT	N/C
2	CK	U/D	CK	U/D	Q_{B}	DATA B INPUT	Q_{B}	DATA B INPUT
3	INPUT A	CK	INPUT A	CK	Q_A	Q_B	Q_A	Q_{B}
4	INPUT B	INPUT A	INPUT B	INPUT A	COUNT DOWN	Q _A	COUNT DOWN	Q_A
5	INPUT C	INPUT B	INPUT C	INPUT B	COUNT UP	COUNT DOWN	COUNT UP	COUNT DOWN
6	INPUT D	N/C	INPUT D	N/C	Q _C	N/C	Q _C	N/C
7	ENABLE P	INPUT C	ENABLE P	INPUT C	Q_D	COUNT UP	Q_D	COUNT UP
8	GND	INPUT D	GND	INPUT D	GND	Qc	GND	Qc
9	LOAD	ENABLE P	LOAD	ENABLE P	DATA D	Q_D	DATA D	Q_D
10	ENABLE T	GND	ENABLE T	GND	DATA C	GND	DATA C	GND
11	Q_D	N/C	Q_D	N/C	LOAD	N/C	LOAD	N/C
12	Q _C	LOAD	Qc	LOAD	CARRY	DATA D	CARRY	DATA D
13	Q _B	ENABLE T	Q _B	ENABLE T	BORROW	DATA C	BORROW	DATA C
14	Q_A	Q_D	Q_A	Q_D	CLEAR	LOAD	CLEAR	LOAD
15	RIPPLE CARRY OUTPUT	Q _c	RIPPLE CARRY OUTPUT	Q _c	DATA A	CARRY	DATA A	CARRY
16	V _{CC}	N/C	V _{CC}	N/C	V_{CC}	N/C	V _{CC}	N/C
17		Q_{B}		Q_B		BORROW		BORROW
18		Q_A		Q_A		CLEAR		CLEAR
19		RC		RC		DATA		DATA
		OUTPUT		OUTPUT		Α		Α
20		V_{CC}		V _{CC}		V_{CC}		V _{CC}

FIGURE 1. <u>Terminal connections</u> - Continued.

	Device t	ype 09	Device	type 10	Device t	ype 11	Device	Device type 12	
				CA	CASES				
Pin number	E, F	2	A,B C, and D	2	E, F	2	E, F	2	
1	DATA B	N/C	INPUT BC	N/C	CLEAR	N/C	CLEAR	N/C	
2	Q_{B}	DATA B	NC	INPUT BC	CLOCK	CLEAR	CLOCK	CLEAR	
3	Q_A	Q_B	NC	N/C	INPUT A	CLOCK	INPUT A	CLOCK	
4	ENABLE G	Q_A	NC	N/C	INPUT B	INPUT A	INPUT B	INPUT A	
5	DOWN UP	ENABLE G	Vcc	N/C	INPUT C	INPUT B	INPUT C	INPUT B	
6	Qc	N/C	R _{O(1)}	N/C	INPUT D	N/C	INPUT D	N/C	
7	Q_D	DOWN UP	R _{O(2)}	N/C	ENABLE P	INPUT C	ENABLE P	INPUT C	
8	GND	Q_{C}	OUTPUT D	V _{CC}	GND	INPUT D	GND	INPUT D	
9	DATA D	Q_D	OUTPUT C	R ₀ ⁽¹⁾	LOAD	ENABLE P	LOAD	ENABLE P	
10	DATA C	GND	GND	R _O ⁽²⁾	ENABLE T	GND	ENABLE T	GND	
11	LOAD	N/C	OUTPUT B	N/C	Q_{D}	N/C	Q_D	N/C	
12	MAX/ MIN	DATA D	OUTPUT A	OUTPUT D	Qc	LOAD	Qc	LOAD	
13	RIPPLE CLOCK	DATA C	NC	OUTPUT C	Q_{B}	Т	Q_{B}	Т	
14	CLOCK	LOAD	INPUT A	GND	Q_A	Q_D	Q_A	Q_D	
15	DATA A	MAX/ MIN		N/C	CARRY OUTPUT	Q_{C}	CARRY OUTPUT	Q _C	
16	Vcc	N/C		OUTPUT B	V_{CC}	N/C	Vcc	N/C	
17		Rc		N/C		Q_B		Q_B	
18		CLOCK		OUTPUT A		Q_A		Q_A	
19		DATA A		N/C		CARRY OUTPUT		CARRY OUTPUT	
20		V _{CC}		INPUT A		V _{CC}		V _{CC}	

FIGURE 1. <u>Terminal connections</u> - Continued.

	Device type 13	
	CASES	
Pin number	E, F	2
1	DATA B	N/C
2	Q _B	DATA B
3	Q_A	Q _B
4	ENABLE	Q_A
	G	
5	DOWN	ENABLE
	UP	G
6	Q_{C}	N/C
7	Q_D	DOWN
		UP
8	GND	Q _C
9	DATA D	Q_D
10	DATA C	GND
11	LOAD	N/C
12	MAX/	DATA D
	MIN	
13	RIPPLE	DATA C
	CLOCK	
14	CLOCK	LOAD
15	DATA A	MAX/
		MIN
16	V _{CC}	N/C
17		Rc
18		CLOCK
19		DATA A
20		Vcc

FIGURE 1. Terminal connections - Continued

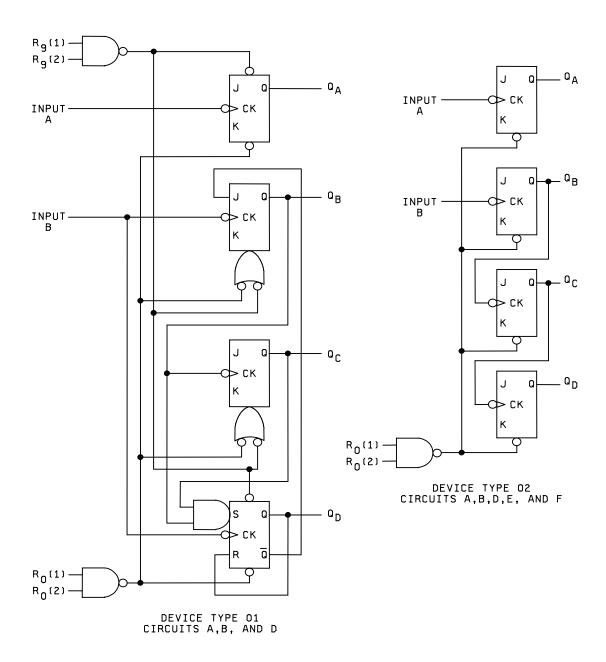


FIGURE 2. Logic diagrams

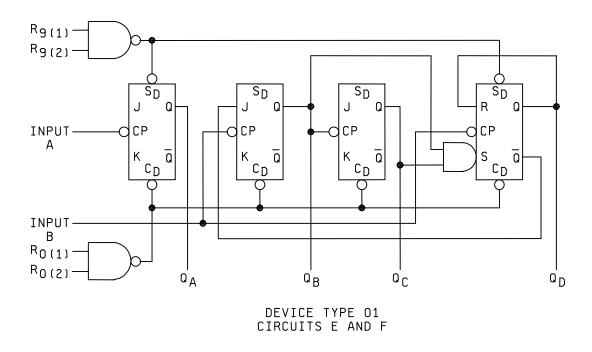


FIGURE 2. Logic diagrams - Continued.

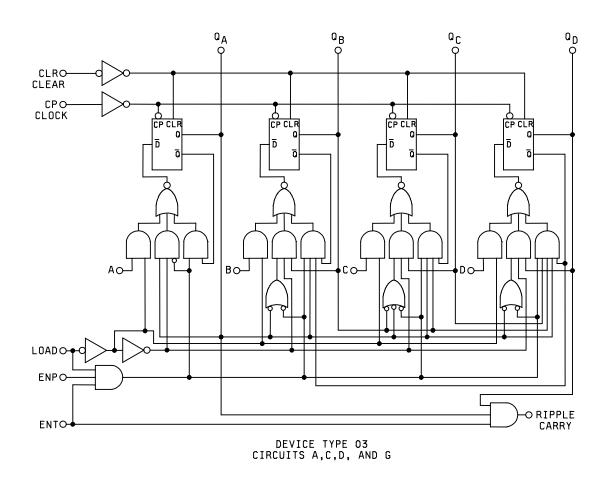


FIGURE 2. Logic diagrams - Continued.

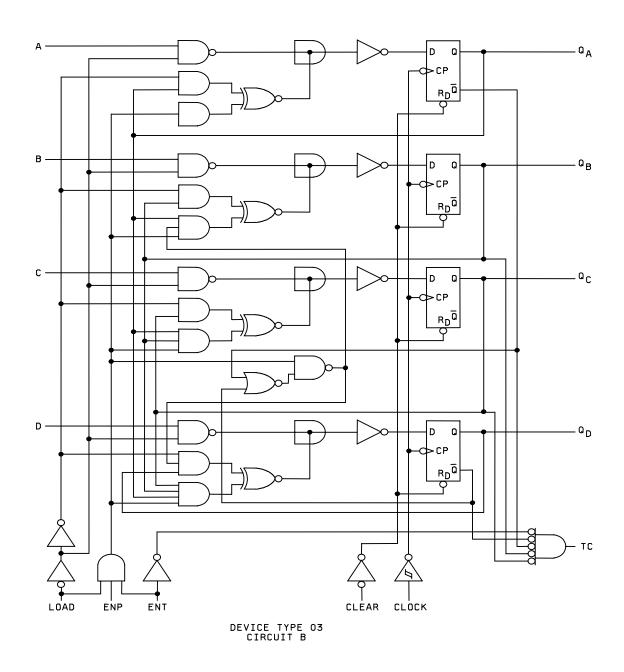


FIGURE 2. Logic diagrams - Continued.

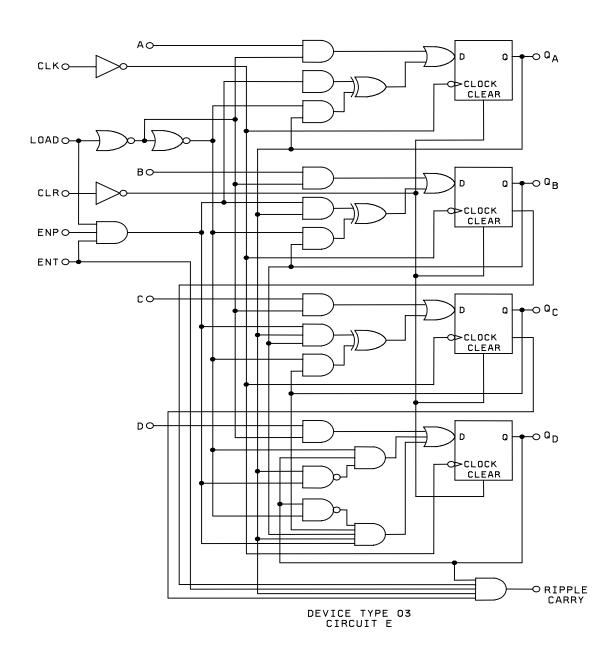


FIGURE 2. Logic diagrams - Continued.

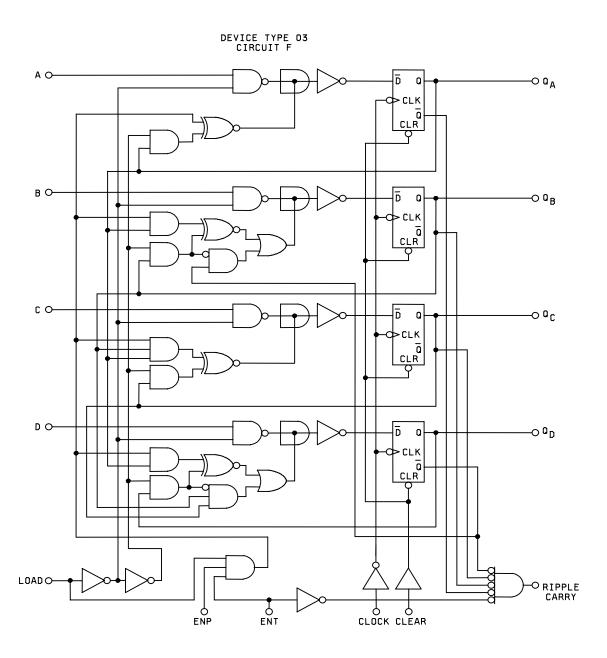


FIGURE 2. Logic diagrams - Continued.

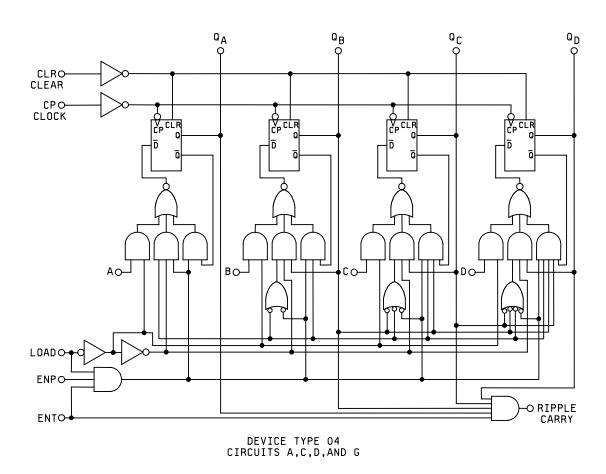


FIGURE 2. Logic diagrams - Continued.

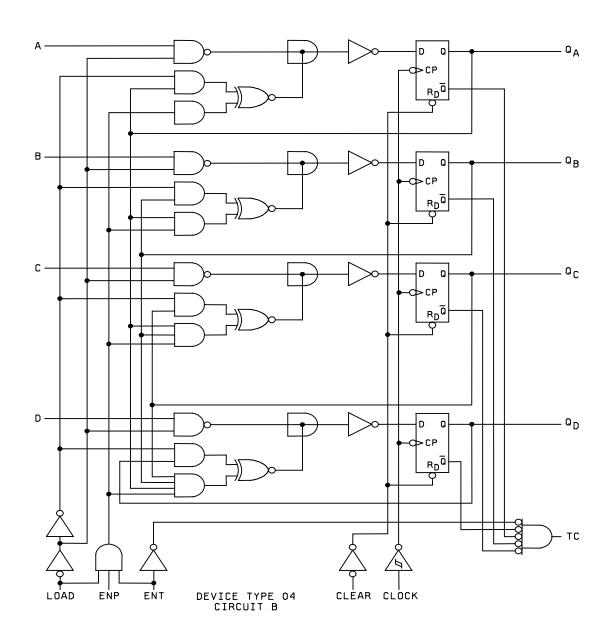


FIGURE 2. Logic diagrams - Continued.

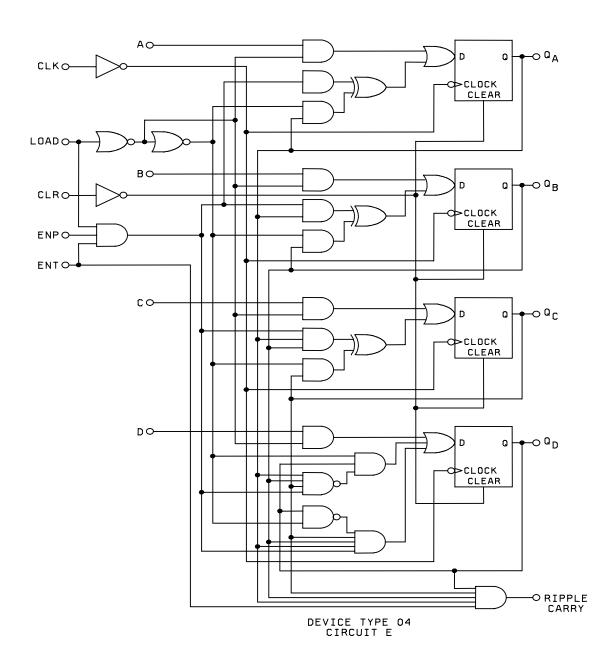


FIGURE 2. Logic diagrams - Continued.

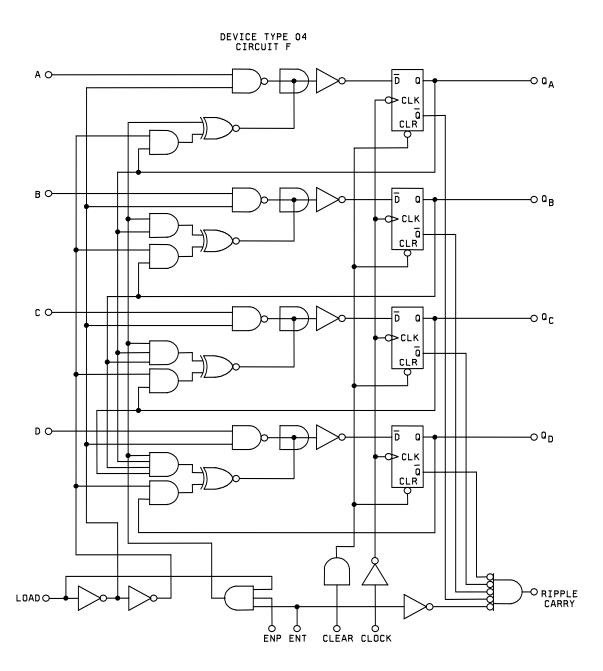


FIGURE 2. Logic diagrams - Continued.

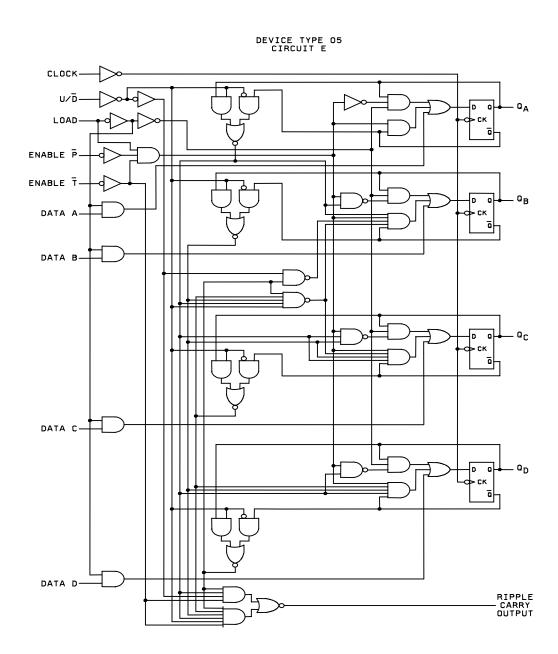


FIGURE 2. Logic diagrams - Continued.

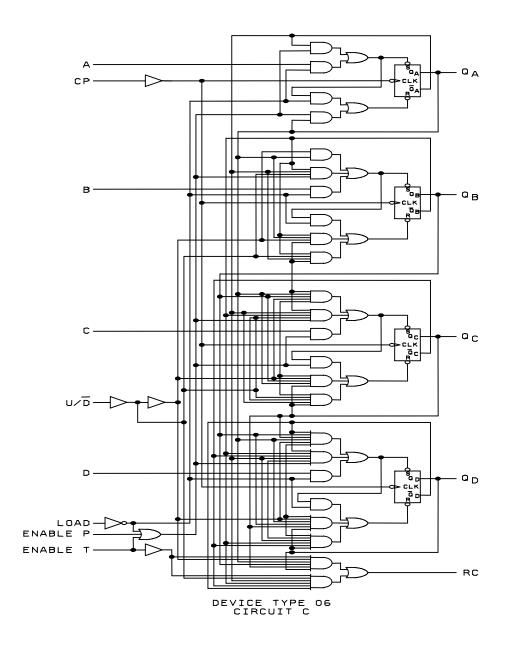


FIGURE 2. Logic diagrams - Continued.

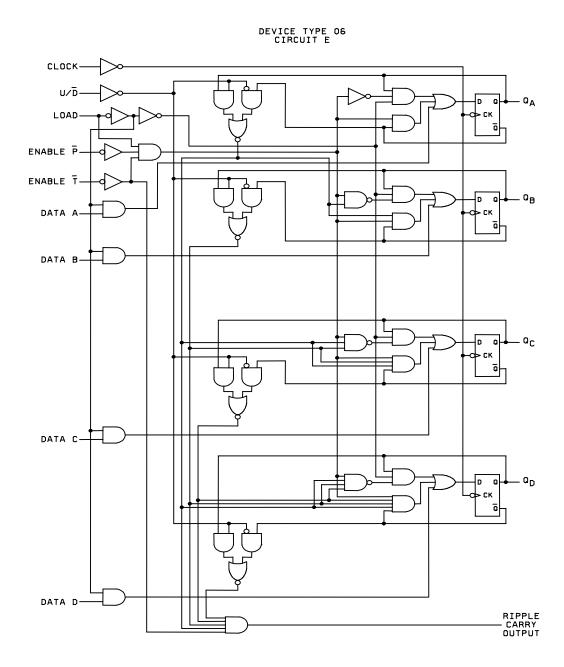


FIGURE 2. Logic diagrams - Continued.

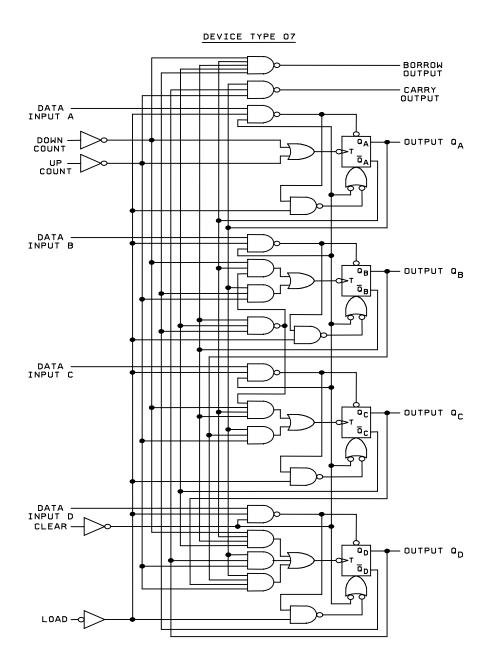


FIGURE 2. Logic diagrams - Continued.

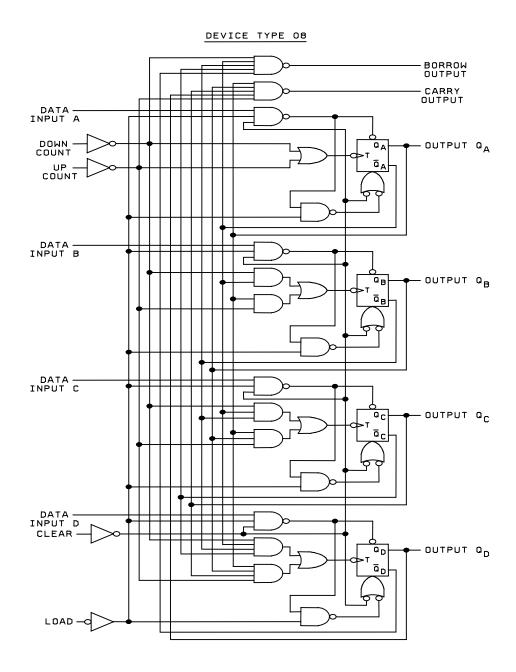


FIGURE 2. Logic diagrams - Continued.

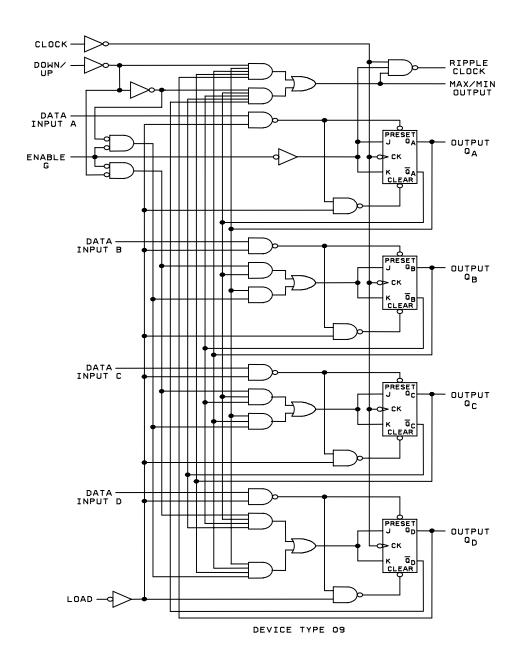


FIGURE 2. Logic diagrams - Continued.

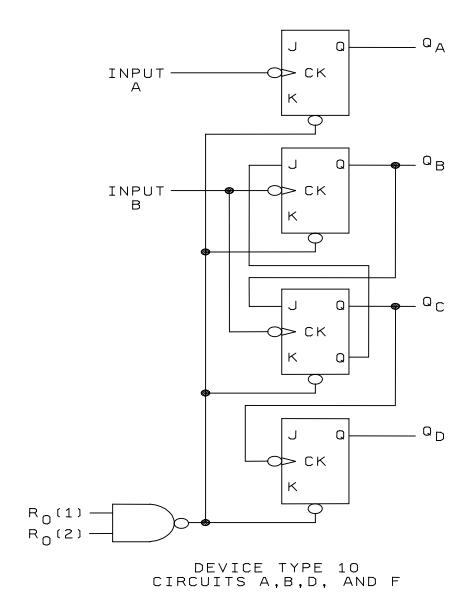


FIGURE 2. Logic diagrams - Continued.

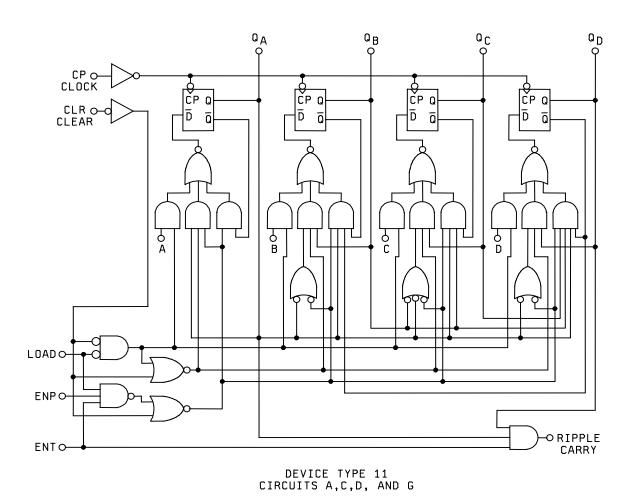


FIGURE 2. Logic diagrams – Continued.

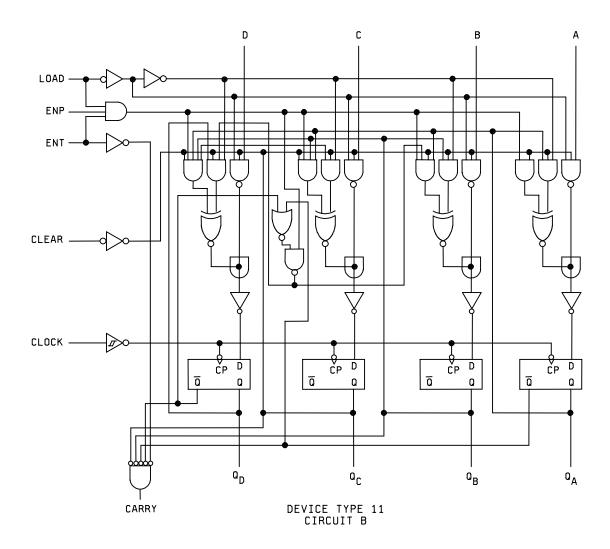


FIGURE 2. Logic diagrams - Continued.

