

# PART NUMBER 4020ABEA-ROCS

# Rochester Electronics Manufactured Components

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

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

# **Quality Overview**

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

Qualified Suppliers List of Distributors (QSLD)

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

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

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

INCH-POUND MIL-M-38510/56G 18 April 2005

SUPERSEDING MIL-M-38510/56F 19 February 1988

# MILITARY SPECIFICATION MICROCIRCUITS, DIGITAL, CMOS, COUNTERS/DIVIDERS, MONOLITHIC SILICON

Reactivated after 18 Apr. 2005 and may be used for new and existing designs and acquisitions.

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

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

- 1. SCOPE
- 1.1 <u>Scope.</u> This specification covers the detail requirements for monolithic silicon, CMOS, logic microcircuits. Two product assurance classes and a choice of case outlines, lead finishes, and radiation hardness assurance (RHA) are provided and are reflected in the complete Part or Identifying Number (PIN). For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535 (see 6.3).
  - 1.2 Part or identifying number (PIN). The PIN is in accordance with MIL-PRF-38535 and as specified herein.
  - 1.2.1 <u>Device types</u>. The device types are as follows:

Device type	<u>Circuit</u>				
01	Decade counter/divider				
02	Presettable divide-by-"N" counter				
03	14-stage ripple-carry binary counter/divider				
04	Divide-by-8 counter/divider				
05	7-stage binary counter				
51	Decade counter/divider				
52	Presettable divide-by-"N" counter				
53	14-stage ripple-carry binary counter/divider				
54	Divide-by-8 counter/divider				
55	7-stage binary counter				

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

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, P.O. Box 3990, Columbus, OH 43218-3990, or email to <a href="mailto:cMOS@dscc.dla.mil">CMOS@dscc.dla.mil</a>. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil</a>.

AMSC N/A FSC 5962

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

Outline letter	<u>Descriptive designator</u>	<u>Terminals</u>	Package style
Α	GDFP5-F14 or CDFP6-F14	14	Flat pack
В	GDFP4-F14	14	Flat pack
С	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	Flat pack
Ε	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
N	CDFP4-F16	16	Flat pack
T	CDFP3-F14	14	Flat pack
X <u>1</u> / <u>2</u> /	GDFP5-F14 or CDFP6-F14	14	Flat pack, except A dimension equals 0.100" (2.54 mm) max
Y <u>1</u> / <u>2</u> /	GDFP1-F14 or CDFP2-F14	14	Flat pack, except A dimension equals 0.100" (2.54 mm) max
Z <u>1</u> / <u>2</u> /	GDFP2-F16 or CDFP3-F16	16	Flat pack, except A dimension equals 0.100" (2.54 mm) max

### 1.3 Absolute maximum ratings.

Supply voltage range ( $V_{DD}$ - $V_{SS}$ ):	
Device types 01, 02, 03, 04, and 050.5 V dc to +15.5 V dc	
Device types 51, 52, 53, 54, and 550.5 V dc to +18.0 V dc	
Input current (each input) ±10 mA	
Input voltage range $(V_{SS} - 0.5 \text{ V}) \le V_I \le (V_{DD} + 0.5 \text{ V})$	0.5 V)
Storage temperature range (T <sub>STG</sub> )65° to +175°C	,
Maximum power dissipation (P <sub>D</sub> )	
Lead temperature (soldering, 10 seconds)+300°C	
Thermal resistance, junction to case (θ <sub>JC</sub> )	
Junction temperature (T <sub>J</sub> )	

### 1.4 Recommended operating conditions.

Supply voltage range ( $V_{DD}$ - $V_{SS}$ ): Device types 01, 02, 03, 04, and 05 Device types 51, 52, 53, 54, and 55 Input low voltage range ( $V_{II}$ ):	4.5 V dc to 12.5 V dc 4.5 V dc to 15.0 V dc
	$0.0 \text{ V to } 0.85 \text{ V dc } @ \text{ V}_{DD} = 5.0 \text{ V dc}$ $0.0 \text{ V to } 2.0 \text{ V dc } @ \text{ V}_{DD} = 10.0 \text{ V dc}$ $0.0 \text{ V to } 2.1 \text{ V dc } @ \text{ V}_{DD} = 12.5 \text{ V dc}$
Device types 51, 52, 53, 54, and 55	
Input high voltage range (V <sub>IH</sub> ):	0.0 V to 4.0 V dc @ V <sub>DD</sub> = 15.0 V dc
	$3.95 \text{ V to } 5.0 \text{ V dc} @ \text{V}_{DD} = 5.0 \text{ V dc} \\ 8.0 \text{ V to } 10.0 \text{ V dc} @ \text{V}_{DD} = 10.0 \text{ V dc} \\ 10 \text{ V to } 12.5 \text{ V dc} @ \text{V}_{DD} = 12.5 \text{ V dc} $
Device types 51, 52, 53, 54, and 55	
Load capacitance	50 pF maximum

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

from the package edge.

Z/ For bottom or side brazed packages, case outlines X, Y, and Z only, the S<sub>1</sub> dimension may go to .000 inch (.00 mm) minimum.

### 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 SPECIFICATION

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

### DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.

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

(Copies of these documents are available online at <a href="http://assist.daps.dla.mil/quicksearch/">http://assist.daps.dla.mil/quicksearch/</a> or <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil/quicksearch/</a> or <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil/quicksearch/</a> or <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil/quicksearch/</a> or <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil/quicksearch/</a> or <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil</a> 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 document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

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

- 3.3.1 Terminal connections. The terminal connections shall be as specified on figure 1.
- 3.3.2 <u>Logic diagrams and functional waveforms</u>. The logic diagrams and functional waveforms shall be as specified on figure 2.
  - 3.3.3 Truth tables. The truth tables shall be as specified on figure 3.
- 3.3.4 <u>Test procedures and test circuits</u>. The test procedures and test circuits shall be as specified on figures 4 through 7.
- 3.3.5 <u>Switching time waveforms and test circuit</u>. The switching time waveforms and test circuit shall be as specified on figure 8.
- 3.3.6 <u>Schematic circuits</u>. The schematic circuits shall be maintained by the manufacturer and made available to the qualifying activity or preparing activity upon request.
  - 3.3.7 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>. Unless otherwise specified, the electrical performance characteristics are as specified in table I, and apply over the full recommended case operating temperature range,.
- 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.
- 3.7.1 <u>Radiation hardness assurance identifier</u>. The radiation hardness assurance identifier shall be in accordance with MIL-PRF-38535 and 4.5.4 herein.
- 3.8 <u>Microcircuit group assignment.</u> The devices covered by this specification shall be in microcircuit group number 40 (see MIL-PRF-38535, appendix A).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/	Device	Lin	nits	Unit
		$V_{SS} = 0 \text{ V}, -55^{\circ}\text{C} \le T_{C} \le 125^{\circ}\text{C}$	type	Min	Max	
Design and a series in the		unless otherwise specified	A !!		4.5	
Positive clamping input to V <sub>DD</sub>	V <sub>IC</sub> (POS)	$T_C = 25$ °C, $V_{DD} = GND$ , $V_{SS} = Open$ , Output = Open, $I_I = 1$ mA	All		1.5	V
Negative clamping input	V <sub>IC</sub>	$T_C = 25^{\circ}C$ , $V_{DD} = Open$ ,	All		-6	V
to V <sub>SS</sub>	(NEG)	$V_{SS} = GND$ , Output = Open, $I_I = -1$ mA	7		ŭ	•
Quiescent supply current	I <sub>SS</sub>	V <sub>DD</sub> maximum, any	01,02,04,		-5.0	μА
		combination of inputs	05,51,52,			
			54,55		40.0	
			03,53		-10.0	μA
High level output voltage	V <sub>OH</sub>	V <sub>DD</sub> = 12.5 V, no load, All outputs	01-05	11.25		V
Tollago		$V_{DD} = 5.0 \text{ V},$	01,04	4.5		V
		$I_{OH}$ = -21 $\mu$ A, DECODED outputs	0.,0.			
		$V_{DD} = 5.0 \text{ V}, I_{OH} = -105 \mu\text{A}$	01,04	4.5		V
		CARRY output				
		$V_{DD} = 5.0 \text{ V}, I_{OH} = -40 \mu\text{A},$	02	4.5		V
		Q <sub>1</sub> through Q <sub>4</sub> outputs				
		$V_{DD} = 5.0 \text{ V}, I_{OH} = -105 \mu\text{A},$	02	4.5		V
		Q <sub>5</sub> output				
		$V_{DD} = 5.0 \text{ V}, I_{OH} = -65 \mu\text{A},$	03	4.5		V
		All outputs	0.5	4.5		\ /
		$V_{DD} = 5.0 \text{ V}, I_{OH} = -105 \mu\text{A},$	05	4.5		V
		All outputs $V_{DD} = 15 \text{ V, } I_{OH} = 0$	E1 EE	14.95		17
Low level output	V <sub>OL</sub>	$V_{DD} = 15 \text{ V, } I_{OH} = 0$ $V_{DD} = 12.5 \text{ V, No load,}$	51-55 01-05	14.95	1.25	V
voltage	VOL	All outputs	01-05		1.25	V
. c.tago		$V_{DD} = 5.0 \text{ V},$	01,04		500	mV
		I <sub>OL</sub> = 35 μA, DECODED outputs	,			
		$V_{DD} = 5.0 \text{ V}, I_{OL} = 105 \mu\text{A}$	01,04		500	mV
		CARRY output				
		$V_{DD} = 5.0 \text{ V}, I_{OL} = 35 \mu\text{A}$	02		500	mV
		Q <sub>1</sub> through Q <sub>4</sub> output				
		$V_{DD} = 5.0 \text{ V}, I_{OL} = 105 \mu\text{A}$	02		500	mV
		Q₅ output				
		$V_{DD} = 5.0 \text{ V}, I_{OL} = 90 \mu\text{A}$	03		500	mV
		All outputs				
		$V_{DD}$ = 5.0 V, $I_{OL}$ = 175 $\mu$ A	05		500	mV
		All outputs V <sub>DD</sub> = 15 V, I <sub>OL</sub> = 0	51-55		50	mV
Input high voltage	V <sub>IH</sub>	$V_{DD} = 13 \text{ V}, I_{OL} = 0$ $V_{DD} = 5 \text{ V}, \text{ see table III}$	01-05	3.6	30	V
input night voltage	V IH	$V_{DD} = 5 \text{ V}$ , see table III	51-55	3.5		V
<u> </u>	1	VDD - 5 V, See lable III	31-33	5.5		v

