INCH-POUND MIL-M-38510/344A <u>14 April 2004</u> SUPERSEDING MIL-M-38510/344 12 June 1986

## MILITARY SPECIFICATION

# MICROCIRCUITS, DIGITAL, BIPOLAR, ADVANCED SCHOTTKY TTL, DECADE COUNTERS, MONOLITHIC SILICON

Reactivated after 14 April 2004 and may be used for either new or existing design acquisition.

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, advanced Schottky TTL, decade counter microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided for each type and are reflected in the complete part number. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).

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

1.2.1 <u>Device types.</u> The device types are as follows:

Device type	<u>Circuit</u>
01	Synchronous 4 - bit decade counter (asynchronous master reset)
02	Synchronous 4 - bit decade counter (synchronous reset)
03	Synchronous 4 - bit up/down decade counter (with mode control)
04	Synchronous 4 - bit up/down decade counter
	(asynchronous master reset)

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

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

Outline letter	Descriptive designator	<u>Terminals</u>	Package style
Е	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

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

	1.3	Absolute	maximum	ratings.
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Supply voltage range Input voltage range Storage temperature range Maximum power dissipation, per device ( $P_D$ ) <u>1</u> / Device types 01, 02, 03, 04 Lead temperature (soldering, 10 seconds) Thermal resistance, junction to case ( $\theta_{JC}$ ): Cases E, F, and 2 Junction temperature ( $T_J$ ) <u>2</u> /	-1.2 V dc at -18 mA to +7.0 V dc -65° to +150°C 303 mW +300°C (See MIL-STD-1835)
1.4 <u>Recommended operating conditions.</u>	
Supply voltage (V <sub>CC</sub> ) Minimum high level input voltage (V <sub>IH</sub> ) Maximum low level input voltage (V <sub>IL</sub> )	maximum 2.0 V dc
Normalized fanout (each output) <u>3</u> / Low logic level High logic level Case operating temperature range (T <sub>C</sub> )	50 maximum
Width of clock pulse, high (PE = high, low) Device types 01, 02	5.0 ns minimum
Width of clock pulse, low (PE = high) Device types 01, 02	8.0 ns minimum
Width of clock pulse, low (PE = low) Device types 01, 02 Width of master reset pulse, low Device type 01	
Width of PL pulse, low Device type 03 Device type 04 Width of clock pulse, low	8.5 ns minimum
Device type 03 Width of CPU or CPD pulse, low Device type 04	
Width of master reset pulse, high Device type 04	
Width of CPU or CPD pulse, low (change of direction) Device type 04 Setup time Pn high to clock pulse	
Device types 01, 02 Setup time Pn low to clock pulse Device types 01, 02	
Setup time $\overrightarrow{PE}$ or $\overrightarrow{SR}$ high to clock pulse Device types 01, 02	
Setup time PE or SR low to clock pulse Device types 01, 02	

 $<sup>\</sup>underline{1}$ / Must withstand the added P<sub>D</sub> due to short-circuit test (e.g., I<sub>OS</sub>).  $\underline{2}$ / Maximum junction temperature should not be exceeded except in accordance with allowable short duration burn-in screening condition in accordance with MIL-PRF-38535.

<sup>3/</sup> The device should fanout in both high and low levels to the specified number of inputs of the same device type as that being tested.

Setup time CEP or CET high to clock pulse	
Device types 01, 02 Setup time CEP or CET low to clock pulse	. 13.0 ns minimum
Device types 01, 02	. 7.5 ns minimum
Setup time $\overline{U}/D$ high to clock pulse	
Device type 03	. 12.0 ns minimum
Setup time U/D low to clock pulse	10.0
Device type 03 Setup time Pn high to PL	. 12.0 ns minimum
Device types 03, 04	. 6.0 ns minimum
Setup time Pn low to PL	
Device types 03, 04	. 6.0 ns minimum
Setup time CE low to clock pulse Device type 03	10 E no minimum
Hold time Pn high to clock pulse	
Device types 01, 02	. 2.5 ns minimum
Hold time Pn low to clock pulse Device types 01, 02	2.5 ns minimum
Hold time $\overrightarrow{PE}$ or $\overrightarrow{SR}$ high to clock pulse	2.0 10 1111110
Device types 01, 02	. 2.0 ns minimum
Hold time $\overline{PE}$ or $\overline{SR}$ low to clock pulse	
Device types 01, 02	. 0.0 ns minimum
Hold time CEP or CET high to clock pulse Device types 01, 02	. 0.0 ns minimum
Hold time CEP or CET low to clock pulse	
Device types 01, 02	. 0.0 ns minimum
Hold time Pn high to PL Device types 03, 04	2.0 ns minimum
Hold time Pn low to PL	
Device types 03, 04	. 2.0 ns minimum
Hold time $\overline{U}/D$ high to clock pulse	
Device type 03	. 0.0 ns minimum
Hold time U/D low to clock pulse Device type 03	0.0 ns minimum
Hold time $\overline{CE}$ low to clock pulse	
Device type 03	. 0.0 ns minimum
Recovery time master reset to clock pulse Device type 01	
Recovery time PL to clock pulse	. 7.0 ns minimum
Device type 03	. 7.5 ns minimum
Recovery time master reset to CPU or CPD	
Device type 04 Recovery time $\overline{PL}$ to CPU or CPD	. 4.5 ns minimum
Device type 04	. 8.0 ns minimum
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# 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 <u>Qualification</u>. 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 Terminal connections. The terminal connections shall be as specified on figures 1.

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

3.3.3 <u>Truth tables.</u> The truth tables 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 upon request.

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

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

3.5 <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 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.

4.3 <u>Qualification inspection</u>. 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 <u>Group A inspection</u>. 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.

# TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions	Device	Lir	nits	Unit
		$-55^{\circ}C \le T_{C} \le +125^{\circ}C$	type	Min	Max	
		unless otherwise specified				
High level output voltage	V <sub>OH</sub>	$V_{CC} = 4.5 \text{ V}, \text{ V}_{IL} = 0.8 \text{ V},$	All	2.5		V
		I <sub>OH</sub> = -1.0 mA, V <sub>IH</sub> = 2.0 V				
Low level output voltage	V <sub>OL</sub>	$V_{CC}=4.5~V,~I_{OL}=20~mA,$	All		0.5	V
		$V_{IH} = 2.0 \text{ V}, V_{IL} = 0.8 \text{ V}$				
Input clamp voltage	VIC	$V_{CC} = 4.5 \text{ V}, \text{ I}_{IN} = -18 \text{ mA},$	All		-1.2	V
		$T_{\rm C} = 25^{\circ}{\rm C}$				
High level input current	I <sub>IH1</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IN} = 2.7 \text{ V}$	All		20	μA
	I <sub>IH2</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IN} = 7.0 \text{ V}$	All		100	μA
Low level input current	I <sub>IL1</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IL} = 0.5 \text{ V}$	All	03	-0.6	mA
	I <sub>IL2</sub>	$V_{CC} = 5.5 \text{ V}, \text{ V}_{IL} = 0.5 \text{ V}$	01, 02	50	-1.2	mA
	I <sub>IL3</sub>		03, 04	75	-1.8	mA
Short circuit output current $\underline{1}/$	los	$V_{CC} = 5.5 \text{ V},  V_{OS} = 0 \text{ V}$	All	-60	-150	mA
Supply current	Icc	V <sub>CC</sub> = 5.5 V	All		55	mA
Maximum count frequency	f <sub>MAX</sub>	V <sub>CC</sub> = 5.0 V	All	70		MHz
Propagation delay time, CP to Qn	t <sub>PLH1</sub>	$V_{CC} = 5.0 \text{ V},  \text{C}_{\text{L}} = 50  \text{pF} \pm 10\%,$ See figure 4	03	3.0	9.5	ns
CP to Qn	t <sub>PHL1</sub>		03	5.0	13.5	ns
CP $\overline{U}/D$ to Qn	t <sub>PLH1</sub>		04	4.0	10.0	ns
CP $\overline{U}/D$ to Qn	t <sub>PHL1</sub>		04	5.5	14.0	ns
CP to Qn $\overline{PE}$ = (high)	t <sub>PLH1</sub>		01, 02	3.5	9.0	ns
CP to Qn $\overline{PE}$ = (high)	t <sub>PHL1</sub>		01, 02	3.5	11.5	ns
CP to TC	t <sub>PLH2</sub>		03	6.0	16.5	ns
CP to TC	t <sub>PHL2</sub>		03	5.0	13.5	ns
CPU to TCU	t <sub>PLH2</sub>		04	4.0	10.5	ns
CPU to TCU	t <sub>PHL2</sub>		04	3.5	9.5	ns

 $\underline{1}$ / Not more than one output should be shorted at a time.

Test	Symbol	Conditions	Device	Lin	nits	Unit
		$-55^{\circ}C \le T_C \le +125^{\circ}C$	type	Min	Max	
Propagation delay time,	t <sub>PLH3</sub>	unless otherwise specified $V_{CC} = 5.0 \text{ V}, \text{ C}_{L} = 50 \text{ pF} \pm 10\%,$	04	5.0	13.5	ns
PL to Qn		See figure 4				
PL to Qn	t <sub>PHL3</sub>		04	5.5	15.0	ns
CPD to TCD	t <sub>PLH4</sub>		04	4.0	10.5	ns
CPD to TCD	t <sub>PHL4</sub>		04	3.5	9.5	ns
CP to Qn $\overline{PE} = (low)$	t <sub>PLH2</sub>		01, 02	3.0	10.0	ns
CP to Qn $\overline{PE}$ = (low)	t <sub>PHL2</sub>		01, 02	3.0	10.0	ns
CP to RC	t <sub>PLH3</sub>		03	3.0	9.5	ns
CP to RC	t <sub>PHL3</sub>		03	3.0	9.0	ns
CP to TC	t <sub>PLH3</sub>		01, 02	4.0	16.5	ns
CP to TC	t <sub>PHL3</sub>		01, 02	4.0	15.5	ns
Pn to Qn	t <sub>PLH4</sub>		03	3.0	9.0	ns
Pn to Qn	t <sub>PHL4</sub>		03	6.0	16.0	ns
Pn to Qn	t <sub>PLH5</sub>		04	3.0	8.5	ns
Pn to Qn	t <sub>PHL5</sub>		04	6.0	16.5	ns
CET to TC	t <sub>PLH4</sub>		01, 02	2.5	9.0	ns
CET to TC	t <sub>PHL4</sub>		01, 02	2.5	9.0	ns
CE to RC	t <sub>PLH5</sub>		03	3.0	9.0	ns
$\overline{CE}$ to $\overline{RC}$	t <sub>PHL5</sub>		03	3.0	9.0	ns
MR to Qn	t <sub>PHL5</sub>		01	5.5	14.0	ns
MR to TC	t <sub>PHL6</sub>		01	4.5	12.5	ns
PL to Qn	t <sub>PLH6</sub>		03	5.0	13.0	ns
PL to Qn	t <sub>PHL6</sub>		03	5.5	14.5	ns

# TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions	Device	Lin	nits	Unit
		$\label{eq:constraint} \begin{array}{l} -55^\circ C \leq T_C \leq +125^\circ C \\ \text{unless otherwise specified} \end{array}$	type	Min	Max	
Propagation delay time,	t <sub>PLH6</sub>	$V_{CC}$ = 5.0 V, $C_L$ = 50 pF $\pm$ 10%,				
MR to TCU		See figure 4	04	6.0	15.0	ns
MR to TCD	t <sub>PHL6</sub>		04	6.0	16.0	ns
U/D to RC	t <sub>PLH7</sub>		03	7.0	22.0	ns
$\overline{U}/D$ to $\overline{RC}$	t <sub>PHL7</sub>		03	5.5	14.0	ns
MR to Qn	t <sub>PHL11</sub>		04	5.5	16.0	ns
Ū/D to TC	t <sub>PLH8</sub>		03	4.0	13.5	ns
Ū/D to TC	t <sub>PHL8</sub>		03	4.0	12.5	ns
PL to TCU	t <sub>PLH7</sub>		04	7.0	18.5	ns
PL to TCU	t <sub>PHL7</sub>		04	7.0	17.5	ns
PL to TCD	t <sub>PLH8</sub>		04	7.0	18.5	ns
PL to TCD	t <sub>PHL8</sub>		04	7.0	17.5	ns
Pn to TCU	t <sub>PLH9</sub>		04	6.0	16.5	ns
Pn to TCU	t <sub>PHL9</sub>		04	5.5	16.5	ns
Pn to TCD	t <sub>PLH10</sub>		04	6.0	16.5	ns
Pn to TCD	t <sub>PHL10</sub>		04	5.5	16.5	ns

# TABLE I. Electrical performance characteristics.

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

### TABLE II. Electrical test requirements.

\*PDA applies to subgroup 1.