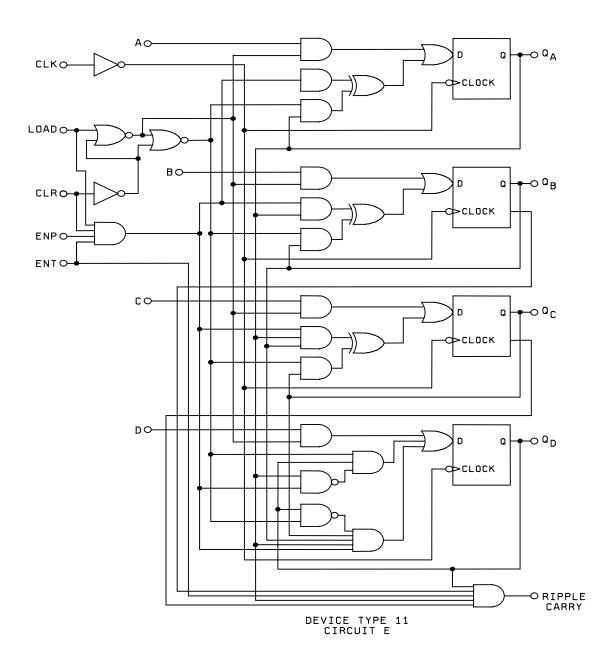


FIGURE 2. Logic diagrams - Continued.

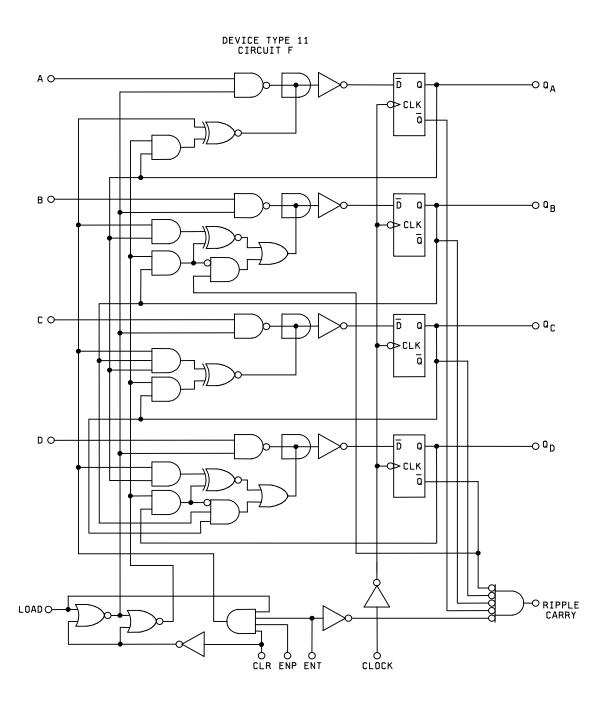
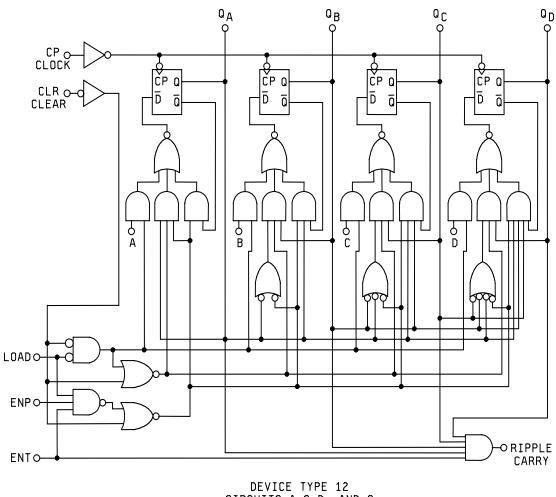


FIGURE 2. Logic diagrams - Continued.



DEVICE TYPE 12 CIRCUITS A,C,D, AND G

FIGURE 2. Logic diagrams - Continued.

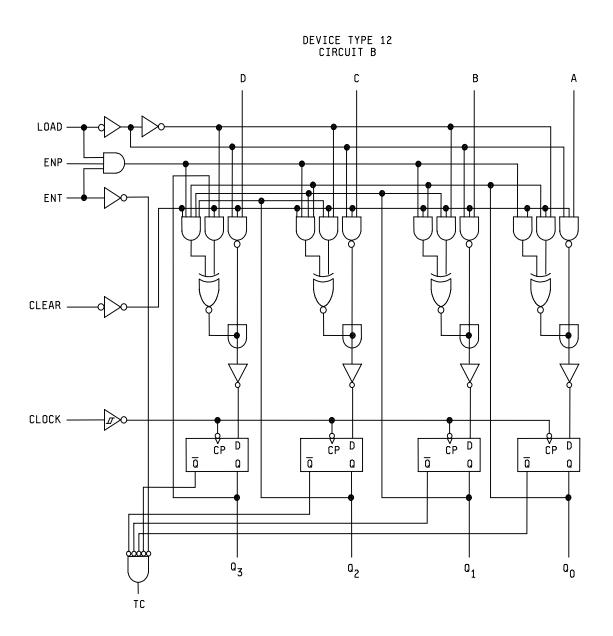


FIGURE 2. Logic diagrams - Continued.

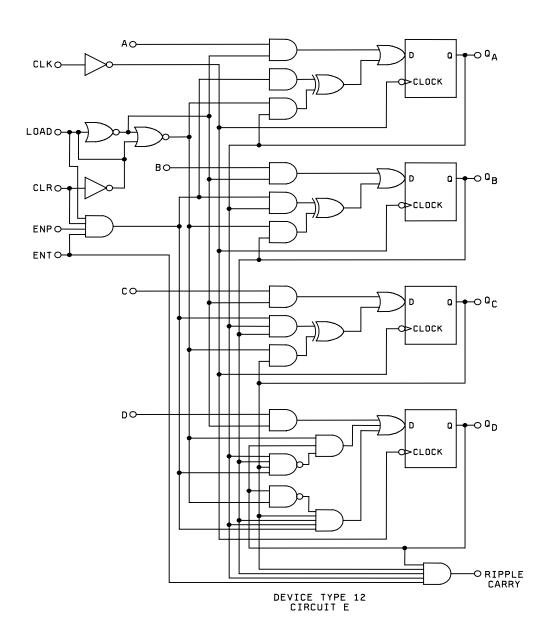


FIGURE 2. Logic diagrams - Continued.

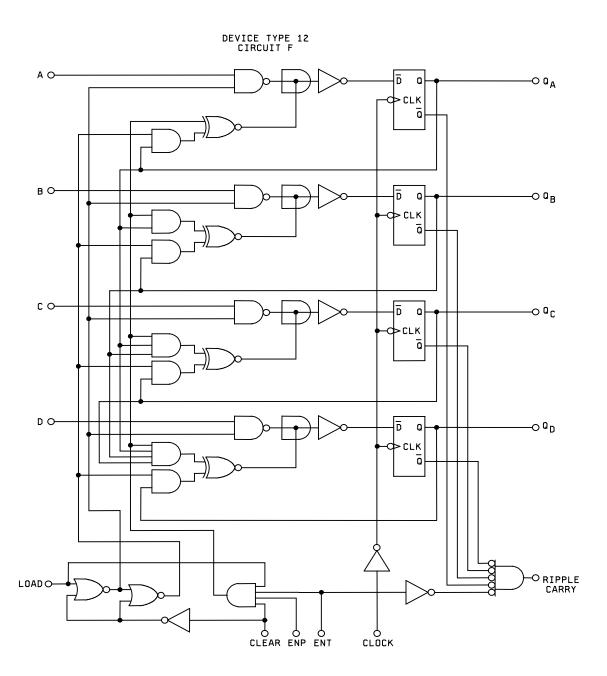


FIGURE 2. Logic diagrams - Continued.

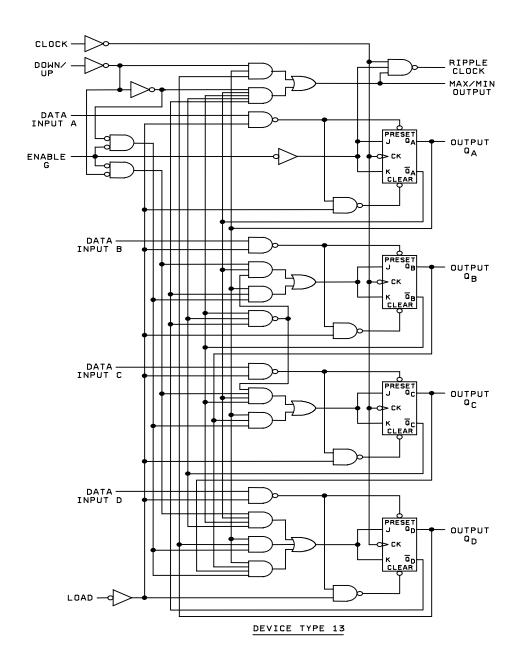


FIGURE 2. Logic diagrams - Continued.

DEVICE TYPE 01

BCD COUNT SEQUENCE (See Note A)

COUNT		OUT	ΓPUT	
COONT	Q_D	Qc	Q_B	Q_A
0	L	L	L	L
1	L	L	L	Н
2	L	L	Н	L
3	L	L	Н	Н
4	L	Н	L	L
5	L	Н	L	Н
6	L	Н	Н	L
7	L	Н	Н	Н
8	Н	L	L	L
9	Н	L	L	Н

BI-QUINARY (5-2) (See Note B)

		OUT	PUT			
COUNT	Q _A	Q_D	Qc	Q _B		
0	L	L	L	L		
1	L	L	L	Н		
2	L	L	Н	L		
3	L	L	Н	Н		
4	L	Н	L	L		
5	Н	L	L	L		
6	Η	L	L	Н		
7	Н	L	Н	L		
8	Н	L	Н	Н		
9	Η	Ι	Ш	L		

RESET/COUNT FUNCTION TABLE

	RESET II	NPUTS			OUTI	PUT	
R ₀₍₁₎	R ₀₍₂₎	R ₉₍₁₎	R ₉₍₂₎	Q_D	Q_{C}	Q_B	Q_A
Н	Н	L	Χ	L	L	Ш	L
Н	Н	Χ	L	L	L	L	L
X	Χ	Η	Η	Н	L	L	Н
Х	L	Х	L		COL	INT	
L	Х	L	Χ		COL	INT	
L	Χ	Χ	L		COL	INT	
Х	L	L	Χ		COL	INT	

NOTES: A. Output Q_A is connected to input B for BCD count.

B. Output Q_D is connected to input A for bi-quinary count.

FIGURE 3. Truth tables.

DEVICE TYE 02

COUNT SEQUENCE (See Note)

COUNT		OUT	PUT	
COOM	Q_D	Q_{C}	Q_B	Q_A
0	Ш	Ш	Ш	Ш
1	Ш	Ш	Ш	Ι
2	Ш	Ш	Ι	Ш
3	L	L	Н	Н
4	L	Н	L	L
5	L	Н	L	Н
6	L	Н	Н	L
7	L	Н	Н	Н
8	Н	L	L	L
9	Н	L	L	Н
10	Н	L	Н	L
11	Н	L	Н	Н
12	Н	Н	L	L
13	Н	Н	L	Н
14	Н	Н	Η	L
15	Н	Н	Н	Н

DEVICE TYPE 10

COUNT SEQUENCE (See Note)

COUNT		OUT	PUT	
COUNT	Q_D	Qc	Q _B	Q_A
0	L	L	L	L
1	L	L	L	Н
2	L	L	Н	L
3	L	L	Н	Н
4	L	Н	L	L
5	L	Н	L	Н
6	Н	L	L	L
7	Н	L	L	Н
8	Н	L	Н	L
9	Н	L	Н	Н
10	Н	Н	L	L
11	Н	Н	L	Н

RESET/COUNT FUNCTION TABLE

RESET	INPUTS		TUO	PUT				
R ₀₍₁₎	R ₀₍₂₎	Q_{D}	QC	Q_B	Q_A			
Н	Н	L	L	L	L			
L	Χ	COUNT						
X	L		CO	UNT				

RESET/COUNT FUNCTION TABLE

RESET II	NPUTS		OUT	ΓPUT			
R ₀₍₁₎	R ₀₍₂₎	Q_D	QC	Q_B	Q_A		
Н	Н	L	L	L	L		
L	Χ	COUNT					
X	L		CO	UNT	•		

NOTE: Output QA is connected to input B.

NOTE: Output QA is connected to input B.

FIGURE 3. Truth tables.

SYNCHRONOUS TRUTH TABLE, DEVICE TYPES 3 AND 11

		I	nput at t	ime t _n						(Outputs	at time t	n+1
Clock	Enable P	Enable T	Load	Α	В	С	D	Clear	Q_{A}	Q_B	Carry output		
CP	L	Х	Н	X	Χ	Х	Χ	Н	NC	NC	NC	NC	NC
CP	Х	L	Н	X	Χ	Х	Χ	Н	NC	NC	NC	NC	L
CP	Н	Н	Н	Χ	Х	Х	Х	Н	Pre		ount plu	s 1	H if count = 9
										(not	e 1)		L if count < 9
CP	X	Н	L	X	X	X	Х	Н	A B C			D	H if count = 9 L if count < 9
CP	Х	L	L	Χ	Χ	Х	Χ	Н	Α	В	С	D	L
CP	Х	Х	Χ	Χ	Χ	Χ	Χ	L	L	L	L	L	L

ASYNCHRONOUS TRUTH TABLE, DEVICE TYPE 3

	Inputs at time t _n									Outp	uts at t	ime t _n	+1
Clock	Enable P	Enable T	Load	A	В	С	D	Clear	Q _A	Q _B	Qc	Q_D	Carry output
Х	Х	Х	Χ	Х	Χ	Χ	Χ	L	L	L	L	L	L

NOTES:

- 1. See up count sequence table.
- L = V_{IL} for inputs, V_{0L} for outputs.
 H = V_{IH} for inputs, V_{0H} for outputs.
- 4. $X = V_{IH}$ or V_{IL} .
- 5. CP = Clock pulse.
- 6. NC = No change.

UP COUNT SEQUENCE TABLE

Q _A (LSB)	Q_B	Q_{C}	Q _D (MSB)
(LSB)			(MSB)
L	L	L	Ш
Н	L	L	L
L	Н	L	L
Н	Н	L	L
L	L	Н	L
Н	L	Н	L
L	Н	Н	L
Н	Н	Н	L
L	L	L	Н
Н	L	L	Н

FIGURE 3. <u>Truth tables</u> – Continued.

SYNCHRONOUS TRUTH TABLE, DEVICE TYPES 4 AND 12

		I	nput at t	ime t _n						(Outputs	at time t	n+1
Clock	Enable P	Enable T	Load	Α	В	С	D	Clear	Q _A	Q _B	Carry output		
CP	L	Х	Н	Χ	Χ	Х	Χ	Н	NC	NC	NC	NC	NC
CP	Х	L	Н	X	Χ	Х	Χ	Н	NC	NC	NC	NC	L
CP	Н	Н	Н	X	Χ	Х	Χ	Н	Pre	evious c	ount plu	s 1	H if count = 15
										(not	e 1)		L if count < 15
CP	Х	Н	L	X	Χ	Х	Χ	Н	Α	В	С	D	H if count = 15
													L if count < 15
CP	Χ	Ĺ	L	Χ	Χ	X	Χ	Н	Α	В	С	D	Ĺ
CP	Χ	Χ	Χ	Χ	Χ	Х	Χ	Ĺ	L	L	Ĺ	Ĺ	Ĺ

ASYNCHRONOUS TRUTH TABLE, DEVICE TYPE 4

	Inputs at time t _n									Outp	uts at t	ime t _n	+1
Clock	Enable P	Enable T	Load	Α	В	С	D	Clear	Q_A	Q_{B}	Qc	Q_D	Carry output
Х	Χ	Χ	Х	Х	Χ	Χ	Χ	L	L	L	L	L	L

NOTES:

- See up count sequence table.
 L = V_{IL} for inputs, V_{0L} for outputs.
 H = V_{IH} for inputs, V_{0H} for outputs.
- 4. $X = V_{IH}$ or V_{IL} .
- 5. CP = Clock pulse.
- 6. NC = No change.

UP COUNT SEQUENCE TABLE

Q _A (LSB)	Q _B	Q_C	Q _D (MSB)
L	L	L	L
Н	L	L	L
L	Η	L	L
Н	Η	L	L
L	L	Н	L
Н	٦	Ι	L
L	Τ	Ι	L
Н	Ι	Ι	L
L	٦	L	Ι
Н	٦	L	Ι
L	Ι	L	Ι
Н	Ι	L	Ι
L	٦	Ι	Ι
Н	L	Н	Н
L	Η	Н	Н
Н	Н	Н	Н

FIGURE 3. <u>Truth tables</u> – Continued.

Device type 05

UP COUNT SEQUENCE TABLE

Q _A (LSB)	Q_B	Q_{C}	Q _D (MSB)
(LSB)			(INISB)
L	L	L	L
Н	L	L	L
L	Н	L	L
Н	Н	L	L
L	L	Н	L
Н	L	Н	L
L	Η	Н	L
Н	Ι	Н	L
L	L	L	Н
Н	L	Ĺ	Н

Device type 06

UP COUNT SEQUENCE TABLE

Q _A (LSB)	Q_B	Q_{C}	Q _D (MSB)
(LSB)			(MSB)
L	L	L	L
Н	L	L	L
L	Н	L	L
Н	Н	L	L
L	L	Η	L
Н	L	Н	L
L	Н	Н	L
Н	Н	Н	L
L	L	L	Н
Н	L	L	Н
L	Н	L	Н
Н	Н	L	Н
L	L	Н	Н
Н	L	Н	Н
Ĺ	Н	Н	Н
Н	Н	Н	Н

Device types 05 and 06

MODE SELECT TABLE

L	EP	ET	U/D	Action on Rising Clock Edge
L	Χ	Χ	Χ	Load $(D_n \rightarrow Q_n)$
Н	L	L	Н	Count Up (increment)
Н	L	L	L	Count Down (decrement)
Н	Н	Χ	Χ	No Change (Hold)
Н	Χ	Н	Χ	No Change (Hold)

H = High voltage level L = Low voltage

X = Don't care

FIGURE 3. <u>Truth tables</u> – Continued.

DEVICE TYPE 7 TRUTH TABLE

	Inputs at time t _n								Outputs at time t _{n=1}				
Count	Count												
Up	Down	Load	Α	В	С	D	Clear	Q_A	Q_B	Q_{C}	Q_D	Carry	Borrow
Н	Η	Н	Χ	Χ	Χ	Χ	L	NC	NC	NC	NC	Н	Н
Н	Н	Н	Χ	Х	Х	Χ	Н	L	L	L	L	Н	Н
Н	Н	L	Χ	Х	Х	Χ	L	Α	В	С	D	Н	Н
Р	Н	Н	Χ	Х	Х	Χ	L	Prev	ious co	ount plu	ıs 1	Н	Н
									(note	e 1)			
Н	Р	Н	Χ	Х	Х	Χ	L	Previ	ous co	unt mir	ius 1	Н	Н
									(note	e 2)			
N	Н	Н	Χ	Х	Х	Χ	L	NC	NC	NC	NC	N if count = 9	Н
												H if count ≠ 9	
Н	N	Н	Χ	Х	Х	Х	L	NC	NC	NC	NC	Н	N if count = 0
													H if count ≠ 0

NOTES:

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

FIGURE 3. <u>Truth tables</u> – Continued.

DEVICE TYPE 07

UP COUNT SEQUENCE TABLE

Q_A	Q_B	Q_{C}	Q_D	Carry
Q _A (LSB)			Q_D (MSB)	_
L	L	L	L	Н
Н	L	L	L	Н
L	Η	L	L	Н
Н	Ι	Ш	Ш	Н
L	Ш	Ι	Ш	Н
Н	L	Ι	L	Н
L	Ι	Ι	Ш	Н
Н	Ι	Ι	Ш	Н
L	L	L	Н	Н
H	L	L	Н	Ĺ

DOWN COUNT SEQUENCE TABLE

Q۸	Q_B	Q _C	Qn	Borrow
Q _A (LSB)	~Β	40	Q _D (MSB)	20
Н	L	L	Н	Н
L	L	L	Н	Н
Н	Н	Н	L	Н
L	Н	Н	L	Н
Н	L	Н	L	Н
L	L	Н	L	Н
Н	Н	Ш	Ш	Н
L	Н	L	L	Н
Н	L	L	L	Н
L	L	L	L	L

DEVICE TYPE 8 TRUTH TABLE

	Input at time t _n								Outputs at time t _{n=1}				
Count	Count												
up	down	Load	Α	В	С	D	Clear	Q_A	Q_B	Q_{C}	Q_D	Carry	Borrow
Н	Н	Н	Χ	Χ	Χ	Χ	L	NC	NC	NC	NC	Н	Н
Н	Н	Н	Χ	Χ	Χ	Χ	Н	L	L	L	L	Н	Н
Н	Н	L	Χ	Χ	Χ	Χ	L	Α	В	С	D	Н	Н
Р	Н	Н	Χ	Χ	Χ	Χ	L	Pre	vious co	ount plu	ıs 1	Н	Н
									(no	te)			
Н	Р	Н	Χ	Χ	Χ	Χ	L	Prev	ious co	unt mir	ius 1	Н	Н
									(note	e 2)			
N	Н	Н	Χ	Χ	Χ	Χ	L	NC	NC	NC	NC	N if count = 15	Н
												H if count ≠ 15	
Н	N	Н	Х	Х	Х	Χ	L	NC	NC	NC	NC	Н	N if count = 0
													H if count ≠ 0

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

FIGURE 3. <u>Truth tables</u> – Continued.

DEVICE TYPE 08

UP COUNT SEQUENCE TABLE

Q _A (LSB)	Q _B	Qc	Q _D (MSB)	Carry
L	L	L	L	Н
Н	L	L	L	Н
L	Н	L	L	Н
Н	Н	L	L	Н
L	L	Н	L	Н
Н	L	Н	L	Н
L	Н	Н	L	Н
Н	Н	Н	L	Н
L	L	L	Н	Н
Н	L	L	Н	Н
L	Н	L	Н	Н
Н	Н	L	Н	Н
Ĺ	Ĺ	Н	Н	Н
Н	Ĺ	Н	Н	Н
Ĺ	Н	Н	Н	Н
Ц	Ц	Ц	Ц	

DOWN COUNT SEQUENCE TABLE

Q _A (LSB)	Q _B	Qc	Q _D (MSB)	Borrow
H	Н	Н	H	Н
L	Н	Н	Н	Н
Н	L	Н	Н	Н
L	L	Н	Н	Н
Н	Н	L	Н	Н
L	Н	L	Н	Н
Н	L	L	Н	Н
L	L	L	Н	Н
Н	Н	Н	L	Н
L	Н	Н	L	Н
Н	L	Н	L	Н
L	L	Н	L	Н
Н	Н	L	L	Н
L	Н	L	L	Η
Н	L	L	L	Н
L	Ĺ	L	L	L

DEVICE TYPES 09 AND 13

Mode select table

	Inputs									
Load	Enable G	U/D	CLK	Mode						
Н	L	L	4	Count up						
Н	L	Н	5	Count down						
L	Х	Х	Х	Preset (Asyn)						
Н	Н	Х	Х	No change (Hold)						

Ripple carry truth table

Inp	outs	Outputs		
Enable G	CLK	Max/Min	RC output	
L		Н		
Н	Х	Х	Н	
Х	Х	L	Н	

NOTE: The up count and down count sequence for device type 09 is identical as that for device type 08.

The up count and down count sequence for device type 13 is identical as that for device type 07.

FIGURE 3. <u>Truth tables</u> – Continued.

L = Low voltage level

H = High voltage level

X = Don't care

_ = Low-to-high clock transition

_ = Negative going clock pulse

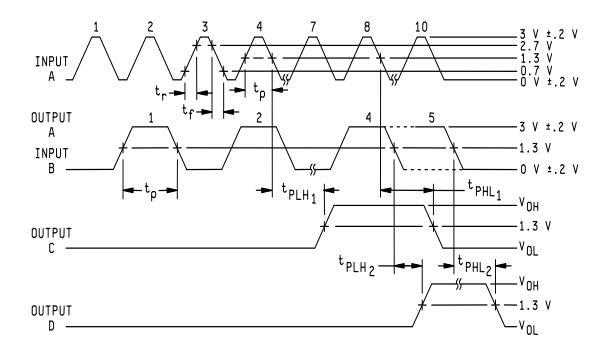
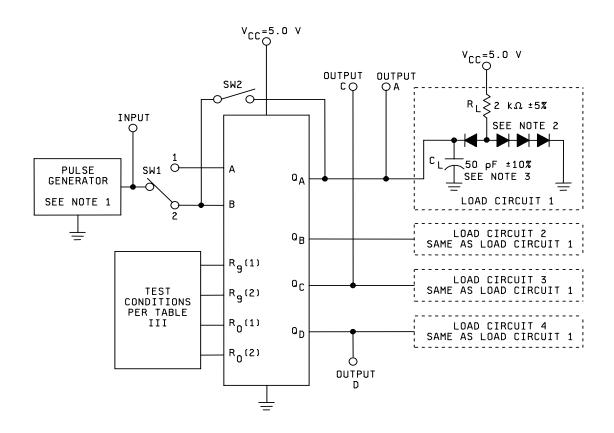


FIGURE 4. Switching time test circuit and waveforms for device type 01.

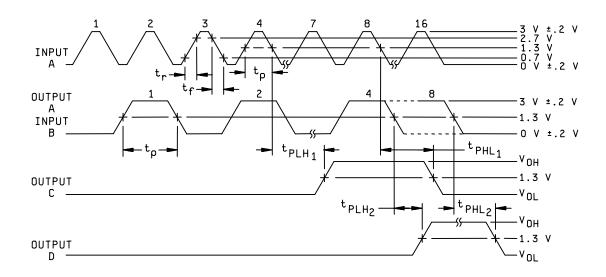


TEST	SWITCH POSITION									
	SW1	SW2								
F MAX	1	CLOSED								
A TO Q _C	1	CLOSED								
B TO Q _D	2	OPEN								

TEST CIRCUIT

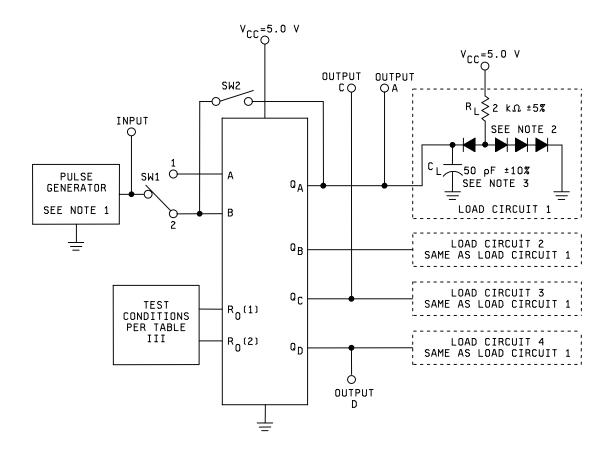
- 1. The pulse generator has the following characteristics: V_{gen} = 3 V, $t_r \le$ 15 ns, $t_f \le$ 6 ns, t_p = .5 μ s, PRR \le 1 MHz, $Z_{out} \approx 50\Omega$.
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
- 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$

FIGURE 4. Switching time test circuit and waveforms for device type 01 – Continued.