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

New Year	Test	Symbol	Conditions	1/	Device	Lin	nits	Unit
Input low voltage					type			
Input low voltage								
Input low voltage	Input high voltage	V <sub>IH</sub>			51-55	7.0		-
Vob = 5 V, see table III						11.0		•
$ \begin{array}{ c c c c c c } \hline & V_{DD} = 10 \ V, see table III & 51.55 & 3.0 \ V \\ \hline V_{DD} = 15 \ V, see table III & 51.55 & 4.0 \ V \\ \hline V_{DD} = 5 \ V, \\ \hline V_{N} = 0 \ V \ or 5 \ V, V_{OL} = 0.4 \ V \\ \hline V_{DD} = 15 \ V, \\ \hline V_{N} = 0 \ V \ or 15 \ V, V_{OL} = 1.5 \ V \\ \hline V_{DD} = 15 \ V, \\ \hline V_{N} = 0 \ V \ or 15 \ V, V_{OL} = 1.5 \ V \\ \hline V_{DD} = 15 \ V, \\ \hline V_{N} = 0 \ V \ or 15 \ V, V_{OL} = 1.5 \ V \\ \hline V_{DD} = 15 \ V, \\ \hline V_{N} = 0 \ V \ or 15 \ V, V_{OL} = 1.5 \ V \\ \hline V_{DD} = 15 \ V, \\ \hline V_{N} = 0 \ V \ or 15 \ V, V_{OH} = 13.5 \ V \\ \hline Input leakage current, ligh \\ Input leakage current, low \\ \hline Input leakage current, low leak$	Input low voltage	VIL						
Output low (sink) current   Vob = 15 V, see table III   S1-55   S1-								_
$ \begin{array}{ c c c c } \hline \text{Output low (sink) current} & I_{\text{OL}} & V_{\text{DD}} = 5  \text{V}, \\ V_{\text{N}} = 0  \text{V or 5 V, V}_{\text{OL}} = 0.4  \text{V} \\ V_{\text{DD}} = 15  \text{V}, \\ V_{\text{NN}} = 0  \text{V or 15 V, V}_{\text{OL}} = 1.5  \text{V} \\ \hline \text{Output high (source)} \\ \hline \text{current} & I_{\text{OH}} & V_{\text{DD}} = 5  \text{V}, \\ V_{\text{NN}} = 0  \text{V or 15 V, V}_{\text{OH}} = 1.5  \text{V} \\ \hline \text{V}_{\text{DD}} = 15  \text{V}, \\ V_{\text{OD}} = 15  \text{V}, \\ V_{\text{N}} = 0  \text{V or 15 V, V}_{\text{OH}} = 13.5  \text{V} \\ \hline \text{Input leakage current, low} & I_{\text{IIL}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input leakage current, low} & I_{\text{IIL}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & \text{mA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & -100 & \text{nA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & -100 & \text{nA} \\ \hline \text{Input capacitance} & C_{\text{I}} & V_{\text{DD}} = 18  \text{V} & 51-55 & -2.4 & -100 $								•
Volume 15 Vol	Output law (sink) surrent	1		111		0.00	4.0	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Output low (sink) current	IOL		= 0.4 V	51-55	0.36		IIIA
Output high (source) current   I <sub>OH</sub>   V <sub>DD</sub> = 5 V, V <sub>VIN</sub> = 0 V or 5 V, V <sub>OH</sub> = 4.6 V   V <sub>DD</sub> = 15.55   -0.36   mA   mA			$V_{DD} = 15 V$ ,		51-55	2.4		mA
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	,	Іон	$V_{DD} = 5 V$		51-55	-0.36		mA
$ \begin{array}{ c c c c } \hline \text{Input leakage current,} \\ \text{high} \\ \hline \\ $	current		$V_{DD} = 15 V$ ,		51-55	-2.4		mA
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Input leakage current	liu			01-05		100	nA
$ \begin{array}{ c c c c c }\hline \mbox{Input leakage current,} & I_{IL} & V_{DD} = 15 \ V & 01-05 \\ \hline \mbox{V}_{DD} = 18 \ V & 51-55 & -100 & nA \\ \hline \mbox{Input capacitance} & C_{i} & V_{DD} = 0 \ V, f = 1 \ MHz \\ \hline \mbox{T}_{C} = 25^{\circ} C, \mbox{ any input} & All & 12 & pF \\ \hline \mbox{Propagation delay time,} \\ \mbox{high-to-low level} & I_{PHL} & V_{DD} = 5.0 \ V, \mbox{ CLOCK to DECODED} \\ \mbox{Outputs} & 51 & -1.40 \\ \hline \mbox{V}_{DD} = 5.0 \ V, \mbox{ CLOCK to CARRY} & 01 & -2.70 \\ \mbox{Outputs} & 51 & -1.42 \\ \hline \mbox{V}_{DD} = 5.0 \ V, \mbox{ CLOCK to CARRY} & 01 & -2.18 \\ \mbox{Output} & 51 & -1.12 \\ \hline \mbox{V}_{DD} = 5.0 \ V, \mbox{ CLOCK to CARRY} & 01 & -2.18 \\ \mbox{Output} & 51 & -1.12 \\ \hline \mbox{V}_{DD} = 5.0 \ V, \mbox{ CLOCK to Q}_{5} \mbox{ output} & 02 & -2.70 & ns \\ \mbox{Outputs} & 52 & -980 & ns \\ \hline \mbox{V}_{DD} = 5.0 \ V, \mbox{ CLOCK to Q}_{1} \mbox{ Q}_{1} & 03 & -1.34 \\ \mbox{Q}_{1} & 0.52 & 5.25 \\ \mbox{Q}_{6} & 0.065 & 6.68 \\ \mbox{Q}_{7} & 0.91 & 9.30 \\ \mbox{Low-to-high level} & 1.04 & 10.65 \\ \mbox{Q}_{11} & 0.13 & 13.35 \\ \mbox{Low-to-high level} & 1.04 & 10.65 \\ \mbox{Low-to-high level} & 1$	_	"	Lacii inpat	$V_{DD} = 18 \text{ V}$			100	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Input leakage current		-	V <sub>22</sub> = 15 V	01-05		-100	nΔ
$ \begin{array}{ c c c c c } \hline \mbox{Input capacitance} & \hline C_i & V_{DD} = 0 \ V, f = 1 \ MHz \\ T_C = 25^{\circ}C, \mbox{ any input} & \mbox{All} & 12 & pF \\ \hline \mbox{Propagation delay time, high-to-low level} & t_{PHL} & V_{DD} = 5.0 \ V, \mbox{ CLOCK to DECODED} & 01 & .013 & 2.70 & .014 & .015 & .014 & .015 & .014 & .015 & .014 $	_			$V_{DD} = 18 \text{ V}$			-100	ПА
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Innut conscitones		\/ - 0 \/ f - 4 MII-		AII	1	40	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Input capacitance	Ci	-		All		12	рг
high-to-low level $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Propagation delay time	tou		o DECODED	01	013	2.70	c
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		PHL	,	OBLOODED		.010		μδ
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1g., to 10.1.10101			DECODED		и		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			*		51	"		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				o CARRY		и	2.18	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					51	"	1.12	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			$V_{DD}$ = 5.0 V, CLOCK t	o Q₅ output	02	и	2.18	
Propagation delay time, high-to-low level, low-to-high level $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					52		980	ns
Propagation delay time, high-to-low level, low-to-high level    Propagation delay time, high-to-low level, low-to-high level   VDD = 5.0 V, CLOCK to   Q1   03   1.34   μs   0.52   5.25   0.65   6.68   0.078   8.03   0.091   9.30   0.091   9.30   0.091			$V_{DD}$ = 5.0 V, CLOCK t	o Q <sub>1</sub> – Q <sub>4</sub>				ns
high-to-low level, low-to-high level    Philips   Vision								ns
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	, , ,		$V_{DD} = 5.0 \text{ V, CLOCK t}$		03			μS
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		t <sub>PLH</sub>				-		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	low-to-nigh level							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				-0				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$								
$\begin{array}{c ccccc} \hline Q_{10} & & .130 & 13.35 \\ \hline Q_{11} & & .143 & 14.85 \\ \hline Q_{12} & & .156 & 16.05 \\ \hline \end{array}$								
Q <sub>11</sub> .143     14.85       Q <sub>12</sub> .156     16.05								
Q <sub>12</sub> .156 16.05								
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				Q <sub>13</sub>		.169	17.40	
Q <sub>14</sub> .182 18.75								

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

Test	Symbol	Conditions 1/	Device	Lin	nits	Unit
1000	Cymbol	$V_{SS} = 0 \text{ V}, -55^{\circ}\text{C} \le T_{C} \le 125^{\circ}\text{C},$	type	Min	Max	Oilit
		unless otherwise specified	typo		WIGA	
Propagation delay time,	t <sub>PHL</sub>	$V_{DD}$ = 5.0 V, RESET to any output	03	.013	4.95	μS
high-to-low level	TIL	l bb cic i, i.e. = i to any coupar	53	.013	630	ns
19		V <sub>DD</sub> = 5.0 V, CLOCK to CARRY output	04	.013	1.80	μS
		The old the section of the compact	54	.013	1.16	μο
		V <sub>DD</sub> = 5.0 V, CLOCK to DECODED outputs	04	.013	3.38	
		V <sub>DD</sub> 0.0 V, GEOOR to BEOOBEB outputs	54	.013	1.40	
		V <sub>DD</sub> = 5.0 V, RESET to DECODED outputs	04	.013	1.80	
		1-7	54	.013	1.40	
Propagation delay time,	t <sub>PLH</sub> ,	$V_{DD} = 5.0 \text{ V}, \text{ CLOCK to } Q_1$	05	.013	0.66	
low-to-high level,	t <sub>PHL</sub>	$Q_2$	00	.026	1.32	
high-to-low level	YPIL	$\frac{Q_2}{Q_3}$		.039	1.98	
riigii to low level		Q <sub>3</sub>		.052	2.64	
		$\frac{Q_4}{Q_5}$		.065	3.30	
		$\overline{Q_{5}}$		.003	3.96	
				.078		
		Q <sub>7</sub>	0E		4.65 2.25	
		$V_{DD}$ = 5.0 V, RESET to any output	05	.013		μS
Donos a satisfactor de la critica a		V	55	13	490	ns
Propagation delay time,	t <sub>PLH</sub>	$V_{DD}$ = 5.0 V, CLOCK to DECODED outputs	01	.013	2.70	μS
low-to-high level		\( \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	51	66	1.40	
		V <sub>DD</sub> = 5.0 V, CLOCK to CARRY output	01	и	2.18	
			51		1.12	
		V <sub>DD</sub> = 5.0 V, RESET to 0 output	01	u	2.70	
			51		1.40	
		V <sub>DD</sub> = 5.0 V, RESET to CARRY output	01	ű	2.18	
			51	и	1.12	
		$V_{DD}$ = 5.0 V, CLOCK to $Q_5$ output	02	ıı	2.18	
		$V_{DD}$ = 5.0 V, CLOCK to $Q_1 - \overline{Q}_4$ outputs	02	"	2.70	
		$V_{\rm DD}$ = 5.0 V, CLOCK to Q <sub>1</sub> – Q <sub>5</sub> outputs	52	13	980	ns
		$V_{DD}$ = 5.0 V, RESET to $Q_5$ output	02	.013	2.70	μS
		$V_{DD} = 5.0 \text{ V}$ , RESET to $Q_1 - Q_4$ outputs	02	.013	2.18	μο
		$V_{DD} = 5.0 \text{ V}$ , RESET to $Q_1 - Q_5$ outputs	52	13	980	ns
Propagation delay time,	t <sub>PHL</sub> ,	$V_{DD} = 5.0 \text{ V}, \text{ RESET to } Q_1 = Q_5 \text{ outputs}$	53	.013	0.77	μS
high-to-low level,	t <sub>PLH</sub>	to $Q_4$	00	.052	2.15	μο
low-to-high level	PLH	$Q_5$		.065	2.62	
low to mgm lovel		$Q_6$		.078	3.08	
		Q <sub>7</sub>		.091	3.54	
		$Q_8$		.104	4.00	
		$Q_9$		.117	4.47	
				.130	4.93	
		Q <sub>10</sub>		.143	5.39	
		Q <sub>11</sub>		.143		
		Q <sub>12</sub>			5.85	
		Q <sub>13</sub>		.169	6.31	
Dropagation dalay time	+	$Q_{14}$ $V_{DD} = 5.0 \text{ V, CLOCK to CARRY output}$	04	.182	6.78	
Propagation delay time, low-to-high level	t <sub>PLH</sub>	V <sub>DD</sub> = 5.0 V, CLOCK to CARRY output	04 54	.013	1.80 1.16	μS
Ĭ		V <sub>DD</sub> = 5.0 V, CLOCK to DECODED outputs	04	и	3.38	
			54	tt.	1.40	
		V <sub>DD</sub> = 5.0 V, RESET to 0 output	04	ű	3.38	
		- 55 0.0 1, 1.1221 to 0 00tput	54	ű	1.40	
		$V_{DD}$ = 5.0 V, RESET to CARRY output	04	ű	1.80	
		- 55 - 5.5 · , · . = 5 · . · · · · · · · · · · · · · · · ·	54	и	1.12	
L	1		<del>-</del>	I	1.14	

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

Propagation delay time, low-to-high level inigh-to-low level   V <sub>PD</sub> = 5.0 V, CLOCK to   Q <sub>1</sub>   Q <sub>2</sub>   Q <sub>3</sub>   Q <sub>5</sub>   Q <sub>5</sub>	Test	Symbol	Conditions 1/		Device	Lin	nits	Unit	
Propagation delay time, low-to-high level, high-to-low level   Mark the text   Mark the te						type	Min	Max	
Dow-to-high level, high-to-low level   Dow-to-high level, high-to-low level   Dow-to-high level   Dow-to			unless otherv	vise sp	ecified				
Digh-to-low level   Dight-to-low level   Dight-t	Propagation delay time,	t <sub>PLH</sub> ,	$V_{DD}$ = 5.0 V, CLOCK	to	$Q_1$	55	.013	0.49	μS
Transition time, high-to-low level = transition time, high-to-low level = transition time, high-to-low level = transition time, low-to-high level	low-to-high level,	t <sub>PHL</sub>			$Q_2$		.026	0.77	
Transition time, high-to-low level = transition time, low-to-high level   Transiti	high-to-low level				$Q_3$		.039	1.05	
Transition time, high-to-low level = transition time, high-to-low level = transition time, low-to-high level   Transitio					$Q_4$		.052	1.33	
Transition time, high-to-low level = transition time, low-to-high level					$Q_5$		.055	1.61	
Transition time, high-to-low level = transition time, low-to-high level					$Q_6$		.078	1.89	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$							.097	2.17	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		t <sub>THL</sub> ,		CAR	RY output	01	10		ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		t <sub>TLH</sub>	V <sub>DD</sub> = 5.0 V				.010	3.38	μS
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		t <sub>THL</sub>				51,54	10	280	ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		t <sub>TLH</sub>	$V_{DD}$ = 5.0 V, CARRY	and [	DECODED	51,54	10	504	ns
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		t <sub>THL</sub> ,		Q	5 output	02	10	825	ns
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					•				•
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			$V_{DD} = 5.0 \text{ V}$ all outpu		1 Q3 Garparo				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				410					•
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		t <sub>THL</sub>			t and		"		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		t <sub>TLH</sub>			it and	04	u	900	ns
Tith   Vode   1050		t <sub>THL</sub>	$V_{DD}$ = 5.0 V, all output	uts		05		645	ns
Minimum setup time, high-to-low level   Tshl   Vob = 5.0 V, Clock input to RESET or CLock enable (DECODED outputs)   Vob = 5.0 V, Clock input to Clock   S1   336   ns						55		280	ns
Minimum setup time, high-to-low level		t <sub>TLH</sub>	$V_{DD}$ = 5.0 V, all output	uts				1050	ns
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						55	u		ns
$V_{DD} = 5.0 \text{ V, CLOCK input to RESET} \\ V_{DD} = 5.0 \text{ V, CLOCK input to RESET} \\ O1 \\ V_{DD} = 5.0 \text{ V, CLOCK input to RESET} \\ O2 \\ O7 \\ O7 \\ O7 \\ O7 \\ O7 \\ O7 \\ O7$		t <sub>SHL</sub>	to RESET or CLOC	K ena	ble	01		1125	ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						51		336	ns
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			V <sub>DD</sub> = 5.0 V, CLOCK or CLOCK ENABLE	input (CAF	to RESET RRY output)				ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					to RESET	_			ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									ns
			$V_{DD} = 5.0 \text{ V, CLOCK}$	input	to data line				ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									ns
		t <sub>SLH</sub>		input	to				ns
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									ns
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		t <sub>SHL</sub>	ENABLE or RESET	_		04		1125	ns
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	_			input	to CLOCK	54		350	ns
Minimum clock pulse width $V_{DD} = 5.0 \text{ V} $ $01,02,04$ $750$ ns $01,02,04$ $01,02,0$				input	to RESET	54		560	ns
width     V <sub>IH</sub> = 5.0 V     51     350       52     700	Minimum clock pulse	t <sub>PH</sub>		1, 2, 4					
52 700		1 11							_
						54		550	