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

4.4.3 <u>Group C inspection</u>. 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.

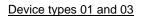
4.4.4 <u>Group D inspection</u>. Group D inspection shall be in accordance with table V of MIL-PRF-38535. End-point electrical parameters shall be as specified in table II herein.

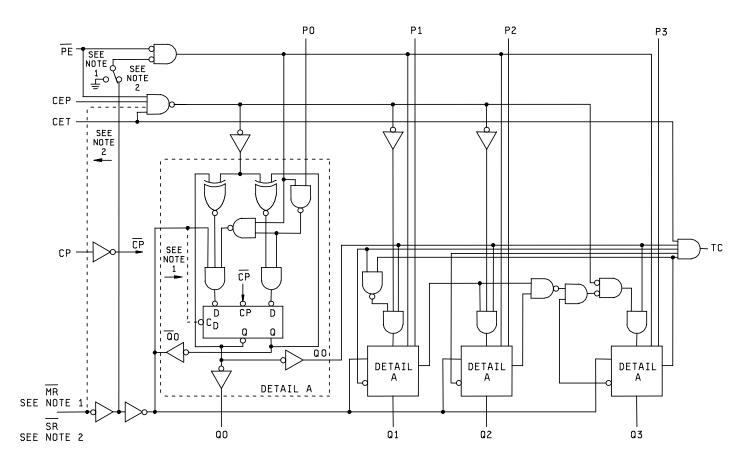
4.5 Methods of inspection. Methods of inspection shall be specified as follows:

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	e type 2	Device type 03		Device type 04	
Terminal	Case	Case	Case	Case	Case	Case	Case	Case
number	E and F	2	E and F	2	E and F	2	E and F	2
1	MR	NC	SR	NC	P1	NC	P1	NC
2	CP	MR	CP	SR	Q1	P1	Q1	P1
3	P0	CP	P0	CP	Q0	Q1	Q0	Q1
4	P1	P0	P1	P0	CE	Q0	CPD	Q0
5	P2	P1	P2	P1	Ū/D	CE	CPU	CPD
6	P3	NC	P3	NC	Q2	NC	Q2	NC
7	CEP	P2	CEP	P2	Q3	Ū/D	Q3	CPU
8	GND	P3	GND	P3	GND	Q2	GND	Q2
9	PE	CEP	PE	CEP	P3	Q3	P3	Q3
10	CET	GND	CET	GND	P2	GND	P2	GND
11	Q3	NC	Q3	NC	PL	NC	PL	NC
12	Q2	PE	Q2	PE	тс	P3	TCU	P3
13	Q1	CET	Q1	CET	RC	P2	TCD	P2
14	Q0	Q3	Q0	Q3	CP	PL	MR	PL
15	TC	Q2	TC	Q2	P0	TC	P0	TCU
16	Vcc	NC	Vcc	NC	Vcc	NC	Vcc	NC
17		Q1		Q1		RC		TCD
18		Q0		Q0		СР		MR
19		TC		TC		P0		P0
20		Vcc		Vcc		Vcc		Vcc

FIGURE 1. Terminal connections.





NOTES: 1. Device type 01 2. Device type 02

FIGURE 2. Logic diagram.



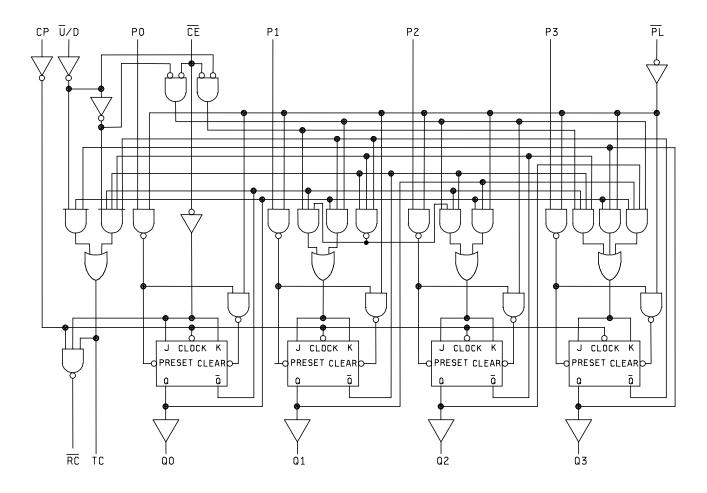


FIGURE 2. Logic diagram - Continued.

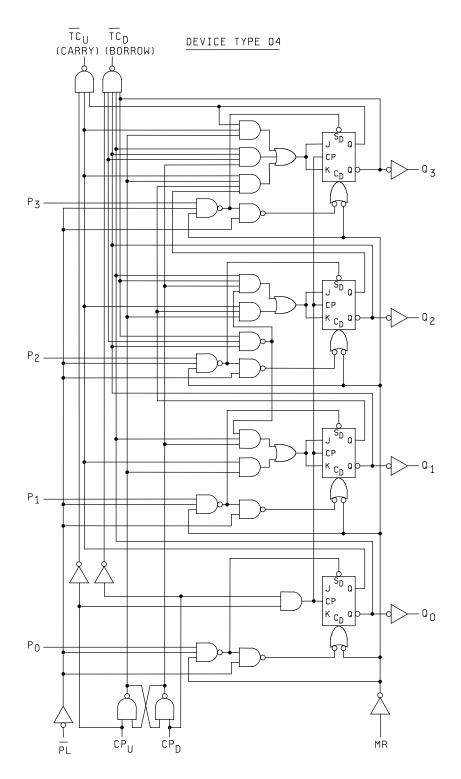


FIGURE 2. Logic diagram - Continued.

# Device types 01 and 02

# Mode select table

* SR	PE	CET	CEP	Action on the rising clock edge ( _ ∫ )
L	Х	Х	Х	Reset (clear)
Н	L	Х	Х	Load (Pn - Qn)
Н	Н	Н	Н	Count (increment)
Н	н	L	Х	No change (hold)
Н	Н	Х	L	No change (hold)

\* For device type 02

H = High voltage level

L = Low voltage level

X = Immaterial

# Device type 03

# Mode select table

	Inp	outs		
PL	CE	Ū/D	CP	Mode
Н	L	L		Count up
Н	L	H		Count down
L	Х	Х	X	Preset (asyn)
Н	Н	Х	Х	No change (hold)

# RC truth table

	Inputs		Output
CE	TC*	СР	RC
L	Н	Ц	U
Н	Х	Х	Н
Х	L	Х	Н

\*TC is generated internally H = High voltage level

L = Low voltage level

- X = Immaterial
- \_ = Transition from low to high level

 $\overline{\underline{\Box}}$  = One low level pulse

# Device type 04

# Function table

MR	PL	CPU	CPD	Mode
Н	Х	Х	Х	Reset (asyn)
L	L	Х	Х	Preset (asyn)
L	Н	Н	Н	No change
L	Н		Н	Count up
L	Н	H		Count down

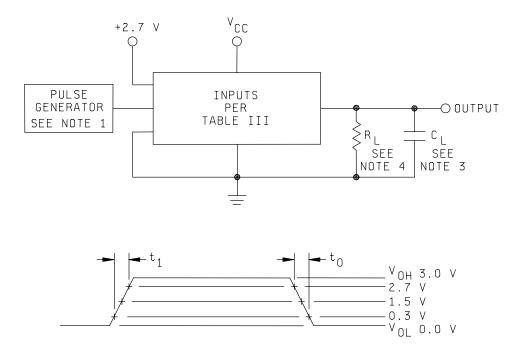
H = High voltage level

L = Low voltage level

X = Immaterial

\_ = Transition from low to high level

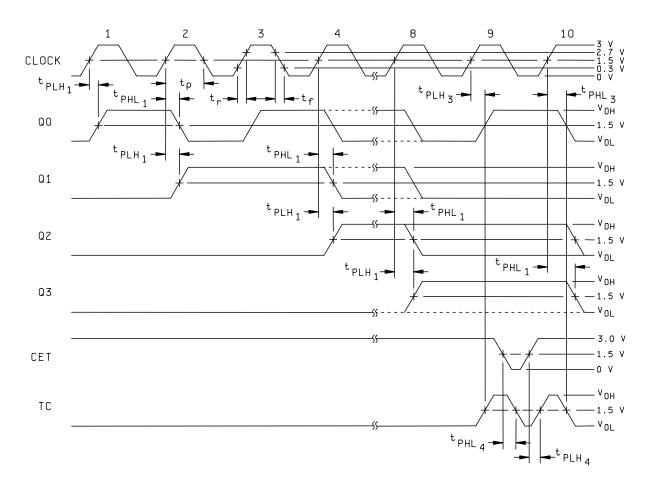
FIGURE 3. Truth tables.



NOTES:

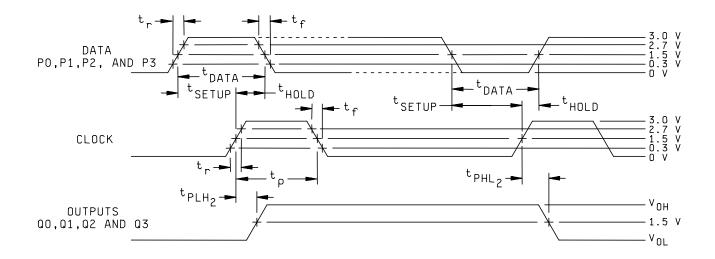
- 1. Pulse generator has the following characteristics:
- $t_1 = t_0 \le 2.5 \text{ ns}, \text{ PRR} \le 1 \text{ MHz}, Z_{OUT} \cong 50\Omega.$
- 2. Inputs not under test are at ground or at 2.7 V as specified in table III.
- 3.  $C_L = 50 \text{ pF} \pm 10\%$  including scope probe, wiring, and stray capacitance without package in test fixture.
- 4.  $R_L$  = 499 $\Omega$  ±5%.
- 5. Voltage measurements are to be made with respect to network ground terminal.

FIGURE 4. Switching test circuit and waveform for all device types.



VOLTAGE WAVEFORMS





NOTE: The data pulse generator has the following characteristics: Vgen = 3.0 V,  $t_r \le 2.5$  ns,  $t_f \le 2.5$  ns,  $t_{DATA} = 7.0$  ns,  $t_{SETUP} = 5.0$  ns,  $t_{HOLD} = 2.0$  ns.

FIGURE 4. Switching time test circuit and waveforms for device types 01 and 02 - Continued.