VOLTAGE WAVEFORMS

FIGURE 5. Switching time test circuit and waveforms for device type 02.

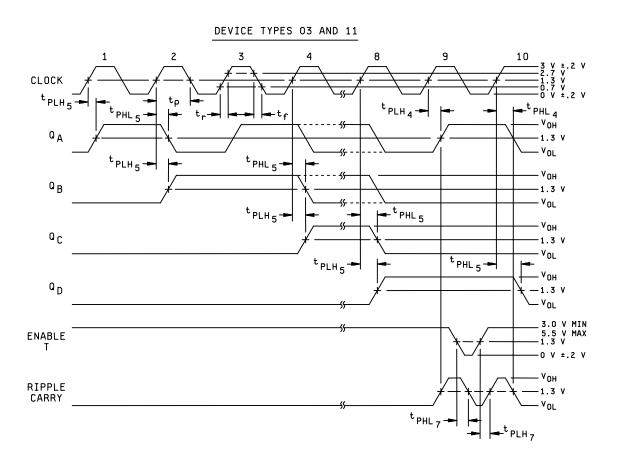


TEST	SWITCH	POSITION					
	SW1	SW2					
F MAX	1	CLOSED					
A TO Q _C	1	CLOSED					
B TO Q _D	2	OPEN					

TEST CIRCUIT

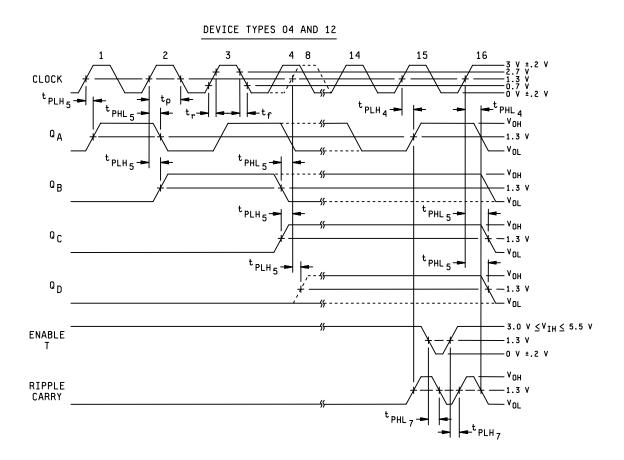
- 1. The pulse generator has the following characteristics: V_{gen} = 3 V, $t_r \le$ 15 ns, $t_f \le$ 6 ns, t_p = .5 μ s, PRR \le 1 MHz, $Z_{out} \approx 50\Omega$.
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
- 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$

FIGURE 5. Switching time test circuit and waveforms for device type 02 – Continued.



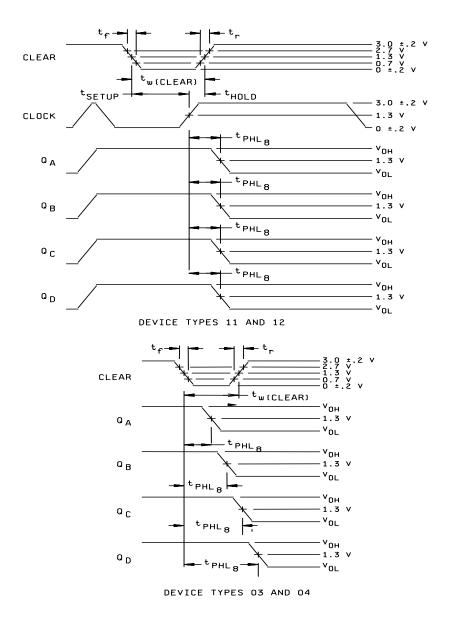
VOLTAGE WAVEFORMS

FIGURE 6. Switching time test circuit and waveforms for device types 03, 04, 11, and 12.



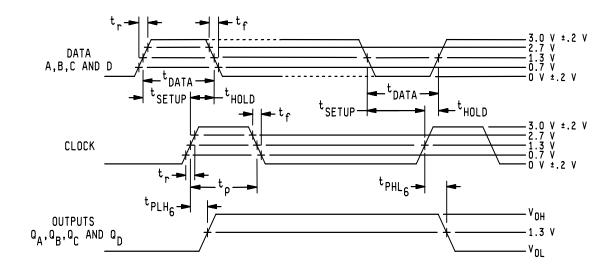
VOLTAGE WAVEFORMS

FIGURE 6. Switching time test circuit and waveforms for device types 03, 04, 11, and 12 – Continued.



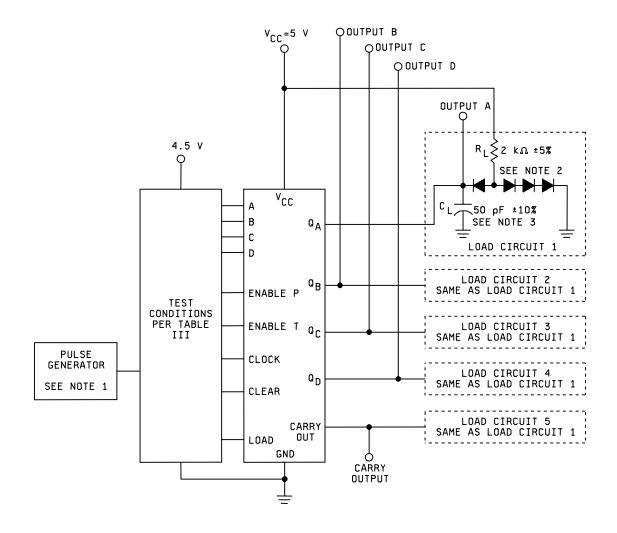
NOTE: The clear pulse generator has the following characteristics: $V_{gen} = 3.0 \text{ V}, \, t_r \leq 15 \text{ ns}, \, t_f \leq 6 \text{ ns}, \, 20 \text{ ns} \leq t_{w(clear)} \leq 25 \text{ ns} \text{ for types 11 and } 12, \, 20 \text{ ns} \leq t_{setup} \leq 25 \text{ ns}, \, t_{hold} = 0 \text{ ns}.$

FIGURE 6. Switching time test circuit and waveforms for device types 03, 04, 11, and 12 - Continued.



NOTE: The data pulse generator has the following characteristics: $V_{gern} = 3.0 \text{ V}$, $t_r \le 15 \text{ ns}$, $t_f \le 6 \text{ ns}$, $t_{DATA} = 30 \text{ ns}$, $t_{setup} = 20 \text{ ns}$, $t_{HOLD} = 10 \text{ ns}$.

FIGURE 6. Switching time test circuit and waveforms for device types 03, 04, 11, and 12 – Continued.



- 1. The pulse generator has the following characteristics: $V_{gen}=3$ V, $t_r \le 15$ ns, $t_f \le 6$ ns, $t_p=.5~\mu s$, PRR ≤ 1 MHz, $Z_{out}~\approx~50\Omega$.
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
- 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$

FIGURE 6. Switching time test circuit and waveforms for device type 03, 04, 11, and 12 - Continued.

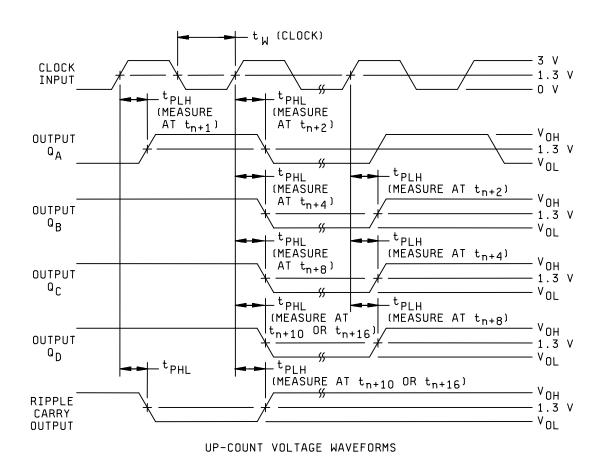
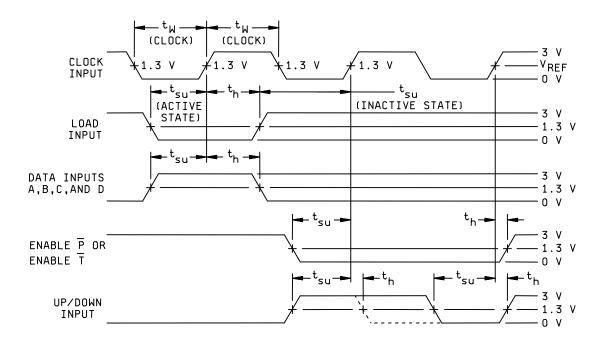


FIGURE 7. Switching time test circuit and waveforms for device types 05 and 06.



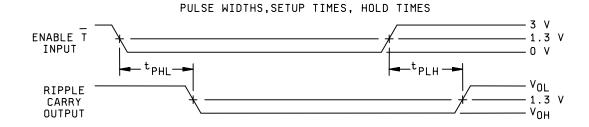
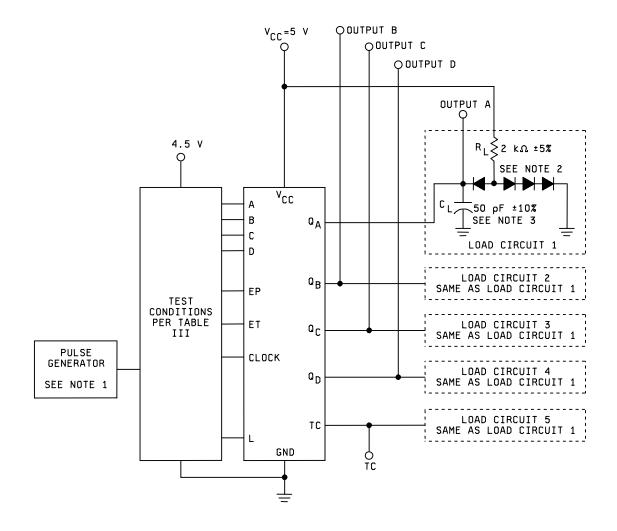
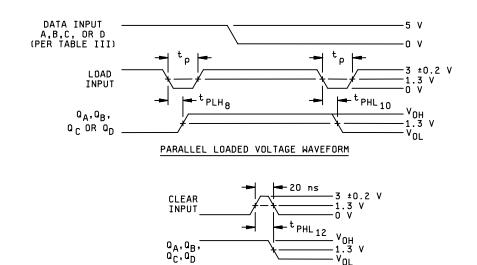


FIGURE 7. Switching time test circuit and waveforms for device types 05 and 06 - Continued.

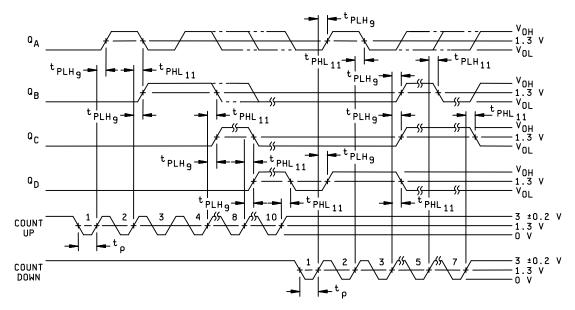


- 1. The pulse generator has the following characteristics: V_{gen} = 3 V, $t_r \le$ 15 ns, $t_f \le$ 6 ns, t_p = .5 μ s, PRR \le 1 MHz, $Z_{out} \approx 50\Omega$.
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
- 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$
- 6. The clear pulse generator has the following characteristics: $V_{gen} = 3.0 \text{ V}$, $t_f \le 15 \text{ ns}$, $t_f \le 6 \text{ ns}$, $t_{w(CLEAR)} = 20 \text{ ns}$.

FIGURE 7. Switching time test circuit and waveforms for device types 05 and 06 - Continued.

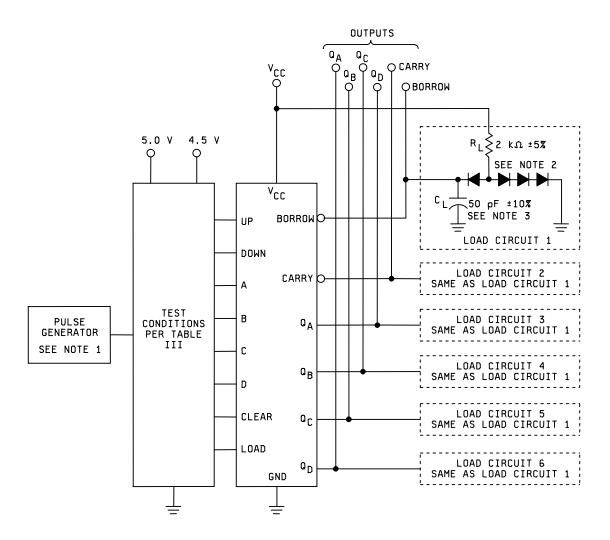


CLEAR SWITCHING VOLTAGE WAVEFORM



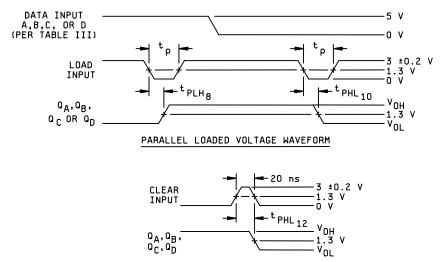
SERIAL LOADED VOLTAGE WAVEFORMS

FIGURE 8. Switching time test circuit and waveforms for device types 07.

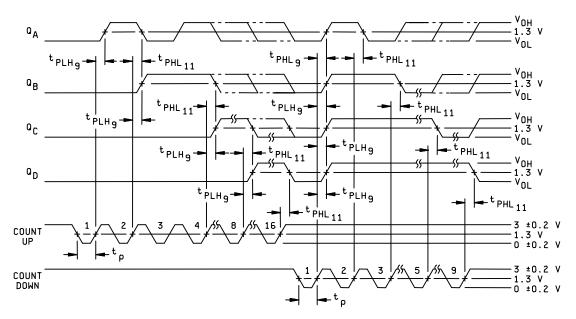


- 1. The pulse generator has the following characteristics: V_{gen} = 3 V, t_p = .5 μ s, PRR \leq 1 MHz, $Z_{out} \approx 50\Omega$, $t_r \leq$ 15 ns, $t_f \leq$ 6 ns between 0.7 V and 2.7 V.
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
- 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$
- 6. The clear pulse generator has the following characteristics: $V_{gen} = 3.0 \text{ V}$, $t_f \le 15 \text{ ns}$, $t_f \le 6 \text{ ns}$, between 0.7 V and 2.7 V, $t_{w(CLEAR)} = 20 \text{ ns}$.

FIGURE 8. Switching time test circuit and waveforms for device types 07 and Continued.

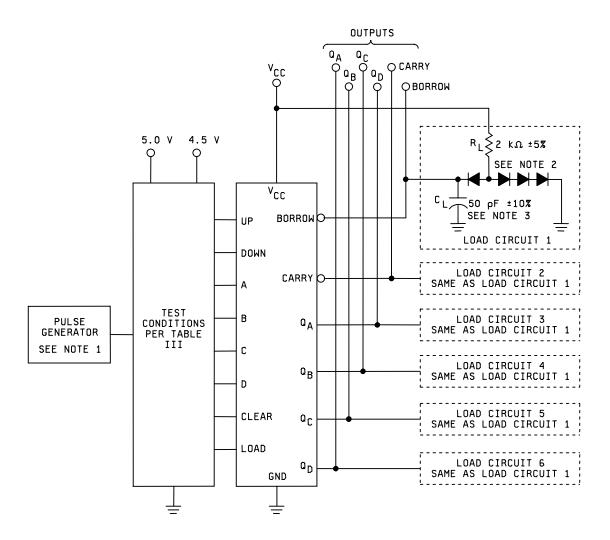


CLEAR SWITCHING VOLTAGE WAVEFORM



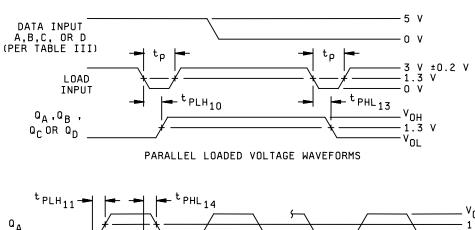
SERIAL LOADED VOLTAGE WAVEFORMS

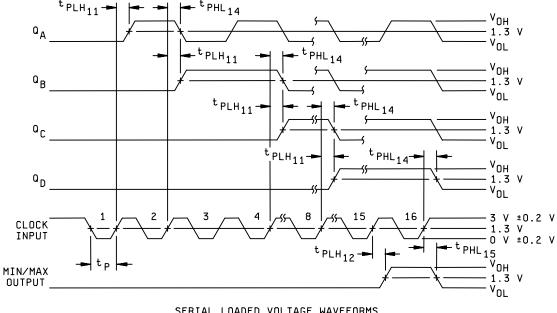
FIGURE 9. Switching time test circuit and waveforms for device type 08.



- 1. The load and count pulse generators have the following characteristics: $V_{gen} = 3 V$, $t_p = .5~\mu s,~PRR \leq 1~MHz,~Z_{out}~\approx~50\Omega,~t_r \leq 15~ns,~t_f \leq 6~ns~between~0.7~V~and~2.7~V.$
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$
- 6. The clear pulse generator has the following characteristics: $V_{gen} = 3.0 \text{ V}$, $t_r \le$ 15 ns, $t_f \le$ 6 ns, between 0.7 V and 2.7 V, $t_{w(CLEAR)}$ = 20 ns.

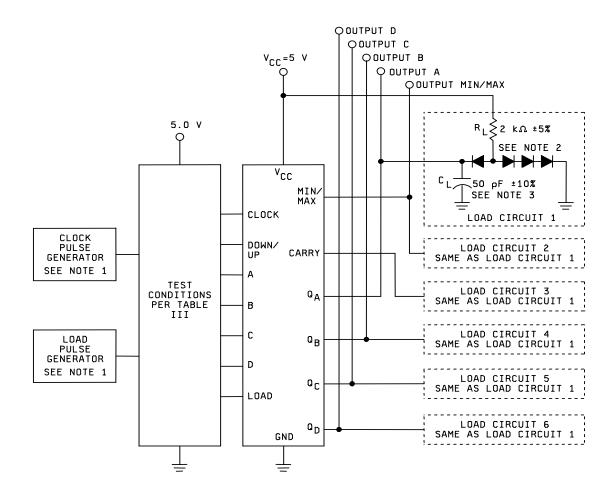
FIGURE 9. Switching time test circuit and waveforms for device type 08 - Continued.





SERIAL LOADED VOLTAGE WAVEFORMS (COUNT UP MODE)

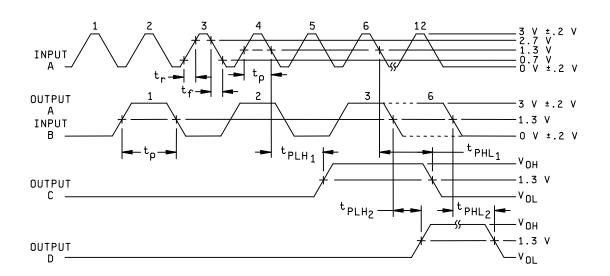
FIGURE 10. Switching time test circuit and waveforms for device type 09.



TEST CIRCUIT

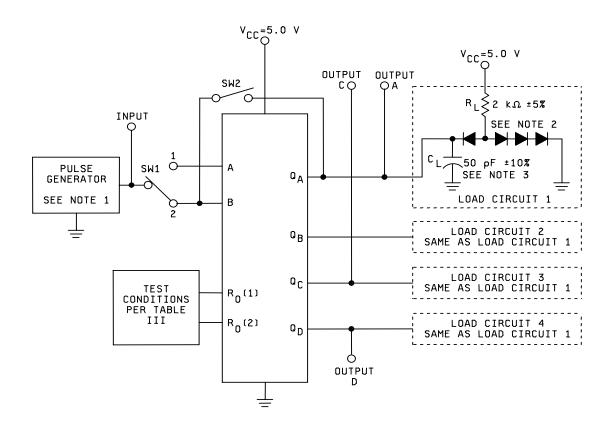
- 1. The pulse generator has the following characteristics: $V_{gen} = 3 \text{ V}$, $t_{p}=.5~\mu s,~PRR \leq 1~MHz,~Z_{out}~\approx~50\Omega,~t_{f} \leq 15~ns,~t_{f} \leq 6~ns~between~0.7~V~and~2.7~V.$
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$

FIGURE 10. Switching time test circuit and waveforms for device type 09 - Continued.



VOLTAGE WAVEFORMS

FIGURE 11. Switching time test circuit and waveforms for device type 10.

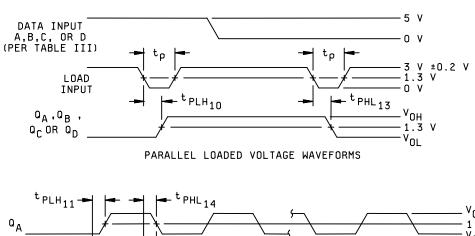


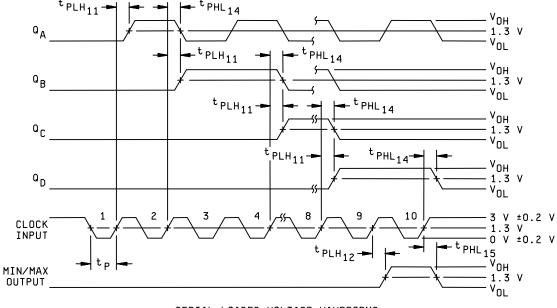
TEST	SWITCH POSITION									
	SW1	SW2								
F MAX	1	CLOSED								
A TO Q _C	1	CLOSED								
B TO Q _D	2	OPEN								

TEST CIRCUIT

- 1. The pulse generator has the following characteristics: $V_{gen} = 3 \text{ V}$, $t_r \le 15 \text{ ns}$, $t_{\text{f}} \leq 6 \text{ ns, } t_{\text{p}} = .5 \ \mu\text{s, PRR} \leq 1 \ \text{MHz, } Z_{\text{out}} \ \approx \ 50\Omega.$
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$

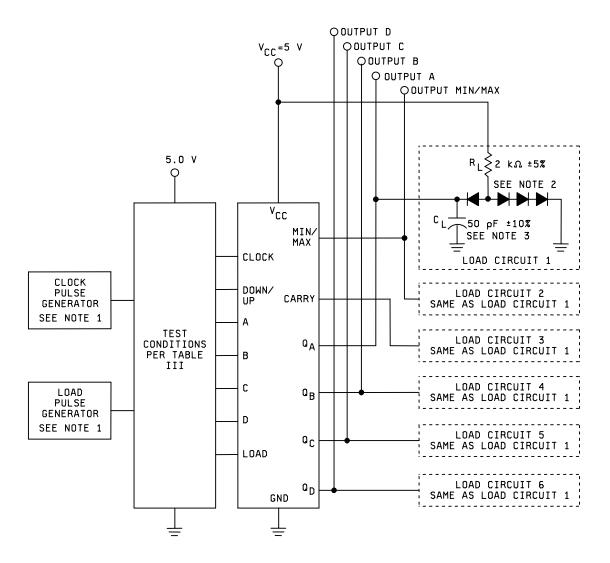
FIGURE 11. Switching time test circuit and waveforms for device type 10 - Continued.





SERIAL LOADED VOLTAGE WAVEFORMS (COUNT UP MODE)

FIGURE 12. Switching time test circuit and waveforms for device type 13.



- 1. The pulse generator have the following characteristics: $V_{gen} = 3 \text{ V}$, $t_{o} = .5 \text{ }\mu\text{s}$, PRR \leq 1 MHz, $Z_{out} \approx 50\Omega$, $t_{f} \leq$ 15 ns, $t_{f} \leq$ 6 ns, between 0.7 V and 2.7 V.
- 2. All diodes are 1N3064 or equivalent.
- 3. C_L includes probe and jig capacitance.
- 4. Voltage values are with respect to ground terminal.
- 5. F_{MAX} : $t_r = t_f \le 6 \text{ ns.}$

Figure 12. Switching time test circuit and waveforms for device type 13 - Continued.

TABLE III. Group A inspection for device type 01. ditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$;

		MIL-STD-	Cases	1	2	3	4	5	6	7	nay be H 8	9	10	11	12	13	14		Lit	nits	
		883	A,B,C,D																		
Subgroup	Symbol	method	Cases <u>1</u> /	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured			Unit
			Test no.	В	R ₀ (1)	R ₀ (2)	NC	V _{CC}	R9(1)	R9(2)	Qc	Q _B	GND	Q_D	Q_A	NC	Α	terminal	Min	Max	
1	V _{OL}	3007	1	2.0 V	2.0 V	2.0 V		4.5 V	GND	GND	4mA		GND				GND	Qc		0.4	V
Γc = 25°C			2			"			GND	GND		4 mA	"				"	Q _B			
			3						2.0 V	0.7 V				4 mA				Q_D			
			4	GND					0.7 V	2.0 V					2/		2.0 V	Q_A			
			5	2.0 V		0.7 V			2.0 V	"	4 mA						GND	Q _C		"	
			6	2.0 V	0.7 V	2.0 V						4 mA						Q _B			
	V _{OH}	3006	7	2.0 V	2.0 V	0.7 V								-0.4 mA				Q_D	2.5		
			8	GND	0.7 V	2.0 V									-0.4 mA		2.0 V	Q_A	"		
			9	2.0 V		0.7 V		-	-	-				-0.4 mA			GND	Q _D			
		-	10	GND		0.7 V									-0.4 mA		2.0 V	Q _A			
			11	3/ 4/	<u>3</u> /	<u>3</u> /			0.7 V	0.7 V	-0.4 mA	0.4 4					GND	Qc			-
		2000	12 13	<u>3</u> / <u>5</u> /	<u>3</u> / 0.4 V	3/		·	0.7 V	0.7 V		-0.4 mA					GND	Q _B	6/	0/	
	I _{IL1}	3009	14		5.5 V	5.5 V 0.4 V		5.5 V										R _O (1) R _O (2)	<u>b</u> /	<u>6</u> /	mA
			15		5.5 V	0.4 V			0.4 V	5.5 V								R ₀ (2)			
			16						5.5 V	0.4 V								R9(2)			
									3.5 V	3/								` ` `			
	I _{IL2}		17		GND	GND											0.4 V	Α		-	
	I _{IL3}		18	0.4 V	GND	GND			<u>3</u> /	<u>3</u> /								В	"		
•	V_{IC}		19					4.5 V	-18 mA									R9(1)		-1.5	V
			20							-18 mA								R9(2)			
			21														-18 mA	Α			
			22	-18 mA				-										В			
			23		-18 mA													R ₀ (1)			
		2010	24			-18 mA			0.71/									R ₀ (2)			
	I _{IH1}	3010	25					5.5 V	2.7 V	071/								R9(1)		20	μA "
			26 27		2.7 V			-		2.7 V								R9(2)			-
		44	28		2.7 V	2.7 V											-	R _O (1) R _O (2)			
		66	29			2.1 V			5.5 V									R9(1)		100	
	I _{IH2}	64	30						3.5 V	5.5 V								R9(2)		100	
		44	31		5.5 V					J.J V								R ₀ (1)			
		66	32		0.0 V	5.5 V												R ₀ (2)			
		66	33			0.0 1											2.7 V	Α		00	
	I _{IH3}	4																		80	
	I _{IH4}	-	34														5.5 V	Α		400	
	I _{IH5}	44	35	2.7 V														В		160	
•	I _{IH6}	44	36	5.5 V														В		800	"

See footnotes at end of device types 01.