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

Test	Symbol	Conditions 1/	Device	Lir	nits	Unit
		$V_{SS}$ = 0 V, -55°C $\leq$ T <sub>C</sub> $\leq$ 125°C unless otherwise specified	type	Min	Max	
Minimum data pulse width	t <sub>PH</sub>	V <sub>DD</sub> = 5.0 V	03		750	ns
		V <sub>IH</sub> = 5.0 V	53		470	
			05		450	
			55		280	
Minimum preset pulse	t <sub>PH</sub>	$V_{DD} = 5.0 \text{ V}$	02		750	ns
width		V <sub>IH</sub> = 5.0 V	52		560	
Minimum reset pulse	t <sub>PH</sub>	$V_{DD} = 5.0 \text{ V}$	01,02		750	ns
width		V <sub>IH</sub> = 5.0 V	51,52		560	
			04,54		560	
			05		975	
			03		2.7	μS
			53		630	ns
			55		490	
Maximum clock frequency	f <sub>MAX</sub>	V <sub>DD</sub> = 5.0 V	03	650		kHz
		$C_L = 50 \text{ pF}$	01,02,04	350		kHz
			51	1.43		MHz
			05,53,55	1.10		MHz
			52,54	0.71		MHz

 $<sup>\</sup>underline{1}'$  Complete terminal conditions shall be as specified in table III.  $\underline{2}'$  Input current at one input node.

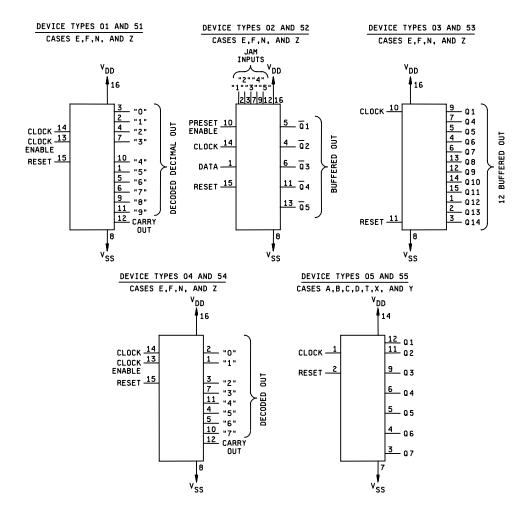


FIGURE 1. Terminal connections.

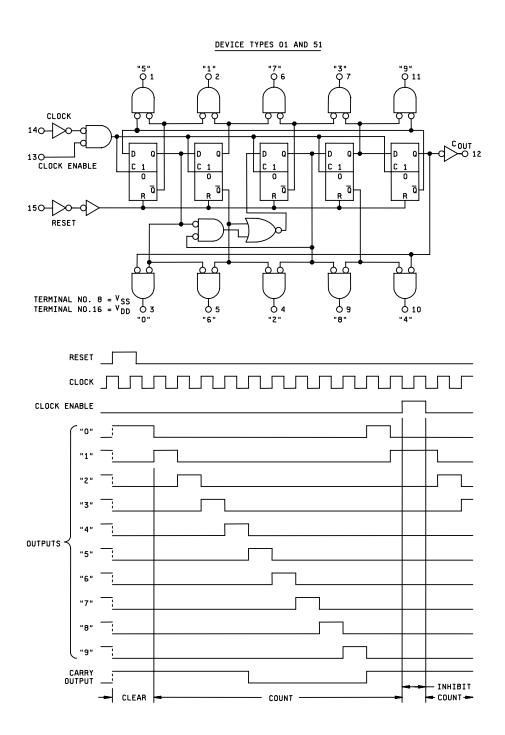
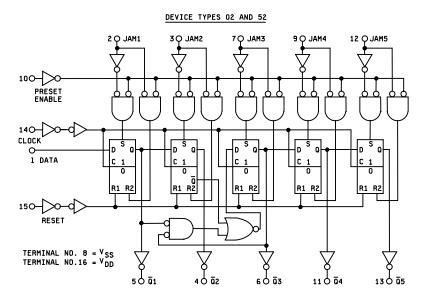


FIGURE 2. Logic diagrams and functional waveforms.



SHOWN IN "DIVIDE BY TEN CONFIGURATION," Q5 TIED DIRECTLY TO DATA INPUT.

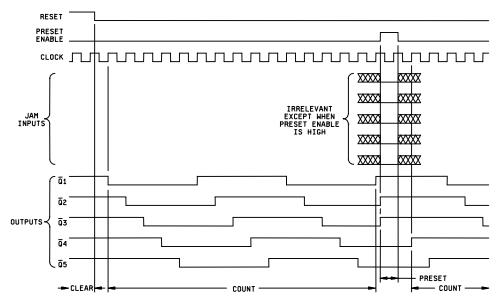
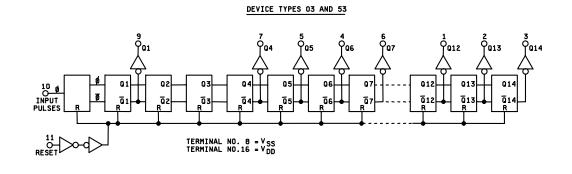


FIGURE 2. Logic diagrams and functional waveforms - Continued.



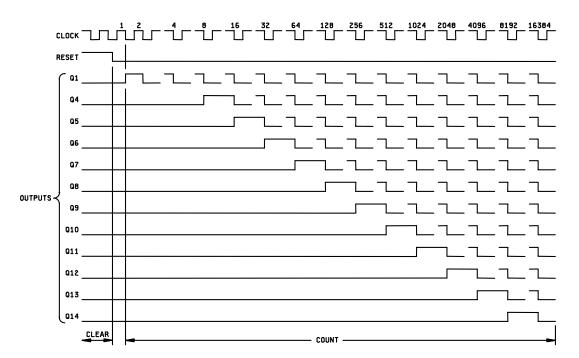


FIGURE 2. Logic diagrams and functional waveforms - Continued.

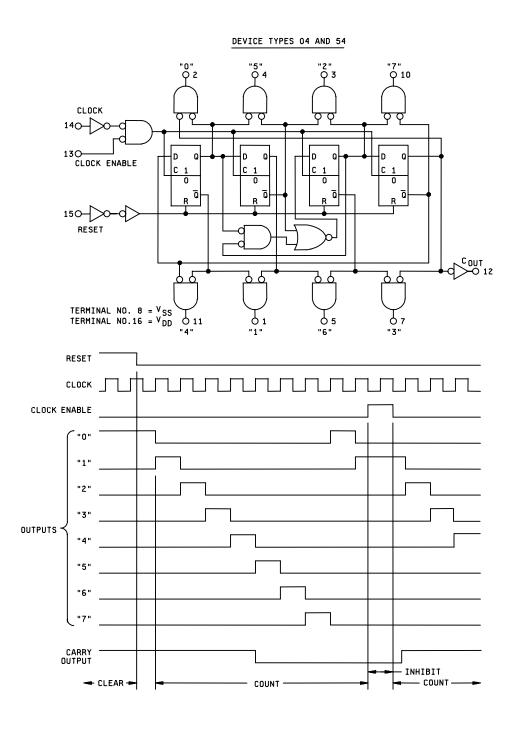


FIGURE 2. Logic diagrams and functional waveforms - Continued.

# DEVICE TYPES 05 AND 55 1 Ø INPUT PULSES <u>0</u>5 TERMINAL 14 = $V_{DD}$ TERMINAL 7 = $V_{SS}$ RESET CLOCK Q1 Q2 Q3 OUTPUTS Q5 CLEAR CLEAR

- COUNT -

FIGURE 2. Logic diagrams and functional waveforms - Continued.

# Device types 01, 04, 51, 54

	Inpu	ıts	Outputs			
CLOCK	CLOCK ENABLE	RESET	Dn-1	Qn	Nn	"On"
Х	Н	L	Χ	Qn-1	Nn-1	"On"-1 *
Х	X	Н	Χ	L	L	Н
$\downarrow$	X	L	Χ	Qn-1	Nn-1	"On"-1 *
<b>↑</b>	L	L	L	L	N-1n-1	"9n"-1
$\uparrow$	L	L	Н	Н	N-1n-1	"9n"-1

N = Any decoded output, "1" through "9" for device types 01and 51 and "1" through "7" for device types 04 and 54.

# Device types 02 and 52

		Οι	utputs				
CLOCK	RESET	DATA	PRESET ENABLE	JAM 1	JAM 2	Q1n	QNn
Х	Н	X	L	Х	X	Н	Н
X	Н	X	Н	X	X	Invalid	condition
X	L	X	Н	L	L	Н	Н
X	L	X	Н	Н	L	L	Н
X	L	X	Н	L	Н	Н	Ш
X	L	X	Н	Н	Н	L	Ш
$\downarrow$	L	X	L	Х	Х	Q1n-1	— QNn-1 *
<b>↑</b>	L	L	L	Х	Х	Н	QN-1n-1
$\uparrow$	L	Н	L	Х	Х	L	QN-1n-1

N = Any stage from 2 to 5.

### Device types 03, 05, 53, and 55

Inpu	ts	Output state
Data input	RESET	- Catput otato
L	L	No change
L	H	All outputs low
Н	L	No change
Н	H	All outputs low
<b>↑</b>	L	No change
<b>↑</b>	Н	All outputs low
<b>\</b>	L	Advance one count
<u> </u>	Н	All outputs low

H = High level voltage.

L = Low level voltage.

\* = No change.

 $\downarrow$  = Negative clock transition from time (n-1) to n.

 $\uparrow$  = Positive clock transition from time (n-1) to n.

X = Irrelevant.

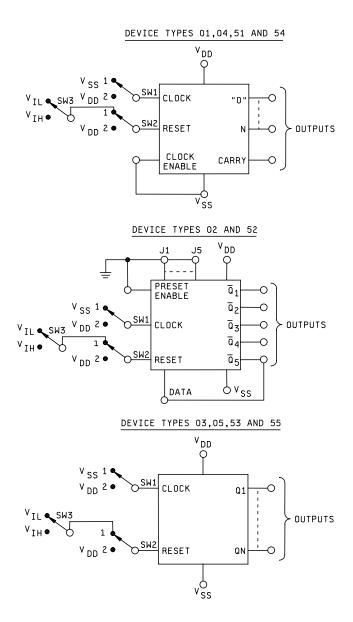
n = 1, 2, 3, ....., and is the input/clock counter after reset.

FIGURE 3. Truth tables.