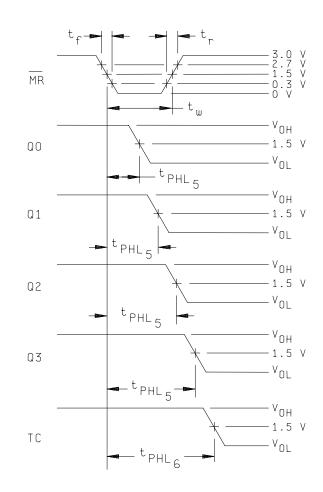
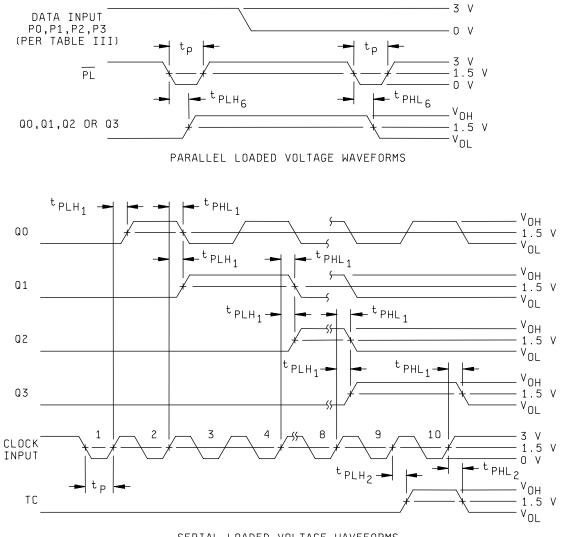
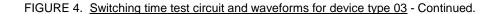
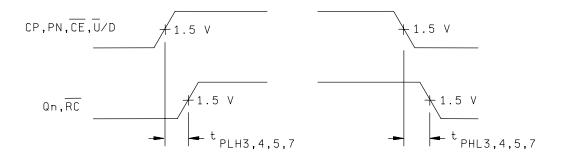


FIGURE 4. <u>Switching time test circuit and waveforms for device type 01</u> - Continued.



SERIAL LOADED VOLTAGE WAVEFORMS (COUNT UP MODE)





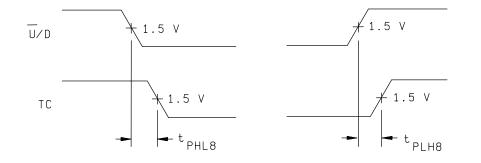
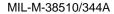


FIGURE 4. Switching time test circuit and waveforms for device type 03 - Continued.



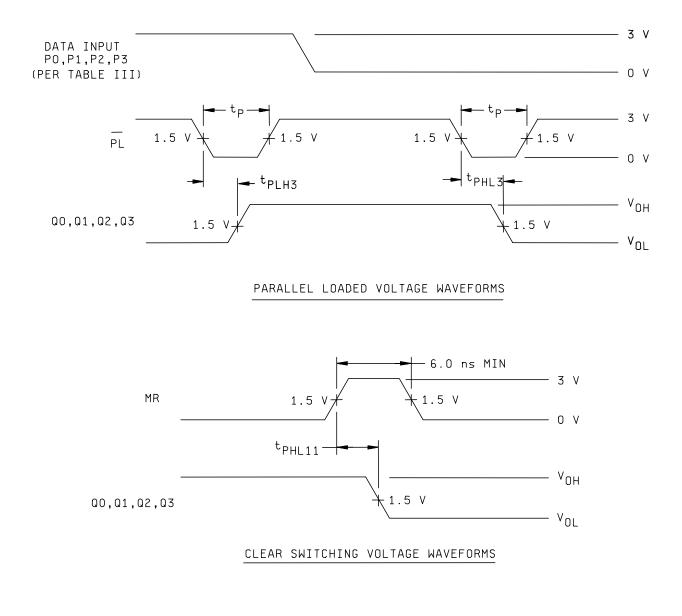
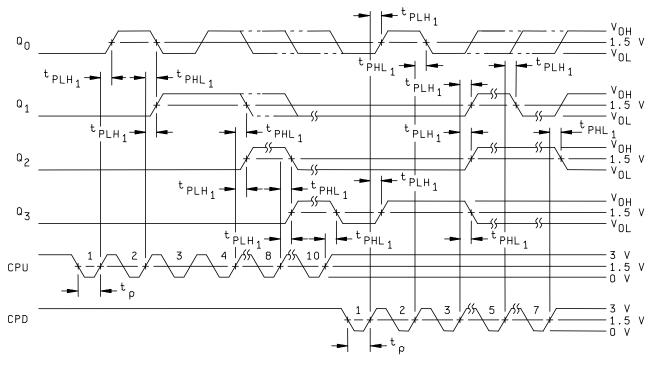
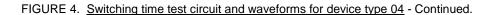


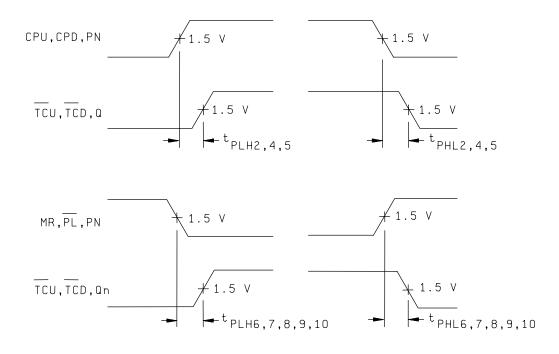
FIGURE 4. Switching time test circuit and waveforms for device type 04 - Continued.

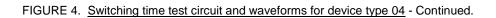


SERIAL LOADED VOLTAGE WAVEFORMS









		Unit		>	=	-	=	=	=	-	-		-	1		-			-	-	=	μA	-	=	-		=	-	-	=	-			-	-	=	-	шA	=	=	-	=	-			
		its	Max						0.5	-	-		, r	7. I-		-	-	=		-	-	20	-	-	-		-	-		100	-			-	-	-	-	3/	-	=	-	-	-		-	-
		Limits	Min	2.5	=	=	=																															3/	=	=	-	=		• •		-
		Measured terminal	•	00 00	a1	Q2	Q3	TC	TC	Q0	α1	02	1 1	MR	CP	22	- 64	2 C	CEP	出	CET	MR.	Ъ	PO	P1	P2	2ED	5 8	CET	M N	СЪ	PO	14	P3 E	CEP	;  出	CET	MR.	, <u>a</u>	50d	P1	P2	P3	I GE	믭	CET
	16	20	V <sub>cc</sub>	4.5 V	=	-	=		=	-	-		-	:		-	-	=	-	-	=	5.5 V	-	=	=		-	-	-	-	-			-	-	-	-	-	-	=	-	=				-
	15	19	TC					-1.0 mA	20 mA																																					
.(1	14	18	00 00	-1.0 mA					_	20 mA																	T						T						-	-						_
or oper	13	17	ð	-	-1.0 mA					_	20 mA																												T	+						_
0.8 V;	2	15	Q2			-1.0 mA						20 mA																											-	+				_		_
Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ V; or open).	-											_	An														+						+						-	╞				_		_
ı ≥ 2.0 \	<del>.</del>	14	T Q3		~		-1.0 mA	~	~	~		0	20 MA	>							μA					_	~	. >	>				-		>	>	>		_	╞				>>	>	>
be high	10	13	CET		5.5 V	-	=	2.0	0.8 V	5.5				_		-	-	=	-	A	/ -18 mA			/			+	/ 0.0 V	/ 2.7 V			_	_		+	/ 0.0 V	/ 7.0 V		_	╞			_	/ 5.5 V	_	/ 0.5 V
ed may	<b>0</b>	12	12			-	-	-	-	-	-					=	=	=	-	-18 mA	5.5 V			5.5 V	-		100	2.7 V	0.0 V	8		5.5 V		-	0.0	7.0 V	0.0 V		_	╞			1	5.5 \	5	5.5 V
signate	ø	10	GND	GND	=	-	=	=	=	-	-		-			=	-	=	-	-	=	-	-	=	-		-	-	-	-	-			=	-	-	-	-	=	-	-	-	-			-
s not de	2	ი	CEP		5.5 V	-	=	-	-	-	-		-	:		=	-	=	-	5.5 V							771	0.0 V	0.0 V						7.0 V	0.0 V	0.0 V						-	0.5 <	> 	5.5 V
ns (pin:	9	œ	P3				2.0 V	5.5 V					0.8 <	> .		=	-	-18 m∆	5.5 V	=	=					740	7.7 N							707	2								0.5 V			
conditio	5	7	P2			2.0 V						0.8 V	2 2 1			=	-18 m∆	722		-	-					2.7 V							1102	V U.1								0.5 V				
rminal e	4	5	P1		2.0 V						0.8 V		2 2 1	> c.c		10	210112			-	=				2.7 V								۷.0.۷								0.5 V					
	3	4	PO	2.0 V				5.5 V	5.5 V	0.8 V			5 5 11	v v v	5.5 V	- 10 MA	> = -	=		-	=			2.7 V								7.0 V								0.5 V						
	7	ю	Ъ	2/	=	-	=	-	-	-	-		2 2 2	2.0 V	_	> c.c	-	=	-	-	=		2.7 V								7.0 V								051	^ ^ ^						
	-	2	MR MR	2/	=	-	=		=	5.5 V	-		10 ~~ 1		5.5 V	-	-	=		=	=	2.7 V							T	7.0 V								0.5 V	T	t						5.5 V
	Cases E, F	Case 2 <u>1</u> /	Test no.	-	2	e	4	5			8	o (	01		12	10	1 T	0 4	17	18	19	20	21	22	23	24 25	25 26	27	28	29	30	31	32	34	35	36	37	38	30	40	41	42	43	44 45	ł	46 <u>6</u> /
		883 method		3006	=	-	=		3007	-	-							1	1	<u> </u>		3010	-	-	-		-1	=	-		-			=	-		-	3009		-	-	-				-
	W	Symbol		V <sub>OH</sub>					Vol 3				,	0								I <sub>H1</sub>								H2														-	11-2	-
		Subgroup Sy			Tc = 25°C																																									_

TABLE III. Group A inspection for device type 01.

See footnotes at end of table.