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

Surpey S							Termin	al condition	ne (nine not	designated	may be H	20 V or I	< 0.7 V or c	nen)								
Subgroup Symbol Miss State Cases y 2 3 4 6 8 9 10 12 13 14 16 18 19 20 terminal Miss					1	2									11	12	13	14	Measured	Lim	its	Unit
1	Subgroup	Symbol		Cases 1/	2	3	4	6	8	9	10	12	13	14	16	18	19	20				
Te = 29°C 1 38					В	R _o (1)	R ₀ (2)	NC	V _{cc}	R9(1)	R9(2)	Qc	Q _B	GND	Q_D	Q_A	NC	Α		Min	Max	1
1 39 39 39 39 39 30 10 10 10 10 10 10 10	1	Ios	3011	37		GND	GND		5.5 V	5.5 V	5.5 V			GND	GND				Q_D	-15	-100	mA
Column A A Column Conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $\Gamma_C = 125^\circ C$ and V_C tests are omitted. Same tests, terminal conditions, and limits as for subgroup 1, except $V_C = 125^\circ C$ and $V_C = 125^\circ C$ a	Tc = 25°C					GND					5.5 V			"		GND						
Loc							3/						GND									
2 Same tests, terminal conditions, and limits as for subgroup 1, except T _C = 125°C and V _C tests are omitted. 3 Same tests, terminal conditions, and limits as for subgroup 1, except T _C = -55°C and V _C tests are omitted. 7 T _C = 125°C tests				40	<u>3</u> / <u>4</u> /	66	"					GND		"					Qc			
3 Same tests, terminal conditions, and limits as for subgroup 1, except T _C = -55°C and V _C tests are omitted. 7 Func. = -25°C Func. = -25°C 7 Func. = -25°C 7 Func. = -25°C 7 Func. = -25°C 8		Icc		41	GND						-								V _{CC}		15	•
Tc = +25°C See 9' Function See 9' See 9	2	Same tests,	terminal condi	tions, and limits	as for sub	group 1, e	xcept T _C =	125°C and	V _{IC} tests are	e omitted.												
Tc = +25°C blones	3							-55°C and \		omitted.												
tests		1																				
1	$T_C = +25^{\circ}C$					- :											ļ	-:-				
1							, D										ļ	-:-	1			
147 B		<u>"</u> "															ł		-			
** 48										B							t		+			
** 49										"					-		ł					
See 9/ S													"	"	"		İ					
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* 555 B * * * * * * * * * * * * * * * *		139 3/5 3/9 3/1																				
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Second S		1				H					ļ		0 0/									
Signature Sign				See <u>9</u> /																		
** 59 B *													ļ									
												-			ш		ł	-	1			
** 61 B *												-					ł					
** 62																	t		1			
Color Colo							В				В		"	"			İ					
1				63	Α					Α					"		İ		1			
Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Color Colo						Α								"	"		İ					
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772 B ' ' ' ' ' ' ' ' L ' ' ' ' ' ' ' ' ' '																	ŀ		-			
73 B B				41 GND																		
** 74						B				B							ł					
** 75 B A *										"							t		1			
** 76											Α		Н	"			İ					
** 77 B *																	İ		ĺ			
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79 B							3															
** 81 B B * A * * * * * * * * * * * * * * * *																	l					
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* 84 A * * * H * * * * * * * * * * * * * * *						-:-								- "			ŀ		-			
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				84 85	B	-			-	-	-	Н	L			-	ł	-	-			

See footnotes at end of device type 01.

TABLE III. Group A inspection for device type 01 - Continued Terminal conditions (pins not designated may be H \ge 2.0 V or L \le 0.7 V or open).

			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured	Lim	its	Unit
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	6	8	9	10	12	13	14	16	18	19	20	terminal			
		method	Test no.	В	R ₀ (1)	R ₀ (2)	NC	Vcc	R9(1)	R9(2)	Qc	Q _B	GND	Q_D	Q_A	NC	Α		Min	Max	
7	Func-	3014	86	A 8/	B <u>8</u> /	Α		4.5 V	Α	В	Н	L	GND	L	L		В				
$T_C = +25^{\circ}C$	tional		87	В		Α				В	Н	Н		L	L						
-	tests		88	Α		В			"	A	L	L		Н	Н						
	7/		89			В				В				Н	Н						
			90		Α	A			В					L	L						
			91	В	Α	Α															
			92	A	В	В															
			93	В	-							Н									
			94	A								Н									
			95	В							Н	Ľ									
			96	A							- ;	Ĺ				ł					
			97	В								H				ł					
			98	A								H				ł					
			99	В	Α	Α					L	i.				ł					
			100	В	В	В					÷	-						See <u>9</u> /			
			101	A														366 <u>3</u> /			
			101	B					-			Н					-				
		-	102	A A	-				-			H	-		-	ļ	-				
		-				-			-				-								
		-	104	В		-			-		н.	L	-				-				
			105	A					-			L					-				
		- :	106	В		-		- :	- "	- :		Н	-				-				
		- :	107	A	- :			- :				Н					-				
		- :	108	A	- :			- :	A	A	Ļ	L		Н	H		- :				
		- :	109	В	- :			- :	Α	A					-:-		- :				
		_	110	В					В	В											
			111	Α					"												
			112	Α	Α	Α			"	•			"	L	L						
		•	113	В	Α	Α		•	"	•			"								
			114		В	В											Α				
			115												H		В				
			116												Н		Α				
			117												L		В				
			118			Α											Α				
			119		Α	Α											В				
			120		Α	В											A				
			121	"	В				"	A					Н		В				
			122	"					"								Α				
			123						Α					Н			В				
			124	"	Α				"	В							Α				
			125	"	Α	A			"	Α				"			В				
8	Same tests,	terminal condi	tions, and limits	as for sub	group 7, e	xcept T _C = 1	125°C and -	-55°C.							•				•		
9 T _C = +25°C	F _{MAX}	3003 (Fig. 4)	126		GND			5.0 V	GND				GND		OUT		IN <u>10</u> /	A to Q _A	29		MH
200	t _{PLH1}	(1.9.1)	127		11/	A 8/				1	OUT	1			l		IN	A to Q _C	3	53	ns
			128		GND	7. 0/				f	OUT	f					IN	A to Q _C		58	"
	t _{PHL1}		129	IN	11/	Α				1	001	1		OUT	 	1	1174	B to Q _D		37	-
	t _{PLH2}		130	IN	GND	^				1		1		OUT	 	1		B to Q _D		40	-
10	F _{MAX}		131	IIN	GND					-		-		001	OUT		IN <u>10</u> /	A to Q _A	29	40	MH
T _C = +125°C			132	 	11/	Α				1	OUT	1			 	1	IN	A to Q _C	3	74	no
	t _{PLH1}	-		-		А				1		1			-	ļ			3		ns
	t _{PHL1}	-	133	INI	GND					4	OUT	4		OUT	-		IN	A to Q _C		81	+
	t _{PLH2}		134	IN	11/	Α			-	1		1	-	OUT		ļ		B to Q _D		52 56	
	t _{PHL2}		135	IN	GND													B to Q _D			

See footnotes at end of device type 01.

- $\underline{1}/$ Case 2 pins not referenced are N/C.
- 2/ Test 4, Pin 12; 4 mA + I_{IL3(MAX)}.
- $\underline{3}\!/$ Apply 4.5 V pulse then ground prior to taking measurements to set device in the desired state.
- $\underline{\textit{4}}/$ Apply two pulses after R_O (reset) pulse.
- $\underline{\textbf{5}}/\quad$ Apply one pulse after R_O (reset) pulse.
- 6/ I_{IL} limits (mA) min/max values for circuits shown:

Parameter	Terminals				Circuits			
		Α	В	С	D	E	F	G
I _{IL1}	R ₀ (1)	-12/36	03/40		03/40	-12/36	-12/36	
	R ₀ (2)				"	"		
	R9(1)					"		
	R9(2)					"		
I _{IL2}	Α	-0.5/-2.0	-1.0/-2.4		-1.0/-2.4	-1.0/-2.4	-0.5/-2.0	
I _{IL3}	В	-0.4/-1.6	-1.3/-3.2		-1.3/-3.2	-1.3/-3.2	-1.0/-2.4	

- 7/ Only a summary of attributes data is required.
- $\underline{8}$ / A = 3.0 V minimum, B = 0.0 V or GND.
- <u>9</u>/ H > 1.5 V; L < 1.5 V.

- $\underline{10}/$ F_{MAX} minimum limit specified is the frequency of the input pulse. The output pulse shall be one-half of the input frequency.
- $\underline{11}\!\!/\,$ Momentary 3.0 V (min), then ground. Maintain ground for measurement.

TABLE III. Group A inspection for device type 02. nditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open)

			Cases	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Li	mits	
ubgroup	Symbol	MIL-STD-	A,B,C,D Cases1/	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured		1	Unit
ubgroup	Syllibol	883	2		3	-	O	0	9	10	12	13	14	10	10	19	20	terminal			Offic
		method	Test no.	В	R ₀ (1)	R ₀ (2)	NC	V _{cc}	NC	NC	Qc	Q _B	GND	Q_D	Q_A	NC	Α	101111111	Min	Max	
1	Vol	3007	1	GND	2.0 V	2.0 V		4.5 V					GND		2/		2.0 V	Q _A		0.4	V
c = 25°C		"	2	2.0 V								4 mA			_		GND	Q _B			
		"	3	"		"		"			4mA							Qc			
		"	4	"	"	"		"						4 mA				Q_D			
	V _{OH}	3006	5	GND	3/	<u>3</u> /		"							-0.4 mA		3/ 4/	Q_A	2.5		
		"	6	3/ 4/	3/	"		"				-0.4 mA					GND	Q _B			
		"	7	3/5/		"					-0.4 mA		-				"	Qc			
	.,		8	<u>3</u> / <u>6</u> /										-0.4 mA				Q _D	-		<u> </u>
	V _{IC}		9	-18 mA													-18 mA	A B		-1.5 mA	-
			10 11	-18 MA	-18 mA													R _O (1)			
			12		-10 IIIA	-18 mA												R ₀ (1)			
	I _{IL1}	3009	13		0.4 V	5.5 V		5.5 V										R ₀ (2)	7/	7/	mA
	'IL1	"	14		5.5 V	0.4 V		U.U V										R ₀ (2)	-17		"
	I _{IL2}		15		<u>3</u> /	<u>3</u> /		"									0.4 V	Α			
	I _{IL3}	"	16	0.4 V	<u>3</u> /	<u>3</u> /		"										В			
	I _{IH1}	3010	17		2.7 V	GND												R ₀ (1)		20	μА
	I _{IH1}	"	18		GND	2.7 V												R ₀ (2)		20	"
	I _{IH2}	"	19		5.5 V	GND		"										R ₀ (1)		100	
	I _{IH2}	"	20		GND	5.5 V												R ₀ (2)		100	
	I _{IH3}	"	21		5.5 V												2.7 V	А		80	
	I _{IH4}	"	22		"			"									5.5 V	Α		400	
	I _{IH5}	"	23	2.7 V	"	"		"										В		80	
	I _{IH6}	"	24	5.5 V	"	"		"										В		400	
	los	3011	25	GND	3/	3/		"							GND		3/ 4/	Q _A	-15	-100	mA
		"	26	3/ 4/		"						GND					GND	Q _B			
		"	27	3/ 5/	"	"		"			GND						"	Qc			
		"	28	<u>3</u> / <u>6</u> /	"	"		"						GND			"	Q_D			
	Icc	3005	29	GND				"										V _{CC}		15	
	Same tes	ts, terminal	29 conditions, conditions,	and limits				T _C = 125°										V _{CC}		15	

See footnotes at end of device types 02.

TABLE III. Group A inspection for device type 02 - Continued Terminal conditions (pins not designated may be H \ge 2.0 V or L \le 0.7 V or open).

									ucsignated	I may be in	2.0 V 01 L	≥ 0.7 V 01									
			Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured	Lim	iits	Unit
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	6	8	9	10	12	13	14	16	18	19	20	terminal			ı
		method	Test no.	В	R ₀ (1)	R _o (2)	NC	V _{cc}	NC	NC	Qc	Q _B	GND	Q _D	Q _A	NC	А		Min	Max	ı
7	Func-	3014	30	B 9/	A 9/	A		4.5 V			L	L	GND	L	L		B <u>9</u> /				
Tc = 25°C	tional		31	A			İ									t					1
	tests		32	В			Ť		1			"		"		Ĭ					ı
	<u>8</u> /		33	В		В										I					ı
			34	Α								"					•				ı
		- :	35	B	- :	"	1	- :			- :	Н			- :	1	-				ı
			36 37		В	A	+	-	-			L	-	-		ļ	-				ı
			38	Α	. D		ł		-							ł					ı
			39	A		В	ŧ		1							ŧ					ı
			40	В		-	Ť					Н				t					ĺ
			41	Α			İ					Н				Ĭ					1
			42	В		"					Н	L				I	•				ı
		- :	43	A	- :						- :	L			- :	ļ	-				ı
		- :	44	В	- :		ł	-:-			- :	Н		- :		ł					1
			45 46	A B				-	-		L	H		Н							ı
			47	A					-		-	- i		- ''							ı
			48	В								H						See 10/			1
			49	Α			İ					Н				Ī		_			.
			50	В		"					Н	L				I					.
			51	Α								L				ļ					.
		- :	52 53	B A			+	- :	-		- :	H				ļ	-				ı
			53	В			ŧ				L	L		L		ł					.
			55	A			ŧ		1		-	i i		-		ŧ					.
			56	В			İ					Н				t					.
			57	Α			Ī		1			Н				Ī					ı
		- :	58	В							Н	L					•				.
			59	A B	:		1	- :			- :	L			:	1	-				ı
			60 61	A					-			H									.
			62	В			ŧ		1		L	L'		Н		ŧ					ı
			63	A							·	Ĺ									1
			64	В			Ť		1			Н		"		Ĭ					.
			65	В	Α							"				I					ı
		- :	66	A									"	"		ļ					ı
		- :	67 68	B A	-:-		ł	-:-			H	L				ł					1
			69	В			ł		-			Н				ł					.
			70	A			ŧ		1			Н				ŧ					.
			71	A		Α			1		L	Ë		L		İ					ı
			72	В		Α										1					.
			73	"	В	В	1					"				1	A				1
			74					•							Н		В				ı
		- :	75 76	-	-:-	-		-:-			- :	- '			Н		A B				.
8	Samo toete	torminal condi	tions, and limits	on for out	group 7 o	voont T -	.125°C and	. 55°C	1	1					L		В				
9	F _{MAX}	3003	77	as ioi sub	GND	vcehr IC =	+125 C and	5.0 V					GND		OUT		IN <u>11</u> /	A to Q _A	29	1	MHz
T _C = +25°C		(Fig. 5)					1		1							1					
	t _{PLH1}	**	78		12/	A <u>9</u> /	1		1		OUT				<u> </u>	1	IN	A to Q _C	3	53	ns
	t _{PHL1}		79 80	IN	GND 12/	Α	1	- :	-		OUT			OUT		1	IN	A to Q _C B to Q _D		58 56	-
	t _{PLH2} t _{PHL1}		80	IN	GND	А	1		1		-			OUT	1	ŧ	 	B to Q _D		56	-
l	PHL1	1	31	HN	CIND		1	1	1	1	1	1	1	501	1	1	1	ביט עס	1	50	

See footnotes at end of device type 02.

TABLE III. <u>Group A inspection for device type 02</u> - Continued nal conditions (pins not designated may be $H \ge 2.0 \text{ V}$ or L $\le 0.7 \text{ V}$ or open).

						emma co	mullions (pina not de	signated	i illay be i	1 = 2.0 V C	JI L = 0.7	v oi opeii).								
			Cases	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Lim	its	Unit
			A,B,C,D															Measured			1
Subgroup	Symbol	MIL-STD-	Cases 1/	2	3	4	6	8	9	10	12	13	14	16	18	19	20	terminal			1
	.,	883	2				-														1
		method	Test no.	В	R ₀ (1)	R ₀ (2)	NC	V _{cc}	NC	NC	Qc	Q _B	GND	Q_D	Q_A	NC	Α		Min	Max	
10	F _{MAX}	3003	82		GND			5.0 V					GND		OUT		IN 11/	A to Q _A	29		MHz
$T_C = +125$ °C		(Fig. 5)																			1
	t _{PLH1}		83		<u>12</u> /	Α					OUT					I	IN	A to Q _C	3	74	ns
	t _{PHL1}		84		GND						OUT		"			Ī	IN	A to Q _C		81	"
	t _{PLH2}		85	IN	12/	Α								OUT		I		B to Q _D		78	"
	t _{PHL2}		86	IN	GND								"	OUT		Ī		B to Q _D		78	"
11	Same test	s, terminal c	onditions, ar	nd limits	as for sub	ogroup 10	except, T	_C = 55°C													

- $\underline{1}/$ Case 2 pins not referenced are N/C.
- $\underline{2}/$ For test 1, 4 mA +I_{IL3} (max).
- 3/ Apply 4.5 V pulse, then ground prior to taking measurements to set device in the desired state. Maintain ground for measurement.
- $\underline{4}\!/$ Input pulse must be applied one time after R₀ pulse.
- $\underline{5}$ / Input pulse must be applied twice after R_O pulse.
- $\underline{6}\!/$ Input pulse must be applied four times after R_O pulse.
- $\underline{\textbf{7}}/\quad \textbf{I}_{\text{IL}}$ limits (mA) min/max values for circuits shown:

Parameter	Terminals				Circuits			
		Α	В	С	D	E	F	G
I _{IL1}	R ₀ (1)	-12/36	03/40	-12/36	03/40	-12/36	-12/36	
	R ₀ (2)		"	"		"		
I _{IL2}	Α	-0.5/-2.0	-1.0/-2.4	-0.5/-2.0	-1.0/-2.4	-1.0/-2.4	-0.5/-2.0	
I _{IL3}	В	-0.4/-1.6	-0.4/-1.6	-0.4/-1.6	-0.4/-1.6	65/-1.6	-0.4/-1.6	
	I _{IL1}	I _{IL1} R _O (1) R _O (2) I _{IL2} A	A	A B B	A B C C I _{IL1} R ₀ (1) -12/36 03/40 -12/36 R ₀ (2) " "	A B C D	A B C D E	A B C D E F F

- 8/ Only a summary of attributes data is required.
- $\underline{9}/$ A = 3.0 V minimum; B = 0.0 V or GND.
- <u>10</u>/ H > 1.5 V; L < 1.5 V.
- $\underline{11}/$ F_{MAX} min limit specified is the frequency of the input pulse. The output frequency shall be one-half the input frequency.
- 12/ Momentary 3.0 V (min), then ground. Maintain ground for measurement.

TABLE III. Group A inspection for device types 03, 04, 11, and 12.

			Cases E, F	1	2	3	4	5	6	7	8	y be H ≥ 2	10	11	12	13	14	15	16		Lie	mits	Г
group	Symbol	MIL-STD- 883	Cases1/	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured		IIIO	Unit
		method	2 Test no.	Clear	Clock	A	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Qa	Ripple	V _{cc}	terminal	Min	Max	
		0000				^	-		_	Lili			LIII		Q()	αB	Q _A	carry					<u> </u>
	V _{OL}	3007	1	4.5 V	<u>2</u> /			0.717	0.7 V		GND	GND		4 mA					4.5 V	Q _D		0.4	V
+25°C		_	2				0.71/	0.7 V			-				4 mA				-	Qc		-	
		-	3			0.71/	0.7 V					-			ļ	4 mA			-	Q _B			_
			4 5			0.7 V							0.7 V		-		4 mA		-	Q _A			
		-	5										0.7 V					4 mA		Ripple carry			
	V _{OH}	3006	6		2/				2.0 V			GND		4 mA						Q _D	2.5		
			7					2.0 V							4 mA				"	Qc			
			8				2.0 V									4 mA				Q _B			
		"	9			2.0 V											4 mA			Q_A	44		
		"	10			2.0 V	<u>3</u> /	<u>3</u> /	2.0 V				2.0 V					4 mA		Ripple carry	"		
	V _{IC}		11	-18 mA																Clear		-1.5	
	* IC		12	101181	-18 mA															Clock		"	
			13			-18 mA														A			
			14				-18 mA													В			
			15					-18 mA												С			
			16						-18 mA											D			
			17							-18 mA										EnP			
			18									-18 mA								Load			_
			19								"		-18 mA						-	EnT			
	I_{IL4}	3009	20	0.4 V							"								5.5 V	Clear	<u>4</u> /	<u>4</u> /	μ
	I _{IL6}		21		0.4 V						"								ш	Clock	"	"	
	I _{IL4}		22			0.4 V						GND							ш	Α	44	ш	-
	*IL4		23			0.11	0.4 V					"							ш	В	44	ш	-
			24					0.4 V			"	"							"	c	"	"	
		"	25						0.4 V		"	"							"	D		"	
			26							0.4 V	**	4.5 V	4.5 V						ш	EnP	44	"	
	I _{IL5}		27							4.5 V	"	0.4 V	4.5 V							Load	"	"	
	I _{IL5}		28 5/							4.5 V		4.5 V	0.4 V						ш	EnT	44		
	I _{IH13}	3010	29 13/	2.7 V							"								u.	Clear		20	
	I _{IH9}	"	30		2.7 V						"								u u	Clock		40	
			31	-	1	2.7 V	1	-				1			1		-	1		A	-	20	\vdash
	I _{IH11}	"	32			2.7 V	2.7 V												ш	В		"	
		"	33				2.1 V	2.7 V											ш	C			\vdash
			34		+		!	Z.1 V	2.7 V		44	+			-			!	и	D	-		1
		44	35			1			2.7 V	2.7 V		GND	GND	1						EnP		"	
	I _{IH9}	"	36		+		!	-		GND		2.7 V	GND		-			!	ш	Load	-	40	
	I _{IH9}		37	l	 			 		GND		GND	2.7 V		 				ш	EnT		40	١.

See footnotes at end of device types 03, 04, 11, and 12.

TABLE III. Group A inspection for device types 03, 04, 11, and 12 – Continued.

			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lir	nits	
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal			Unit
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q_D	Qc	Q _B	Q_A	Ripple carry	V _{CC}		Min	Max	
1	I _{IH14}	3010	38 <u>13</u> /	5.5 V							GND								5.5 V	Clear		100	μА
c = +25°C	I _{IH10}		39		5.5 V															Clock		200	
	I _{IH12}		40			5.5 V														A		100	
			41				5.5 V													В			
		"	42					5.5 V												С			
			43						5.5 V											D			-
		-:-	44							5.5 V	-	GND	GND							EnP			
	IH10		45							GND	- :	5.5 V	GND						-	Load		200	-
	IH10	3011	46 47	4.5 V	2/				4.5 V	GND	-	GND GND	5.5 V	GND						EnT	-15	200 -100	mA
	los	3011	47	4.5 V	<u>2</u> /			4.5 V	4.5 V			GND "		GND	GND				-	Q _D	-15	-100	mA "
			49				4.5 V	4.5 V							GIND	GND				Q _B			
			50			4.5 V	1.0 1									0.10	GND			Q _A	**		-
		u	51			4.5 V	<u>6</u> /	<u>6</u> /	4.5 V				4.5 V					GND		Ripple			
	I _{CCH}	3005	52	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V		5.5 V	5.5 V							Vcc		31	
	I _{CCH}	44	53	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V		GND	5.5 V									31	
	I _{CCL}	"	54	GND	GND	GND	GND	GND	GND	GND		GND	GND									32	
	I _{CCL}	"	55	GND	GND	GND	GND	GND	GND	GND		GND	GND									32	
2	Same te	sts, termina	al conditions	s, and limit	s as for s	ubgroup	1, excep	ot T _C = 1	25°C an	d V _{IC} tes	ts are or	mitted.											
3	Same te	sts, termina	al conditions	s, and limit	s as for s	ubgroup	1, excep	ot T _C = -5	55°C and	l V _{IC} test	s are on	nitted.											

See footnotes at end of device types 03, 04, 11, and 12.

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TABLE III. Group A inspection for device type 03 – Continued. Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$ or $L \le 0.7 \text{ V}$ or open).