# DEVICE TYPES 01,04,51 AND 54 v <sub>DD</sub> 2 ● CLOCK V SS 1 SW2 V <sub>DD</sub> 2 ● RESET OUTPUTS CLOCK ENABLE CARRY DEVICE TYPES 02 AND 52 ${}_{\Lambda}{}^{\vec{D}D}$ <u>0</u>1 ENABLE ō2 V SS 1 • v <sub>DD</sub> 2 ● <u>ā</u> 3 OUTPUTS Q4 V DD 2 vss ۷<sub>DD</sub>. 🖒 ВАТА DEVICE TYPES 03,05,53 AND 55 V<sub>DD</sub> V <sub>DD</sub> 2 ● CLOCK OUTPUTS

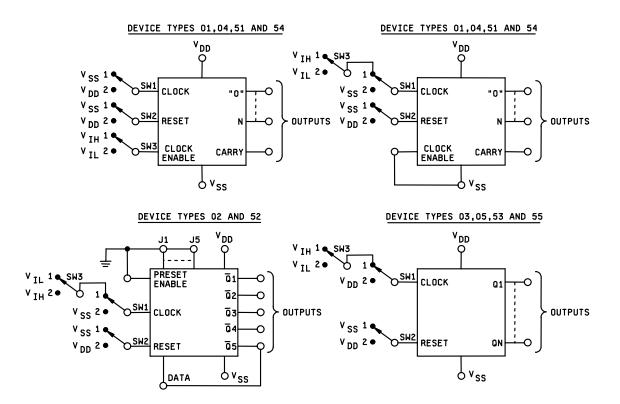
- 1. Each output shall be measured as specified in table III.
- 2. For device types 01 through 05, the input-output voltage subscript numbers (V<sub>IH1</sub>, V<sub>OH1</sub>, etc.) are matched for each test. Each applicable load current is specified in table III.
- 3. See figure 2 for logic diagram and functional waveform.
- 4. To step counter through its sequence, momentarily place SW2 in position 2, then with SW1 increment counter to the to the correct output logic state for measurements. Set device type 02 DATA input high or low to achieve correct input.

FIGURE 4. Test procedures and test circuits for output voltage and current measurements.



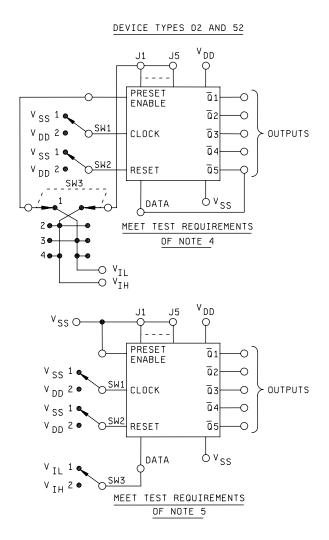
- 1. All outputs shall be checked for proper operation as specified in table III.
- 2. To step counter through its sequence, momentarily place SW2 in position 2, then with SW3 in the required logic position, toggle SW1 to increment counter.
- 3. See figure 2 for logic diagram and functional waveform.
- 4. Test requirements are considered met if counter returns to its zero count whenever SW3 is momentarily placed in position 2. Further, when SW3 is in position 2, counter will not advance but advances when SW3 is in position 1.

FIGURE 5. Test procedures and test circuits for RESET input voltage tests.



- 1. All outputs shall be checked for proper operation as specified in table III.
- 2. To step counter through its sequence, momentarily place SW2 in position 2, then with SW3 in the required logic position, toggle SW1 to increment counter.
- 3. See figure 2 for logic diagram and functional waveform.
- 4. Test requirements are considered met, if counter advances when SW3 is in position 2 but does not advance when SW3 is in position 1.

FIGURE 6. Test procedures and test circuits for CLOCK and CLOCK ENABLE input voltage tests.



- 1. All outputs shall be checked for proper operation as specified in table III.
- 2. To step counter through its sequence, momentarily place SW2 in position 2, then with SW3 in the required logic position, toggle SW1 to increment counter.
- 3. See figure 2 for logic diagram and functional waveform.
- 4. Test requirements are considered met if: (a) counter advances with SW3 is in positions 1 and 3; (b) all counter outputs are logic "L" with SW3 in position 2; and (c) all counter outputs are logic "H" with SW3 in position 4.
- 5. Test requirements are considered met if, with SW3 in position 1, the counter advances to a full count during 5 clock periods with outputs achieving logic "H". At this point, SW3 is changed to position 2 and after 5 more clock periods, a full count shall be registered with outputs achieving logic "L".

FIGURE 7. Test procedures and test circuits for JAM, PRESET ENABLE, and DATA input voltage tests.

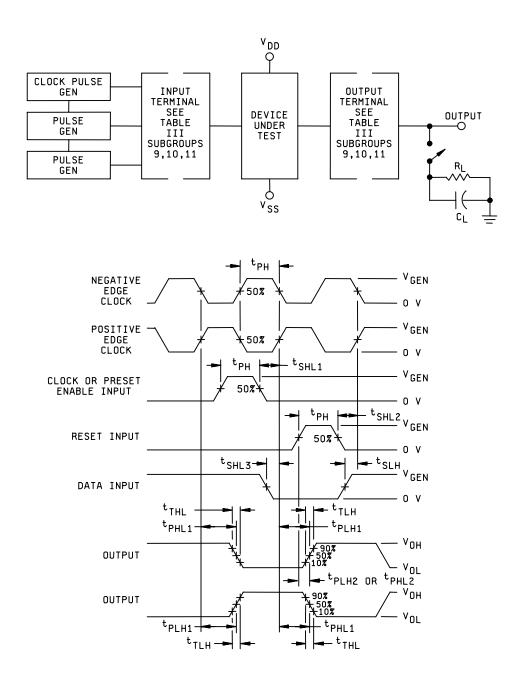


FIGURE 8. Switching time waveforms and test circuit.

					Ger	erator	oulse cor	nditions			Lo	ad
Test	Input	Device		PRR	at °C	t <sub>THL</sub>	t <sub>TLH</sub>	Duty	t <sub>PH</sub> :	at °C	$R_L  k\Omega$	C <sub>L</sub> pF
	terminal	type	$V_{GEN}$	+25, -55	+125	$\leq$	≤	cycle %	+25, -55	125	±10%	
									≤	≤		
t <sub>PLH</sub> , t <sub>PHL</sub>		01, 02, 04	5.0 V	450 kHz	350 kHz	15 ns	15 ns	50			200	50
CLOCK to		52, 54	5.0 V	995 kHz	710 kHz	15 ns	15 ns	50			200	50
output	CLOCK *	03	5.0 V	850 kHz	650 kHz	15 ns	15 ns	50			200	50
		51	5.0 V	2.0 MHz	1.43 MHz	15 ns	15 ns	50			200	50
		05, 53, 55	5.0 V	1.5 MHz	1.1 MHz	15 ns	15 ns	50			200	50
	RESET *	01, 02	5.0 V			30 ns	30 ns		500 ns	750 ns	200	50
	CLOCK	01, 02	5.0 V			15 ns	15 ns		1.111 μs	1.429 μs	200	50
	RESET *	03	5.0 V			30 ns	30 ns		1.8 μs	2.7 μs	200	50
1	CLOCK	03	5.0 V			15 ns	15 ns		588 ns	769 ns	200	50
t <sub>PLH</sub> , t <sub>PHL</sub>	RESET *	04	5.0 V			30 ns	30 ns		400 ns	560 ns	200	50
RESET to	CLOCK	04	5.0 V			15 ns	15 ns		1.111 μs	1.429 μs	200	50
output	RESET *	05	5.0 V			30 ns	30 ns		650 ns	975 ns	200	50
	CLOCK	05	5.0 V			15 ns	15 ns		333 ns	455 ns	200	50
	RESET *	52, 54	5.0 V			30 ns	30 ns		400 ns	560 ns	200	50
	CLOCK	52, 54	5.0 V			15 ns	15 ns		503 ns	704 ns	200	50
	RESET *	51	5.0 V			30 ns	30 ns		400 ns	560 ns	200	50
	CLOCK	51	5.0 V			15 ns	15 ns		250 ns	350 ns	200	50
	RESET *	53	5.0 V			30 ns	30 ns		450 ns	630 ns	200	50
	CLOCK	53	5.0 V			15 ns	15 ns		333 ns	455 ns	200	50
	RESET *	55	5.0 V			30 ns	30 ns	_	350 ns	490 ns	200	50
	CLOCK	55	5.0 V	•		15 ns	15 ns		333 ns	455 ns	200	50

FIGURE 8. <u>Switching time waveforms and test circuit</u> – Continued.

					Genera	ator puls	se cond	itions			Loa	ad
Test	Input	Device		PRR a	at °C	t <sub>THL</sub>	t <sub>TLH</sub>	Duty	t <sub>PH</sub> at	:°C	$R_L$	$C_L$
	terminal	type	$V_{GEN}$	+25, -55	+125	≤	$\leq$	cycle %	+25, -55	125	kΩ	pF
									≤	$\leq$	±10%	
	CLOCK	51	5.0 V	1.876 MHz	1.34 MHz	15 ns	15 ns	50				
	CLOCK	54	5.0 V	995 kHz	710 kHz	15 ns	15 ns	50				
	RESET or *	01, 04,	5.0 V			15 ns			1.0 μs	1.0 μs		
	CLOCK	51, 54							min	min		
$t_{SLH},t_{SHL}$	ENABLE											
Input to	CLOCK	01, 04	5.0 V	450 kHz	350 kHz	15 ns	15 ns	50				
CLOCK	RESET or *	02, 52	5.0 V			30 ns			1.0 μs	1.0 μs		
	CLOCK								min	min		
	ENABLE											
	CLOCK	02	5.0 V	450 kHz	350 kHz	15 ns	15 ns	50				
		52	5.0 V	995 kHz	710 kHz	15 ns	15 ns	50				
	DATA	52	5.0 V	834 kHz	595 kHz	15 ns	15 ns	50				
		02	5.0 V	225 kHz	175 kHz	15 ns	15 ns	50				
	RESET	02, 52	5.0 V			30 ns	30 ns		1.0 μs	1.0 μs		
	CLOCK	52	5.0 V	995 kHz	710 kHz	15 ns	15 ns	50	min	min		
	323011	02	5.0 V	450 kHz	350 kHz	15 ns	15 ns	50				

- Test conditions grouped by double horizontal lines are simultaneously applicable to the test being performed.
- 2. Unless otherwise specified, test each output separately.
- 3. "C<sub>L</sub>" conditions include probe and wiring capacitance.
- 4. Apply input pulses as shown in abbreviated waveforms. See figure 2 for complete functional waveforms.
- 5. Setup times (t<sub>SHL</sub> and t<sub>SLH</sub>) are set to the maximum values given in the test limits columns of table III. Setup time test requirements are considered met if counters advance in the next actuating transition of the clock pulse following the negative transition of the reset, clock enable, or preset enable pulse. Device type 02 "data" of the "data" input logic level with the next positive transition of the clock pulse after a "data" input logic change.
- 6. For device type 02, the "Q5" output is connected to the "data" input in all switching time tests except the "data" setup time test.
- 7. The inputs marked with an asterisk designate the measured terminal.
- 8. Duty cycle and PRR, although not relevant for real-time measurements, are specified to accommodate other measurement techniques.

FIGURE 8. <u>Switching time waveforms and test circuit</u> – Continued.

### 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 affect 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. Delete the sequence specified as interim (pre-burn-in) electrical parameters through interim (post-burn-in) electrical parameters of table IA of MIL-PRF-38535 and substitute lines 1 through 7 of table II herein.
  - c. Burn-in (method 1015 of MIL-STD-883).
    - (1) Unless otherwise specified in the manufacturers QM plan for static tests (test condition A), ambient temperature (T<sub>A</sub>) shall be +125°C minimum. Test duration for each static test shall be 24 hours minimum for class S devices and in accordance with table I of method 1015 for class B devices.
      - i. For static burn-in I, all inputs shall be connected to 0.0 V.
      - ii. For static burn-in II, all inputs shall be connected to V<sub>DD</sub>.
      - iii. Except for  $V_{DD}$  and  $V_{SS}$ , the terminal shall be connected through resistors whose value is 2 k $\Omega$  to 47 k $\Omega$ . The actual measured value of the resistor selected shall not exceed  $\pm 20\%$  of its branded value due to use, heat or age.
      - iv. Output may be open or connected to  $V_{\text{DD}}/2$ .
      - v.  $V_{DD}$  = 12.5 V minimum, 15 V maximum for device types 01, 02, 03, 04, and 05.  $V_{DD}$  = 15 V minimum, 18 V maximum for device types 51, 52, 53, 54, and 55.  $V_{DD}/2 = V_{DD}/2 \pm 1.0$  V for all devices.  $V_{SS}$  = 0.0 V.
    - (2) Unless otherwise specified in the manufacturers QM plan for dynamic test (test condition D), ambient temperature shall be +125°C minimum. Test duration shall be in accordance with table I of method 1015.
      - i. Except for  $V_{DD}$  and  $V_{SS}$ , the terminals shall be connected through resistors whose value is 2 k $\Omega$  to 47 k $\Omega$ . The actual measured value of the resistor selected shall not exceed  $\pm 20\%$  of its branded value due to use, heat or age.
      - ii. Input signal requirements: Square wave, 50% duty cycle; 25 kHz < PRR < 1 MHz;  $t_{TLH}$  and  $t_{THL}$  < 1  $\mu$ s. Voltage level: Minimum =  $V_{SS}$  0.5 V, +10%  $V_{DD}$ ; Maximum =  $V_{DD}$  + 0.5 V, -10%  $V_{DD}$ .
      - iii.  $V_{DD}$  = 12.5 V minimum, 15 V maximum for device types 01, 02, 03, 04, and 05.  $V_{DD}$  = 15 V minimum, 18 V maximum for device types 51, 52, 53, 54, and 55.  $V_{DD}/2$  =  $V_{DD}/2 \pm 1.0$  V.  $V_{SS}$  = 0.0 V.