		Unit		mA	-		. =	-																																									
		imit		0 -150				55	3																																								
			Min	-60	-				_																						Т																		
		Measured terminal		Q0	a1	02 02	ED L		222		AII	outputs			-	=	-	-		=	-	-	-	-	=	-			-	-	=	=	-	-		=	=	-	=	-	-				-	-	=		
	16	20	V <sub>cc</sub>	5.5 V	-		-	=			8/				-	-		=	: :	=	-	-	=	-	-	=			=	=	=	=	=	=		-	-	-		=	-			: :	:	-	-		:
	15	19	TC				100	0.0			_				-	-	-	-		=	-	-	=	-	-	-			E	= _	-	т	_	-		-	=	-	=	-	-				-	=	=		
en).	71	18	00	0.0 V							L	-	т :	I -	-	т	н			ᄗ	-		н	=	=	-			гг	=	-	=	Γ	-	- :	E =	=	=		-	_	_:	I:		-	L	=		
V; or op	13	17	Q1		0.0 V						_			. 1	-	-	-	_		=	Т	-	=		-	-			-	=	-	=	=	-	- :	E =	=	=		-	-	- :	т·		-	Γ	L	т:	I
2.0 V; low ≤ 0.8 V; or open).	12	15	Q2			0.0 V					_				-	=	-	т	-	=	-	-	=	-	-	=		_ =	-	=	-	=	=	-	- :	E =	=	=	-	-		_	т:	т -	-	=	=		
2.0 V; lo	11	14	Q3				0.0 V				L				-	-	-	-		=	=	-	=		=	-	- :	I =	-	-	-	-	_	-	- :	<b>E</b> =	=	-	Γ	-	-	= :	I ·		-	_	_	т:	I
onditions (pins not designated may be high $\ge 2.0^{\circ}$	10	13	CET	5.5 V	-			-			в	A			-	=	-	-		=	-		=	=	-	-			-	ď	<u>م</u> م	A	A	в		-	A	В	-	-	-		- •	¥ -	-	-	-		
Terminal conditions (pins not designated may be high ≥	6	12	PE	0.0 V	-			55 \	> 0.0		A				-	-	-	-		-	=	-	-	-	=	-			-	-	-	-	-	в		-	-	-	-	-	=				-	-	=	- •	A
gnated	8	10	GND	GND	-			-	_		GND					-	-	-		-	=		=		=	-			-	=	-	-	=	-		-	-	-	-	-	-				-	-	-		
not desi	7	ი	CEP	5.5 V	-			-	ire omitted	e omitted.	в	A :			-	-	-	-		-	-		-	В	-	-	A :		-	-	-	-	-	-		-	-	-	-	-	-				-	-	-		
s (pins i	9	ω	P3	5.5 V		, L	5.5 V	2.0 V	V <sub>IC</sub> tests a	c tests are	В				-	-	-	-		-	-		-		-	-			-	-	-	-	-	A		α	) =	-	A	-	-				-	-	-		
ndition	5	7	P2			5.5 V		100	25°C and	5°C and V	в				-	-	-	-		-	-		-		-	-			-	-	-	-	-	A		α	ы m	A	-	-	-		= (	m a	⊿∢	В	-		
minal co	4	ى ک	P1		5.5 V			\ U U	$T_{c} = +1$	pt $T_c = -56$	в				-	-	-	-		-	=	-	-	-	=	-			-	-	-	-	-	A		α	) =	-	-	A	-				в	A	=		
Ter	ю	4	PO	5.5 V			5 E V	2.00	up 1, exce	up 1, exce	в				-	=	-	-		=	-		-	=	=	-			-	-	-	=	-	A		α	о m	A	-	-	-					в	-		
	2	ю	СР	2/	=		. =	551	as subgrot	as subgrou	В	в	< 4	n <	< m	A	в	A	8 <	τ α	D A	с <b>п</b>	A	A	в	A	B	۲d	n <	₹ ⊲	< @	в	A	A	а,	4 4		в	A	в	-	= •	٩u	8 <	< 00	=	=	٩	A
	٢	2	MR	2/	=		. =	551	and limits ;	and limits	в	A :			-	=	-	-	-  -	=	=	-	-		-	-			-	=	=	=	-	-		-	=	=	=	-	в	A			=	в	A		
	Cases E, F	Case 2 <u>1</u> /	Test no.	47	48	49	20	50	conditions,	Same tests, terminal conditions, and limits as subgroup 1, except $T_c = -55$ °C and V <sub>IC</sub> tests are omitted.	53	54	55	56	58	59	60	61	62	64	65	66	67	68	69	70	71	7.7	74	75	20	77	78	79	80	81 82	83	84	85	86	87	88	89	90	92	93	94	95	96
	MIL-STD-	883 method		3011	-			3005	s, terminal (	, terminal	3014				-	=	-			=	-	-	=	=	=	=				=	-	=	=	-		-	=	=	-	-	=				-	=	-		-
	M	Symbol		los					Same tests	Same tests	Eunc-	tional	test	4																																			
		Subgroup S		٢	Tc = 25°C			1		s e		Tc = 25°C t																																					

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

See footnotes at end of table.

		Unit																					-114	ZHIM	-	-	su	-		-	-	=				-	=	-			-	-	=	-	=	=		-	-	
		Limits	Max																								7.5	-				-	=	8.5	-	-	-	-		= -	14.0	7.5	7.5	12.5	=	=		-	10.5	
		5	Min			-	-	1	1		1	1		1						1			00	G Ga =	-	-	3.5	-		=		-	=		-	-	-	-		-	с.4 л			5.5	=	-		-	4.5	
		Measured terminal		AII	outputs "	-		-	-	-	-	-		-						-		-	ç	36	02	Q3	CP to Q0	CP to Q1	CP to Q2		CP to 01	CP to Q2	CP to Q3	CP to Q0		CP to Q3	CP to Q0	CP to Q1	CP to Q2	CP to Q3		CET to TC	CET to TC	MR to O0		MK to Q1	MR to Q2	MR to Q3	MR to TC	
	16	20	V <sub>cc</sub>	8/		-	=	=	-	-	-	-	-			-	"					=		> 0.c	-	=	-	-		=	-					-	-	-			-	=	=	-	=	-		-	-	
	15	19	TC	_		=	=	=	-	=	=	-	-	=	=	-			-	-		-																		E		=	-						OUT	
en).	14	18	<b>0</b> 0	_	тт	c -	J =	-	-	=	=	т	т	_	=	-	=	=	-	т	н	L	Ē	IND			OUT			Ę	00			OUT			OUT					T		OUT						
/; or op	13	17	a1	т		-	-	-	-	=	-	=	-	-	=	-	т	=	-	=	-			ЦС				OUT			OUT			!	IND			OUT							OUT					
I ABLE III. <u>Group A inspection for device type 01</u> - Continued. conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ )	12	15	Q2	_		5	c _	-	ı I	-	-	-	-	-		_	т		=	-		_			OUT				OUT			OUT			Ę	0	l		OUT							Ε				
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.8 V; or open)	11	14	Q3	т		-	-	-	т	=	-	-		_	=	-	н		=	=	-	_				OUT			Ę	100			OUT			OUT			!	OUT								OUT		
ue type high≥2	10	13	CET	A		=	=	-	-	=	-	-	-	-	=	-	-	=	=	=		в	110	> / ?	-	-	=	-		-	-	=	=			-	-	=			-	Z	z	2.7 V	=	-		-		
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pecuori gnated r	ω	10	GND	GND		=	=	=	-	-	=	-	-	=	=	-	=		=	-		=		enu e	-	=	-	-		-		=	=			-	-	-				=	-	-	-	-			-	
iot desig	2	6	CEP	A		=	=	-	-	=	-	=	-	-	=	-	=	-	=	=		=	-	7.7	-	=	=	-		-		=	=			-	-	-				=	-	-	=	-			-	table I.
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ndition	ى ك	7	P2	в		=	Δ	< =	-	=	-	=	-	-	=	-	=	-	=	=		=	-		T				T						~ ~ ~ ~	>	Ī		0.0 V			T				1 2 2				and use I
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Ter	e	4	PO	в		=	=	=	=	=	=	=	-	=	=	-	=	=	-	=	=	=	°.		Ī				T					2.7 V			0.0 V					7 V	=	-					2.7 V	except T <sub>6</sub>
	2	e	СР	в	٨a	• <	τ α		⊳ ⊲	. 4	в	A	в	A	в	в	A	A	В	A	В	A	$d T_c = -55$	z -	-	=	-	-		=		-	-			-	-	-				16		-	-	-		-	-	bgroup 9,
	-	7	MR	A		=	æ	⊿	: =	=	=	-	-	-	в	A	=	=	-	-	-	=	125°C an	7.1	=	=	2/	=	-	11 4 0	2/	j) =	-	=	> / Z.	-	-	=		= č	17 1		-	z	-	=		-	-	Is as for s
	Cases E, F	Case 2 <u>1</u> /	Test no.	97	98 00	2004	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	=		119	120	121 7/	122 "	123 "	+	-	127 "	128 "			132	133	134	135			T	140	141	142	142	143	144	145	Same tests and terminal conditions as for subgroup 9, except $T_c$ = +125°C and use limits from table I.
	MIL-STD-	883 0 method		3014		-	-	=	-	=	=	=	-	=	=	-	=	=	-	=	-	=	group 7 tes	3003 Fin 4	- 	=	-	-		=	-	-	=			-	-	-				=	-	-	=	-			-	and termin
	MIL				tional tect		Ŧ															_	atsut				t <sub>PLH1</sub>				tPHL1			tpuhz			t <sub>PHL2</sub>			+	[PLH3	thuis to the	tenı∡	tPHL5					t <sub>PHL6</sub>	ame tests
		Subgroup Symbol			$Tc = 25^{\circ}C$ tic	-																					<sup></sup>			•	-			t			t			*	-	-	<u></u>	TT I					t	10 Se

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

26

See footnotes at end of table.

		Unit		>	-		-	-		-						-	-	-		-	-	-	hΑ	-	=						-		-	-					-	-	тA		-	-	-	=	=	=	-
		ts	Мах						0.5	-				-1.2	-	=	-	-	-	-		-	20		-	-					-	100	-	-					-	-	3/	-	-	-		-	-	-	-
		Limits	Min	2.5	-	=	-	-																																	<u>3</u> /	-	-	-		=	-	-	=
		Measured terminal	1	Q0	ą	Q2	Q3	TC	Q3	Q2	6 G	00	2	SR	СР	PO	P1	P2	P3	CEP	믭	CET	SR SR	СР	PO	P1	P2	er la	LEP	Н	CET	SR	СР	PO	P1	PZ	Р3 Сгр	CEP	믭	CET	СР	PO	P1	P2	P3	CEP	SR	믭	CET
	16	20	V <sub>cc</sub>	4.5 V	-	-	-	-		-			: 1	5.5 V	-	=		-	-	-		-	-	-	=	=					-		-	-					-	=	-	-	-	-		-	-	-	=
	15	19	TC					-1.0 mA					20 MA																																				
	14	18	00	-1.0 mA				÷-				20 mA	. V																																				
r open)	13	17	ð	_	-1.0 mA	_		_	1	•	20 mA	20																	+						1		+												
0.8 V; c	, 0					mA		_		_	20																		+								+												$\vdash$
ditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ V; or open).		15	03 03		_	-1.0 mA	nA		_	20 mA										_																											<u> </u>		
≥ 2.0 V	11	14	03				-1.0 mA		20 mA			_										Ā									/					_				/						/	<u> </u>		/
be high	10	13	CET		_			2.0 V			_	0	0.8 <		-	=	-	-	-		4	-18 mA						+	0.0		2.7 V						+	0.0 <		7.0 V					-	5.5 V			0.5 V
d may	<b>0</b>	12	믭	0.8 V	-	-	-	-		-		•	: 1	5.5 <	-	=		-	-		-18 mA				5.5 V	-			0.0 \	7 / A	0.0 V			5.5 V		•		0.0 <	7.0 V	0.0 V						5.5 V	5.5 V	0.5 V	5.5 V
signate	ω	10	GND	GND	-	-	-	=		-					-	=		-	-	-		-	-	-	=	=					-	-	=	=					-	=	-	-	-	-		=	-	-	-
s not de	7	6	CEP									i L	2.5 <		-	=		-	-	-18 mA									2.7 V	0.0 V	0.0 V							7.0 \	0.0 V	0.0 V						0.5 V	5.5 V	-	-
ns (pins	9	œ	P3				2.0 V	5.5 V	0.8 \	5.5 V					-	=		-	-18 mA	5.5 V	-	-						7.7 V									V 0.7								0.5 V				
conditio	5	7	P2			2.0 V	5.5 V			0.8 V	5.5 V	5.5 V		5.5 V	-	=		-18 mA	5.5 V	=	-	-					2.7 V									7.0 V								0.5 V					
Terminal con	4	5	P1		2.0 V	5.5 V	5.5 V				0.8 V	5.5 V		5.5 V	-		-18 mA	5.5 V	-	-		-				2.7 V									7.0 V								0.5 V						
Те	3	4	PO	2.0 V	5.5 V	=	-	-				0.8 \	5.5 V		-	-18 mA	5.5 V	-	=	-		-			2.7 V									7.0 V								0.5 V							
	7	ю	СР	2/	-	=	-	-		-			: 1	5.5 V	-18 mA	5.5 V	=	-	=	-				2.7 V									7.0 V								0.5 V								
	-	7	RS	5.5 V	-	-	-	-		-				-18 mA	5.5 V	-		-	-	=		-	2.7 V									7.0 V														5.5 V	0.5 V	5.5 V	5.5 V
	Cases E, F	Case 2 <u>1</u> /	Test no.	1	2	e	4	5	9	7	ω (	o (		-	12	13	14	15	16	17	18	19	20	21	22	23	24	Q7.	26	17	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46 <u>6</u> /
	MIL-STD-	883 method		3006	-	=	-	-	3007	-						•							3010		-	-					-		-	-					-	-	3009	-	-	-	=	=	-	=	-
	Σ	Symbol		V <sub>oh</sub>					VoL				:	<1C									h <sub>H1</sub>									H12														_	112		_
		Subgroup S		1	Tc = 25°C																		I																		1								

TABLE III. Group A inspection for device type 02.