			Cases E, F	1	2	3	4	5	6	7	8	9	10 10	11	12	13	14	15	16	Measured	Limi	its	Ur
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Q _A	Ripple	V _{cc}	-	Min	Max	
7	Func-	3014	56	B <u>8</u> /	A 8/	A <u>8</u> /	A <u>8</u> /	Α	Α	A	GND	Α	Α	L	L	L	L	L	4.5 V				
= +25°C	tional		57	Α	Α	В.	В	В	В	и			В										
	tests		58	"	В	Α	Α	Α	Α	u			Α			66	"			1			
	7/		59	"	A	A	A	A	A	u			A			66	Н			1			
	I-		60		Α	В	В	В	В				В										
			61	"	В	A	A	A	A				A							1			
			62		Α	A	Α	Α	Α			"	Α			Н	L						
			63		Α	В	В	В	В				В										
			64		В	Α	Α	Α	Α				Α										
			65		Α	A	Α	Α	Α				A				Н			1			
			66	"	Α	В	В	В	В				В										
			67		В	Α	Α	Α	Α				Α										
			68		Α	Α	Α	Α	Α				Α		Н	L	L						
			69		Α	В	В	В	В				В										
			70		В	Α	Α	Α	Α				Α										
			71	"	Α	A	A	Α	Α				Α				Н]			1
			72	"	Α	В	В	В	В				В]			1
			73	"	В	A	A	Α	Α				Α]			1
			74	"	Α	Α	Α	Α	Α				Α			Н	L			See <u>9</u> /			1
		•	75		Α	В	В	В	В	•			В							1			1
		•	76	"	В	A	Α	A	Α		•		Α										
		•	77		Α	Α	Α	Α	Α				Α				Н	•					
		-	78		Α	В	В	В	В				В					-					
		- :	79		В	Α	Α	Α	Α	- :	- :		Α										
		- :	80		Α	A	A	Α	Α	- :	- :		Α	H	Ļ	Ļ	L						
		- :	81	- :	A	В	В	В	В	- :	- :		В	- :	-:								
			82		В	A	A	A	A		-		A										
			83		A	A	A	A	A				A				H	Н					
			84 85		A B	B A	B A	B A	B A				B A					H					
			86		A	- A	, A	- A	A				A	L			L	L		+			
			87	В	A									-			-	-		+			
			88	A	A					В													
			89		В															1			
			90		A																		
			91		A	В	В	В	В	Α			В										
			92		A	A	A	A	A	*			-							1			
			93		В	*	A	A	A											1			
			94		A		A	A	A											1			
			95		A		В	В	В			В								1			1
			96	"	В		В	В												1			
			97	"	Α	"	В	В									Н			1			
			98		Α		Α	Α															1
			99	"	В]			1
			100	"	Α										Н	Н]			1
		•	101	"	Α				66	ű		Α			44	66	"		"	1			1
			102	"	В														"	1			1
			103		Α					•										1			1
		- :	104		Α		В	В	Α		- :	В								1			1
		- :	105		В	- :	-	-		- :	- :					-				4			
		- :	106		A	- :	- :	- :		- :	- :			H	Ļ	Ļ				4			
		- :	107		A	- :		- :		- :	- :	A	- :	- :	- :	-				1			
		- :	108	-	В	- :		- :		- :	-:-			- :	- :			<u> </u>	-	1			
		- :	109		A	- :				- :	- :				- :	- :				1			
		- :	110	В	Α	- :	A	A		- :	- :	B	A "	L	- :		L			1			
		- :	111	A	A	- :				- :	- :			- :	- :			<u> </u>		1			1
		- :	112	A	В	- :	- :	- :		- :	-:-					-				ł			1
		- :	113	A	A	- :	-	-	-	- :			-	Н.	H	Н	Н	X		ł			1
	1	1 -	114	В	Α	_	1 -	1 -	1 -	1 -	_	Α	1 "	L	L	L	L	L		1	1	1	1

TABLE III. Group A inspection for device type 03 – Continued. Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$ or $L \le 0.7 \text{ V}$ or open).

			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Lim	iits	Uni
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Q _C	Q _B	Q _A	Ripple carry	V _{cc}		Min	Max	1
7	Func-	3014	115	A <u>8</u> /	A <u>8</u> /	A <u>8</u> /	B <u>8</u> /	В	В	В	GND	В	В	L	L	L	L	L	4.5 V				
Tc = +25°C	tional		116	"	В	"			4			"		"	66	44	L						
	tests		117	"	Α	и		"	66	"	4	"	"	"		44	Н						
	7/		118	"	Α	В	44		Α	Α			Α			66							
			119	"	В		44	"		"	66	"	"	"	66	66	"	"	"				
			120	"	Α	и	66							Н			L						
			121		Α	и	Α		В	В		"	"			44	ı	*					
			122		В		44			"	**	"	"	"	**	**		*	4				
			123		Α	и	66						"	L		Н							
			124		Α	и	В	A	A	"	64	"	"	"	66	44	"	**					
			125	"	В	и	ш	"	44	"	64	"	"	"	66	66	"	*					
			126		Α	u	4	"	**	"	44	"	"	Н	Н	L							
			127		Α	"	Α	"	44				В		66	44	"						
			128		В	ii .	ш	"	4				"										
			129	"	A	u .	44	"					"			H		- :					
			130		Α	Α	В	В		A			Α						-				
		- :	131		В		66			"	4		"	"		"		"					
			132	-	A										L.	L	H	Н					
			133		A		A	A	В	B			В "			-		L		See <u>9</u> /			
			134 135		B A		"							ı	Н	Н							
			135		A	В	44	В	A	A				- L	н	- H							
			137		В	D	44	D	- A	A			- 44			-							
			138		A	и								Н		-							
			139		A	Α	44	"	В				Α	- "	-	-	-						
			140		В								- ^			-							
			141		A	-								L			Н						
			142		A	В	В	Α						-									
			143		В		-	- '															
			144		A	-									Н	L	L						
			145		A	Α									- 1		ī						
			146		В	*														1	1	1	1
			147		A												Н						
			148		A	В	Α													1	1	1	
			149		В	-																	
			150		A	-										Н	L						

See footnotes at end of device types 03, 04, 11, and 12.

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

				,									0.7 V or ope		,			,	,				
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Limi	its	Un
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Q _A	Ripple	V _{CC}		Min	Max	
7	Func-	3014	56	B <u>8</u> /	A <u>8</u> /	A <u>8</u> /	A	Α	Α	A 8/	GND	Α	Α	L	L	L	L	carry	4.5 V				\vdash
Гс = +25°С	tional		57	Α	Α	В	В	В	В	"	0.10		В	-	-	-	-	-					
C = 723 C	tests		58	"	В	A	A	A	A	ш			A			66	ш	"					
	7/		59		A	A	A	A	A	"			A			66	Н	"					
	-		60		A	В	В	В	В				В				- "						
			61		В	A	A	A	A				A										
			62		A	A	A	Α	A				A			Н	L	"					
			63		Α	В	В	В	В				В				"						
			64		В	A	A	A	A				A										
			65		Α	A	Α	Α	Α				Α				Н						
			66	"	Α	В	В	В	В				В										
			67		В	A	Α	Α	Α				Α										
			68		A	A	A	Α	Α				A		Н	L	L						
			69		A	В	В	В	В				В										
	1		70		В	Α	Α	Α	Α				Α										1
	1		71		Α	Α	Α	Α	Α				Α				Н			1			1
	1		72		Α	В	В	В	В				В										1
	1		73	"	В	A	A	Α	Α				Α										1
			74	"	Α	Α	Α	Α	Α				Α			Н	L			See <u>9</u> /			
			75		A	В	В	В	В				В										
			76		В	Α	Α	Α	Α				Α										
			77	"	Α	A	A	A	Α				Α				Н						
			78	"	A	В	В	В	В				В										
			79	"	В	A	A	Α	Α				Α			•							
		-	80		Α	Α	Α	Α	Α				Α	Н	L	L	Ļ						
			81		Α	В	В	В	В				В			•							
		- :	82	"	В	A	A	A	A				A				"						
			83		A	A	A	Α	Α		- :		Α	- :			H	"					
			84		A	В	В	В	В	-	-		В			-							
			85		В	A	A	A	A				A										
		-	86		A	A	A	A	A				A			H	L "						
			87 88		A B	B A	В	B A	B A				B A			-							
			89		A	A	A A	A	A				A				Н						
			90		A	В	В	В	В				В										
			91		В	A	A	A	A				A										
			92		A	A	A	A	Ä				A		н	L	L						
			93		A	В	В	В	В				В		- ''	-	-						
			94		В	A	A	A	A				A										
	1		95		A	A	A	A	A			"	A				н			1			1
	1		96		A	В	В	В	В				В							1			1
	1		97		В	A	A	A	A				A							1			1
	1		98		Α	A	A	Α	Α				Α			Н	L			1			1
	1		99		A	В	В	В	В				В							1			1
	1		100		В	Α	Α	Α	Α				Α			66				1			1
	1		101		Α	Α	Α	Α	Α	и		"	Α		66	66	Н	Н	"				1
	1		102	"	Α	В	В	В	В				В					L					1
	1		103	44	В	Α	Α	Α	Α				Α					Н					1
	1		104	"	A	A	A	A	Α				Α	L	L	L	L	L					1
	1		105	В	Α	A	A	Α	Α				Α										
	1		106	Α	Α	Α	A	Α	Α	В			Α	"	**	66							1
	1		107	"	В	-	-	-	-	В	-		В	-		•		-	-				1
	1		108		Α					Α													1
	1		109		В		В	В	В								"						1
	1		110	"	Α		44	"				"	"	"			ш						1
	1	- :	111	"	В							В					"						1
	1	-:-	112	"	Α												Н						1
	1	-:-	113		A	-:-	A	A		- :	-			- "		66			"				1
	1		114		В		A	A						. "			"	"	. "	l	1		1

See footnotes at end of device types 03, 04, 11, and 12.

TABLE III. Group A inspection for device type 04 – Continued. Terminal conditions (pins not designated may be H \ge 2.0 V or L \le 0.7 V or open).

			Cases E, F	1	2	3	4	5	6	7	8	9	0.7 V or ope	11	12	13	14	15	16	Measured	Lim	nits	Uı
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Q _A	Ripple	V _{cc}		Min	Max	1
7	Func-	3014	115	A <u>8</u> /	A <u>8</u> /	Α	Α	Α	В	Α	GND	В	В	L	Н	Н	Н	L	4.5 V				+
= +25°C	tional		116		A				-			A	-	-				-					
- +23 C	tests		117	"	В					"		- 7				66	ш	44					
	7/		118		A																		
	D .		119	"	В		В	В	Α			В											
			120	"	A		В	В	- '`			-		Н	L								
			121	В	A		A	A		"		"	Α	ï	-	-	1	**					
			122	A	A		- 1	*						ī			-						
			123	"	В																		
			124		A									Н	Н	Н	Н	Н					
			125		В																		
			126	В	A							Α		L	L	L	L	L					
			127	Α	Α	В						В											
			128		В																		
			129	"	Α									Н	Н	Н	"						
			130		Α			В	В														
			131	"	В																		
			132		Α									L	L		"						
			133		Α	Α														See <u>9</u> /			
			134		В												"						
			135		Α												Н						
			136		Α	В	В	Α															
			137	"	В																		
			138		Α										Н	L	L						
			139	"	Α	A																	
			140	"	В												"						
			141		Α												Н						
			142	"	Α	В	Α										"	44					
		- :	143	"	В			-	-:-					- :									
			144		Α					- :				-		H	L						
		- :	145	"	Α	-	В	B	A		- :												
		-	146		В	- :	- :	- :	-:-		- :							-					
		-	147	-	A						-:-			H	L	L	- "	-					
		-	148		A	A	A			-						-							
			149		В																		
		-	150		A											H	H						
			151 152		A B	B	В	A										-					
										-						H -	H .	-					1
		-	153 154		A		-	-		-					H	Ŀ	L	-					
		-	154 155		A B	A	-	-		-							-	-					
			156		A												Н						

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

		,					Terminal c																
		MIL-STD-	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Lim	its	Unit
Subgroup	Symbol	883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Q _A	Ripple carry	V _{cc}		Min	Max	1
7	Func-	3014	56	B <u>8</u> /	B <u>8</u> /	B <u>8</u> /	В	В	B <u>8</u> /	A <u>8</u> /	GND	В	Α	Х	Х	Х	Х	X	4.5 V				1
Tc = +25°C	tional		57	В	Α					u u				L	L	L	L	L					
	tests		58	Α	В					"						66	ш	**					
	7/		59	Α	Α					ш						66	-	"					
			60	В	Α	Α	Α	Α	Α	"		Α					-						
		•	61	В	В	Α	A	Α	Α				•			•							
			62	В	Α	Α	Α	Α	Α									"					
			63	Α	Α	В	В	В	В				В			•							
		- :	64		В	Α	Α	Α	Α	:			Α		-	-							
		- :	65		A	A	A	A	A	- :			A	- :			Н	-					
		- :	66	-	A	В	В	В	В	- :			В	- :			-	-					
			67		В	A	A	A	A				A				- "						
		-	68		A	A	A	A	A				A			H	L.						
			69 70	-	A B	B A	B A	B A	B A				B A				-						
			70		A	A	A	A	A				A				Н						
			72		A	В	В	В	В				В										
			73		В	A	A	A	A				A										
			74		A	Ä	A	A	A				A		н	L	L			See 9/			
			75		A	В	В	В	В				В			-	-			000 <u>0</u> /			
			76		В	A	A	A	A				A										
			77		A	A	A	A	A				A				Н						
			78		A	В	В	В	В				В				- "						
			79		В	Α	Α	Α	Α				Α										
			80		Α	Α	A	Α	Α				Α			Н	L						
			81		Α	В	В	В	В				В										
			82		В	Α	A	Α	Α				Α										
			83		Α	Α	Α	Α	Α				Α				Н	**					
			84		Α	В	В	В	В				В				=	"					
			85		В	Α	Α	Α	Α				Α					"					
			86		Α	Α	Α	Α	Α				Α	Н	L	L	L						
			87		A	В	В	В	В				В				"						
		- :	88		В	В	В	В	В	"			В			•							
			89		В	Α	A	A	Α	:			A										
			90	"	Α	A	A	Α	Α				Α				Н	Н					
		- :	91	"	Α	В	В	В	В				В		-		-	L					
		- :	92	-	В	A .	A.	A "	A				A		-	-		Н					
		- :	93		A			- :					A	L.			L	Ļ					
		-	94 95		A B					B						-							
			96		A	-																	
			97		В					А			В										
			98		A	-	В	В	В	- ^													
			99		В		-	Ÿ	Ÿ			В											
			100		A										44	66	Н						
			101		A		A	Α		"					4	44	- 11		"				
			102		В														44				
			103		A										Н	Н							
			104		Α							Α											
			105		В																		
	1		106	Α	Α					Α				u		66					1		1
			107		В		В	В	Α			В											
			108		Α							В		Н	L	L							
			109		Α							Α											1
			110	"	В		44	"				"		"			"						
			111		Α		-		-			-	-	-		•	-						
	1		112	В	В		A	Α					Α					Н			1		1
			113	В	Α									L	66	66	L	L	"		1		
			114	Α	A			"				В			66	66	L		44				

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

Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V or } L \le 0.7 \text{ V or open}$).

Subgroup	Symbol	MIL-STD-	Cases E, F Cases 1/	1 2	3	3	5	5 7	6 8	7	8 10	9 12	10	11 14	12 15	13 17	14 18	15 19	16 20	Measured terminal	Lim	its	U
subgroup	Symbol	883	2	2		4						12								torriira			
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Q _A	Ripple carry	V _{cc}		Min	Max	
7	Func-	3014	115	A <u>8</u> /	B <u>8</u> /	Α	В	В	Α	Α	GND	В	Α	L	L	L	L	L	4.5 V				Т
= +25°C	tional		116		Α							4		Н			Н	Н					
	tests		117		В					u						66		44					
	<u>7</u> /		118	"	Α					ű													
			119	В	В			•		и													
			120	В	Α					•				L			L	L					
			121	Α	A	В			В	u		"	В			•		"					
		- :	122		В	- :	A		- :														
		-	123	-	A	- :	A	- :		- :	- :		- :	- :	-	Н		-					
		-	124 125		A		В		A	-				-		-							
			125		В									Н									
			126		A A				В				A	н		-							
			128		В				- D				A										
			129		A									-									
			130		A		Α	A	Α					-									
			131		В		,	*	- '`														
			132		A									Н	Н	Н							
			133		A	A		В	В											See 9/			
			134		В																		
			135	"	Α									L	L		Н						
			136		Α	В	В	A															
			137		В																		
			138		Α										Н	L	L						
			139		A	A		•		•													
		•	140		В					•						•	"						
		-	141	"	A			- :									Н						
			142		A	В	A	- :	- :	- :					-	- :							
		-	143	-	В				- :						-				-				
		-	144 145		A		В	В								H	L						
			145		A B		В "	В	Α														
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			148		A	Α								- 7	-	-							
			149		В	- ^																	
	1		150		A					и							Н	н					
	1		151		A		Α	A				Α											1
	1		152		В		,	•				- ^											1
	1		153		A													<u> </u>			1	1	- 1

See footnotes at end of device types 03, 04, 11, and 12.

TABLE III. <u>Group A inspection for device type 12</u> – Continued.

Symbol Misch Misch Cases 1 2 3 4 5 7 6 9 10 12 13 14 15 17 18 19 30				,										0.7 V or ope							,			
				Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Limi	its	Unit
Te 1	Subgroup	Symbol			2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
T = -250 C					Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Q _A		V _{CC}		Min	Max	•
Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Marie S Mari	7	Func-	3014	56	B <u>8</u> /	B <u>8</u> /	B <u>8</u> /	В	В	В	A <u>8</u> /	GND	В	Α	Х	Х	Х	Х		4.5 V		+	_	
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See footnotes at end of device types 03, 04, 11, and 12.

TABLE III. Group A inspection for device type 12 – Continued. Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$ or $L \le 0.7 \text{ V}$ or open).

		1	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Lin	nits	U
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q _D	Q _C	Q _B	Q_A	Ripple carry	V _{cc}		Min	Max	1
7	Func-	3014	115	A <u>8</u> /	В	A	B <u>8</u> /	B <u>8</u> /	В	A	GND	В	В	L	L	L	L	L	4.5 V			+	+
= +25°C	tional		116		A		В	В	-								Н						
= +25 C	tests		117		A		A	A								66	"						
	7/		118		В		- ^	- ^		и						-							
	11		119		A					и					н	Н							
			120	**	A							Α				- ;	**	44					
			121		В				66	"								44					
			122		A		В	В	Α														
			123		В			-	- 1			В				66							1
			124		A		ш		66			ï		Н	L	L							1
			125		A		Α	Α					Α	- 1	-								1
			126		В		*	- 1					- 1			66							1
			127		A				66						Н	Н		Н					1
			128		A	В																	1
			129		В	A								**									1
			130		В	A	В	В	В														1
			131		A	A	-	-	-					L	L	L		L					
			132		"	В								**	66	66							
			133		"	A	44	Α	Α											See <u>9</u> /			
			134		u u	В			Α											_			
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			145		В																		1
			146		Α												Н						
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					A	A											-						
		-	157 158		В			-		-						-	Н	-				1	1
			158	-	A A	В	В	A								-	H					1	1
			160		B	P .	P	A								-	-						1
			161		A										Н	1	L					1	-1
			162		A	A									Н.	÷	<u> </u>						1
			163		В	A .																1	-1
			164		A												Н					1	-1
			165		A							А				-	- ;;						-1
			166		В							- A											1
	1		167		A		-									Н					l	1	- 1

										nal conditi	ons (pins	not desi	ction for d gnated ma	ay be H≥	2.0 V; or	L ≤ 0.7 \	; or open									
		MIL-STD- 883		Ca:			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Li	mits	
Subgroup	Symbol	method		Cas	e <u>1</u> /		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
			([Test Device	no. types)	Clear	Clock	Α	В	С	D	EnP	GND	Load	EnT	Q_D	Qc	Q _B	Q_A	Ripple carry	V_{CC}	terminal	Min	Max	
9 Tc = +125°C	F _{MAX} 10/	3003 (Fig 6)	151	157	154	168	4.5 V	IN					4.5 V	GND	4.5 V	4.5 V				OUT		5.0 V	Q_A	22		MHz
	t _{PLH4}		152	158	155	169	"	"					44	44	"	"					OUT	**	Clk to carry	3	40	ns
	t _{PHL4}		153	159	156	170		"					**		"	"					OUT	"	Clk to carry		40	
	t _{PLH5}		154	160	157	171		"					44	66	"	"				OUT		"	Clk to Q _A		29	
		44	155	161	158	172		"					66			"			OUT			"	Clk to Q _B			
			156	162	159	173		"					44	66	"	ш		OUT				"	Clk to			-
			157	163	160	174	**	"						66	"	и	OUT					"	Q _C			-
	t _{PHL5}		158	164	161	175		"					66	66	"	"				OUT		"	Q _D Clk to		32	-
	PALS		159	165		176		"					4	4	"				OUT			"	Q _A Clk to	44	4	
		44	160	166		177							66	66	"			OUT					Q _B Clk to	66	66	-
		66	161	167		177								66	"		OUT	001					Q _C	66	66	**
								"							GND		001					"	Q _D Clk to		29	
	t _{PLH6}		162	168		179			IN											OUT			Q _A		32	-
	t _{PHL6}	66	163	169	166	180			IN											OUT			Q _A		29	-
	t _{PLH6}	66	164	170	167	181				IN					"				OUT				Q _B			<u> </u>
	t _{PHL6}	66	165	171	168	182		"		IN									OUT				Clk to Q _B		32	
	t _{PLH6}	66	166	172	169	183					IN							OUT					Clk to Q _C		29	
	t _{PHL6}	44	167	173	170	184		"			IN			"	"			OUT				"	Clk to Q _C		32	
	t _{PLH6}	44	168	174	171	185						IN		66	"		OUT						Clk to Q _D		29	
	t _{PHL6}	44	169	175	172	186		"				IN			"		OUT					"	Clk to Q _D		32	
	t _{PLH7}	66	170	176	173	187	44	"					4.5 V	66	4.5 V	IN					OUT	"	EnT to C _v	66	19	
	t _{PHL7}		171	177	174	188		"					4.5 V	66	4.5 V	IN					OUT		EnT to C _v	66	19 11/	
	t _{PHL8}		172	178	175	189	IN	12/	4.5 V						GND					OUT			Cir to Q _A	66	33	"
	t _{PHL8}		173	179	176	190				4.5 V				66					OUT				CIr to	86	66	
	t _{PHL8}		174	180	177	191					4.5 V				"			OUT					Q _B	66	ш	"
	t _{PHL8}	66	175	181		192						4.5 V					OUT						Q _C Clr to	66	44	

TABLE III. Group A inspection for device types 03, 04, 11, and 12.

					ses F		1	2	3	4	5	6	gnated ma 7	8	9	10	11	12	13	14	15	16		L	imits	
bgroup	Symbol	MIL-STD-			e <u>1</u> /		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Uni
		883 method	03		t no. e types 11	12	Clear	Clock	А	В	С	D	EnP	GND	Load	EnT	Q _D	Qc	Q _B	Q _A	Ripple	V _{CC}	terminal	Min	Max	
10 = +125°C	F _{MAX}	3003 (Fig 6)	176	182	179	193																	Clk to Q _A	22		MH:
- 1120 0	t _{PLH4}	(1.9.4)	177	183	180	194																	Clk to Carry	3	56	ns
	t _{PHL4}				181																		Clk to carry		56	
	t _{PLH5}				182																		Clk to Q _A		41	
		66		186	183																		Clk to Q _B	44	66	
					184																		Clk to Q _C	Ċ		
		i.		188	185 186																		Clk to Q _D Clk to	Ė		<u> </u>
	t _{PHL5}	a		190																			Q _A	66	45	
		66	185		188																		Q _B		4	
		66			189																		Q _C			
	t _{PLH6}	66	187	193																			Q _D Clk to		42	
	t _{PHL6}	66	188	194	191	205	Sam	e terminal	conditions	s as for su	ıbgroup 9	9.											Q _A Clk to		48	
	t _{PLH6}	66	189	195	192	206																	Clk to		42	44
	t _{PHL6}	a	190	196	193	207																	Q _B Clk to Q _B		48	
	t _{PLH6}	66	191	197	194	208																	Clk to Q _C		42	
	t _{PHL6}	es .	192	198	195	209																	Clk to Q _C		48	
	t _{PLH6}	66			196																		Clk to Q _D		42	
	t _{PHL6}	44	194	200	197	211																	Clk to Q _D		48	
	t _{PLH7}	a		201	198																		EnT to carry		28	
	t _{PHL7}			202	199	1 1																	EnT to carry		28	
	t _{PHL8}				200																		CIr to Q _A CIr to		46 46	
	t _{PHL8}				201																		Q _B	ш	46	"
		es .		206	203																		Q _C		46	
	t _{PHL8}		200	200	203	211																	Q _D		40	

- $\underline{1}$ / For case 2, pins not referenced are NC.
- 2/ Apply one pulse prior to measurement as follows:

2.5 V min/5.0 V max or 2.5 V min/5.0 V max or 0 V ± .2 V

- $\underline{3}\!/$ Apply 0.7 V for types 03 and 11; apply 2.0 V for types 04 and 12.
- $\underline{4}\!/ \quad I_{IL} \;\; \text{limits (μA) min/max values for circuits shown:}$

Parameter	Terminals				Circuits			
, aramotor	Tommalo	Α	В	С	D	Е	F	G
	Clear 03	-160/-400	-30/-300	-120/-360	-160/-400	-120/-360	-0/-100	-16/-400
	Clear 04	64	44	"	"	66	"	"
	Clear 11	и	"		"	44	-150/-450	"
	Clear 12	64	"	-290/-630	"		-130/-430	"
	EnP	"	"	-120/-360	"	-120/-360	-150/-380	"
	A, B, C, D	64	"	-160/-400	"	-150/-380	-0/-100	"
I _{IL5}	Load	-320/-800	-30/-300	-290/-630	-320/-800	-120/-360	-160/-400	-320/-800
IL5	EnT	525/-000	30,-300	-340/-860	323/-000	-240/-720	-300/-760	323/-000
I _{IL6}	Clock	-160/-400	-0/-100	-290/-630	-160/-400	-180/-420	-0/-100	-160/-400

 $\underline{5}$ / For types 03 and 11, set outputs to 9th count (Q_A = 1, Q_D = 1, Q_B and Q_C = 0) prior to measurement.

For types 04 and 12, set outputs to 15^{th} count (Q_A, Q_B, Q_C and Q_D = 1) prior to measurement.

- $\underline{6}\!/$ Apply GND for types 03 and 11; apply 4.5 V for types 04 and 12.
- $\underline{\textbf{7}}\!/$ Only a summary of attributes data is required.
- 8/ A = 3.0 V minimum; B = 0.0 V or GND.
- $\underline{9}$ / H > 1.5 V; L < 1.5 V; X = don't care.

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- $\underline{10}'$ The F_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency. For type 04, circuit C, 20 MHz minimum.
- $\underline{11}\!\!/$ The limit for circuit B shall be 23 ns.
- 12/ For types 03 and 04, apply one clock pulse prior to test. For types 11 and 12 apply one clock pulse prior to test and another pulse during test.
- $\underline{13}/\ I_{IH13}$ limit for types 11 and 12; 40 μA maximum.

I_{IH14} limit for types 11 and 12; 200 μA maximum.

TABLE III. Group A inspection for device types 05 and 06. conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open).