- d. Interim and final electrical test parameters shall be as specified in table II.
- e. For class S devices, post dynamic burn-in, or class B devices, post static burn-in, electrical parameter measurements may, at the manufacturer's option, be performed separately or included in the final electrical parameter requirements.

TABLE II. Electrical test requirements.

$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		1/	Class B device		1/	Class S device		MIL-PRF-38535	Line
2   limits   3   2   limits   3     1   Interim electrical parameters   1   1   1     2   Static burn-in I (method 1015)   4.5.2     3   Same as line 1   1   Δ	e IV	Table	Table III	Ref.	Table IV		Ref.	test requirements	no.
1		delt	•	par.		• .	par.		
1 Interim electrical parameters 2 Static burn-in I 4.2c (method 1015) 4.5.2 3 Same as line 1 1 Δ 4.2c 4/2 (method 1015) 4.5.2 5 Same as line 1 4.2e 1* Δ 4.2e 1* Δ 6 Dynamic burn-in (method 1015) 4.5.2 7 Same as line 1 4.2e 1* Δ			<u>2</u> /			<u>2</u> /			
parameters		<u>3</u> /			<u>3</u> /				
2 Static burn-in I			1			1		Interim electrical	1
(method 1015)       4.5.2         3       Same as line 1       1         4       Static burn-in II (method 1015)       4.2c (method 1015)         5       Same as line 1       4.2e (method 1015)         6       Dynamic burn-in (method 1015)       4.5.2         7       Same as line 1       4.2e (method 1015)         7       Same as line 1       4.2e (method 1015)									
3   Same as line 1   1   Δ									2
4 Static burn-in II 4.2c 4.5.2 4.5.2  5 Same as line 1 4.2c 1* Δ 4.2e 1* Δ  6 Dynamic burn-in 4.2c (method 1015) 4.5.2  7 Same as line 1 4.2e 1* Δ							4.5.2		
(method 1015)     4.5.2       5     Same as line 1       4.2e     1*       Δ     4.2e       1*     Δ       6     Dynamic burn-in (method 1015)       4.5.2       7     Same as line 1       4.2e     1*       Δ					Δ	1		Same as line 1	
5 Same as line 1 4.2e 1* Δ 4.2e 1* Δ 6 Dynamic burn-in 4.2c (method 1015) 4.5.2 7 Same as line 1 4.2e 1* Δ			<u>4</u> /	4.2c				Static burn-in II	4
6 Dynamic burn-in 4.2c (method 1015) 4.5.2 7 Same as line 1 4.2e 1* Δ									
(method 1015)     4.5.2       7     Same as line 1     4.2e     1*     Δ		Δ	1*	4.2e	Δ	1*			5
7 Same as line 1 4.2e 1* Δ									6
7   Carrie de line 1   1.25   1   Δ							4.5.2	,	
8   Final electrical   1* 2 3 7 9     1* 2 3 7 9					Δ	·	4.2e	Same as line 1	-
1,2,0,7,0			1*, 2, 3, 7, 9			1*, 2, 3, 7, 9		Final electrical	8
parameters									
(method 5004)								,	
9 Group A test 4.4.1 1, 2, 3, 4, 7, 9, 4.4.1 1, 2, 3, 4, 7,				4.4.1			4.4.1		9
requirements 10, 11 9, 10, 11			9, 10, 11			10, 11			
(method 5005)									
10 Group B test 4.4.2 1, 2, 3, 7, 9, Δ					$\Delta$		4.4.2		10
when using 10, 11						10, 11			
method 5005									
QCI option			4.0.0	4.4.0					
		Δ	1, 2, 3	4.4.3					11
point electrical parameters									
(method 5005)									
12 Group D end- 4.4.4 1, 2, 3 4.4.4 1, 2, 3			1 2 3	111		1 2 3	111		12
point electrical 1, 2, 3 4.4.4 1, 2, 3			1, 4, 3	4.4.4		1, 4, 5	4.4.4		12
parameters									
(method 5005)								•	

- 1/ Blank spaces indicate tests are not applicable.
- 2/ \* indicates PDA applies to subgroup 1 (see 4.2.1).
- 3/ ∆ indicates delta limits shall be required only on table III subgroup 1, where specified, and the delta values shall be computed with reference to the previous interim electrical parameters.
- 4/ The device manufacturer may at his option either perform delta measurements or within 24 hours after burn-in (or removal of bias) perform the final electrical parameter measurements.

### 4.2.1 Percent defective allowable (PDA).

- a. The PDA for class S devices shall be 5 percent for static burn-in and 5 percent for dynamic burn-in, based on the exact number of devices submitted to each separate burn-in.
- b. Static burn-in I and II failure shall be cumulative for determining the PDA.
- c. The PDA for class B devices shall be in accordance with MIL-PRF-38535 for static burn-in. Dynamic burn-in is not required.
- d. Those devices whose measured characteristics, after burn-in, exceed the specified delta (Δ) limits or electrical parameter limits specified in table III, subgroup 1, are defective and shall be removed from the lot. The verified failures divided by the total number of devices in the lot initially submitted to burn-in shall be used to determine the percent defective for the lot and the lot shall be accepted or rejected based on the specified PDA.
- 4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.
- 4.3.1 <u>Qualification extension</u>. When authorized by the qualifying activity for qualification inspection, if a manufacturer qualifies to a 51-55 device type which is manufactured identically to a 01 05 device type on this specification, then the 01- 05 device type may be part I qualified by conducting only worse case group A electrical tests and any electrical tests specified as additional group C subgroups and submitting data 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, D, and E inspections (see 4.4.1 through 4.4.5).
- 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 performed in accordance with table II herein.
  - b. Subgroups 5, 6, and 8 shall be omitted.
  - c. Subgroup 4 (C<sub>I</sub> measurement) shall be measured only for initial qualification and after process or design changes that may affect input capacitance. Capacitance shall be measured between the designated terminal and V<sub>SS</sub> at a frequency of 1 MHz.
  - d. Subgroups 9 and 11 shall be measured only for initial qualification and after process or design changes which may affect dynamic performance.
  - e. At the manufacturer's option, test tapes may be programmed simultaneously for each identical section provided that each output is measured and each specified input combination is tested.
  - f. When device types 01 through 05 are qualified by extension (see 4.3.1), these device types will be inspected (QCI) according to the requirements for device types 51 through 55, respectively.
  - 4.4.2 Group B inspection. Group B inspection shall be in accordance with table II of MIL-PRF-38535.
- 4.4.3 Group C inspection. Group C inspection shall be in accordance with table IV of MIL-PRF-38535 and as follows:
  - a. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 1 of group C inspection and shall consist of tests specified in table IV herein.
  - b. The steady-state life test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
  - c. When device types 01 through 05 are qualified by extension (see 4.3.1), these device types will be inspected (QCI) according to the requirements for device types 51 through 55, respectively.

Symbol		Cases								Termi	nal con	ditions	<u>4</u> /						Measured			Lin	nits			Unit
	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal	Subgi	roup 1 25°C	Subgr		Subgr		
	method	Test no.	5 OUT	1 OUT	0 OUT	2 OUT	6 OUT	7 OUT	3 OUT	V <sub>SS</sub>	8 OUT	4 OUT	9 OUT	CARRY OUT	CLOCK ENABLE	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub>		1													1 mA	1 mA	1 mA	GND	EACH INPUT		1.5					V
V <sub>IC</sub>		2								GND					-1 mA	-1 mA	-1 mA		EACH INPUT		-6.0					V
I <sub>IL1</sub> <u>6</u> /	3009	3								66					GND	GND	GND	15.0 V	ALL INPUTS TOGETHER		-300.0					nA
I <sub>IL2</sub>	3009	4								44					GND	GND	GND	и	EACH INPUT		-100.0		-100.0			u
I <sub>IH1</sub>	3010	5								44					15.0 V	15.0 V	15.0 V	и	ALL INPUTS TOGETHER		300.0					u
I <sub>IH2</sub>	3010	6								44					15.0 V	15.0 V	15.0 V	и	EACH INPUT		100.0		100.0			u
V <sub>OH1</sub> <u>1</u> / 2/	3006	7	I <sub>OH1</sub>	44	I <sub>OH1</sub>	I <sub>OH1</sub>	I <sub>OH1</sub>	I <sub>OH2</sub>	IN	IN	IN	5.0 V	EACH OUTPUT	4.5		4.5		4.5		V						
V <sub>OL1</sub>	3007	8	I <sub>OL1</sub>	"	I <sub>OL1</sub>	I <sub>OL1</sub>	I <sub>OL1</sub>	I <sub>OL2</sub>	u	и	и	5.0 V	EACH OUTPUT							mV						
V <sub>OH2</sub>	3006	9	OUT	"	OUT	OUT	OUT	OUT	u	и	u	12.5 V	EACH OUTPUT	11.52050		11.52050		11.52050		V						
V <sub>OL2</sub>	3007	10	ш	"	и	и	и	44	"	"	"	и	66	u	и	"	и	12.5 V	EACH OUTPUT				1.25		1.25	и
V <sub>IL</sub> <u>1</u> / <u>2</u> /	Fig. 6	11	66	66	"	и	и	66	66	66	66	"	66	и	u	и	и	5.0 V	CLOCK ENABLE	1.102	5	0.85		1.35		"
V <sub>IH</sub>	66	12	ш	"	и	и	и	44	"	"	"	и	66	u	ec .	"	и	44	CLOCK ENABLE				3.60		3.95	и
V <sub>IL</sub>	"	13 14	"	"	"	"	"	"	"	"	"	"	66	u	u	"	"	"	CLOCK CLOCK	1.1808	0	0.85	3.60	1.35	3.95	u
VIL	Fig. 5	15	"	u	"	и	и	u	и	"	u	и	es .	и	и	и	и	и	RESET	1.10		0.85	3.00	1.35	0.30	ee .
VIL	Fig. 5	16	44	"	"	u	u	"	и	"	"	"	44	"	"	"	"	"	RESET	3.8	0	0.00	3.60	1.00	3.95	"
I <sub>SS</sub> <u>3</u> /	3005	17								"					GND "	GND GND	15.0 V GND	15.0 V	V <sub>SS</sub>	3.8	-0.5		"		0.00	μA
	u	18 19								"					"	15.0 V	GND "	"	V <sub>SS</sub> None	3.0	"	-5.0	"			"
	u	20								"					"	GND	"	"	V <sub>SS</sub>		"	0.0	"			"
	"	21								"					"	15.0 V	"	"	None		"		"			"
	u	22								"					"	GND	"	"	V <sub>SS</sub>		"		"			"
	"	23								"					"	15.0 V	"	"	None		"		"			"
	u	24								"					u	GND	"	"	$V_{SS}$		"		"			"
	u	25								"					u	15.0 V	"	"	None		"		"			"
	"	26								"					"	GND	"	"	$V_{SS}$		"		"			"
	"	27								"					"	15.0 V	"	"	$V_{SS}$		"		"			**
	"	28								"					"	GND	"	**	None		"		"			"
	"	29	1							"					69	15.0 V	44	"	$V_{SS}$		"		"			**
	"	30	1							"					"	GND	44	"	None		"		44			"
	"	31	1							"					"	15.0 V	"	"	V <sub>SS</sub>		"		44			"
	"	32	1							"					"	GND	"	"	None		"		"			"
	"	33	1							"					"	15.0 V	"	"	V <sub>SS</sub>		"		"			"
	"	34	1							"						GND	"	"	None				"			"
	"	35	1													15.0 V		"	Vss							"
	"	36								. "			l	l	15.0V	15.0 V		. "	$V_{SS}$	l	. "		"			"