See footnotes at end of table III.

		Unit		mA "	-																																											
		its	Max	-150	-		55																																									
		Limits	Min	-60																																												
		Measured terminal		03 02	Q1	00 40	Vcc Vcc			All outputs	=	=								-	-		-				=	-		-				-	-	-			=	-	=	-	=			-	-	
	16	20	V <sub>oc</sub>	5.5 V "	-				-	/ <b>0</b> 1 =	-	=		-	:	-	:	: :	-	-	-	-	=		: :		-	-	-	=	-		-	:	-	=	:		=	=	-	-	:	: :	: :	:	-	
	15	19	TC				0.0 V			=	=	=		=	=		=		. =	-	-	-	=				т	: т	L		I	т -		-	-	=	=		-	- 1	-	-	=		. =	-	-	
en).	4	18	8			0.0 V			-		т	т		т	т		-	I	т -	-	ιT	=	=				ı I	-	=	=	-			-	т	т	-		г т	-	1	ιT	-			-	-	
/; or op	13	17	Ø		0.0 V					=	-	=	т =	=	-	Γ	=			=	-	=	=				-	-	=	=	-		=	-	т	т	L		гI	-		ιT	=		. =		-	
Terminal conditions (pins not designated may be high $\geq 2.0$ V; low $\leq 0.8$ V; or open).	12	15	Q2	0.0 V					-	=	=	=		=	=	т	=			-	-	=	=				=	-	=	=			-	-	т	т	L		гI	-	-	ιT	=			ιT	-	: _J
<u>02</u> - Co .0 V; lov	11	14	Q3	0.0 V					-	=	-	-		=	-	=	=			-	-	=	-			I =	-	-	-	=	-		_ =		т	т	L	_ ]	гт	-		ιI	-		: =	-	-	
TABLE III. Group A inspection for device type 02 - Continued on onditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ )	10	13	CET				5.5 V		-	8 4	=	-		-	-	-	-		. =	-	-	-	-				=	-	В	в	A		α	) =	-	-	-		-	-	=	-	-	×-		-	-	
for dev may be	o	12	旧	0.0 \	-		5.5 V		-	×-	-	-		-	-		-			-	-	-	-				-	-	-	=			α	) =	-	-	-		=	=	-	-	-		: =	-	-	
spection gnated i	ω	10	GND	GND	-				-	GND =	-	-		=	-	=	=		. =	-	-	=	=				=	-	-	=			=	-	=	=	=		-	-	-	-	-				-	
up A ins not desi	7	ი	CEP				5.5 V	are omitted	e omitted.	B	=	-		=	-	=	=		. =	-	-	в	-		4		=	-	-	=	-		=		-	-	=		-	=	-	-	-		: =		-	
III. <u>Gro</u> s (pins r	9	ω	ЪЗ	5.5 V			∧ c.c	V <sub>IC</sub> tests a	c tests ar€	œ =	-	-		=	-	=	=		. =	-	-	=	=				=	-	=	=	-		Δ	:=	=	в	в	۹.	-	=	-	-	-			-	-	
TABLE	5	7	P2	5.5 V			0.0 V	25°C and	5°C and V	e =	-	-		-	-	=	-		-	-	-	-	-				-	-	-	=	-		Δ	: =	-	в	в	<b>∀</b> ⁼	-	-	-	-	=	<u>а</u>	ЧA	: 4	в	
minal c	4	ъ	Ł		5.5 V		0.0 V	ept T <sub>c</sub> = +1	$pt T_c = -5$	ш =	-	-		=	-	=	=		. =	-	-	=	-				=	-	-	=	-		Δ	: =	-	в	в	A=	=	-	-	-	-		· œ	<u>л</u> ш	A	
	ო	4	PO			5.5 V		up 1, exc∈	up 1, exce	œ =	-	-		=	-	=	=		-	-	-	=	=				=	-	=	=	= :		4	: =	-	в	в	۹.	=	=	-	-	-		. =	-	в	
	7	т	ß	<u>-</u> 2/	-		5.5 V	as subgro	as subgro	<u>2/</u> B	A	в	4 ۵		В	A	в	٩u	n <	< œ	⊳∢	A	в	4	а «	< 4	•	< ◄	A	A	в	я <	4 4	с <b>ш</b>	A	в	A	8 <	< 8	⊿	< m	Þ	A	в <	4 H	Ā	A	m =
	-	2	18	5.5 V "	=		5.5 V	and limits	and limits	A B	=	=		=	=	=	=		-	=	-	=	=				=	-	=	=	-		=	-	=	=	=		-		A	: =	=		. =	-	в	
	Cases E, F	Case 2 <u>1</u> /	Test no.	47 48	49	50	52	conditions,	conditions,	Func- 3014 53 B 2/ B B B B B B tional "54 A B " 7 A B T A B T A B A A B A A B A A B A A B A A A B A A A A A B A	55	56	57	20	60	61	62	63	64 65	99	67	68	69	70	17	73	74	75	76	77	78	79	81	82	83	84	85	86	0/ 88	200	306	91	92	93	94 95	96	97	86 66
	MIL-STD-	883 method	1	3011	-		3005	s, terminal	s, terminal	3014	-	=		=	-	=	-			-	-	-	=				=	-	=	=	-		=	-	-	=	-		=	=	-	-	=			-	-	
	2	Symbol		los			5	Same test	Same test	Func- tional	test	4																																				
		Subgroup		1 Tc = 25°C					З	7 Tc = 25°C																																						

See footnotes at end of table III.

-		Unit	1																												MHz	=	-	-	ns "			-	-	-	-	-				-	-	-	=	=	=	-		
		Limits	Max																												_				7.5		-	10.01	=	=	=	8.5				=	-	=	14.0	14.0	7.5	7.5		
_			Min						1												-1										06	-	=		3.5		-	-	-	-	=					=	-	=	4.5		2.5			
		Measured terminal		AII	outputs	-	-		-		-	-	-	-	=		-	-	-	-	-	-	-	-					-		00	ø	02	Q3	CP to Q0	CP to Q1			CP to Q1	CP to Q2	CP to Q3	CP to Q0	CP to Q1	CP to UZ	CP to Q3			CP to Q2	CP to TC	CP to TC	CET to TC	CET to TC		
	16	20	V <sub>cc</sub>	/8		=	-	-	=	=	=	=	-	=	-	-	-	-	-	-	=	=	=	-				-	=		5.0 V	=	=	-			-	-	=	=	=					=	=	=	=	-	=	=		
!	15	19	TC			=		-	-	-	=		-	=	-	-	-	-	=	-	=	-	-	-				-	-																				OUT	-	=	=		
en).	14	18	ø			=		н	т	L	=		-	=	-	-	-	т	т		=	=	-	=			. :		c _	J	OUT				OUT			ЦС	5			OUT			Ę	100								
; or ope	13	17	a1	-	_ I	-		-	=	_	-		=	=	-	-	-	-	-	-	-	=	-	-	I,			-	-	J		OUT			Ē	100			OUT			ļ	OUT			Ē	5							
Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ V; or open).	5	15	Q2	-		=		-	=	т	н	Γ	=	=	т		=	=	=	-	-	L	-	=	т		-	=	-	J	F		OUT			Ē	100	T		OUT	⊢		Ŀ	INO	T	T	U I T	5						
0 V; low		14	03		- т	: =		-	-	_	=		-	=	т		-	-	-		-	=	-	=	I.			-	_		-			OUT				INN			OUT		_		INO			0 IT	2					
igh≥2.	10	13	CET	A		-		-	=	-	=		=	=	-	-	-	-	-	-	-	-	-	-				-	α	2	2.7 V	-	-	-					-	-		0.0 V				=	-	=	2.7 V	.7 V	z	Z		
ay be h	თ	12		B		A	: =	-	-	-	В	-	-	=	-	A	-	-	-	-	в	-	-	-		<b>4</b> =		-	-		2.7 V 2		=	-					-	-		0.0 V				-	-	=	+	2.7 V 2				
iated m	ω	10		GND		-		-	-	-	=		-	-	-	-	-	-	=	-	-	-	-	-				-	-		GND 2	-	=	-					=	-		•				-	-	=	=	=	0	0		
t desigr		6	CEP G	9 V											-		-	-			-			-				_		_	2.7 V G	-	-								=	_									_	_	ole I.	
oins not						-	-		-	_	_	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	_	2.7	-	-	-				-	-	-	_		_		>	-	-	>	- > >	-	>	>	ts from tat	
ditions (	<u>م</u>	∞	2 P3	A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-															2.7 V	2.7 V		~ ~ ~ ~	+	0.0 V 2.7 V		2.7 V	2.7	id use limi	
nal cone	Ω.	2		B		-		-	-	-	A		=	=	-	-	-	-	-		-	-	-	=				-	-		_											:	-	.7.		>	Ì	0.0	_	+			+125°C ar	T I I
	4	5	P	A		=	-	-	-	-	В	=	=	=	-	-	-	-	-	-	A	=	-	=				-	-	-	_					_	_					-	2.7 V		>	+	^ ^ ^		V 0.0 V		>	>	cept T <sub>c</sub> =	010 010
-	с М	4	_	B		-	-	-	-	-	-	-	-	-	=	-	-	*	-	-	-	-	-	*				-	-		200					+	+					2.7 V	+		200	0.0			0.0 V			/ 2.7 V	roup 9, ex	and and a second
	0	с С	<u>Р</u>	A	8 V	< 4	а А	A	В	A	В	A		В	A	A	B	A	В	_	B	A	A	В	A ·	< 4	£ ⊲	< □				=	-	-			-	-	=	=	=	-	-			=	-	=	=	-	2/	2/	s for subg	mite ac to
_	с 0	2	o. SR	A	: :	-	-	-	=	-	В		A	-	=	-	-	-	=	_			A	=				-	-	Tr - ±12	2.7 V		=					77 /	2/			2.7 V	-	•	-	=	-	=	=	-	=	-	nditions a:	I pue suo
(	- E, F	Case 2 <u>1</u> /	Test no.	100	101	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	G71	121	7 tacts at	128	129	130	131	132 7/	133	134	135	137 "	138 "	139 "	140	141	142	143	144	146	147	148	149	150	151	erminal cor	nal conditi.
	MIL-STD-	883 method		3014		-		-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-				-	-	Beneat subtrain 7 tests at Tc = ±125°C and T <sub>2</sub> = -55°C	3003	Fig. 4	=	-				-	-	-	=					-	-	-	=	=	=	=	Same tests and terminal conditions as for subgroup 9, except $T_c = +125^{\circ}C$ and use limits from table I.	acts termi.
		Symbol		Func-		1001		4/	1																					Panat.		5/ 9/			t <sub>PLH1</sub>			t	1.1HL1			t <sub>PLH2</sub>				PHL2			tours	t <sub>PHL3</sub>	t <sub>PLH4</sub>	t <sub>PHL4</sub>	Same te	Same 14
		Subgroup		7	Tc = 25°C																									α	ი თ	T <sub>C</sub> = 25°C																					10	Ę

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

See footnotes at end of table III.