Subgroup	Symbol	MIL OTD	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lir	nits	
Subgroup	Symbol											9	10	1.1	12	10	1-7	10	10		LII	IIII	
ļ	Cyco.	MIL-STD- 883	Case <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
		method	Test no.	U/ D	СК	Α	В	С	D	EP	GND	L	ET	Q _D .	Q _{C'}	Q _B	Q _A ·	Ripple carry	V _{CC}	terminal	Min	Max	i
1	V _{OL}	3007	1	4.5 V	2/	0.7 V	0.7 V	0.7 V	0.7 V	4.5 V	GND	0.7 V	4.5 V	4 mA					4.5 V	Q _D		0.4	V
Гс = +25°С			2		7	"		"			"				4 mA				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Q _C			
10 - 120 0			3													4 mA				Q _B		-	
'			4													7111/3	4 mA			Q _A		-	
'			5	0.7 V						0.7 V			0.7 V				7 1117	4 mA		Ripple			
'			Ŭ	0.7						0.7			0							carry			1
l '	V _{OH}	3006	6	4.05 V		2.0 V	2.0 V	2.0 V	2.0 V					4 mA						Q _D	2.5		
'	*OH	"	7	1.00 4		2.0 1	1.0 0	2.0 V	1.0 1						4 mA					Q _C	"		
1 '			8												1	4 mA				Q _B	44		
1 '			9														4 mA			Q _A			
'			10	0.7 V														4 mA		Ripple	"		
'				0.7																carry			1
	V _{IC}		11	-18 mA																U/ D		-1.5	
1			12		-18 mA															CK			
'			13		101111	-18 mA														A			
'			14			1011111	-18 mA													В		-	
'			15				1011111	-18 mA												C		"	66
'			16					101101	-18 mA		**								и	Ď			
'			17						1011111	-18 mA	**								и	EP			
'			18							1011111	4	-18 mA							ш	L.		ш	-
'			19								"		-18 mA						и	ET		"	44
'	I _{IL12}	3009	20			0.4 V					**	GND	1011111						5.5 V	A	3/	3/	μА
'	*IL12	"	21			0.1 0	0.4 V				"	"							# # #	В	<u> </u>	<u> </u>	μ/ι
'		44	22				0.1 0	0.4 V			"	и							и	C			
'		44	23					0.11	0.4 V		"	и							и	Ď			
	I _{IL13}		24	0.4 V					0.1.1											U/ D	3/	3/	**
1			25		0.4 V														и	CK			
'			26		U.4 V						"	0.4 V								L			66
'												U.4 V							и		3/	3/	
	I _{IL14}	**	27							0.4 V										EP			"
	I _{IL15}		28								"		0.4 V							ET	<u>3</u> /	<u>3</u> /	-
	I _{IL17}	3010	29	2.7 V							"								u	5		20	66
] }		30		2.7 V					-		-		-		l				U/ D CK			
1 '			31		2.1 V	2.7 V		-			"					-				A			
1 '			32			2.1 V	2.7 V	-			"					-				В			
1 '			33				Z.1 V	2.7 V		-		-	-	-	-				и	С		"	
1 '			33					Z.1 V	2.7 V		"					-				D			
1 '			35						2.7 V	2.7 V	"								и	EP			44
1 '			36							2.7 V		2.7 V							и	L		"	
1 '												2.7 V								_			
1	I _{IH19}	"	37										2.7 V							ET		40	44

		MIL-STD-	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lir	nits	
Subgroup	Symbol	883 method	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
			Test no.	U/ D	СК	Α	В	С	D	EP	GND	L	ET	Q _D	Qc	Q _B	Q _A	Ripple carry	V _{cc}	terminal	Min	Max	
1	I _{IH18}	3010	38	5.5 V							GND								5.5 V	U/ D		100	μА
Γc = +25°C			39		5.5 V															CK			
		-	40			5.5 V														A			
			41				5.5 V													В			
			42					5.5 V												С			
		"	43						5.5 V											D			
			44							5.5 V										EP		ı	
			45									5.5 V								L		и	
	I _{IL20}	"	46										5.5 V							ET		200	
	I _{os}	3011	47	5.5 V	2/	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V		GND	5.5 V	GND						Q_D	-15	-100	
			48												GND					Q _C	46		
			49													GND				Q _B	"		
			50			"		"									GND			Q_A	44		66
			51					"										GND		Ripple carry	"		
	Icc	3005	52	GND		GND	GND	GND	GND	GND		5.5 V	GND							V _{cc}		34	

See footnotes at end of device types 05 and 06.

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

			Cases E, F	1	2	3	4	5	6	7	ay be H≥2 8	9	10	11	12	13	14	15	16	Measured	Lim	iits	Un
Subgroup	Symbol	MIL-STD-	Cases 1/	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		883 method	2 Test no.	U/ D	CK	Α	В	С	D	EP	GND	L	ET	Q _D	Q _C	Q _B	Q _A	Ripple	V _{CC}		Min	Max	-
7	Func-	3014	53	A <u>5</u> /	B 5/	В	В	В	В	В	GND	В	В	Х	Х	Х	Х	carry	4.5 V			+-	+
	tional	3014	54	"	A A	В.					GIND	В							4.5 V				
c = +25°C	tests		55		В	_						A		L <u>5</u> /	L	L	L	H <u>5</u> /					
			56			-				"		A					Н						
	4/				A	_									66	66							
		-	57		В	_						4					Н						
			58 59		A B				- 44			"		-		H	L						
			60			-	44										L H						
		-			A		-			-													
		-	61		В			-		-	-						Н						
		-	62		A		-		-		-		-		Н	Ļ	L						
		-	63		В		-		-	-	-						L						
			64	-	A											66	Н						
		-	65		В			-			-				-		Н						
			66	-	A				-		-		-			H	L						
		-	67		В		-										L						
		-	68		A		-			-							Н:						
		-	69		В			-	-	-							Н						
		-	70	-	A		-				-			Н	Ļ	L.	L						
		- :	71	- "	В					- :	- :	- :		- :	-		L			See <u>6</u> /			
		-	72	-	A			-								-	H	L					
		- :	73		В					Α		- :				-	-	L					
		-	74		Α				- :	Α				-									
		- :	75		В				- :	B						-							
		- :	76		Α	-		- :	- :	- :		- :	Α		- :			Н					
		_	77		Α	- : -				- :			A					Н	_				
			78		В								В			66		L					
			79		Α			"		- :				L			L	Н					
			80		В	Α			Α			В		L		66	L	"					
			81		Α	•	•					В		Н	66	44	Н	L					
			82	В	В	и	•					A					Н	Н					
			83	"	Α									*			L						
			84		В												L						
			85	"	Α	"				"	•			L	Н	Н	Н						
			86	"	В		•										Н						
			87	"	Α											66	L						
			88	-	В		44		44							Н	L						
			89		Α											L	Н						
			90	"	В										66	66	"						
			91	"	Α		44										L						
			92		В												L						
			93		Α										L	Н	Н						
			94		В												Н						
			95	"	Α												L						
			96		В												L						
			97		A	"	66	"		-	-					L	Н						
			98		В												Н						
			99	"	Α										44	-	L	L			1	1	1
			100	"	В	ш				Α											1	1	1
			101	"	Α					Α											1	1	1
			102		В					В											1	1	1
			103	"	В								Α					Н			1	1	1
			104	"	Α								Α					Н			1	1	1
			105	"	В								В			66	"	L			1	1	1
		44	106		В	В	Α	Α				В		"	66		"	L	44		1	1	1
	1	44	107		Α	В	Α	Α	44		66	В		44	66	Н	Н	Н	"		1	1	1

See footnotes at end of device types 05 and 06.

TABLE III. Group A inspection for device type 06 – Continued. sinal conditions (pins not designated may be $H \ge 2.0 \text{ V}$ or $L \le 0.7 \text{ V}$ or open).

			1										0.7 V or op										
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Lim	its	Uni
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	U/ D	CK	Α	В	С	D	EP	GND	L	ET	Q _D	Qc	Q _B	Q _A	Ripple	V _{cc}		Min	Max	
7	Func-	3014	53	A <u>5</u> /	B 5/	В	В	В	В	В	GND	В	В	Х	Х	Х	Х	X	4.5 V				†
Tc = +25°C	tional		54	" "	A .						"	В	-	L <u>5</u> /	L	L	L	H <u>5</u> /	1.0 1				
10 = +25 0	tests		55		В		66					A		L <u>3</u> /	-		L	" "					
			56	"	A					"		. A					Н						
	<u>4</u> /		57	"	B	-									44	44	Н						
			58		A	_										Н	L						
														-		н							
			59		В				-								L						
			60		A												H						
		-	61		В		-	-									Н						
		-	62		Α				-	-	-	-		-	Н.	Ļ	L						
		-:	63		В		-								-		L						
			64		Α												Н						
		- :	65		В										66	44	Н				1	l	1
			66		Α											Н	L				1		
			67	"	В	u u	•							4			L				1		1
			68		Α	u	"	"	**								Н						
			69	"	В	u								"	66	66	Н	"					
			70	"	Α	u u		•						Н	L	L	L						
			71		В	и	4	u									L			See <u>6</u> /			
			72		Α	и			44								Н	"					
			73		В	"			**					**	66		Н						
			74	"	Α		44									Н	L						
			75		В		66										L						
			76		Α												Н						
			77		В												Н						
			78		Α										Н	L	L						
			79	"	В	ii ii	44										L						
			80	"	Α						44		"			66	Н	"					
			81		В										66	66	Н						
			82	"	Α	u u										Н	L						
			83	"	В												L						
			84	"	Α												Н	L					
			85	"	В					Α							"						
			86		Α					Α													
			87		В					В						66							
			88		В		66		66	"			Α					Н					
			89		Α								Α				"	Н					
			90		В								В		66	66	**	Ĺ					
			91		A		44							L	L	L	L	H					
			92		В	Α	Α	Α	Α			В		Ē	Ē	Ē	Ē	Н					
			93		A	*	*	*	- "			В		H	H	H	H	i			1		1
			94	В	В	и						A			- 1		H	H					
			95	"	A	-						- 1					Ĺ						
			96		В	-											Ĺ				1	l	1
			97		A	"	44	u								L	Н						
			98		В	-										-	Н				1		
			99		A	-										66	L				1		1
			100		В												L				1		1
			101		A										-	Н	Н				1	l	
		-								-					L.	H					1		1
		-	102	- "	В			-	-	-	-			-			Н				1	l	1
		-	103	- "	A				-				-	-	-		L	-			1		
			104	-	В	- : -		- :		- :	- :					-	L	-			1		1
			105		A		-:-	-:-				-				L "	H	-	"		1		1
			106	"	В		- :	- :					"				Η.				1		1
			107		A		- :	- :	-		-	<u> </u>					L	- :			1		
	1		108		В	-											L				1	l	1

See footnotes at end of device types 05 and 06.

			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Limit	s Ui
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal		
		method	Test no.	U/ D	CK	Α	В	С	D	EP	GND	L	ET	Q _D	Q _C	Q _B	Q _A	Ripple carry	V _{CC}		Min	Max
7	Func-	3014	109	B <u>5</u> /	A <u>5</u> /	Α	Α	Α	Α	В	GND	Α	В	L	Н	Н	Н	H	4.5 V			
Tc = +25°C	tional		110		В		44			"					"		Н					
	tests		111	"	Α		66	ш		"		ii ii		"		44	L	"				
	4/		112	"	В	"				"		"		"			L					
			113	"	Α	"						"	"	"	44	L	Н	"				
			114		В							ii .		"		4	Η	"				
			115	"	Α	"			"	"		"					L	"				
			116		В			"	"								L					
			117		Α		44					u u	"	"	L	Н	Н	"				
			118		В		**		"				"	"	44	44	Н	"		See <u>6</u> /		
			119	"	Α								"				L		"			
		-:-	120		В			:		:			"			44	L		-			
			121		Α	"						-				L	Н	"	-:-			
			122		В				- :								Н	"				
		- :	123		A				-								Ļ	Ļ	-			
		- :	124		В				-	A							- :					
		- :	125		A		- :	- :		A	- :						- :					
		- :	126		В	-				B		-:-	A			- :	-	H				
		- :	127		A					- :			A	- "		-	- :	Н				
			128	_	В		_	_	-	_			В					L				

TABLE III. <u>Group A inspection for device type 05</u>– Continued.

													0.7 V or op										
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Lim	nits	Unit
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminai			l '
		method	Test no.	U/ D	CK	Α	В	С	D	EP	GND	L	ET	Q _D	Qc	Q _B	Q _A	Ripple carry	V _{cc}		Min	Max	
9	t _{PLH5}	See	108	5.0 V	IN <u>7</u> /	GND	GND	GND	GND	GND	GND	IN <u>7</u> /	GND				OUT		5.0 V	CK TO Q _A	3	22	ns
Tc = +25°C		fig. 7	109		IN		44		66		44	5.0 V				OUT			"	CK TO Q _B	66	**	44
		"	110	"	IN 2/	"	44	"	66	"	66				OUT					CK TO Q _C	66	"	66
		44	111	44	IN 8/	и	ш	u u	44	и	4			OUT						CK TO Q _D	66	ш	-
	t _{PHL5}	66	112	"	IN <u>7</u> /	5.0 V		"	66	ű	44	IN					OUT			CK TO Q _A	66	"	66
		66	113	"	"	ű	5.0 V	"	66	ű	44	"				OUT				CK TO Q _B	66	"	66
		44	114	44	"		66	5.0 V	66		44	"			OUT					CK TO Q _C	66	**	66
		44	115	**	"		**	"	5.0 V		**			OUT					"	CK TO Q _D	66	**	44
	t _{PHL15}	a	116				66		44		66	"						OUT	"	CK TO RC		32	a
	t _{PLH12}	66	117		IN	"	66			"		5.0 V						OUT	"	CK TO RC	66	30	44
	t _{PLH5}	66	118	GND	IN 9/	IN	GND	GND	GND		66	GND					OUT			CK TO Q _A	66	22	- 64
	t _{PHL5}	66	119	"	IN S	GND	GND	"	"	и	66	0.10					OUT			CK TO QA	66	"	- 44
	t _{PLH5}	66	120	4		"	5.0 V	и	44	и	4					OUT				CK TO Q _B	66	ш	-
	t _{PHL5}	66	121	44			GND	"	- 4							OUT				CK TO Q _B	66	ш	ш
	t _{PLH5}	44	122				66	5.0 V	66		66				OUT					CK TO Q _C	66	и	66
	t _{PHL5}	44	123	"	"	"	44	GND	66	"	66				OUT					CK TO Q _C	66	"	66
	t _{PLH5}	44	124	"	u u		66	ш	5.0 V		66			OUT					"	CK TO Q _D	66	ш	66
	t _{PHL5}	44	125	44	"	и	ш	u u	GND	и	4			OUT						CK TO Q _D	66	ш	-
	t _{PHL7}	66	126	5.0 V	IN 7/	5.0 V	66	"	5.0 V			IN	IN					OUT		ET to RC	66	24	66
	t _{PLH7}	86	127	5.0 V	GND	ш		ii ii	66	ш	66	5.0 V	IN					OUT	"	ET to RC	66	15	66
	t _{PHL11}	es .	128	IN	IN <u>7</u> /	"	66	п	66	и	66	IN	GND					OUT	"	U/ D to RC	*	28	"
	t _{PLH9}	66	129	IN	GND	"	44	"	"	"	44	5.0 V	GND						"	U/ D to RC	66	22	44
	t _{PHL7}	44	130	GND	IN 7/	GND		"	GND	и	44	IN	IN							ET to RC	66	24	ш
	t _{PLH7}	ш	131	GND	GND	"			"	и	66	5.0 V	IN						"	ET to RC	66	15	44
	t _{PHL11}	es .	132	IN	IN <u>7</u> /	"	66	"	86		66	IN	GND						"	U/D to RC	*	28	"
	t _{PLH9}	GG GG	133	IN	GND		66		"		66	5.0 V							"	U/ D to RC	66	22	44
	F _{MAX} 10/	66	134	5.0 V	IN					и	64	5.0 V		OUT	OUT	OUT	OUT		"	CK to Q _n	25		MHz
	F _{MAX} 10/	66	135	GND	IN					и	66	5.0 V		OUT	OUT	OUT	OUT		"	CK to Q _n	25		MHz

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

			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Lim	nits	Unit
Subgroup	Symbol	MIL-STD-	Cases 1/	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		883	2		CK			С	D	EP	GND		ET	_	_	_	_	Disale	.,		Min	Max	4
		method	Test no.	U/D	CK	Α	В	C	D	EP	GND	L	EI	Q _D	Qc	Q _B	Q _A	Ripple carry	V _{CC}		IVIII	IVIAX	
10	t _{PLH5}	See	136								•					•				CK TO Q _A	3	26	ns
Гc = +125°C		fig. 7	137																	CK TO Q _B	66		66
			138																	CK TO Q _C			
			139																	CK TO Q _D			
	t _{PHL5}		140																	CK TO Q _A	66		66
			141																	CK TO Q _B	66	"	66
			142																	CK TO Q _C	66	"	66
			143	1																CK TO Q _D	66	"	
	t _{PHL15}		144																	CK TO RC	65	37	
	t _{PLH12}		145																	CK TO RC	44	35	66
	t _{PLH5}		146	1																CK TO Q _A	66	26	- 66
	t _{PHL5}		147	1																	66		66
	t _{PLH5}		148																	CK TO Q _B	66	"	ű
	t _{PHL5}		149		Same	e conditions	s as for sub	group 9.												CK TO Q _B	66	"	
	t _{PLH5}		150																	CK TO Q _C	66		66
	t _{PHL5}		151	_																CK TO Q _C	66	"	66
	t _{PLH5}		152																	CK TO Q _D	66	"	66
	t _{PHL5}		153																	CK TO Q _D	66	"	66
	t _{PHL7}		154																	ET to RC	66	28	- 4
	t _{PLH7}	- :	155																	ET to RC	66	18	- 4
	t _{PHL11}		156																	U/D to RC	66	33	**
	t _{PLH9}		157																	U/ D to RC		26	
	t _{PHL7}		158	1																ET to RC	44	28	ш
	t _{PLH7}		159	1																ET to RC	66	18	66
	t _{PHL11}		160																	U/ D to RC	66	33	**
	t _{PLH9}	66	161																	U/ D to RC	44	26	"
	F _{MAX}	66	162	1																CK to Q _n	25		MH
	F _{MAX}	66	163	1																CK to Q _n	25		MH

TABLE III. Group A inspection for device type 06.

		MIL-STD-	Cases E. F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Lim	its	Unit
Subgroup	Symbol	883	Cases <u>1</u> /	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		method	Test no.	U/ D	CK	Α	В	С	D	EP	GND	L	ET	Q _D	Q _C	Q _B	Q _A	Ripple	V _{cc}		Min	Max	1
9	t _{PLH5}	See	129	5.0 V	IN <u>7</u> /	GND	GND	GND	GND	GND	GND	IN	GND				OUT		5.0 V	CK TO Q _A	3	22	ns
= +25°C		fig. 7	130	"	"	5.0 V	44	"		"	44	"	"			OUT			"	CK TO Q _B	44	"	66
			131		ш	ш	5.0 V	и	66	u u	4	"			OUT				44	CK TO Q _C	66	ш	66
			132		"	ш	4	5.0 V			4	"	"	OUT					"	CK TO Q _D	66	"	66
	t _{PHL5}	4	133		" 7/	5.0 V	GND	GND	GND		GND	IN	GND				OUT		44	CK TO Q _A	66	32	66
			134	"	"	"	5.0 V	"	66	"	44	"	"			OUT			**	CK TO Q _B	66	"	66
		4	135			ш	4	5.0 V	66		4	"			OUT				44	CK TO Q _c	66	ш	66
		66	136	"	"	ı		"	5.0 V	"		"	4	OUT					"	CK TO Q _D	66	"	66
	t _{PHL15}		137	"	"	GND		"	66	"		"						OUT	"	CK TO RC	66	35	66
	t _{PLH12}	es .	138		"	GND						5.0 V	4					OUT	"	CK TO RC	66	33	66
	t _{PLH5}	66	139	GND		5.0 V	GND	GND	GND	"		5.0 V	4				OUT		**	CK TO Q _A	66	22	66
	t _{PHL5}	66	140	"	ш	GND	GND	"	66	"	44	"	"				OUT		44	CK TO Q _A	66	32	66
	t _{PLH5}	66	141	"	"	и	5.0 V	"		"	44	"	44			OUT			44	CK TO Q _B	**	22	66
	t _{PHL5}	66	142	"	"	и	GND	"	**	и	44	"				OUT			44	CK TO Q _B	66	32	66
	t _{PLH5}		143		ш	u	64	5.0 V			44	"			OUT				"	CK TO Q _C	66	22	66
	t _{PHL5}	66	144					GND	44			"			OUT				"	CK TO Q _C	66	32	-
	t _{PLH5}		145		"			"	5.0 V					OUT					"	CK TO Q _D	66	22	-
	t _{PHL5}	-	146	"					GND	"				OUT					"	CK TO Q _D	66	32	- "
	t _{PHL7}		147	5.0 V	" <u>7</u> /	5.0 V	5.0 V	5.0 V	5.0 V			5.0 V	IN					OUT		ET to RC		28	
	t _{PLH7}	6	148	5.0 V								5.0 V	IN					OUT		ET to RC	-	24	-
	t _{PHL11}		149	IN	IN <u>7</u> /							5.0 V	GND					OUT		U/D to RC		32	
	t _{PLH9}	66	150	IN	IN							5.0 V	GND						"	U/D to RC		28	66
	t _{PHL7}		151	GND	IN 7/	GND	GND	GND	GND		4	5.0 V	IN					44	"	ET to RC	66	28	66
	t _{PLH7}	66	152	GND	IN	и	44		"		44	5.0 V	IN					"	"	ET to RC	66	24	66
	t _{PHL11}	66	153	IN	IN <u>7</u> /	и	66	"	66	"	66	5.0 V	GND					"	"	U/ D to RC	66	32	66
	t _{PLH9}	es	154	IN	IN	и	66	ш	"	"	66	5.0 V	**					"	"	U/ D to RC	66	22	66
	F _{MAX}		155	5.0 V	IN	и	66		44	и	66	5.0 V		OUT	OUT	OUT	OUT		44	CK to Q _n	25		MH
	F _{MAX}	44	156	GND	IN	5.0 V	5.0 V	5.0 V	5.0 V	"		5.0 V	44	OUT	OUT	OUT	OUT		44	CK to Q _n	25	1	MH

TABLE III. Group A inspection for device type 06.

			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured	Lim	nits	Unit
Subgroup	Symbol	MIL-STD-	Cases 1/	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	terminal			
		883 method	Z Test no.	-	CK	A	В	С	D	EP	GND	L	ET	Q _D	Qc	Q _B	Q _A	Ripple	V _{cc}		Min	Max	1
				U/D	0.1	,,					0.10	_		Φ.	Q.C	ω,	- Α	carry	• 66				
10	t _{PLH5}	See	157																	CK TO Q _A	3	26	ns
Γc = +125°C		fig. 7	158																	CK TO Q _B	66		66
			159																	CK TO Q _C			
		-	160																	CK TO Q _D			
	t _{PHL5}	- :	161	4																CK TO Q _A	66	36	
			162 163																	CK TO Q _B			
			164	4																CK TO Q _D			
	-																				66		66
	t _{PHL15}		165																	CK TO RC		40	
	t _{PLH12}		166																	CK TO RC	66	38	
	t _{PLH5}		167																	CK TO Q _A	66	26	66
	t _{PHL5}		168																	CK TO Q _A	66	36	66
	t _{PLH5}		169																	CK TO Q _B	66	26	66
	t _{PHL5}		170		Same	e conditions	s as for sub	group 9.												CK TO Q _B	44	36	66
	t _{PLH5}	- :	171																	CK TO Q _C	66	26	
	t _{PHL5}		172 173	4																CK TO Q _C		36	
	t _{PLH5}		173	4																CK TO Q _D	66	26 36	66
	t _{PHL5}		174																	ET to RC	66	32	
	t _{PHL7}		176																	ET to RC	66	28	
	t _{PHL11}		177																		44	37	
																				U/D to RC			
	t _{PLH9}		178																	U/D to RC	"	32	4
	t _{PHL7}		179																	ET to RC	66	32	66
	t _{PLH7}		180																	ET to RC	66	28	66
	t _{PHL11}		181																	U/D to RC	66	37	*
	t _{PLH9}	64	182																	U/ D to RC	66	32	66
	F _{MAX}	*	183	1																CK to Q _n	25		MHz
	F _{MAX}	4	184	1																CK to Q _n	25		MHz

 $\underline{1}$ / Case 2, pins not referenced are N/C.

 $\underline{2}\!/$ Apply one clock pulse prior to test as follows:

 $\underline{3}\!/\quad I_{IL}\;$ limits (µA) min/max values for circuits shown:

Parameter	Terminals				Circuits			
		Α	В	С	D	Е	F	G
I _{IL12}	A, B, C, D			-160/-400		-0.5/-400		
I _{IL13}	U/ D , CK, L			-160/-400		-135/-370		
I _{IL14}	EP			160/-400		-150/-385		
I _{IL15}	ET			-140/-720		-280/-760		

4/ Only a summary of attributes data is required.

 $\underline{5}/$ A = 3.0 V minimum; B = 0.0 V or GND.

 $\underline{6}$ / H > 1.5 V; L < 1.5 V; X = don't care.

7/ Apply one clock pulse with "L" low prior to test.

8/ Apply three clock pulses prior to test.

9/ Apply one clock pulse with "A" low prior to test.

 $\frac{10'}{F_{MAX}} \text{frequency input to "CK"}.$

TABLE III. Group A inspection for device types 07 and 08.