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

ymbol	MIL-	Cases								Termir	nal cond								Measured			Lin	nits			U
	STD- 883	E,F, N,Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal	Subgr T <sub>C</sub> = 1						
	method	Test	5	1	0	2	6	7	3	V <sub>SS</sub>	8 OUT	4 OUT	9 OUT	CARRY	CLOCK	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	1
C <sub>1</sub> 2/	3012	no. 37	OUT	OUT	OUT	OUT	OUT	OUT	OUT	GND				OUT	ENABLE IN	IN	IN	GND	EACH INPUT		12.0					r
J <u>2</u> /	3012	31		ļ.					ļ.	GIND					IIN	IIN	IIN	GND	LACITINFOT	Subgr			Subgr	roup 8		۲
																				$T_C = 1$		T <sub>C</sub> = 1	125°C	T <sub>C</sub> = -	-55°C	1
																				Min	Max	Min	Max	Min	Max	1
ruth	3014	38	L	L	Н	L	L	L	L	GND	L	L	L	Н	GND	5.0 V	5.0 V	5.0 V	EACH							Т
able test	"	39 40	L L	L H	H	L	L	L	L	"	L	L	L	H H	"	5.0 V PA	GND "	5.0 V	OUTPUT							
<u>3</u> /	"	41	Ĺ	Ľ	L	Н	L	L	L	u	L	L	L	H	u	rA "	"	"	u u							
_	"	42	L	L	L	Ĺ	L	Ĺ	H	"	Ĺ	Ĺ	Ĺ	H	u	"	"	"	u							
	"	43	L	L	L	L	L	L	L	"	L	Н	L	Н	"	"	"	**	"							
	"	44 45	H	L	<u> </u> -	Ļ	L H	L	L	"	L	L	L	L	"	"	"	"	"							
	"	45 46	L	L	L	L	L	L H	L	u	L	L	L	L	u	"	"	"	ű							
	"	47	Ĺ	ΙĒ	Ĺ	Ĺ	Ĺ	Ľ	Ŀ	u	H	Ĺ	Ŀ	Ĺ	u	"	"	"	"							
	ű	48	L	L	L	L	L	L	L	u	L	L	Н	L	"	"	"	44	"							
	"	49	L	Ŀ	H	Ŀ	L	L	L	"	L	L	L	Н	"	"	"	"	"							
	"	50 51	L L	H H	L	L	L	L L	L L	"	L L	L	L	H H	5.0 V	5.0 V	"	"	"							
	u	52	Ĺ	l ;;	l È	ΙĖ	Ĺ	L	Ĺ	"	Ĺ	Ĺ	Ĺ	H	5.0 V	PA	"	44	и							
	"	53	Ē	Ë	Ē	H	Ĺ	Ĺ	Ĺ	u	Ĺ	Ĺ	Ĺ	H	GND	5.0 V	"	**	"							
	"	54	X	Х	Х	X	Х	Х	Х	u	Х	Χ	Х	Х	u	PC	"	"	"							
	"	55	H	L.	L	L	L	L	L	"	L	L	L	L	u	5.0 V	"	"	"							
	"	56 57	H	L	L	L	L	L	L	u	L	L	L	L H	"	GND GND	5.0 V	"	ű							
	"	58	Ĺ	ΙĒ	l н	Ĺ	Ĺ	Ĺ	Ĺ	u	Ĺ	Ĺ	Ĺ	H	u	GND	GND	"	ш							
	ű	59	L	Н	L	L	L	L	L	"	L	L	L	Н	u	5.0 V	"	"	ш							
	"	60	X	X	Х	X	X	X	X	"	X	Х	X	X	"	PD	"	"	"							
	"	61	H	L	<u> </u>	L	L	L	L	"	L	L	L	L	"	5.0 V	501/	"	"							
	"	62 63	L		H		L	L	L	"	L	L	L	H H	u	5.0 V 5.0 V	5.0 V GND	u	u							
		00	_									_	_	• • •		0.0 1	OND	L		Subgr	oup 9	Subgro	oup 10	Subgro	oup 11	t
																				$T_C = 1$	25°C		125°C		-55°C	
	0000	0.4						1		0110				O. 17	OND		- ONE		01.001/.70	Min	Max	Min	Max	Min	Max	1
1/ 2/	3003	64 65	OUT	OUT	OUT	OUT	OUT	OUT	OUT	GND "	OUT	OUT	OUT	OUT	GND "	IN "	GND GND	5.0 V	CLOCK TO OUTPUT	.013	1.45 1.80	.018	2.18 2.70	.013	1.45 1.80	
17 <u>2</u> 7 H1	ű	66	001	001	001	001	001	001	001	и	001	001	001	OUT	u	u	GND	"	CLOCK TO	"	1.45	и	2.18	"	1.45	t
H1	"	67	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	OUT	OUT	OUT		u	u	GND	"	OUTPUT	"	1.80	"	2.70	"	1.80	
H2	"	68			OUT					u					"	"	IN	"	RESET TO	"	1.80	"	2.70	"	1.80	Ī
H2	"	69	OUT	OUT		OUT	OUT	OUT	OUT	u	OUT	OUT	OUT	OUT	u	"	"	"	OUTPUT	"	1.45	"	2.18	"	1.45	+
HL2		70	OUT	OUT		001	OUT	001	OUT		OUT	OUT	OUT						RESET TO OUTPUT		1.80		2.70		1.80	
HL	3004	71								и				OUT	и	и	GND	"	OUTPUT	10	550	14	825	10	550	t
HL	u	72	OUT	OUT	OUT	OUT	OUT	OUT	OUT	u	OUT	OUT	OUT		"	u	"	**	OUTPUT	.010	2.25	.014	3.38	.010	2.25	
LH	3004	73	01.17	0117	Q. I.T.		01.17	OUT	0117	"	01.17	O. 1.T.	01.17	OUT	"	u	"	"	OUTPUT	10	550	14	825	10	550	ſ
LH	"	74	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	OUT	OUT	OUT	OUT	INI	"	"	"	OUTPUT	.010	2.25	.014	3.38	.010	2.25	+
.1 <u>2</u> /														OUT	IN				CLOCK ENABLE						500	
																			TO CLOCK	500		750				
	75	76	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	OUT	OUT	OUT		IN	и	"	"	CLOCK ENABLE		750	. 50	1125		750	
HL1			1	I	ı	l	i		1		1		1			1		1	TO CLOCK			1	l	1		
HL1 HL2		77			OUT										GND	"	IN		RESET TO			1	1125		750	_

TABLE III. Group A inspection for device type 02.

Symbol	MIL-	Cases								Term	inal cond	ditions 4/							Measured			Lim	its			Unit
,	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		group 1 = 25°C		roup 2 125°C	Subgr		
	method	Test no.	DATA	JAM 1	JAM 2	Q2	Q1	Q3	JAM 3	V <sub>SS</sub>	JAM 4	PRESET ENABLE	Q4	JAM 5	Q5	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub>		1	1mA	1mA	1mA				1mA		1mA	1mA		1mA		1mA	1mA	GND	EACH INPUT		1.5					V
V <sub>IC</sub>		2	-1mA	-1mA	-1mA				-1mA	GND	-1mA	-1mA		-1mA		-1mA	-1mA		EACH INPUT		-6.0					V
I <sub>IL1</sub> <u>6</u> /	3009	3	GND	GND	GND				GND	GND	GND	GND		GND		GND	GND	15.0V	ALL INPUTS TOGETHER		-900.0					nA
I <sub>IL2</sub>	3009	4	GND	GND	GND				GND	ii.	GND	GND		GND		GND	GND	u	EACH INPUT		-100.0		-100.0			"
I <sub>IH1</sub>	3010	5	15.0V	15.0V	15.0V				15.0V	и	15.0V	15.0V		15.0V		15.0V	15.0V	ee.	ALL INPUTS TOGETHER		900.0					и
I <sub>IH2</sub>	3010	6	15.0V	15.0V	15.0V				15.0V	"	15.0V	15.0V		15.0V		15.0V	15.0V	44	EACH INPUT		100.0		100.0			"
V <sub>OH1</sub> <u>1</u> / <u>2</u> /	3006	7	IN	GND	GND	I <sub>OH3</sub>	I <sub>OH3</sub>	I <sub>OH3</sub>	GND	и	GND	GND	I <sub>OH3</sub>	GND	I <sub>OH2</sub>	IN	IN	5.0V	EACH OUTPUT	4.5		4.5		4.5		V
$V_{OL1}$	3007	8	и	"	и	I <sub>OL1</sub>	OL1	I <sub>OL1</sub>	"	66	ш	u	I <sub>OL1</sub>	и	I <sub>OL2</sub>	"	44	5.0V	EACH OUTPUT				500		500	mV
V <sub>OH2</sub>	3006	9	ıı	"	ee	OUT	OUT	OUT	ш	íí.	44	u	OUT	и	OUT	ш	66	12.5V	EACH OUTPUT	11.85	•	11.25		11.25		V
$V_{OL2}$	3007	10	ıı	"	ee	u	"	u	ee	íí.	"	u	u	и	"	"	66	12.5V	EACH OUTPUT		1.25				1.25	"
V <sub>IL</sub> 1/ 2/	Fig. 5	11	"	"	"	"	u	"	"	66	"	"	"	u	"	"	"	5.0V	RESET	1.10		0.852	5	1.35		
V <sub>IH</sub>	Fig. 5	12	"	"	"	и	"	"	и	"	"	ű	"	"	"	"	и	"	RESET		3.80		3.60		3.95	"
V <sub>IL</sub>	Fig. 7	13	и	IN	IN	u	66	es .	IN	u	IN	IN	u	IN	es	u	u	u	PRESET ENABLE	1.10		0.85		1.35	"	и
V <sub>IH</sub>	"	14	и	"	u	ű	u	ű	ű	ű	"	66	u	66	"	и	66	"	PRESET ENABLE		3.80				3.95	"
V <sub>IL</sub>	и	15	u	66	66	u	66	u	66	и	"	u	"	"	66	"	66	и	EACH JAM INPUT	1.10		0.8560		1.35		"
$V_{IH}$	и	16	и	66	66	ee .	"	66	66	и	"	и	и	и	66	"	ee	и	EACH JAM INPUT		3.80				3.95	"
$V_{IL}$	Fig. 6	17	"	GND	GND	u	"	"	GND	"	GND	GND	"	GND	"	"	"	ű	CLOCK	1.10		0.8560	)	1.35		"
$V_{IH}$	Fig. 6	18	"	"	"	"	"	"	и	"	"	"	"	"	"	"	"	ű	CLOCK		3.80	1	3.60		3.95	u
$V_{IH}$	Fig. 7	19	"	"	"	"	"	"	u	"	"	"	"	"	"	"	ű.	"	DATA		3.80		3.60		3.95	"
$V_{IL}$	Fig. 7	20	u	"	"	"	"	"	u	"	"	ű	"	u	"	"	ű	u	DATA	1.10		0.85		1.35		
I <sub>SS</sub> <u>3</u> /	3005	21	GND	15.0V	15.0V				15.0V	"	15.0V	15.0V		"			15.0V	15.0V	V <sub>SS</sub>		l					μА
	"	22	u	"	15.0V				GND	"	GND	"				GND	GND	"	V <sub>SS</sub>		"		"		"	**
	"	23	"	"	GND				15.0V	"	"	"	15.0	<b>p∨</b> "	GN	D GND	"	"	V <sub>SS</sub>	-0.	5 "	-5.0	"			"
	"	24	"		GND				15.0V							15.0V			None		"					"
		25		CND	GND				15.0V		15.0\	GND 15.0V		GND		15.0V	"	"	V <sub>SS</sub>							"
	"	26 27	15.0V	GND "	15.0V				GND GND	"	15.0V	15.0V 15.0V		GND		GND 15.0V	"	"	V <sub>SS</sub>		"		"			
	"	28	"	"	"				GND	"	"	GND		"		15.0V 15.0V	"	u	None V <sub>SS</sub>		"		"			"
	"	20 29	"	"	"				15.0V	"	"	15.0V		"		15.0V 15.0V	"	"			"		"			**
		29							15.07		l	15.07				15.07			$V_{SS}$		1	1		<u> </u>		11