		Unit		>		-	-	-	-	=	-						-	=	=	-	=	=	μA	-	-	-	=	-	-					-		-	=				-		-	-	-	mA
		lits	Max						0.5	=	-				-1.2		-	=	=	-	=	=	20	-		=	=		=	=	100	:		-		-	-	= c	<u>ہ</u>	2	-		-	-	-	-
		Limits	Min	2.5		=	-	-																														i c	3/	£			-		=	
		Measured terminal		a 1	00 00	200	n C		01 01	00	Q2	03	2	ßC	P1	CE	Ū/D	P3	P2	님	СР	PO	P1	빙	Ū/D	P3	P2	님	СР	PO	F	CE	Ū/D	P3	P2	님	СР	P0	4	Ū/D	P3	P2	님	СР	PO	CE
	16	20	V <sub>cc</sub>	4.5 V		-		-	-	-	-								=	-	=	-	5.5 V	-	-	=	=	=	-					-		-					-			=	-	-
	15	19	PO		2.0 V		2.0 V	2.0 V		0.8 V			2.0 <	2								-18 mA								2.7 V								7.0 V							0.5 V	
	14	18	СР					2.0 V					0.8 V		1						-18 mA								2.7 V								7.0 V		-	_				0.5 V		
or open	13	17	RC				~	-1.0 mA 2					20 mA 0								4								2								7		_	_				0	_	
0.8 V; c	12						MA				H			3	+																								+		_			$\left  \right $		
		15	TC	>			-1.0 mA					0	20 mA		+					<u>م</u> ر			>			~	~	~		>	>			>	> '	>		>.	>		>	>	>		>	
≥ 2.0 V; low	1	14	님	0.8 V		-			-	-									-	-18 mA			5.5 V			+	7 5.5 V	2.7 \		5.5 V	5.2			5.5 V	-	7.0		5.5 V	0.0			V 0.0 V	0.57		0.0 V	
nated may be high	10	13	P2			2.0 V	0.8 \	0.8 V			0.8 V	-	0.8 0	_					-18 mA							$\vdash$	2.7 V								7.0 V				_			0.5 V			_	
d may t	თ	12	P3			200	> 0 =	-				0.8 V	2.0 <	2				-18 mA								2.7 V								7.0 V							0.5 V					
signate	8	10	GND	GND		=		-	-	-	-						-	-	-	-	=	-	-	-	-	-	=	-	-					-		-	-			:	-		-	-	-	-
not desig	7	6	Q3			V ~~ ( F	-1.0 mA					20 mA																										1							1	
Terminal conditions (pins not designated may be high $\geq$	9	8	Q2		10-01	-1.U MA					20 mA																																		1	
onditior	5	7	Ū/D				0.8 V	0.8 V					2.0 <	· · · ·			-18 mA								2.7 V								7.0 V						, L	0.5 V						
minal c	4	ى ع	빙	2.0 V		-	0.8 V	0.8 V	2.0 V	=	-		780	• •	10 0	- 10 IIIA								2.7 V							707	× 0. /													;	0.5 V
	ო	4	00 00		-1.0 mA					20 mA					T																							_		-						
	0	ю	g	-1.0 mA	_				20 mA	-	╞┤		t		T																								┦		H			H		
	-	2	P1	2.0 V			7.8 V	0.8 V	0.8 V				0.8 \		-18 mA								2.7 V								7.0 V								0.5 V	_	$\left  \right $			╞┼		
	Cases E, F	Case 2 <u>1</u> /	Test no.	-	2	υ <b>τ</b>			2		6					4	15	16	17	18	19	20		22	23	24	25	26	27		30		31	32	33	34	35	36		38	39	40	41	42	43	44
				9					7					_																															_	
	MIL-STD-	ool 883 method		1 3006		-		•	3007		-			_	3022		•	•	-	-	-	=	3010	-	-	-	-	-	-	-			•	-		-	-		3009		•		-	-	=	-
		up Symbol		V <sub>OH</sub>					V.01	5				:	c</td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>LH1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>·</td> <td>IH2</td> <td></td> <td>IL 3</td>								LH1							·	IH2															IL 3
		Subgroup		-	Tc = 25°C																																									

See footnotes at end of table III.

TABLE III. Group A inspection for device type 03.

	Unit		шA		-	-	-	-	-																																					
	ts	Max	-150	=	-	-		-	55																																					
	Limits	Min	-60		=	=		-																																						
	Measured terminal	•	<u>6</u>	Q0	Q2	Q3	TC	RC	V <sub>cc</sub>		114	All	=		=	=		-	-	=		-	-	-												-	-		-	-	-	-		-	=	
16	20	V <sub>cc</sub>	5.5 V	=	-	-		-	=		ò	ò =	-	-	-	=	=	:		-	-	-	-	-	=	- :		-								-	=		-			=		:	=	
15	19	PO		5.5 V			5.5 V	5.5 V	0.0 V		6	0 ⊲	A	B	в	A	=	-		-	-	=	=	-	-												-	=	-	=		=		в	а	
14	18	СР					5.5 V	5.5 V	0.0 V		<	₹ =	-	-	-	2/	=	-	=	-	-	=	=	-	в	A j	-15	-			- 1	ъ	<b>л</b> -	4 د	ъ	A	2	=	-	=		=		A	в	
13	17	RC						0.0 V			-	c =	-	-	-	-	=	-		-	-	=	=	-		т·						_	<b>r</b> :	г.	_	т	-	=	-	-		=			=	
12	15	TC					0.0 V				-	- T	: т		-	-	=	-	-	-	-	-	-	т	т					. :	I ·					_		=	-	-		=			-	
11	14	님	0.0 V	-	=	-		-	0.0 V		c	0 00		: <b>с</b>	A	-	=	-		-	-	=	=	-	-													=	-	-		=		в	в	
10	13	P2			5.5 V	-	0.0 V	0.0 V	0.0 V		_	_0 ⊲	. 4	В	в	A	=	=		=	=	=	=	=	=												-		-	=		=		в	в	
თ	12	P3				5.5 V		-	0.0 V		-	_0 ⊲	. ◄	В	в	A	=	-	-	-	-	-	-	-	-			-								-	-	-	-	-		=		В	в	-
80	10	GND	GND		-	=		-	-			- END	-	-	-	-	=			-	-	=	=	=	-													=	-			=			=	
7	ი	Q3 (				0.0 V				e omitted.			: т		-	-	=			=	=	=	т	=	=										. :	т	Т	L	-			=		-	-	
9	80	Q2			0.0 V	0				C and V <sub>IC</sub> tests are omitted	and V <sub>IC</sub> tests are omitted	т	: т	:	-	-	=	-	н	=	-	-	_	-	=												-	н	-			_			=	
5	7	Ū/D			0	-	0.0 V	V 0.	V 0.	°C and V	c and V <sub>IC</sub>	n =	=	-	-	-	=	-		-	-	=	=	-	-			-		A						-	-	=	-	-		=		В	В	
4	£		5.5 V		-		-		0.0 V 0.0	$T_{c} = +125$	$1_{\rm C} = -55^{\circ}$	<u>ء</u> م	-	-	-	-	=	-		=	-	=	=	-	=		: <	τ 0	- ۵			: 4	٩	< 1	ъ.	-	-	=	-			=		-	-	
e	4	00	4	0.0 V			0	0		1, except	1, except	T L	: т			т		н	L	т	_	т	_	т	т	_:	т I		_	I.	-				. :	г	L	т	_	н	T	н	L	-	-	
5	е	6	0.0 V	0						s subgroup	s subgroup	тг	: т	:	-	-	т	т	L	L	т	т	_	-	-			-	Е.	-							-	т	т	L	L	н	н	L	_	= -55°C.
-	7	P1	5.5 V C				0.0 V	0.0 V	0.0 V	nd limits as	nd limits as	٩	. 4	B	в	A	=	-		=	-	=	=	-	=			-								-	-	=	-			=		В	в	C and Tr =
Cases E, F	Case 2 <u>1</u> /	Test no.			47	48			51 (	Same tests, terminal conditions, and limits as subgroup 1, except $T_c = +125^{\circ}$	nditions, ai	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	10	22	1	72	2	74	۲ <u>۵</u>	/6	77	78	79	80	81	82	83	84	85	86	Repeat subgroup 7 at $T_c$ = +125°C and $T_c$ = -55°C.
	σ	Τe	11	-		_			3005	erminal co	erminal co	3014					_		_			_	_	_															_			_				roup 7 at
MIL-STD-			los 3011						cc 30	me tests, t	me tests, t	tional 30	st	4/	-	-	•	•	•								2		-			-	-												-	meat subo
	Subgroup Symbol		1	Tc = 25°C						2 Sar		C°C		4																																8 Re

# TABLE III. Group A inspection for device type 03 - Continued. Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ V; or open).

See footnotes at end of table III.

		Unit		MHz	-	-	= 0	2 =	=	=	=	-	=	-	=	-	-	=	-	=	=	-		-	=	-	-	-	-	-	-		=	-	-	=	-	-	-	
		its	Max				7 6	C:	-	=	11.0	-	=	-	13.0	11.0	7.5	7.0	7.0	=		-	13.0	-		7.0	7.0	11.0	-		-	12.0		-	-	18.0	12.0	10.0	10.0	
		Limits	Min	90	-	-	= 0	0.0 -	=	=	5.0	=	-	=	6.0	5.0	3.0	-	=	=		-	6.0	-	-	3.0	3.0	5.0	-	-	-	5.5	-	-	-	7.0	5.5	4.0	4.0	
		Measured terminal		Q0	a1	Q2	Q3				CP to Q0	CP to Q1	CP to Q2	CP to Q3	CP to TC	CP to TC	CP to RC	CP to RC	P0 to Q0	P1 to Q1	P2 to Q2	P3 to Q3	P0 to Q0	P2 to Q2	P3 to Q3	CE to RC	CE to RC	PL to Q0	FL to Q1	FL to Q2	PL to Q3				FL to Q3	Ū/D to RC	Ū/D to RC	Ū/D to TC	Ū/D to TC	
16	2	20	V <sub>cc</sub>	5.0 V	-	=		-	-	-	-	-	-	=	=	=		-	-	-		-			=	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15	2	19	PO				~~~~	> 0.0	z./ v	=	-	-	=	-	0.0 V	2.7 V	-	-	Z	2.7 V		-	NN	× / ×	-	-	-	-	2.7 V	-	-	0.0 V	2.7 V	-	-	-	-	0.0 V	0.0 V	
14	:	18	Ъ	Z	-	=		-	-	=	-	-	-	-	-	=			2.7 V	=		-		-	-	0.0 V	0.0 V	2.7 V	-	-	-			-	-					
13	)	17	RC														OUT	OUT								OUT	OUT									OUT	OUT			
12	!	15	TC												OUT	OUT							T															OUT	OUT	
11	:	14	님	2.7 V	-	-	= c	71 =	-	=	-	-	=	-		=			0.0 V	=		-		-	-	-		z	-	-	-			-	-	2/			-	
10	)	13	P2				~~~~	>	-	7 \	V 0.0	0.0 V	2.7 V	0.0 V	=	=		-	2.7 V	+	N	2.7 V		z	2 7 V	0.0 V	0.0 V	2.7 V	-		-		-	0.0 V	2.7 V	0.0 V	-		-	
6	)	12	B3				~~~~	-	-	=	-	-	=	-	0.0 V	=			2.7 V			-	2.7 V "	-	+	2.7 V		-			-			-	0.0 V	2.7 V	2.7 V	0.0 V	0.0 V	
8	,	10	GND	GND	-	=		-	=	=	=	=	=	=	=	=			-	=		-		-	-	=	-	-	-		-			-	-	=	=	-	=	
7			<b>0</b> 3				OUT		T	Ξ	-			OUT								OUT			OUT						OUT				OUT					able I.
9	,	ω	02			OUT			0 IT	+			OUT								OUT	-		OUT						OUT				OUT						mits from t
2	)	7	Ū/D	GND	=	=		-	=	-	-	=	=	-	=	=		-	2.7 V	=		-			-	0.0 V	0.0 V	2.7 V	-	-	-	-	-	-	-	z	-	-	-	3 and use limits from table 1 -55°C.
4		ى ك		GND	-	=		-	=	=	-	-	=	-	=	=			2.7 V	-		-		-	=		z	2.7 V :	-		-			-	-	0.0 V	-	-		= +125°C cept T <sub>c</sub> =
e	)	4	8	OUT			Ē	100			OUT								OUT				OUT					OUT				OUT								except T <sub>c</sub> oup 10, ex
2	1	m	g		OUT			Ę	100			OUT								OUT			ΞO	100					OUT				OUT							abgroup 9, s for subgr
		5	P				~~~~	V.U V	0.0 V 2 7 V	7 1.2	2.1 V 0.0 V	2.7 V		0.0 V	=	=			2.7 V	Z	2.7 V	-	= 2	2.7 V	2 T V	0.0 V	0.0 V	2.7 V	-	-	-		0.0 V	2.7 V	2.7 V	0.0 V	-	-		ns as for su
ases	ш	Case 2 <u>1</u> /	Test no.	87	88	89	90					T				100	101	102	ŀ	104		106	107	109	t	-	112	113	114	115	116	117	118	119	120	121	122	123	124	Same tests and terminal conditions as for subgroup 9, except $T_c = +125^{\circ}C$ Same tests, terminal conditions and limits as for subgroup 10, except $T_c =$
		883 C method	Ť	3003	g. 4	=		_		-	-	-	-	-	=	-		-	-	-	-	=	 		-			-	-	-	-	-	-	-	-		-			and termin. terminal cc
_		Symbol 8 me		-	Ы 2/			(PLH1			ten 1	ī			t <sub>PLH2</sub>	t <sub>PHL2</sub>	t <sub>PLH3</sub>	t <sub>PHL3</sub>	tei Ha	t			t <sub>PHL4</sub>			tPLH5	tPHL5	tPLH6				tPHL6				t <sub>PLH7</sub>	t <sub>PHL7</sub>	t <sub>PLH8</sub>	t <sub>PHL8</sub>	me tests a me tests,
		Subgroup Syr			$T_c = 25^{\circ}C$		ŀ	9			to	ł			tPI	tpi	te.	t <sub>Pi</sub>	te	;			t <sub>p</sub>			th	t <sub>Pi</sub>	tpi				t <sub>Pi</sub>				t <sub>P:</sub>	t <sub>Pi</sub>	t <sub>Pi</sub>	t <sub>P</sub> ,	10 Sar 11 Sar

# Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ V; or open).

See footnotes at end of table III.

		Unit		^	-	=	-		-	-	-	=	=	-	=		=	=	-		-	=	-	ЧA	-					-	-		-					-	-	mA	-	-	-	-	-	
		its	Max							0.5	-	=		-	-	-1.2	-	-	-	=	-	-	-	20	-					-	-	100	-					-	-	3/				-	-	
		Limits	Min	2.5	=	=	=		-																															3/				-	-	
		Measured terminal		۵1 م	Q0	Q2	Q3	TCU	TCD	a 1	Q0	Q2	Q3	TCU	TCD	P1	CPD	CPU	P3	P2	님	MR	P0	P1	СРD	CPU	P3	27	ΡĹ	MR	PO	P1	CPD	CPU	r r	77	님	MR	PO	P1	P3	P2	12 12	MR	PO	CPD
16		20	V <sub>cc</sub>	4.5 V	-	-	-		-	-	-	=	=	-	=	-	=	=	-	-		-	-	5.5 V	-					-	=		-					-	-	-			-	-	-	
15		19	P0		2.0 V			5.5 V	0.0 V		0.8 V			5.5 V	0.0 V								-18 mA								2.7 V								7.0 V						0.5 V	
14		18	MR	0.0 V	-	-	-	0.8 V	0.8 V	0.0 V	-		=	-	-							-18 mA	_							2.7 V								7.0 V		0.0 V				0.5 V		
13		17	TCD						-1.0 mA						20 mA																															
12		15	TCU					-1.0 mA						20 mA																																
11		14	님	0.8 V	-	-	-		0.0 V	0.8 V	-	=	=	=	-						-18 mA								2.7 V								7.0 V			0.0 V			0.5 V			
10		13	P2	)		2.0 V			0.0 V 0.0		-	0.8 V		0.0 V	0.0 V					-18 mA								2.7 V								· .0 V	-			0		0.5 V			$\left  \right $	
6		12	P3				2.0 V		0.0 V (				0.8 V		0.0 V (				-18 mA	-							2.7 V								.0 V	-					0.5 V	)				
8		10	GND	GND	-		=	-	-	-	-			=	-	-	-	-	=	-	-	-	-		=					-	-		-		T			-	-	-				-	-	
7		6	03 03	)			-1.0 mA						20 mA														_																		Ī	
9		8	Q2			-1.0 mA	-					20 mA	_																																+	
5		7	сРՍ			7		2.0 V	5.5 V			2	_	0.8 V	5.5 V			18 mA								2.7 V								7.0 V											+	5.5 V
4		5	СРD						2.0 V					5.5 V	0.8 V		-18 mA	~							2.7 V		_						7.0 V												-	0.5 V
3		4	00		-1.0 mA						20 mA																																		ŀ	
2		3	g	-1.0 mA	•					20 mA	-																																			
+		2	P1	2.0 V				0.0 V	0.0 V	0.8 V	-			0.0 V	0.0 V	-18 mA	2							2.7 V				T				7.0 V			╉				H	0.5 V				T	ŀ	
Cases	Е, F	Case 2 <u>1</u> /	Test no.		2	3			9	7	-	6		11	12	l	14	15	16	17	18	19			22	23	24	<b>G</b> Z	26	27	28	29	30	31	32	33	34	35	36		38	39	40	41	42	43
	-	883 ( method	<u> </u>	3006	-	-	-		-	3007	=	=	=	=	-		<u> </u>	1		<u>                                     </u>		<u> </u>	1	3010	_				-	-	=		-					-	_	3009	-	-	-	-	-	
-		Symbol		V <sub>он</sub> 3						V <sub>OL</sub> 3						۷.r	2							I <sub>IH1</sub> 3								H <sub>2</sub>														113
$\left  \right $		Subgroup Sy			Tc = 25°C					[						ſ																														

Terminal conditions (pins not designated may be high  $\geq$  2.0 V; low  $\leq$  0.8 V; or open).

See footnotes at end of table III.

		Unit		mA	-				-	-																																					
		Limits	Мах	-150	-				-	55																																					
		Lin	Min	-60	=				-																																						
		Measured terminal		Q1	Q0	Q2	Q3	Tau		V <sub>cc</sub>			All outputs	=				-		=	-	-	-	-		-	-			-		-		-		-	-	-	-	-				-	-	-	-
	16	20	V <sub>cc</sub>	5.5 V	-				-	-			/8	-				=	=	=	-	-	-	-		-	-	-	: :	=	-	-		=	-	-	-	-	-	-	-		: :		=	:	-
	15	19	PO		5.5 V			5.5 V	0.0 V	5.5 V			A=	=	В			-	=	=	=	-	-	-		-	-	=		=	-	-		=	-	=	=	-	-	=	-				-	-	=
	14	18	MR	0.0 V	=				-	-			AB	=	-			-	-	=	-	-	-	-		-	-	-		=	=	-		-	-	-	=	-	-	=					-	-	=
	13	17	TCD						0.0 V				I =	=	-			-	-	=	-	-	-	-		-	-	=		=	-	-		-	-	-	=	-	-	=	-					-	=
	12	15	TCU					0.0 V					I =	-	-			-	=	=	-	-	-	-		-	-	=		=	-	-		c =	-	-	=	_	т	=					с =	-	=
	11	14	님	0.0 V	-					-		-	× 8	Ā	A	в,	4 -	-	=	=	-	-	-	-		-	-	=		=	-	-		=	α	n 4	: =	=	-	=	ш	4 =		-		в	A
	10	13	P2			5.5 V			0.0 V	5.5 V		-	4 =	-	В			-	=	=	=	-	-	=		-	-	-		=	-	-		=	-	-	=	-	-	A	-					-	=
	თ	12	P3			-	5.5 V			5.5 V		-	A =	-	В			-	=	=	=	-	-	=		-	-	=		=	-	-		<	<b>۲</b> =	-	=	-	-	=	-					-	=
	œ	10	GND	GND	-				-	=			GND =	-	-			-	=	=	-	-	-	-		-	-	-		=	-	-		=	-	-	-	-	-	=	-					-	=
in uccord	7		03 03	0			0.0 V				omitted.	. L				:			=	=	=	-	-	-		-	-	-		Т		-			тı	-	=	-	_	_	т			-		т	=
	9		Q2			0.0 V	0				c tests are	tests are o		=	-	:		-	=	=	-	-	-	т		-	-	=		_	1 =	-		-	-	-	=	-	г	=	-						=
	ۍ		СРU			0		5.5 V		5.5 V	°C and V	and V <sub>IC</sub>	A =	-				n <	τ α	⊿	с в	A	В	A	8 <	с в	A	В	٩	D A	с в	A	8	<b>t</b> =	-	а		в	A	=	- 1	а ·	۸a	ר בי	×∗	-	в
2	4		сРD С						5.5 V	5.5 V 5	$T_{c} = +125$	T <sub>c</sub> = -55°C	4 =						-	=	-	-		-		-	-	-		-		-		-	-		-	-	-	=	-					-	=
	т		00 0		0.0 V				5.	5.	1, except	1, except		-				_	- I			т	т			: I		-	т			т	т.	_ =	-	-	Т	Т	L	-	-	- :	т э	I _	=		-
	5	е С	۵1 0	0.0 V	0						subgroup	subgroup				:			=	Т		_		_		_	н					-			п		-	_		=			_	_		т	=
									>	>	limits as	limits as	-		В	-						=					-	=		-		-			 -	-	-		_	в	_					-	
	se la		то. Р1	5.5 V					0.0 V	5.5 V	tions, and	tions, and	A =						-	-			-		+	-										-		-									-
	Cases D- E, F		Test no.	45	46	47	48	49	50	51	Same tests, terminal conditions, and limits as subgroup 1, except $T_c$ = +125°C and V <sub>1C</sub> tests are omitted.	inal co		54	55	56	21	20	60	9 9	62	63	64	65	66 67	68	69	70	71	73	74	75	76	102	20/	80	81	82	83	84	85	86	18	00	68 06	91	92
	MIL-STD-	883 method		3011	=				-	3005	ests, term	ests, term	3014	-	•			-	=	-	=	=	-	-		-	•	-		=	-	-		-	-	-	-	=	•	=					-	-	=
		Symbol		los						1 cc	Same t	Same t	Func-		4																																
		Subgroup		-	Tc = 25°C						2	ε Γ	7 Tc = 25°C																																		

TABLE III. Group A inspection for device type 04 - Continued. Terminal conditions (pins not designated may be high  $\ge 2.0$  V; low  $\le 0.8$  V; or open).

See footnotes at end of table III.