			Cases E, F	1	2	3	4	5	6	7	8	9	.0 V; or L≤	11	12	13	14	15	16		Lir	mits	
bgroup	Symbol	MIL-STD-	Cases1/	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured	C.II	1110	Uni
		883 method	2 Test no.	В	Q _B	Q _A	Count	Count	Qc	Q _D	GND	D	С	Load	Ripple Carry	Borrow	Clear	Α	V _{CC}	terminal	Min	Max	
1	V _{OL}	3007	1			4 mA	GOWII	ОР			GND			0.7 V	Carry		0.7 V	0.7 V	4.5 V	Q _A		0.4	V
+25°C	· OL		2	0.7 V	4 mA						"			"			"			Q _B			
			3						4 mA				0.7 V	"						Qc			
			4							4 mA		0.7 V		"			"			Q _D			
		"	5	<u>2</u> /				0.7 V				2.0 V	2/	"	4 mA		44	2.0 V	4.5 V	Ripple carry		ű	
		**	6				0.7 V									4 mA	2.0 V		4.5 V	Borrow		"	Ī
	V _{OH}	3006	7			-0.4 mA								0.7 V			0.7 V	2.0 V		Q_A	2.5		
			8	2.0 V	-0.4 mA									"			"		"	Q _B			
		"	9						-0.4 mA		"		2.0 V	"					- "	Qc			
			10							-0.4 mA		2.0 V		"			-		-	Q _D			-
			11					2.0 V							-0.4 mA					Ripple Carry			
		"	12				2.0 V				-					-0.4 mA				Borrow			
	V _{IC}		13	40.4														-18 mA		A		-1.5	
			14 15	-18 mA							-		-18 mA							B C			
			16									-18 mA	-18 MA							D			
			17									-10 IIIA		-18 mA						Load		и	\vdash
			18											-101117			-18 mA			Clear		ш	
			19					-18 mA									-101111/4		"	Count up		"	
			20				-18 mA												u	Count		"	
	I _{IL9}	3009	21											GND			GND	0.4 V	5.5 V	A	3/	3/	μ
	-123		22	0.4 V										"			"	•		В	- "	-	Γ,
			23										0.4 V	"					"	C		"	
			24									0.4 V		"					"	D		"	
	I _{IL10}	"	25											0.4 V						Load			
	I _{IL11}		26														0.4 V		ш	Clear	**		
		44	27					0.4 V											ш	Count up	*		
		"	28				0.4 V													Count down			
	I _{IH17}	3010	29											5.5 V			5.5 V	2.7 V		A		20	
			30	2.7 V										"			"			В			
		"	31		1				ļ	ļ		0.00	2.7 V	"	ļ	ļ			u	С		u u	
			32 33		-							2.7 V								D			
			33											2.7 V			2.7 V			Load Clear			
			35		1		-	2.7 V	1	1	44			-	-	1	2.1 V			Count up			
			36		 		2.7 V	2.1 V	 	 				-	-					Count up			
							2.1 V													down			
	I _{IH18}		37											5.5 V			5.5 V	5.5 V		Α		100	
		"	38	5.5 V										"					и	В		и	
		"	39										5.5 V	"						С			
			40									5.5 V								D			
			41		-									-						Load			
			42 43		1		-	5.5.1	 	 	-			-	ļ	 	5.5 V			Clear		"	
			43 44		1		5.5 V	5.5 V	 	 				-	ļ	 				Count up			
	1	1	44		1	1	5.5 V	1	1	1	1	1	1	1	1	1				Count	l		1

TABLE III. Group A inspection for device types 07 and 08 – Continued. Terminal conditions (pins not designated may be H \geq 2.0 V; or L \leq 0.7 V; or open)

		Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lit	mits	1
Symbol	883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
	method	Test no.	В	Q _B	Q _A	Count	Count Up	Qc	Q _D	GND	D	С	Load	Ripple Carry	Borrow	Clear	Α	V _{CC}	terminal	Min	Max	
Ios	3011	45			GND					GND			GND			GND	5.5 V	5.5 V	Q_A	4/	4/	mA
		46	5.5 V	GND															Q _B			
		47						GND				5.5 V							Qc			
		48							GND		5.5 V								Q _D			
	"	49					5.5 V							GND					Ripple			
	"	50				5.5 V				"					GND			"	Borrow		"	
I _{CC}	3005	51											GND			GND			V _{CC}		34	
Same te	sts, termin	al conditions	s, and limit	s as for s	ubgroup	1, excep	ot T _C = +	-125°C a	nd V _{IC} te	ests are o	mitted.											
Same te	sts, termin	al conditions	s, and limit	s as for s	ubgroup	1, excep	ot T _C = -	55°C and	d V _{IC} test	ts are on	nitted.											
	I _{cc} Same te	883	883 2 Test no. los 3011 45 - 46 - 47 - 48 - 49 - 50 loc 3005 51 Same tests, terminal conditions	MIL-STD-883	Symbol MIL-STD 883 method Cases1/ 2 3 3 method Test no. B Q ₈ los 3011 45 * 46 5.5 V GND * 48 * 49 * 50 lcc 3005 51 Same tests, terminal conditions, and limits as for significant conditions.	Symbol MIL-STD- 883 method Cases1/ 2 2 3 4 Test no. B Q _B Q _λ Ios 3011 45 GND * 46 5.5 V GND * 47 - * 48 - * 49 - I _{CC} 3005 51 Same tests, terminal conditions, and limits as for subgroup	Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number 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8 9 10	Symbol MIL-STD Cases E, F 1 2 3 4 5 6 7 8 9	Symbol MIL-STD: Cases E, F 1 2 3 4 5 6 7 8 9 10	Symbol MIL-STD: 883 Method Cases E, F 1 2 3 4 5 6 7 8 9 10 11	Symbol MIL-STD Casesi 2 3 4 5 7 8 9 10 12 13 14 15	Symbol MIL-STD: Cases E, F 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 17 17 18 19 10 12 13 14 15 17 17 18 18 18 19 10 12 13 14 15 17 18 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 17 18 19 10 12 13 14 15 17 17 18 19 10 12 13 14 15 17 17 18 19 10 12 13 14 15 17 17 18 19 10 12 13 14 15 17 17 18 19 10 12 13 14 15 17 17 18 19 10 12 13 14 15 17 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 12 13 14 15 17 18 19 10 10 10 10 10 10 10	Symbol MIL-STD: Cases E, F 1 2 3 4 5 6 7 8 9 10 11 12 13 14	Symbol MIL-STD: Cases E, F 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Symbol MIL-STD: Cases E, F 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number Number 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B Q ₈ Q _A Count Q _C Q _O GND D C Load Ripple Borrow Clear A V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC} V _{CC}	MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD MilSTD

TABLE III. <u>Group A inspection for device types 07 – Continued.</u> Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open).

												y be H ≥ 2											
		MIL-STD-	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Li	mits	
Subgroup	Symbol	883 method	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
			Test no.	В	Q _B	Q _A	Count down	Count Up	Qc	Q_D	GND	D	С	Load	Ripple Carry	Borrow	Clear	Α	V _{cc}	terminal	Min	Max	
7	Func-	3014	52	A <u>6</u> /	L	L	A	A	L	L	GND	A	Α	A	Н	Н	A	Α	4.5 V	ļ			
Γc = +25°C	tional		53	-		L		Α									B <u>6</u> /						
	tests		54			L		В												Ī			
	5/		55			Н		Α															
			56			Н		В															
			57		Η	L		Α															
		"	58			L		В				•								ļ			
			59			Н		Α			"	•						"					
			60			Н		В															
		"	61		L	L		Α	Н		"							"		ļ			
			62			L		В			"							"					
1			63			Н		Α			"								"	1			
		•	64	и		Н		В			"							"	"	1			
1			65		Н	L		Α			"							"		1			
			66			L		В		- :	"	:	:			- :		"		1			
		- :	67			Н		Α							"			"		l.			
			68			Н		В			"	•											
			69		L	L		Α	L	Н	"							"		l.			
		-:-	70			L		В				- :	:		- :	- :			-	l.			
		- :	71			Н		Α												1			
			72			Н	**	В				- :			L	- :							
			73	- :	- :	L		A	- :	L		-:-	- :		H		- :		-	1			
			74			L	В	-		L		- :				L							
			75		- :	Н	A			H		- :	- :	-	- :	Н		- "					
			76			Н	В					-			-	H							
			77	- :		L	A	-		- :		- :		-	- :	- :				See <u>7/</u>			
			78	-		L	В	-					-		-				-				
			79	-	H	Н	A	-	H	L			-		-					ł			
		"	80			H	В												-	ŀ			
			81			L	A													ŀ			
			82 83			H	В	-	-							-				ŀ			
					L.		A																
			84 85			H	В													ł			
			86			L	A B																
			87		н	H	A		L											ł			
			88		- 11	H	В		-											ŧ			
			89			Ľ	A													t			
			90			L	В													ŧ			
			91		L	H	A													t			
			92		÷	H	В													t			
			93			Ľ	A													t			
1			94			L	В									L				t			
			95			H	A			н						H				t			
1			96		н	Н	-		Н	Н				В		- ''				t			
			97							Ľ				- B			А			t			
			98		Н	H			H	H							В			t			
1			99		H	H			H	H				Α			В			t			
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			101		ī	T-			ī	Ĺ							В			t			
			.0.								1	1	1		1	1		1	1	1	1	1	

TABLE III. Group A inspection for device types 07 – Continued. conditions (pins not designated may be high $\geq 2.0 \text{ V}$; or low $\leq 0.7 \text{ V}$; or open).

		AUL OTO			_								.0 V, OI 10V			- 40			- 40				$\overline{}$
		MIL-STD-	Cases E, F	1	2	3	4	5	6	/	8	9	10	11	12	13	14	15	16		LII	mits	
Subgroup	Symbol	883 method	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
			Test no.	В	Q _B	QA	Count	Count Up	Qc	QD	GND	D	С	Load	Ripple Carry	Borrow	Clear	Α	Vcc	terminal	Min	Max	
7	Func-	3014	102	A 6/	Н	Н	Α	Α	Н	Н	GND	Α	Α	B <u>6</u> /	Н	Η	В	Α	4.5 V				
Гc = +25°C	tional		103	Α								Α	Α	Α	"			Α		Ī			1
	tests		104	В								В	В	Α				В		Ī			1
	5/		105		L	L			L	L				В						Ī			1
	["	106				В									L				Ī			1
		"	107				Α									Н				Ī			1
		"	108					В							"					See <u>7</u> /			1
			109					Α															1
		"	110											Α	"					Ī			1
		"	111														Α						1
			112				В				-				-	L				I			1
		"	113				Α								-	Н				I			1
			114				A	В							"								1
			115				Α	Α												Ī			1

See footnotes at end of device types 07 and 08.

TABLE III. Group A inspection for device types 0.8 – Continued. Terminal conditions (pins not designated may be high ≥ 2.0 V; or low ≤ 0.7 V; or open

							Termina	I conditio	ns (pins n	ot designa	ated may l	e high ≥ 2	.0 V; or lo	v ≤ 0.7 V;	or open).								
			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Li	mits	1
Subgroup	Symbol	883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
		method	Test no.	В	Q _B	Q _A	Count down	Count Up	Qc	Q_D	GND	D	С	Load	Ripple Carry	Borrow	Clear	Α	V _{CC}	terminal	Min	Max	
7	Func-	3014	52	B <u>6</u> /	L	L	A <u>6</u> /	Α	L	L	GND	В	В	В	Н	Н	В	В	4.5 V				1
Γc = +25°C		-	53			L	- :	"				:		Α		-		В					1
	tests	- :	54			Н	-:-					- :	- :	В		- :		A	- "	-			1
	<u>5</u> /		55 56	A	н	H L								A B				A B					1
			57	- ^	- 17	i i								A				В					1
		**	58			H								В				A		1			1
			59			Н					"			A				A		İ			1
			60	В	L	L		"	Н		"		Α	В				В		İ			1
			61			L					"			Α				В		I			1
			62			Н								В				Α		_			1
		"	63			Н				- :		:		Α	"	-		A	"				1
			64	A	H	L	-:-					- :	- :	В	-	-:-		B B	-	-			1
			65			H					-			A B									1
			66 67			Н								A				A A		-			1
			68	В	L	Ľ			L	Н		Α	В	В				В		1			1
			69	-	-	Ē			-	- 1	"		-	A				В		İ			1
			70			Н					"			В	"			Α		İ			1
			71			Н					"			Α	"			Α		1			1
			72	Α	Н	L					"			В				В		_			1
		"	73			L								Α				В					1
			74		-	H	- :	-	- :	- :	-	- :	-:	В		- :	-	A		-			1
			75 76	В	L	H L	-		Н			-	A	A B		-		A B		-			1
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			79			Н								A				A		†			1
			80	Α	Н	L								В				В		Ť			1
		44	81			L					"			Α	"			В		1			1
		**	82			Н					"			В				Α		ļ			1
			83		L	L		"	L	L	"			В	"		A						1
			84			- "	- :					- :	- :	A		- :	A B		- "	-			1
			85 86			-	В				-					L	В						1
			87		н	Н	A		Н	н						H							1
			88		- 11	H	В		- ''	- 11						- "							1
			89			Ĺ	A				"									İ			1
			90			L	В				"				"	•		"		İ			1
		44	91		L	Н	Α				"				"					1			1
		"	92			Н	В	-		-:		:	:			- :				_			1
			93			L	A			- :		- :				- :				-			1
			94	- :		L	В	-		- :		- :	- :			-:-			-	-			1
			95 96		Ĥ	H	A B		Ļ											+			1
			97			L	A								-				-	†			1
			98			È	В													t			1
			99		L	H	A													Ť			1
		"	100			Н	В				"				"					1			1
			101			L	A				"				"				"	I			1
			102			L	В				"				"					1			1
			103	- :	H	Н	A		H	Ļ	"	-	-			-				1			1
			104	- :		Н	В	-	- :	- :		- :	- :			- :				1			1
			105 106			L	A B								-					+			1
			106		L	H	A													1			1
L	l		107	1			_ ^	L	l		1	l	L	l	1	1	l	1	1	L		l	ь

TABLE III. <u>Group A inspection for device types 08</u> – Continued. Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open).

			Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Li	mits	4
group	Symbol	MIL-STD- 883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			L
		method	Test no.	В	Q _B	Q _A	Count	Count Up	Qc	QD	GND	D	С	Load	Ripple Carry	Borrow	Clear	Α	V _{cc}	terminal	Min	Max	
7	Func-	3014	108	A 6/	L	Н	B <u>6</u> /	A	Н	L	GND	Α	Α	Α	Н	Н	B <u>8</u> /	Α	4.5 V				+
	tional		109			Ĺ	A	"		-	"						"	"	"	İ			
20 0	tests		110			ī	В													t			
	5/		111		Н	Н	A		L											t			
	=		112			Н	В		-											t			
			113			L	A													t			
			114			i	В													t			
			115		L	H	Ā													t			
			116		ī	H	В													t			
			117			Ĺ	A													t			
		"	118			Ĺ	- "	В												ł			
		"	119			H		A												ł			
			120			H		В												t			
			121		Н	ï		A												t			
			122		- ''	L		В							-					ł			1
			123			H		A			-				-					ł			1
			124			H		В												t			1
			125		-	i		A	Н											t			
			126		-	ī		В												t			
			127			H		A												t			
			128			H		В												t			
			129		н	i		A												t			
			130		- 1	ī		В												t			
		"	131			H		A												t			
		"	132			H		В												t			
			133		L	i		A	L	Н										See 7/			
		"	134		-	Ĺ		В	-	- "										000 <u>II</u>			
		"	135			H		A												t			
		"	136			H		В												t			
			137		Н	L		A												t			
			138			ī		В												t			
			139			H		A												t			
			140			Н		В												t			
			141		L	L		Α	Н											İ			
			142			Ĺ		В												İ			
		"	143			Н		A												t			
		"	144			Н		В												İ			
		"	145		Н	L		Α												İ			
			146			L		В												İ			
		"	147			Н		Α												İ			
		"	148			Н		В							L					İ			
		"	149	"	L	L		Α	L	L					Н					Ī			
		"	150					Α							"		Α			Ī			
			151					В												Ī			
			152					Α										"		Ī			
			153				В								"	L				Ī			
			154			"	Α				"				"	Н		"		Ī			1
			155														В			İ			1
		"	156		Н	Н			Н	Н				В						İ			1
			157					В							L					İ			1
			158			"		Α			"				Н	•		"		Ī			1
			159				В	Α												İ			1
			160				Α	Α												Ī	1	1	1

TABLE III. Group A inspection for device types 07 and 08 - Continued.

											s not desi	gnated m				0.7 V; or								
		MIL-STD-	Cas E,		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lii	mits	
Subgroup	Symbol	883 method	Case <u>1</u> /		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
			(Dev	/ice	В	Q _B	Q _A	Count down	Count up	Q _C	Q _D	GND	D	С	Load	Ripple carry	Borrow	Clear	Α	V _{CC}	terminal	Min	Max	
9 Tc = +25°C	F _{MAX} 8/	3003 <u>9</u> /	116				OUT	5.0 V	IN			GND			5.0 V			GND		5.0 V	Count up to Q _A	22		MHz
	F _{MAX} 8/		117	162			OUT	IN	5.0 V						5.0 V			GND			Count down to Q _A	22		MHz
	t _{PLH8}		118	163			OUT								IN			GND	5.0 V		Load to Q _A	3	45	ns
	1210		119	164	5.0 V	OUT									44			ш			Load to Q _B		66	
			120	165						OUT				5.0 V	66			ii ii			Load to Q _C	ű	44	
		66	121	166							OUT		5.0 V	66	66			ш			Load to Q _D			
	t _{PHL10}		122	167			OUT								44			GND	GND		Load to Q _A		66	
			123	168	GND	OUT									66			ii ii			Load to Q _B	ű	44	
			124	169						OUT				GND	66			ii ii			Load to Q _C	ű	44	
		66	125	170							OUT		GND		66			ш			Load to Q _D	ш	66	"
	t _{PLH9}	44	126	171			OUT	5.0 V	IN						5.0 V			"			Count up to Q _A		43	
			127	172		OUT		66							66			ii ii			Count up to Q _B		44	
			128	173				66	"	OUT					66			"			Count up to Q _C		66	"
			129	174				66			OUT				66			и			Count up to Q _D		66	
		44	130	175				IN	5.0 V		OUT				66			"			Count down to Q _D		66	
				176				66	"	OUT					66			"			Count down to Q _C		66	
			132	177		OUT		66	66						66			"			Count down to Q _B		66	
		44	133	178			OUT	66	66						66			"			Count down to Q _A		66	
	t _{PHL11}	44	134	179			OUT	5.0 V	IN						66			"			Count up to Q _A	"	52	
			135	180		OUT		66							66			44		44	Count up to Q _B	ű	44	
			136	181				66	"	OUT		"			66			"			Count up to Q _C	"	66	"
			137	182				66	"		OUT	"			66			ш			Count up to Q _D	ш	66	"
			138	183				IN	5.0 V		OUT				66			"			Count down to Q _D	"	66	"
			139	184				66		OUT		"			66			44		ш	Count down to Q _C	ű	44	"
		66	140	185		OUT		44	-			66			44			44		ш	Count down to Q _B	ш	66	ш
			141	186			OUT								- 4			"		ш	Count down to Q _A	"	-	
	t _{PHL12}	44	142	187			OUT					"			10/			IN	5.0 V		Clear to Q _A		40	44
			143	188	5.0 V	OUT						66			44			ш		ш	Clear to Q _B	ш	66	
			144	189						OUT		66		5.0 V	44			ш		ш	Clear to Q _C	"	44	
		**	145								OUT		5.0 V		66			"		"	Clear to Q _D	"	66	"

TABLE III.	Group A inspection for device types 07 and 08 - Continued.
an ann dition.	a (nine not decignated may be high > 2.0 \/; or law < 0.7 \/; or on

		MIL-STD-	Cases E, F	1	2	3	4	5	6	7	8	9	n ≥ 2.0 V 10	11	12	13	14	15	16		Lii	nits	
Subgroup	Symbol	883	Case <u>1</u> /	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
		method	2																				
			(Device	В	Q _B	Q _A	Count	Count	Q _C	Qn	GND	D	С	Load	Ripple	Borrow	Clear	Α	Vcc	terminal	Min	Max	
			type) 07 08				down	up							carry								
9	F _{MAX}	3003			1																		
Tc = +25°C	<u>8</u> /	<u>9</u> /	146 191																	Count up to Q _A	22		MHz
	F _{MAX} <u>8</u> /		147 192																	Count down to Q _A	22		MHz
	t _{PLH8}		148 193																	Load to Q _A	3	63	ns
			149 194																	Load to Q _B		4	
		66	150 195																	Load to Q _C	"	44	
		66	151 196																	Load to Q _D			
	t _{PHL10}		152 197																	Load to Q _A		66	
		66	153 198																	Load to Q _B	"	a	
		66	154 199																	Load to Q _C	"	66	
		44	155 200																	Load to Q _D	"	44	"
	t _{PLH9}	66	156 201																	Count up to Q _A	•	60	
		66	157 202																	Count up to Q _B		4	
			158 203	8	Same termi	inal condit	ions as to	r subgrou	ıp 9.											Count up to Q _C			
			159 204																	Count up to Q _D			- :
			160 205																	Count down to Q _D	- :		- :
			161 206																	Count down to Q _C			- :
			162 207																	Count down to Q _B	- :		- :
			163 208																	Count down to Q _A		66	- :
	t _{PHL11}		164 209																	Count up to Q _A	"	73	- :
			165 210																	Count up to Q _B		66	-
			166 211	1																Count up to Q _C			"
			167 212																	Count up to Q _D			- "
			168 213																	Count down to Q _D	-		
			169 214																	Count down to Q _C			
			170 215																	Count down to Q _B			
		-	171 216																	Count down to Q _A			
	t _{PHL12}	-	172 217																	Clear to Q _A	-	56	
			173 218																	Clear to Q _B			
	1		174 219 175 220																	Clear to Q _C	-	66	- "
 			175 220	l																Clear to Q _D			
11	Same to	sts, termir	nal condition	ns, and li	mits as fo	or subgro	oup 10, e	except T	c = -55°	C.													

- $\underline{1}\!/$ Case 2, pins not referenced are N/C.
- $\underline{\textit{2}}\textit{/}$ Apply 0.7 V for device type 07; apply 2.0 V for device type 08.
- $\underline{3}/\quad I_{IL}$ limits (µA) min/max values for circuits shown:

Parameter	Terminals				Circuits			
- aramotor	Tommalo	Α	В	С	D	Е	F	G
		-160/-400	-160/-400	-160/-400	-100/-340	-100/-340	-120/-360	-135/-370
I _{IL9}	А	u	u	66	"	и	66	44
	В	"	"	66	"	u	66	66
	С	"	"	66	"	u	66	66
	D	u	44	66	44	и	66	44
I _{IL10}	Load	-100/-340	"	-150/-380	-120/-360	-120/-360	и	-100/-340
	Clear	-160/-400	ű	-150/-380	"	и	66	-135/-370
I _{IL11}	Count up	и	u	66	"	u	66	66
	Count down	u	"	66	"	u	66	44

- 4/ I_{OS} limits (mA) min/max values for circuits shown: -15/-100 for circuits A, C, D, E, F, and G and -15/-110 for circuit B.
- 5/ Only a summary of attributes data is required.
- $\underline{6}$ / A = 3.0 V minimum; B = 0.0 V or GND.
- 7/ H > 1.5 V; L < 1.5 V; X = don't care.

- 8/ F_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.
- 9/ See figure 8 for device type 07 and figure 9 for device type 08.
- $\underline{10} \text{/} \text{ Apply momentary GND, then 4.5 V minimum prior to input pulses. Maintain 4.5 V minimum for measurement.}$

TABLE III. <u>Group A inspection for device types 09 and 13</u> – Continued. ninal conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or oper

			Cases E, F	1	2	3	4	5	6	7	8	ay be H ≥:	10	11	12	13	14	15	16		Lii	mits	
Subgroup	Symbol	MIL-STD- 883	Cases <u>1</u> /	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
		method	Test no.	В	Q _B	QA	Enable G	Down/ up	Qc	Q _D	GND	D	С	Load	Max/ Min	Ripple	Clock	А	Vcc	terminal	Min	Max	
1	VoL	3007	1	0.7 V	4 mA			ч			GND			0.7 V		ourry			4.5 V	Q _B		0.4	V
c = +25°C			2			4 mA								66				0.7 V	"	Q _A			
			3						4 mA				0.7 V	66						Qc			
			4							4 mA		0.7 V		44						Q_D			
		66	5	2.0 V				2.0 V						44	4 mA				"	Max/Min		66	
		66	6	2/			0.7 V	0.7 V				2.0 V	2/	"		4 mA	0.7 V	2.0 V	ı	Ripple carry		66	
	V _{OH}	3006	7	2.0 V	-0.4 mA									44						Q _B	2.5 V		
			8			-0.4 mA												2.0 V		Q _A	ш		
			9						-0.4 mA		"		2.0 V						"	Qc	"		
			10	0.71/	1		ļ	0.01/		-0.4 mA		2.0 V	0.71/					0.771	-	Q _D	"		
			11	0.7 V				2.0 V				0.7 V	0.7 V		-0.4 mA			0.7 V	-	Max/Min	"		-
			12				2.0 V				-					-0.4 mA				Ripple carry		4 = 17	
	V _{IC}		13 14	-18 mA			-18 mA				-									B Enable G		-1.5 V	
			15				-18 MA	-18 mA			-									Down/up			
			16					-10 IIIA				-18 mA								Down/up D			
			17									-1011114	-18 mA						"	C			- 44
			18								4		-10 IIIA	-18 mA					и	Load		44	- 44
			19											-101111/4			-18 mA			Clock			- "
			20								"						1011111	-18 mA	"	A			
	I _{IL7}	3009	21				0.4 V	5.5 V			"							101181	5.5 V	Enable G	<u>3</u> /	<u>3</u> /	μА
	I _{IL8}		22	0.4 V							44			GND						В	ш	44	- 44
	-ILD	44	23					0.4 V			"								"	Down/up	"	66	**
		66	24								44	0.4 V		66					ii ii	D	"	66	**
			25								"		0.4 V	"					"	С	"		"
		"	26								44			0.4 V						Load		44	44
			27														0.4 V			Clock	"	66	
		66	28								"			GND				0.4 V	"	Α	"	66	"
	I _{IH15}	3010	29				2.7 V				"									Enable G		60	
	I _{IH16}	66	30				5.5 V												"	Enable G		300	
	I _{IH17}		31	2.7 V							"			5.5 V						В		20	"
		**	32					2.7 V												Down/up		66	
		66	33								"	2.7 V		5.5 V					"	D		66	44
			34										2.7 V	5.5 V					"	С		66	"
			35											2.7 V						Load		66	"
			36														2.7 V		ii ii	Clock		66	"
		66	37								"			5.5 V				2.7 V	"	Α		**	44

See footnotes at end of device types 09 and 13.

TABLE III. <u>Group A inspection for device types 09 and 13</u> – Continued. Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open)

							16111	iii ai conu	ilidis (bili	S HOLUESI	gnateu m	ay be n 2 2	2.0 V, OI L	≥ 0.7 V, U	i openj.								
		MIL-STD-	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lir	nits	1
Subgroup	Symbol	883 method	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
			Test no.	В	Q _B	Q _A	Enable G	Down/ Up	Qc	Q _D	GND	D	С	Load	Max/ Min	Ripple Carry	Clock	Α	V _{CC}	terminal	Min	Max	
1	I _{IH18}	3010	38	5.5 V							GND			5.5 V					5.5 V	В		100	μA
Tc = +25°C			39					5.5 V												Down/up			
			40									5.5 V		5.5 V						D			
			41										5.5 V							С			"
		"	42																	Load		4	
			43														5.5 V			Clock		44	
			44								44			5.5 V				5.5 V		A		44	
	Ios	3011	45	5.5 V	GND						**			GND						Q _B	4/	4/	mA
			46			GND					"			**				5.5 V		Q_A		44	"
			47						GND		44		5.5 V	44						Qc		44	44
			48							GND	44	5.5 V		44						Q_D		44	44
		ш	49	GND				5.5 V			"	GND	GND	44	GND			GND	"	Max/Min	"	44	"
			50				5.5 V				44					GND				Ripple carry		44	44
	Icc	3005	51	GND			GND	GND				GND	GND	GND			GND	GND		V _{cc}		35	
2	Same te	sts, termin	al conditions	, and limit	s as for s	subgroup	1, excep	ot T _C = +	125°C a	nd V _{IC} te	ests are	omitted.											
3	Same te	sts, termin	al conditions	, and limit	s as for s	subgroup	1, excep	ot T _C = -5	55°C and	d V _{IC} test	ts are on	nitted.											