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

Symbol	MIL-	Cases								Term	inal con	ditions 4/							Measured			Lim	nits			Unit
- 	STD- 883	E,F, Z,N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 4 25°C					
	method	Test no.	DATA	JAM 1	JAM 2	Q2	Q1	Q3	JAM 3	V <sub>SS</sub>	JAM 4	PRESET ENABLE	Q4	JAM 5	Q5	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	
C <sub>i</sub> <u>2</u> /	3012	30	IN	IN	IN				IN	GND	IN	IN		IN		IN	IN	GND	EACH INPUT		12.0				l	pF
											ı			L						Subg	roup 7		Subgr			
																					25°C	$T_C = 1$		$T_C = -$		
<b>+</b>	0044	0.1	- o	- ov /	- ov /				501	0115	- ov /	5 O) (		5 O) (		= 0\ /	ONE	- ov /		Min	Max	Min	Max	Min	Max	<u> </u>
Truth table	3014	31 32	5.0V 5.0V	5.0V 5.0V	5.0V 5.0V	L H	H	L	5.0V 5.0V	GND "	5.0V 5.0V	5.0V 5.0V	L H	5.0V 5.0V	L H	5.0V	GND 5.0V	5.0V	EACH OUTPUT							
test	"	33	5.0V	GND	GND	H	Н	Н	GND	"	GND	GND	H	GND	H	"	5.0V 5.0V	"	001701							
3/	"	34	GND	GND	"	H	H	H	GND	"	"	GND	H	GND	Н	u	GND	"	"							
_	"	35	5.0V	5.0V	"	Н	Н	Н	5.0V	44	"	GND	Н	5.0V	Н	ee	u	"	"							
	"	36	u	5.0V	"	Н	L	L	5.0V	"	"	5.0V	Н	5.0V	L	"	"	"	"							
	"	37 38	"	5.0V GND	"	H H	L	L L	5.0V GND	"	"	GND "	H H	5.0V GND	L L	GND	"	"	"							
	"	39	"	GIND "	"	L	Ĺ	H	GND "	"	"	44	Ľ	GIND "	Н	5.0V	u	"	u							
	"	40	GND	"	"	Ĺ	Ĺ	Н.	**	"	"	"	Ĺ	"	H	5.0V	u	"	"							
	er er	41	GND	"	66	L	L	Н	"	"	44	"	L	u	Н	GND	44	"	"							
	"	42	GND	"	"	L	Н	L	"	"	"	"	Н	"	L	5.0V	"	"	"							
	"	43 44	5.0V	"	"	L	H	L	"	"	"	"	Н	"	L	5.0V GND	"	"	"							
	"	44 45	"	"	"	L H	H L	L	**	"	"	"	H L	"	L H	5.0V	"	"	и							
	"	46	"	**	"	H	H	H	**	"	"	"	H	"	H	5.0V	5.0V	u	и							
	"	47	"	"	"	Н	Н	Н	"	"	"	"	Н	u	Н	5.0V	GND	"	u							
	"	48	"	5.0V	5.0V	Н	Н	Н	"	"	5.0V	"	Н	"	Н	GND	u	"	u							
	"	49	"	5.0V	5.0V	L	L	H	"	"	5.0V	5.0V	Ļ	"	Н	"	"	"	"							
	"	50 51	"	5.0V GND	5.0V GND	L L	L	H	5.0V	"	5.0V GND	GND GND	L L	5.0V	H	"	u	"	"							
	"	52	"	GIVD	GIVD "	H	Ь	Ľ	3.0 v	**	GIVD "	5.0V	H	3.0 V	Ľ	"	"	"	"							
	"	53	"	66	"	Н	Н	L	66	"	"	GND	Н	ee	L	ee	u	"	"							
	"	54	"	"	"	Н	Н	L	"	"	"	5.0V	Н	"	L	"	u	"	"							
	"	55	"	"	"	Н	Н	L	"	u u	"	5.0V	Н	"	L	5.0V	"	"	"							
	"	56 57	GND	5.0V	5.0V	H H	H	L L	GND	"	5.0V	GND GND	H H	GND	L L	5.0V GND	u	"	"							
	"	58	GIVD	3.0 V	3.0 V	Ľ	L'	H	GIVD	"	3.0 V	5.0V	Ľ	"	H	"	44	"	"							
	"	59	"	"	"	L	L	Н	"	"	"	GND	Ĺ	"	Н	"	u	ű	и							
	"	60	"	"	"	L	L	Н	"	"	"	5.0V	L	"	Н	"	u	u	"							
	"	61	u	"	"	Ļ	L	Н	"	"	"	5.0V	Ļ	"	Н	5.0V	"	u	"							
	"	62 63	5.0V	GND	"	L L	L H	H	"	"	"	GND 5.0V	L L	"	H H	5.0V GND	u	"	"							
	"	64	3.0 V	GND	"	Ĺ	Н	Н	"	"	"	GND	Ĺ	"	Н	GND	u	u	u							
	u	65	"	GND	44	H	Ë	H	"	"	44	GND	H	u	L	5.0V	44	"	44							
	"	66	и	5.0V	GND	Н	L	Н	"	u	"	5.0V	L	"	Н	GND	"	"	u							
	"	67	"	5.0V	GND	Н	L	Н	"	"	"	5.0V	L	"	Н	5.0V	"	"	"							
	"	68	CND	5.0V	GND	H	L	H	"	"	"	GND "	L	"	H	5.0V		"	"							
	"	69 70	GND "	"	"	H H	H	H	"	"	"	ш	H H	44	H H	5.0V GND	5.0V	"	u							
	"	71	u	u	"	H	H	H	"	u	u	"	H	66	H	5.0V	u	u	u							
	"	72	и	"	"	Н	Н	Н	"	"	"	"	Н	"	H	GND	и	u	"							
	"	73	"	"	"	Н	Н	Н	"	"	66	ű	Н	"	Н	5.0V	44	"	ш						1	

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

Symbol	MIL-	Cases								Term	inal cond	ditions 4/							Measured			Lir	nits			Unit
	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 9 25°C		roup 10 125°C	Subgro		
	method	Test no.	DATA	JAM 1	JAM 2	Q2	Q1	Q3	JAM 3	V <sub>SS</sub>	JAM 4	PRESET ENABLE	Q4	JAM 5	Q5	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	
t <sub>PHL1</sub> 1/2/ t <sub>PHL1</sub>	3003	74 75	IN "	GND "	GND "	OUT	OUT	OUT	GND "	GND "	GND "	GND "	OUT	GND "	OUT	IN "	GND "	5.0V "	CLOCK TO OUTPUT	.013	1.45 1.80	.018	2.18 2.70	.013	1.45 1.80	μs "
t <sub>PLH1</sub> t <sub>PLH1</sub>	"	76 77	"	"	44	OUT	OUT	OUT	"	u	u	u	OUT	"	OUT	"	"	"	CLOCK TO OUTPUT	"	1.45 1.80	"	2.18 2.70	"	1.45 1.80	"
t <sub>PLH2</sub>	"	78 79	66	"	u	OUT	OUT	OUT	"	u	"	u	OUT	"	OUT	u	IN IN	"	RESET TO OUTPUT	"	1.45 1.80	££	2.18 2.70	"	1.45 1.80	"
t <sub>THL</sub>	3004	80 81	"	"	u	OUT	OUT	OUT	"	u	u	u	OUT	"	OUT	"	GND GND	"	OUTPUTS OUTPUTS	10 .010	550 2.25	14 .014	825 3.38	10 .010	550 2.25	ns แร
t <sub>TLH1</sub> 1/2/ t <sub>TLH1</sub>	3004	82 83	IN "	GND "	GND "	OUT	OUT	OUT	GND "	GND "	GND "	GND GND	OUT	"	OUT	"	GND GND	"	OUTPUTS OUTPUTS	10 .010	550 2.25	14 .014	825 3.38	10 .010	550 2.25	ns us
t <sub>SHL1 2_</sub> /		84	и	и	66	и	u	и	ш	и	44	IN	и	"	и	66	u	66	PRESET TO CLOCK		750		1125		750	ns
t <sub>SHL2</sub>		85	ű	ű	ec .	и	u	и	и	и	66	GND	и	ш	и	66	IN	"	RESET TO CLOCK				1125		750	u
t <sub>SHL3</sub>		86	er .	и	ee	u	í,	66	u	u	и	GND	"	"	"	и	GND	и	DATA TO CLOCK	750			750		500	"
t <sub>SLH3</sub>		87	"	и		и	ee	66	и	ш	"	GND	u	"	и	и	GND	и	DATA TO CLOCK	500			750		500	ш
	•						•				•	•		•		•				500	)				•	

# TABLE III. Group A inspection for device type 03.

Symbol	MIL-	Cases							-	Termina	l conditi	ons 4/							Measured			Lim	nits			Unit
1	STD-	E,F, N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal	Subg	roup 1	Subg	roup 2	Subgr		
	883	Z																			25°C		125°C	$T_C = -$		
	method	Test no.	Q12	Q13	Q14	Q6	Q5	Q7	Q4	V <sub>SS</sub>	Q1	CLOCK	RESET	Q9	Q8	Q10	Q11	$V_{DD}$		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub> (POS)		1										1mA	1mA					GND	EACH INPUT		1.5					V
V <sub>IC</sub>		2								GND		-1mA	-1mA						EACH		-6					V
(NEG)		_																	INPUT							-
I <sub>IL1</sub> 6/	3009	3								"		GND	GND					15.0V	ALL		-200.0					nA
																			INPUTS							
<u> </u>	3009	4								66		GND	GND					"	TOGETHER		400.0		100.0			u
I <sub>IL2</sub>	3009	4										GND	GND						EACH INPUT		-100.0		-100.0			
I <sub>IH1</sub>	3010	5								66		15.0V	15.0V					"	ALL		200.0					и
- """																			INPUTS							
																			TOGETHER							
I <sub>IH2</sub>	3010	6								"		15.0V	15.0V					u	EACH		100.0		100.0			"
V 4/0/	2000	7					<b>.</b>			"		IN	INI			<b>.</b>		5.0\/	INPUT EACH	4.5						V
V <sub>OH1</sub> <u>1</u> / <u>2</u> /	3006	,	I <sub>OH4</sub>		I <sub>OH4</sub>	IIN	IN	I <sub>OH4</sub>	I <sub>OH4</sub>	I <sub>OH4</sub>	I <sub>OH4</sub>	5.0V	OUTPUT	4.5						V						
V <sub>OL1</sub>	3007	8	I <sub>OL3</sub>	66	I <sub>OL3</sub>	u	u	I <sub>OL3</sub>	I <sub>OL3</sub>	I <sub>OL3</sub>	I <sub>OL3</sub>	5.0V	EACH		5QQ <sub>5</sub>		5Q <sub>0</sub> 5		500	mV						
1 021			-025	1023	1023	1023	-023	-023	1023		-025			-025	-025	1023	1023		OUTPUT		- 4.5		- 4.5			
$V_{OH2}$	3006	9	OUT	"	OUT	"	u	OUT	OUT	OUT	OUT	12.5V	EACH	11.25		11.25		11.25		V						
	000=	40	,,	"	"		"	"	"	"		"	"	,,		"	"	40.51/	OUTPUT				4.0=		4.05	"
$V_{OL2}$	3007	10								-	-			-		-		12.5V	EACH OUTPUT				1.25		1.25	
V <sub>II</sub> 1/ 2/	Fig. 6	11	"	"	и	"	и	"	"	"	"	"	и	и	"	"	"	5.0V	CLOCK	1.1102	5	0.85		1.35		и
V <sub>IH</sub>	Fig. 6	12	"	"	"	"	ű	"	"	"	"	"	u	"	"	"	"	"	CLOCK		3.80	0.00	3.60	1.00	3.95	"
V <sub>IL</sub>	Fig. 5	13	"	"	"	"	"	"	"	"	"	"	u	"	"	"	"	"	RESET	1.10		0.85		1.35		u
$V_{IH}$	Fig. 5	14	"	u	"	"	ű	"	"	"	"	"	и	и	"	"	"	"	RESET		3.80		3.60		3.95	u
I <sub>SS</sub> <u>3</u> /	3005	15								"		0110	15.0V					15.0V	V <sub>SS</sub>				,			μA
	"	16								"		GND PU	GND "					"	V <sub>SS</sub>			4.0	. "			"
	"	17 18								"	GN	PU GND	44					"	None V <sub>SS</sub>	-1.0	"	-10.	U "			"
	"	19								"		PU	"					"	None		"		u			"
	u	20								"		15.0V	и					"	V <sub>SS</sub>		"		"			u
																					roup 4					
																					25°C					
0.01	1	0.4		ı	1			ı		0.15	1			1		Г		LOVE	54011	Min	Max					
C <sub>i</sub> <u>2</u> /		21								GND		IN	IN					GND	EACH INPUT		12					pF
L			l			l			l	1			l						INFUI							