	Unit																																			MHz	-	-			-	-	su		=	-			-
	its	Мах																																									8.5	-	=	-			-
	Limits	Min																																		06	-	-			=	-	4.0	=		=			-
	Measured terminal		All		-				-	=	=	=				=	=	=	=		-	-			=	=	-	-			-	-				CPU to Q0	CPU to Q1	CPU to Q2	CPU to Q3		CPD to Q1	CPD to Q3	CPU to Q0	CPU to Q1	CPU to Q2	CPU to Q3	CPD to Q0	CPD to Q1	CPD to Q3
16	20	V <sub>cc</sub>	<u>-</u> 8/	:	-	: :	: :		=	=	-	-	-	: :		-	:	-	=		-	=	: :	-	:	-	=	-			:	=	-	: :		5.0 V	-	-			-	-	=	=	=	=			-
15	19	Ы	<b>œ</b> =	-	A				-	=	-	-	-			-	-	-	-	-	=	-			-	=	=	-			=	-	-										0.0 V	2.7 V	2.7 V	2.7 V	0.0 V		-
14	18	MR	= ۵		-				-	-	-	-	-				-	-	-	-	=	-			-	-	=	-			-	-		- 4	c	GND	-	-			=	-	0.0 V	-	=	=			-
13	17	TCD	т-	-	-				-	=	-	-	-				-	-	-	-	=	-		-	-	-	=	-			-	-	:	I I	=														T
12	15	TCU	т-	т	-				-	=	-	-	-				-	-	=	-	=	-				=	=	-			-	=								T								T	+
11	14	님	A =	-	-	ш·	A :		-	-	-	-	-				-	-	-	-	=	-				=	=	-			-	-			_	2.7 V	-	-			-	-	2/	=	=	=			-
10	13	P2	<b>4</b> -	-	-				=	=	-	-					-	-	-	-	=	-				-	-	-			-	-			_	2							0.0 V	-	=	7 V	>0.	> ~	0.0 V
6	12	P3	۲.		-				_	_	-	-					-	-	-	-		-				-	=	-			-	-			_								0.0 V 0.0	-		1	•	-	0.0 V 0
8	10																									=		_							_	GND		_					.o "					c = =	
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Cases E. F	_; . Case 2 <u>1</u> /	Test no.	93	95 95	96	<u>55</u>	86	66 100	101	102	103	104	105	106	107	100	110	111	112	113	114	115	116	111/	119	120	121	122	123	124	126	127	128	129	7 at T <sub>c</sub> = 1:	131	132	133	134	135	137	138	139	140	141	142	143	144	= 143 146 =
MIL-STD-	883 method		3014 "		-				-	=	-	-				-	-	-	-	-	=	-		-		-	=	-			-	-			ubaroun 7	3003	Fig. 4	-			-	-	=	-	=	-			-
	Symbol		Func-	4/	1																														Reneat s	f <sub>MAX</sub>	<u>5/ 9/</u>						t <sub>PLH1</sub>						
	Subgroup			ر 10 = 20°U																															8	6	$T_{C} = 25^{\circ}C$						<u> </u>						

Terminal conditions (pins not designated may be high  $\ge 2.0$  V; low  $\le 0.8$  V; or open).

See footnotes at end of table III.

	Unit		ns	-	=	-	-			=		-	-	-	-	-	-	=	=	-	=	-			-	=	=		-	=	=	-	=	-
	ts	Max	12.5	-	-	-	-			-	9.0	8.0	11.0	-	-	-	13.0	-	-	-	9.0	8.0	7.0		-	14.5	-		13.5	14.5	15.5	15.5	14.5	14.5
	Limits	Min	5.5	-	-	-	-				4.0	3.5	5.0	-		=	5.5	-	-	-	4.0	3.5	3.0		-	6.0	-			6.0	7.0	-	-	-
	Measured terminal	1	CPU to Q0	CPU to Q1	CPU to Q2	CPU to Q3	CPD to Q0	CPD to Q1	CPD to Q2	CPD to Q3	CPU to TCU	CPU to TOU	PL to Q0	PL to Q1	PL to Q2	PL to Q3	PL to Q0	PL to Q1	PL to Q2	PL to Q3	CPD to TCD	CPD to TCD	P0 to Q0	P1 to Q1	P3 to Q2	P0 to Q0	P1 to Q1	P2 to Q2	MR to TCU	MR to TCD	PL to TCU	PL to TCD	PL to TCU	PL to TCD
16	20	V <sub>cc</sub>	5.0 V	-	=	-	-				=	-	-	-	-	-	-	-	-	-	-	=			=	-	=		-	-	-	-	=	-
15	19	PO	2.7 V	-	=		-	0.0 V			=	2.7 V	2.7 V	0.0 V	-	=	-	-	-	-	=	2.7 V	Z			Z			2.7 V	2.7 V	0.0 V	2.7 V	2.7 V	0.0 V
14	18	MR	0.0 V	-	-	-	=				=	-	2/	-		-	0.0 V	-	-	-	=	=			-	-	-		z	z	0.0 V	2/	2/	0.0 V
13	17	TCD																			OUT	OUT								OUT		OUT		OUT
12	15	TCU									OUT	OUT																	OUT		OUT		OUT	
11	14	님	2/	-	=	-	=						z	-	-		-	-	-	-	2/	2/	0.0 V		-	-	=		5	2/	z	-	-	
10	13	P2	0.0 V	0.0 V	2.7 V	2.7 V	0.0 V	0.0 V	2.7 V	0.0 V	=	-	0.0 V	0.0 V	2.7 V	0.0 V	-	-	-	-	-	-	0	4	Z			z	0.0 V	-	-	-	=	
6	12	P3	0.0 V 0.0	0		2.7 V 2.	0.0 V 0.0	0		2.7 V 0.	7 V	2.7 V	0.0 V 0.0	0	- 2	2.7 V 0.	0.0 V	-		-		-			Z			-	2.7 V 0	-			-	0.0 V
			GND 0.			2.	0.			2.	5	2.	0.			5	0.												- 2					ō
∞	10		G	-	-	-	-			- -	=	-	-	-	-	- -	-	-	-	- -	-	-	-		-	-	-		-	-	-	-	-	-
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4	2	CPD	2.7 \	-	-		Z			=	2.7 V	2.7 V	0.0 V	-	-	-	-	-	-	-	Z	Z	0.0 V		=	-	=		2.7 V	0.0 V	2.7 V	0.0 V	2.7 V	0.0 V
m	4	ő	OUT				OUT						OUT				OUT						OUT			OUT								
2	б	ð		OUT				OUT						OUT				OUT					ŀ	00			OUT							
~	7	£	0.0 V	2.7 V	2.7 V	2.7 V	0.0 V	2.7 V	0.0 V	-	-	-	0.0 V	2.7 V	0.0 V	-	-	-	-	-	-	-		z			Z		0.0 V	-	-	-	-	-
Cases E, F	Case 2 <u>1</u> /	Test no.	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	170	171	172	173	175	176	177	178	179	180
MIL-STD-	883 method		3003	Fig. 4	=	=	-	=	=	-		=	-	-	-		-	-	-	-	-	-			-	=	-			=	-	-	=	-
			t <sub>PHL1</sub>								t <sub>PLH2</sub>	t <sub>PHL2</sub>	tputa				t <sub>PHL3</sub>				t <sub>PLH4</sub>	t <sub>PHL4</sub>	t <sub>PLH5</sub>			t <sub>PHL5</sub>			t <sub>PLH6</sub>	t <sub>PHL6</sub>	t <sub>PLH7</sub>	t <sub>PLH8</sub>	t <sub>PHL7</sub>	t <sub>PHL8</sub>
	Subgroup Symbol		6	$T_{C} = 25^{\circ}C$																						-								

# Terminal conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ V; or open).

See footnotes at end of table III.

		Unit		su	-	-	-	-	-	-	-	-		-	-	=		-	-		
		nits	Max	14.5	14.5	14.0	14.0	14.5	-	-	-	14.0	-	-	-	14.5					
		Limits	Min	6.0	6.0	5.5	5.5	6.0	-	-	-	5.5	-	-	-	5.5	-	=	-		
		Measured terminal		P0 to TCU	P3 to TCU	P0 to TCU	P3 to TCU	P0 to TCD	P1 to TCD	P2 to TCD	P3 to TCD	P0 to TCD	P1 to TCD	P2 to TCD	P3 to TCD	MR to Q0	MR to Q1	MR to Q2	MR to Q3		
	16	20	V <sub>cc</sub>	5.0 V	-	-	-	-	-	-	-	-	-	-	-			=	-		
	15	19	ЬO	z	2.7 V	z	2.7 V	z	0.0 V	-	-	z	0.0 V	-	-	2.7 V	0.0 V		-		
en).	14	18	MR	0.0 V	-	-	=		-	-	-	-	-	-	-	N					
·; or op(	13	17	TCD					OUT	-	-	-	-	-	-	-						
conditions (pins not designated may be high $\ge 2.0$ V; low $\le 0.8$ V; or open).	12	15	<u>TC</u> U	OUT	-	=	=														
2.0 <; 10	11	14	Ρ	0.0 V	-	-	-	-	-	-	-	-	-	-	-	2/					
high ≥	10	13	P2	0.0 V	-	-	=	-	-	Z	0.0 V	-	-	Z	0.0 V	=		2.7 V	0.0 V		
onditions (pins not designated may be high $\geq 2$ .	თ	12	P3	2.7 V	N	2.7 V	N	0.0 V	-	-	Z	0.0 V	-	-	Z	0.0 V	н	н	2.7 V		
ignated	ω	10	GND	GND	-	-	=	-	-	-	-	-	-	-	-	=		=			
not des	7	6	Q3																OUT	m table I.	
ns (pins	9	8	02															OUT		e limits fro	
condition	2ı	7	СРИ	0.0 V	-	-	-	2.7 V	-	-	-	-	-	-	-	0.0 V		=	=	5°C and use limits from table	c = -55°C.
Terminal c	4	5	СРD	2.7 V	=	-	-	0.0 V	-	-	-	-	-	-	-	=		=	-	$T_{c} = +125$	except T <sub>C</sub>
Te	ę	4	g													OUT				9, except	ogroup 10,
	2	ю	Q1														OUT			subgroup	as for sub
	-	2	P1	0.0 V	=	-	-	=	N	0.0 V	-	-	≥	0.0 V	-	=	2.7 V	0.0 V	0.0 V	ions as for	and limits
	Cases E, F	Case 2 <u>1</u> /	Test no.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	Same tests and terminal conditions as for subgroup 9, except $T_{\rm C}$ = +125	Same tests, terminal conditions and limits as for subgroup 10, except $T_{\rm c}$
	MIL-STD-	883 method		3003	Fig. 4	=	-	=	-	-	-	=	-	-	-	=	-	-	-	sts and teri	ssts, terminé
		Symbol		t <sub>PLH9</sub>		t <sub>PHL9</sub>		t <sub>PLH10</sub>				t <sub>PHL10</sub>				tpHL11				Same te	Same te
		Subgroup Symbol		6	$T_{\rm C} = 25^{\circ}{\rm C}$															10	11

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

Γ

For case 2, pins not referenced are NC. Apply one pulse prior to measurement. 5



ပ			
В	03/-0.6	50/-1.2	75/-1.8
A	25/-0.6	50/-1.2	75/-1.8
Device	IIA	01, 02	03, 04
Parameter	l <sub>IL1</sub>		113
		Device         A           All        25/-0.6	Device A All25/-0.6 01, 0250/-1.2

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H = 2.5 V, L = 0.5 V, A = 3.0 V minimum; B = 0.0 V or GND.
The f<sub>MAX</sub> minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.
For types 01 and 02, set outputs to 9th count (P0 = 1, P3 = 1, P1 and P2 = 0).
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the specified output can occur on the next applied CP.
For types 01 and 02, increment such that measurement of the conditions of initial qualification and after process or design changes which may affect this parameter. For all other conditions, f<sub>MAX</sub> shall be guaranteed, if not tested, to the limits specified in table III, herein.

# 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

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.
  - Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements should not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
  - i. Requirements for "JAN" marking.
  - j. Packaging requirements (see 5.1).

6.3 <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 <sub>IN</sub>	Current flowing into an input terminal
V <sub>IN</sub>	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-35810 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	Generic-industry
type	type
01	54F160A
02	54F162A
03	54F190
04	54F192

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.

Device	A	В	С
type	National Semiconductor/	Motorola Inc.	Signetics Corp.
	Fairchild		Corp.
01	Х		
02	Х		
03			
04	Х		

### TABLE IV. Manufacturers' designations.

6.9 <u>Changes from previous issue</u>. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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

(Project 5962-2027)

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

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