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

							Tormi					device type			anan)								
		1	Cases E, F	1	2	3	1 ermi	5	tions (pins	7	gnated ma	y be H≥2 9	10 V; OF L 5	11	open).	13	14	15	16		1 16	mits	
Subgroup	Symbol	MIL-STD- 883	Cases L, 1	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured		IIIII	Uni
		method	Test no.	В	Q _B	Q _A	Enable G	Down/	Qc	Q _D	GND	D	С	Load	Max/Min	Ripple Carry	Clock	Α	V _{CC}	terminal	Min	Max	
7	Func-	3014	52	A 6/	Н	Н	B 6/	В	Н	Н	GND	Α	Α	В	Н	Н	Α	Α	4.5 V		1		
c = +25°C	tional		53			"	A	"						В	"		"	"		İ			
	tests		54			"		"			"			Α				"	"	İ			
	5/		55	В		"		"				В	В	"	"		В	В		İ			
			56	В		"					"				"		Α		"	Ī			
			57	В			В										Α		-	I			
			58	Α								Α	Α			L	В	Α		I			
			59		L	L			L	L					L	Н	Α						
			60			L		"			"				"		В	"					
			61			Н		"							"		Α	В					
			62			Н											В	"		1			
			63	В	Н	L						В	В				Α		"	1			
			64	A		L				- :	"	A	A				В	Α	"	1			
			65	-:-		Н						- :	A				A	Α		1			
		- :	66	- :		Н		- :			-	-:-	В	-		- :	В	В		1			
			67	- :	L	L		- :	H				- :	- :		- :	Α	В	-	1			
		- :	68	- :	- :	L				- :	-	В					В	A	-	1			
			69		-	Н				-		A	A	-	- "	-	A	В		1			
		-	70			H							В				В	В		1			
			71 72		H	L				-		В	A	-	- "	-	A B	A B		1			
			72		-	H						В	-	-	- "	-	A A	A		1			
			74	В		Н						A	В				В	В		+			
			75	В	L	L			L	н		A	В				A	В		+			
			76	A	-	L			ļ.			В	A				В	A		+			
			77			H							-				A	A		See 7/			
			78			Н											В	В		000 11			
		44	79	В	н	L						Α	В				A	A		t			
		44	80		- 1	Ĺ							В				В	- "		†			
			81			Н							A				A			†			
			82			Н							A				В	В		†			
			83		L	Ĺ			Н				В				A	-	"	†			
			84		7	Ĺ			- 1			В	В				В			†			
			85	A		Н						Α	Α				Α	Α		İ			
		**	86	В		Н		"			"	В	В				В	В	"	İ			
			87	A	Н	L						Α	A				Α	Α		İ			
			88	В		L		"				В	В		"		В	"		İ			
			89	Α		Н					"	Α	A		Н		Α		"	Ī			
			90	В		Н						В	В		Н	L	В	В					
		"	91	Α	L	L			L	L		A	A		L	Н	A	Α					
		"	92	В	-	-	-	Α				В	В		Н			В]			
			93	A		"	A					Α	Α		"			Α]	1		
		"	94	В		"						В	В				В	В		1			
			95	Α								В	Α				Α	"		1			Ĭ
			96	В		"	В					Α	В				Α	"	"	1	1		1
			97	Α								•	В			L	В	"	"	1			
			98	A	Н	Н			Н	Н			A		L	Н	A	Α		1			
			99	В		Н				-		В	В		-		В	В		1	1		
			100	В		L		"	-:	- :		В	В				A	В	-	1			
	1		101	Α		L						A	Α				В	Α					Ш_

See footnotes at end of device types 09 and 13.

TABLE III. <u>Group A inspection for device types 09</u> – Continued. minal conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open)

		Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lir	mits	T
Symbol	MIL-STD- 883	Cases1/	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Un
	method	Test no.	В	Q _B	Q _A	Enable G	Down/ up	Qc	Q _D	GND	D	С	Load	Max/Min	Ripple Carry	Clock	Α	V _{CC}	terminal	Min	Max	
Func-	3014	102	A 6/	L	Н	B <u>6</u> /	A	Н	Н	GND	В	Α	Α	L	Н	A	В	4.5 V				
tional	•					•	44			"		Α										
<u>5</u> /																						
								Ŀ														
																			-			
	ш																					
	66			-																		
	66																					
1	66	113	В		L		"				В	В				В	Α					
i i		114	В	Н	Н		"	Н	L		В	В		"		Α	В	"				
i i		115	Α		Н						Α	Α				В	A					
		116			L					-						A						
							"															
										-												
	66			- 11				-														
	ш																					
	66																В					
	66			L								В										
1	44				Н							Α				В			See 7/			
1	ш	128	В		L		"				В	В		Н		Α	В	"	1 -			
	66	129	Α		L		-				Α	Α		Н	L	В	Α					
							"							L								
			Α																			
			-				В															
									-	-												
														-								
	66																					
	4						Α		ï													
	66					В	"		Н													
	ш	140	В	Ĺ	H	-		Н	L		В	A					A					
1	66	141	Α	Н	L			L	Н		Α	В				Α	В	"				
	66	142	Α				"			"	Α	В	Α	"			В	"				
	es	143	В				"			-	В	Α					A					
							"			"				"					1		1	1
																			4			
																			1			
					- :			- :		- "			- :	- "	- :	- :			1			
			A					Ú	-	-	-								-			
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TABLE III. <u>Group A inspection for device types 13</u> – Continued. Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open).

	1		0			_						/ be H ≥ 2.0				40	- 44	45	40	1			
		MII OTD	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	1	LII	mits	
Subgroup	Symbol	MIL-STD- 883	Cases1/	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Unit
		method	2				Facility	D							-	Disale				4	Min	Max	
			Test no.	В	Q _B	Q_A	Enable G	Down/	Qc	Q _D	GND	D	С	Load	Max/Min	Ripple	Clock	Α	V _{cc}	terminal	IVIII	iviax	
7	Func-	3014	52	B <u>6</u> /	L	н		up B	L	н	GND	Δ.	В	B 6/	н	carry	В	۸	4.5 V				
		3014	53	B <u>6</u> /	-	- "	A <u>6</u> /	B #	-		GIND	A	_ D	A A			В	A	4.5 V	+			
Tc = +25°C														- А				и		1			
	tests		54 55	44		"	В										A	и	-	1			
	<u>5</u> /		56		-		В "		-								B			1			
					-	L			-							L		-		+			
			57 58							Ŀ					L.	H	A B			1			
				A		L							A			66				 			
			59	A	-	Н			-	-							A		-	 			
			60	В		H							_				В	В		 			
			61	В	H	L	-	- :		-:	- :	В	В			- :	A	В	- :	1			
		- "	62	A		L						A	A		-	- :	В	A		1			
		- "	63	B		Н							В			- :	Α			1			
			64			Н							В				В			1			
			65		L	L			Н				Α				Α	В					
		"	66	Α		L							Α				В	"					
		"	67	В	"	Н	"		"		•	В	В	"			Α	ш					
			68	Α		Н			"			ш	A	"			В	ű		1			
		"	69		Н	L	"					ш	В	"			A	и		1			
		"	70			L	-						В	-			В	u					
			71			Н	-					Α	Α				Α	Α					
			72	В		Н	-					В	В				В	В					
		"	73	Α	L	L			L	Н		Α	Α		-		Α	Α					
		"	74	Α		L						Α	Α		66		В	A					
		"	75	В	"	Н						В	В		Н		Α	В		Ī			
		"	76	В		Н						"	66		Н	L	В	и		Ī			
		"	77	В		L				L				"	L	Н	Α			See 7/			
		"	78	A		L	"					Α	Α	"			В	A		_			
		"	79	В	"	Н						Α	В				Α	Α		İ			
		"	80	A		4	Α	A				В	Α	"			В	В		İ			
		"	81	Α		66						В	Α				Α	В		İ			
			82	В		44						Α	В				В	A		İ			
		"	83			44			"				В				Α	Α		†			
		"	84			66	В					"	Α				В	В		İ			
			85			L							Α		Н		А	ш		İ			
			86			Ĺ						В	В		Н	L	В	ш		İ			
			87	Α		Н				Н			-		Ĺ	H	A	Α		†			
			88	66		H						u u	- 4		Ē	Н	В	и		†			
			89	66		Ĺ						"	44		66		A			†			
			90	66		Ĺ						Α	Α		66	44	В	и		†			
		"	91	66	Н	H			Н	L		"	"		66		A	и		†			
		"	92	44	- ''	H			- ;;	-							В	В		+			
		44	93			- ii											A			t			1
		"	94			ì						В	В				В			t			1
1			95		L	H						D II	В				A			†	1		l
			96	В	-	Н							A				В	A		†			1
			97	В		L							- A				A	В		+			
		-																		†	1		l
			98 99	A		L						A					В	В		+			
			100	-	H	H			L			-	-			-	A B	A		+			1
							-		-	-		-	-	-	-				-	+			1
1	1		101			L		-							1 -		Α	-		l	L		L

TABLE III. Group A inspection for device types 13 – Continued. Terminal conditions (pins not designated may be H \geq 2.0 V; or L \leq 0.7 V; or open).

	1	MIL-STD-	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	l	Li	mits	4
Subgroup	Symbol	883	Cases <u>1</u> / 2	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured			Ur
		method	Test no.	В	Q_B	Q_A	Enable G	Down/ up	Qc	Q_D	GND	D	С	Load	Max/Min	Ripple Carry	Clock	Α	V _{cc}	terminal	Min	Max	
7	Func-	3014	102	B <u>6</u> /	Н	L	B <u>6</u> /	A <u>6</u> /	L	L	GND	В	B <u>6</u> /	Α	L	Н	В	В	4.5 V				
= +25°C	tional		103		L	Н		*									Α	В					
	tests		104			Н											В	Α					
	5/		105			L									Н		Α	Α					
			106	Α	-	L	Α					Α	Α				Α	В					
			107	A								Α	A				В						
			108	В	-							В	В				Α						
			109		*		В										Α						
			110													L	В						
			111	A		Н				Н		Α	Α		L	Н	Α	Α					
			112		-	Н											В	В					
			113			L											Α	Α					
			114	В	=	Н							В	В		-							
			115											Α									
			116									В						В					
			117				Α																
			118														В						
			119														Α						
			120					В							Н		Α						
			121														В						
			122														Α						
			123	A			В					Α	Α				Α	Α		İ			
			124													L	В			i			
			125			L			L	L					L	Н	Α			i			
			126	В		Н			Н			В		В			Α			İ			
			127														В			See 7/			
			128		"												Α			_			
			129											A						i			
			130	A								Α	В					В		i			
			131	Α													В			i			
			132	В		L			L	Н				В			В						
			133											В			Α						
		и	134				Α	Α						Α			Α						
			135									В	Α				В	Α					
			136									В	A				A			1			
			137			Н						Α	В	В									
		и	138	Α	Н	L			Н	L		В	Α					В					
		и	139	A	Н	Ĥ			Н	-			A					A					
			140	В	Ĺ	Ĺ		В	Ĺ				В					В		1			
			141	В		-	В	-	-				В	Α				В		1			
		и	142	A			-					Α	A					A		i			
		ш	143	*				Α				- 1	"		Н			-		1	1		1
		u	144					-							H	L	В			1	1		1
			145			Н				Н		В			Ë	H	A	В		1	1		1
			146					В				В			H	H	A	В		1			
			147									A			H	Ľ	В	A		1	1		1
			148			L				L					L L	H	A	-		1			
			149		Н	H			Н	H				В	H	H	A			i	1		1

TABLE III. Group A inspection for device types 09 and 13 – Continued.

								16	erminai co	onaitions (pins not	designate	a may be	H ≥ 2.0	v; or L ≤ !	0.7 V; or o	pen).							
		MIL-STD-	Cas E,		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Li	mits	
Subgroup	Symbol	883 method	Cas 2		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal			Unit
			(Der typ		В	Q _B	Q _A	Enable G	Down/ up	Qc	Q _D	GND	D	С	Load	Max/Min	Ripple carry	Clock	А	V _{CC}		Min	Max	
9 Tc = +25°C	F _{MAX} <u>8</u> /	3003 <u>9</u> /	152	150			OUT	GND	GND			GND			5.0 V			IN		5.0 V	Ck to Q _A	18		MHz
	t _{PLH10}		153	151			OUT								IN			GND	5.0 V		Load to Q _A	3	38	ns
			154	152	5.0 V	OUT									и			66			Load to Q _B			
			155	153						OUT				5.0 V				66			Load to Q _c	"	44	
			156	154							OUT		5.0 V					66			Load to Q _D			
	t _{PHL13}		157	155			OUT								и				GND		Load to Q _A		55	
			158	156	GND	OUT									и			66			Load to Q _B			
			159	157						OUT				GND				66			Load to Q _c	"	44	
			160	158							OUT		GND		и					66	Load to Q _D	"	"	"
	t _{PLH11}		161	159			OUT	GND	GND						5.0 V			IN			Ck to Q _A		29	
			162	160		OUT									и			66			Ck to Q _B			
			163	161					"	OUT								66			Ck to Q _c		44	44
			164	162				"	"		OUT				и			66			Ck to Q _D		"	
	t _{PHL14}		165	163			OUT								и			66			Ck to Q _A		41	
			166	164		OUT									и			66			Ck to Q _B			
		"	167	165					и	OUT								66			Ck to Q _C		44	
		"	168	166				"	"		OUT							66			Ck to Q _D		"	
	t _{PLH12}	"	169	167				"	"			"				OUT		66		"	Ck to Max/Min	"	47	
	t _{PHL15}		170	168				ш				ш				OUT					Ck to Max/Min		57	

TABLE III. <u>Group A inspection for device types 09 and 13</u> – Continued.

		MIL-STD-	Cas E,	es F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Lir	nits	
Subgroup	Symbol		Case 2		2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20	Measured terminal			Unit
			(Dev typ		В	Q _B	Q _A	Enable G	Down/ up	Qc	Q _D	GND	D	С	Load	Max/Min	Ripple carry	Clock	Α	V _{cc}		Min	Max	
10 Tc = +125°C	F _{MAX} 8/	3003 <u>9</u> /	171	169						l .		ļ.			!					ļ.	Ck to Q _A	18		MHz
	t _{PLH10}		172	170																•	Load to Q _A	3	53	ns
				171																	Load to Q _B	"	ш	
			174	172																	Load to Q _C		"	
		"	175	173																	Load to Q _D	**		
	t _{PHL13}	•	176	174																	Load to Q _A		77	
				175																	Load to Q _B	"		- :
			178	176																	Load to Q _C			
			179	177	Com		ol oondis	ions as fo		ın 0											Load to Q _D			
	t _{PLH11}		180	178	Sam	ie termin	iai condit	ions as ic	ii subgrou	ıp 9.											Ck to Q _A	- "	41	
		-	181	179																	Ck to Q _B			
			182	180																	Ck to Q _C		- "	
			183	181																	Ck to Q _D			-
	t _{PHL14}		184 185	182 183																	Ck to Q _A Ck to Q _B		57	-
		44	186	184																	Ck to Q _B			
		44	187	185																	Ck to Q _D		ш	
	-			_																		1		
	t _{PLH12}	*	188	186																	Ck to Max/Min	"	66	
	t _{PHL15}		189	187																	Count up to Q _B	"	80	

- $\underline{1}$ / Case 2, pins not referenced are N/C.
- $\underline{2}\!/$ Apply 2.0 for device type 09; apply 0.7 V for device type 13.
- $\underline{3}\!/\quad I_{IL}$ limits (µA) min/max values for circuits shown:

Parameter	Terminals				Circuits			
		А	В	С	D	Е	F	G
I _{IL7}	Enable G	-360/-1080	-160/-400	-360/-1080	-360/-1080	-360/-1080	-360/-1080	-360/-1080
I _{IL8}	A, B, C, D	-130/-400	-160/-400	-160/-400	-160/-400	-120/-360	-120/-360	-120/-360
	Down/up	"	u	-150/-380	"	"	"	66
	Clock	и	u	66	u	u	u	66
	Load	-100/-340	u	44	-100/-340	u	u	

- 4/ I_{OS} limits (mA) min/max values for circuits shown: -15/-100 for circuits A, C, D, E, F, and G and -15/-110 for circuit B.
- $\underline{\bf 5}\!/$ Only a summary of attributes data is required.
- $\underline{6}$ / A = 3.0 V minimum; B = 0.0 V or GND.
- $\underline{7}/$ H > 1.5 V; L < 1.5 V; X = don't care.
- $\underline{8}/$ F_{MAX} minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.
- $\underline{9}\!/$ See figure 10 for device type 09 and figure 12 for device type 13.

TABLE III. Group A inspection for device types 10. Terminal conditions (pins not designated may be $H \ge 2.0 \text{ V}$; or $L \le 0.7 \text{ V}$; or open).

		MIL-STD-	Cases A, B, C, D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Lir	mits	
Subgroup	Symbol	883 method	Cases <u>1</u> / 2	2	3	4	6	8	9	10	12	13	14	16	18	19	20	Measured terminal			Unit
			Test no.	В	NC	NC	NC	V _{CC}	R ₀ (1)	R ₀ (2)	Q _D	Qc	GND	Q _B	Q_A	NC	Α		Min	Max	
1	VoL	3007	1	GND				4.5 V	2.0 V	2.0 V			GND		4 mA		2.0 V	Q_A		0.4	V
Tc = +25°C			2	2.0 V						"				4 mA	+I _{IL3} (max)		GND	Q _B			
			3							"							"	Q _c			
			4						*	"	4 mA		66					Q_D			
	V _{OH}	3006	5	GND					2/	2/			44		-0.4 mA		2/ 3/	Q_A	2.5		
			6	2/ 3/					"	"			"	-0.4 mA			GND	Q _B	**		
		"	7	2/ 4/					"	"		-0.4 mA	66				44	Q _C	**		
		"	8	2/ 5/						"	-0.4 mA						"	Q_D	"		
	V _{IC}		9														-18 mA	A		-1.5	
			10	-18 mA					40.1									В			-
			11						-18 mA	40. 4								R _o (1)			
		3009	12 13					5.5 V	0.4 V	-18 mA 5.5 V								R _o (2)	0/		mA
	I _{IL1}	3009	13					5.5 V	5.5 V	0.4 V			-					R ₀ (1) R ₀ (2)	6/	<u>6</u> /	mA "
	I _{IL2}	"	15						2/	2/							0.4 V	A A			
	I _{IL3}		16	0.4 V					-	-								В			
				U.4 V									66							— —	
	I _{IH1}	3010	17						2.7 V	GND								R _o (1)		20	μA
	I _{IH1}		18						GND	2.7 V								R ₀ (2)		20	<u> </u>
	I _{IH2}		19 20						5.5 V GND	GND 5.5 V								R _o (1) R _o (2)		100 100	-
	I _{IH2}		20						5.5 V	5.5 V							2.7 V	R ₀ (2)		80	
	I _{IH3}																				
	I _{IH4}	"	22					"	"	"			"				5.5 V	A		400	
	I _{IH5}	"	23	2.7 V						"			66					В	<u>13</u> /	80	**
	I _{IH6}	"	24	5.5 V				"	"	"			-					В		400	-
	Ios	3011	25	GND				"	2/	2/			"		GND		2/ 3/	Q_A	7/	7/	mA
		"	26	2/ 3/				u	44					GND			GND	Q _B	44	66	66
		"	27	2/ 4/					*	"		GND	66					Qc	"	66	66
		"	28	2/ 5/				"	"	**	GND		66				"	Q _D	**	**	"
	Icc	3005	29	GND									44					V _{cc}		15	
2	Same te	sts, termina	al conditions	, and limit	s as for s	ubgroup	1, exce	ot T _C = +	125°C a	nd V _{IC} te	ests are	omitted.	•								
	1																				
3	Same te	sts, termina	al conditions	, and limit	s as for s	subgroup	1, exce	of $T_C = -6$	55°C and	V _{IC} tes	ts are on	nitted.									

See footnotes at end of device type 10.

7 Fu Tc = +25°C Tio	Symbol Func- Fional ests	MIL-STD- 883 method	Cases E A, B, C, D Cases1/ 2 Test no. 30 31 32 33	1 2 B B 9/	2 3 NC	Terminal of 3 4 NC	6	5	6	7	8	9	10	11	12	13	14		Li	mits	
7 Fu Tc = +25°C Tie	Symbol Func- Fional ests	883 method 3014	Cases <u>1</u> / 2 Test no. 30 31 32	B B <u>9</u> /			6	8	0												
Tc = +25°C Tio	ional ests	3014	Test no. 30 31 32	B <u>9</u> /	NC	NC	_		3	10	12	13	14	16	18	19	20	Measured			Unit
Tc = +25°C Tio	ional ests	" "	31 32				NC	V _{CC}	R ₀ (1)	R ₀ (2)	Q _D	Q _C	GND	Q _B	Q _A	NC	А	terminal	Min	Max	
tes	ests	" "	32	Α				4.5 V	A 9/	A 9/	L	L	GND	L	L		B <u>9</u> /				
								66													
8/	/	и		В									"								
	-			В					В				"	-:-			-				
	ļ		34	A						- :											
	ļ		35 36	B B					A					H L			-	-			
	H		37	В					A "	Х				÷			-				
			38	A						В				-				1			
	†		39	В						"		66		Н	44						
	t		40	A										H							
	İ		41	В								Н		L							
	İ		42	Α								Н	"	66				1	1	1	
	Ī		43	В							Н	L		66							
			44	Α								44									
	1		45	В					:	:				Н			-				
	1	-:-	46	A					- :					Н	- :						
	+		47	В								H		<u> </u>				_			
	+		48 49	B B					В	A	L.	<u> </u>						_			
	ł		50	A					D			-		-							
	+	ш	51	В								4	"	Н				-			
	†		52	A										H							
	f	"	53	В						44		Н		Ĺ	44			1			
	İ		54	Α					4			Н									
	Ī		55	В							Н	L						See 10/			
			56	Α																	
	1	"	57	В					:				"	Н			-				
	1	"	58	A										Н							
	ļ.		59	В								Н		L	-						
	+		60 61	A B							L	H L					-	_			
	H	u	62								-	-					Α	-			
	ŧ		63								66	66	"		Н		В	-			
	t		64								44	44			H		A	1			
	İ	u u	65									66	"	66	Ĺ		В				
8 Sa	Same tes	ts, termina	al conditions	, and limit	s as for	subgroup	7, excep	ot T _C = +	125°C a	nd -55°C	D.							•			
9 F _N Tc = +25°C	MAX	3003	66					5.0 V	GND				GND		OUT		IN <u>12</u> /	A to Q _A	29		MHz
	PLH1	(Fig 11)	67		 	 		44	11/	A <u>9</u> /		OUT			-	 	IN	A to Q _C	3	53	ns
	PLH1 PHL1	(119 11)	68			1			GND	N 9/		OUT	"		 		IN	A to Q _C	"	58	113
	PLH2	"	69	IN					11/	A 9/	OUT		"					B to Q _D	"	37	66
t _{PF}	PHL2		70	IN				66	GND		OUT							B to Q _D	**	50	66
10 F _N Tc = +125°C	MAX	u	71						GND						OUT		IN <u>12</u> /	A to Q _A	29		MHz
	PLH1		72						<u>11</u> /	A <u>9</u> /		OUT					IN	A to Q _C	3	74	ns
	PHL1		73					66	GND			OUT					IN	A to Q _C	44	81	-
	PLH2		74	IN					11/	A <u>9</u> /	OUT		"					B to Q _D	"	52	66
t _{PF}	PHL2		75	IN					GND		OUT							B to Q _D	"	56	66

See footnotes at end of device type 10.

- $\underline{1}/\quad$ Case 2, pins not referenced are N/C.
- $\underline{2}/$ Apply 4.5 volts pulse, then ground prior to taking measurements to set device in the desired state. Maintain ground for measurement.
- $\underline{3}\!/$ Input pulse must be applied one time after R₀ pulse.
- $\underline{4}\!/$ Input pulse must be applied twice after R_O pulse.
- $\underline{5}\!/$ Input pulse must be applied four times after R_O pulse.
- $\underline{6}/\quad I_{IL}$ limits (mA) min/max values for circuits shown:

Parameter	Terminals	Circuits										
		Α	В	С	D	Е	F	G				
I _{IL1}	R _o (1) R _o (2)	12/36	03/40	03/40	03/40		12/36					
I _{IL2}	Α	-0.5/-2.0	-1.0/-2.4	-1.0/-2.4	-1.0/-2.4		-0.5/-2.0					
I _{IL3}	В	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2	-0.4/-1.6		-0.7/-3.2					

 $\underline{Z}/$ I_{OS} limits (mA) min/max values for circuits shown:

	Measured				Circuits			
Parameter	terminals	А	В	С	D	E	F	G
los	Q _A , Q _B , Q _C , Q _D	-15/-100	-15/-100	-30/-130	-15/-100		-15/-100	

- 8/ Only a summary of attributes data is required.
- $\underline{9}$ / A = 3.0 V minimum; B = 0.0 V or GND.
- $\underline{10}$ / H > 1.5 V; L < 1.5 V; X = don't care.
- 11/ Momentary 3.0 V (min), then ground. Maintain ground for measurement.
- $\underline{12} / \ F_{\text{MAX}} \ \text{min limit specified is the frequency of the input pulse}. \ \ \text{The output frequency shall be one-half of the input frequency}.$
- $\underline{13}\!/$ The minimum limit for circuit F shall be –150 $\mu A.$

5. PACKAGING

5.1 <u>Packaging requirements</u>. 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 or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service or Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

- 6.1 <u>Intended use.</u> Microcircuits conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.
 - 6.2 Acquisition requirements. Acquisition documents should specify the following:
 - a. Title, number, and date of the specification.
 - b. PIN and compliance identifier, if applicable (see 1.2).
 - c. Requirements for delivery of one copy of the 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 shall not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
 - I Requirements for "JAN" marking.
 - j. Packaging Requirements (see 5.1)
- 6.3 <u>Superseding information</u>. 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 <u>Qualification</u>. 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 <u>Abbreviations, symbols, and definitions</u>. 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}	
V _{IN}	Voltage level at an input terminal

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

Military device type	Generic-industry type
01	54LS90
02	54LS93
03	54LS160
04	54LS161
05	54LS168
06	54LS169
07	54LS192
08	54LS193
09	54LS191
10	54LS92
11	54LS162
12	54LS163
13	54LS190

6.8 <u>Manufacturers' designation.</u> Manufacturers' circuits which form a part of this specification are designated with an "X" as shown in table IV herein.

TABLE IV. Manufacturers' designation.

Device	Circuit	А	В	G	С	Е	F	D
type	Manufacturer Commercial Type	Texas Instruments, Incorporated	Signetics Corp.	National Semi- Conductor Corp.	Raytheon Company	Fairchild Semi- conductor	Motorola, Inc.	Advanced Micro Devices Inc.
01	54LS90	Х	Χ	•	Х	Х	Х	
02	54LS93	Х	Х	Х	Х	Х	Х	
03	54LS160A	Х	Х	Х	Х	Х	Х	Х
04	54LS161A	Х	Х	Х	Х	Х	Х	Х
05	54LS168			Х		Х		
06	54LS169A			Х		Х		
07	54LS192	Х	Х	Х	Х	Х	Х	Х
08	54LS193	Х	Х	Х	Х	Х	Х	Х
09	54LS191	Х	X	Х	Х	X	Х	Х
10	54LS92	Х		Х	Х		X	
11	54LS162A	X	Х	Х	X	X	Х	Х
12	54LS163A	X	Х	Х	X	Х	Х	Х
13	54LS190	Х	Х	Х	Х	Х	Х	Х

^{6.9 &}lt;u>Change from previous issue.</u> 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

Review activities:

Army – SM, MI Navy - AS, CG, MC, SH TD Air Force – 03, 19, 99 Preparing activity: DLA - CC

(Project 5962-1996)