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

Symbol	MIL-	Cases								Termina	I condit	ions 4/							Measured			Lin	nits			Unit
1	STD-	E,F, N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal	Subg	roup 7		Subgr	roup 8		
	883	Z																		T <sub>C</sub> =	25°C	T <sub>C</sub> = 1	25°C	T <sub>C</sub> = -	55°C	
	method	Test	Q12	Q13	Q14	Q6	Q5	Q7	Q4	$V_{SS}$	Q1	CLOCK	RESET	Q9	Q8	Q10	Q11	$V_{DD}$		Min	Max	Min	Max	Min	Max	
		no.																								
Truth	3014	22	L	L	L	L	L	L	L	GND	L	GND	5.0V	L	L	L	L	5.0V	EACH							
table		23	L	Ļ	L	L	L	L	Ļ	"	Ļ	GND	GND "	L	Ŀ	ŀ	Ļ	"	OUTPUT							
test	"	24	Ļ	L	l ŀ	L	L	L	L	44	L H	5.0V GND	"	L	L		L	"	"							
<u>3</u> /	"	25 26	L L	L	L	L	L	L	L L	66	Н	5.0V	"	L	L L	L	L	66	"							
	"	27	Ĺ	Ιī	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	"	Ľ	GND	"	Ĺ	Ĺ	Ιī	ΙĒ	"	44							
	"	28	X	X	X	X	X	X	X	"	X	PE	"	X	X	X	X	"	44							
	"	29	L	L	L	L	L	L	L	"	Н	5.0V	"	L	L	L	L	"	"							
	"	30	L	L	L	L	L	L	Н	"	L	GND	66	L	L	L	L	"	44							
	"	31	Х	Х	Х	X	Х	Х	Х	"	Х	PF	"	Х	Х	Х	Х	"	"							
	"	32	L	L	L	L	L	L	H	"	H	5.0V	"	L	L.	l L	L L	"	"							
		33	L	L	L	L	Н	L	L	"	L	GND	"	L	L	L	L	"	"							
	"	34 35	X L	X L	X L	X L	X	X L	X H	"	X H	PG 5.0V	"	X L	X L	X L	X L	"	"							
	"	36	L	Ĺ	Ĺ	H	L	L	L	44	L	GND	"	L	L	Ĺ	L	66	"							
	"	37	X	X	X	X	X	X	X	44	X	PH	"	X	X	X	X	66	"							
	"	38	Ĺ	Ĺ	Ĺ	Ĥ	H	Ĺ	Ĥ	"	Ĥ	5.0V	"	Ĺ	Ĺ	Ĺ	Ĺ	"	44							
	"	39	L	L	L	L	L	Н	L	"	L	GND	"	L	L	L	L	"	"							
	"	40	Х	Х	X	X	X	Х	Х	"	Х	PJ	66	X	Х	Х	X	"	"							
	"	41	L	L	L	Н	Н	Н	Н	"	Н	5.0V	"	L	L	L	L	"	44							
	"	42	L	L	L	L	L	L	L	"	L	GND	"	L	Н	L	L	"	"							
	"	43	X	X	X	X	X H	X	X	"	X H	PL 5 OV	"	X	X H	X	X	"	"							
	"	44 45	L	L	L	l H L	L	H L	H L	"	L	5.0V GND	"	L H	L	L	L	"	44							
	"	46	X	X	X	X	X	X	X	"	X	PM	"	X	X	X	X	"	"							
	u	47	Ĺ	L	Ĺ	Ĥ	Ĥ	Ĥ	Ĥ	"	Ĥ	5.0V	"	Ĥ	Ĥ	Ĺ	Ĺ	"	"							
	"	48	L	L	L	L	Ĺ	Ĺ	L	"	Ĺ	GND	"	L	Ĺ	H	L	"	"							
	"	49	Х	X	X	X	Х	Х	Х	66	Х	PN	"	X	X	X	X	44	44							
	"	50	L	L	L	Н	Н	Н	Н	"	Н	5.0V	"	Н	Н	Н	L	44	ш							
	"	51	L	L	L	L	L	L	L	"	L	GND	"	L	L	L	Н	"	"							
		52	X	X	X	X	X	X	X	"	X	PR	"	X	X	X	X	"	"							
	u	53 54	L H	L	L	H L	H L	H L	H L	"	H L	5.0V GND	"	H L	H L	H L	H L	"	44							
	"	55	Х	X	X	X	X	X	X	44	X	PS	"	X	X	X	X	66	"							
	u	56	Ĥ	Ĺ	Ĺ	Ĥ	Ĥ	Ĥ	Ĥ	"	Ĥ	5.0V	"	Ĥ	Ĥ	ΙĤ	ΙĤ	"	"							
	"	57	Ĺ	H	L	L	Ĺ	Ĺ	L	"	Ĺ	GND	"	L	Ĺ	L	L	"	"							
	"	58	Х	X	X	X	Х	Х	Х	66	Х	PT	"	X	X	X	X	44	44							
	"	59	Н	Н	L	Н	Н	Н	Н	"	Н	5.0V	66	Н	Н	Н	Н	"	44							
	"	60	L	L	Н	L	L	L	L	"	L	GND	"	L	L	L	L	"	"							
		61	X	X	X	X	X	X	X	"	X	PV	"	X	X	X	X	"	"							
	"	62 63	H	H	H L	H L	H L	H L	H L	"	H L	5.0V GND	"	H L	H L	H	H L	"	"							
	"	64	L X	X	X	X	X	X	X	44	X	PY	"	X	X	X	X	"	"							
	"	65	Ĥ	Ĺ	Ĥ	Ĥ	Ĺ	Ĺ	Ĥ	66	Ĺ	GND	ű	Ĺ	Ĥ	Ĥ	Ĺ	"	"							
	"	66	Ë	ΙĒ	Ë	Ľ	Ĺ	Ĺ	L L	"	Ĺ	GND	5.0V	Ĺ	Ľ	l ï	ΙĒ	es .	ш							
	"	67	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	"	Ĺ	GND	GND	Ĺ	Ē	Ĺ	Ē	44	"							
	"	68	Х	Х	Х	X	Х	Х	Х	"	Х	PU	GND	X	X	X	X	"	"							
	"	69	L	Н	L	L	Н	Н	L	"	Н	GND	GND	Н	L	L	Н	"	44							
	"	70	L	L	L	L	L	L	L	"	L	GND	5.0V	L	L	L	L	"	"							
		71	L	L	L	L	L	L	L	"	L	GND	GND	L	L	L	L									

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

Symbol	MIL-	Cases							1	ermina	I conditi	ons <u>4</u> /							Measured			Lir	nits			Unit
	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 9 25°C	Subgro			oup 11 -55°C	
	method	Test	Q12	Q13	Q14	Q6	Q5	Q7	Q4	Vss	Q1	CLOCK	RESET	Q9	Q8	Q10	Q11	$V_{DD}$		Min	Max	Min	Max	Min	Max	
		no.																								
t <sub>PHL1 1/2</sub> /	3003	72							O. 17	GND	OUT	IN "	GND					5.0V	CLOCK TO	.013	0.89	.018	1.34	.013	0.89	μS
		73					OUT		OUT			"						"	OUTPUT	.052	3.50	.072	5.25	.052	3.50	"
		74				OUT	OUT												"	.065	4.45	.090	6.68	.065	4.45	
		75				OUT		OUT				"						"	"	.078	5.35	.108	8.03	.078	5.35	
	"	76						OUT		"		"	"		OUT			"	"	.091	6.20	.126	9.30	.091	6.20	
	"	77								"		"	"	OUT	OUT			"	"	.104	7.10	.144	10.65	.104	7.10	
	"	78 79								"		u	"	OUT		OUT		44	"	.117 .130	8.10 8.90	.162 .180	12.15 13.35	.117 .130	8.10 8.90	"
	"	79 80								"		u	"			001	OUT	44	"	.143	9.90	.100	14.85	.130	9.90	"
	"	81	OUT							"		"	"				001	"	"	.143	10.70	.216	16.05	.143	10.70	"
	"	82	001	OUT						"		"	"					"	"	.169	11.60	.234	17.40	.169	11.60	"
	"	83		001	OUT					"		"	"					"	и	.182	12.50	.252	18.75	.182	12.50	"
t <sub>PI H1</sub>	u	84			001					"	OUT	"	"					"	и	.013	0.89	.018	1.34	.013	0.89	"
PLH1	"	85							OUT	"	00.	u	"					44	"	.052	3.50	.072	5.25	.052	3.50	"
	u	86					OUT		001	"		u	"					"	ш	.065	4.45	.090	6.68	.065	4.45	u
	"	87				OUT				"		"	"					"	u	.078	5.35	.108	8.03	.078	5.35	"
	"	88						OUT		"		"	"					"	"	.091	6.20	.126	9.30	.091	6.20	"
	"	89								"		u	"		OUT			"	u	.104	7.10	.144	10.65	.104	7.10	"
	u	90								"		u	"	OUT				"	"	.117	8.10	.162	12.15	.117	8.10	"
	u	91								"		u	"			OUT		"	"	.130	8.90	.180	13.35	.130	8.90	"
	"	92								"		"	"				OUT	"	"	.143	9.90	.198	14.85	.143	9.90	"
	"	93	OUT							"		"	"					"	"	.156	10.70	.216	16.05	.156	10.70	"
	tt.	94		OUT						"		u	"					44	"	.169	11.60	.234	17.40	.169	11.60	"
	ű	95			OUT					"		íí.	u					"	"	.182	12.50	.252	18.75	.182	12.50	"
t <sub>PHL2</sub>	"	96	OUT	OUT	u	OUT	OUT	OUT	OUT	ee .	OUT	u	IN	OUT	OUT	OUT	OUT	"	RESET TO	.013	3.30	.018	4.95	.013	3.30	**
																			OUTPUT							
t <sub>THL</sub>	3004	97	"	"	"	и	u	"	"	"	"	u	GND	"	"	"	"	"	OUTPUT	.010	1.15	.014	1.73	.010	1.15	"
$t_{TLH}$	3004	98	"	"	"	и	и	tt	"	"	íí.	u	GND	"	u	tt	tt	66	OUTPUT	.010	1.15	.014	1.73	.010	1.15	"

Symbol	MIL-	Cases	ı							Terr	ninal co	nditions 4	/						Measured			Li	mits			Unit
Cymbol	STD- 883	E,F,N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Subgr	roup 1	Subgr	oup 2	Subgr		0
	method	Test no.	1 OUT	0 OUT	2 OUT	5 OUT	6 OUT	NC	3 OUT	V <sub>SS</sub>	NC	7 OUT	4 OUT	CARRY	CLOCK ENABLE	CLOCK	RESET	V <sub>DD</sub>		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub> (POS)		1												001	1 mA	1 mA	1 mA	GND	EACH INPUT		1.5					V
V <sub>IC</sub> (NEG)		2								GND					-1 mA	-1 mA	-1 mA		EACH INPUT		-6.0					V
I <sub>IL1</sub> <u>6</u> /	3009	3								и					GND	GND	GND	15.0V	ALL INPUTS		-300					nA
I <sub>IL2</sub>	3009	4								и					GND	GND	GND	44	TOGETHER EACH		-100		-100			u
I <sub>IH1</sub>	3010	5								и						15.0V	15.0V	и	INPUT ALL INPUTS		300					и
	2010	6								"				15.0	V	15.0V	15.0V	ű	TOGETHER EACH		100					и
I <sub>IH2</sub>	3010	6								"					OND				INPUT	4.5	100	4.5		4.5		
V <sub>OH1</sub> <u>1</u> / <u>2</u> /	3006	7	I <sub>OH5</sub>	OH5	OH5	OH5	OH5		I <sub>OH5</sub>			I <sub>OH5</sub>	OH5		√ GND	IN	IN	5.0V	EACH INPUT	4.5		4.∳00		4.5		V
V <sub>OL1</sub>	3007	8	I <sub>OL4</sub>		OL4	u		I <sub>OL4</sub> I	I <sub>OL4</sub> I	I <sub>OL2</sub>	ű	u	ű	5.0V	EACH OUTPUT		500				500	mV				
V <sub>OH2</sub>	3006	9	OUT	OUT	OUT	OUT	OUT	I	OUT	и		OUT	OUT	OUT	u	и	ű	12.5V	OUTPUT	11.25		11.850		11.25		V
V <sub>OL2</sub>	3007	10	"	44	64	и	u		44	и		и	ee	и	и	и	ű	12.5V	EACH OUTPUT		1.25		1.25			и
V <sub>IL</sub> <u>1</u> / <u>2</u> /	Fig. 6	11	"	"	44	и	ee		44	"		и	ee	66	IN	ш	и	5.0V	CLOCK ENABLE	1.10		0.85		1.3525	5	и
V <sub>IH</sub>	66	12	"	"	66	и	u		44	"		и	ee	66	IN	и	и	ee	CLOCK ENABLE		3.80		3.60			и
$V_{IL}$	"	13	"	"	"	"	u		"	"		u	"	"	GND	u	и	u		1.10		0.85		1.3595	5	и
$V_{IH}$	и	14	и	"	"	"	u		"	"		u	u	u	ű	"	и	и	CLOCK		3.80		3.60			u
V <sub>IL</sub>	Fig. 5	15	"	"	"	"	"		"	"		и	"	"	u	и	u	u		1.10		0.85		1.35		ű
V <sub>IH</sub>		16		и		- "									"		45.0) (		RESET		3.80		3.60	3.95	3.95	<u> </u>
I <sub>SS</sub> <u>3</u> /	3005	17 18								"					u	GND GND	15.0V GND	15.0V	V <sub>SS</sub>		-0.5		"			μA
	66	19								44					u	15.0V	GND "	"	V <sub>SS</sub> None		"	- 0	"			44
	"	20								"					u	GND	"	"	V <sub>SS</sub>		"	-5.0	"			"
	"	21								"					"	15.0V	"	"	None		u		"			"
	"	22								"					u	GND	"	"	$V_{SS}$		**		"			"
	"	23								"					"	15.0V	"	"	None		"		"			"
	"	24								"					"	GND	"	"	V <sub>SS</sub>		"		"			"
	"	25								"					"	15.0V	"	"	V <sub>SS</sub>		"		"			"
	"	26 27								"					"	GND 15.0V	"	"	None		"		"			"
	"	28								u					"	GND	"	"	V <sub>SS</sub> None		u		"			44
	"	29								u					u	15.0V	"	"	V <sub>SS</sub>		"		"			"
	66	30								u					u	GND	"	"	None		u		"			**
	"	31								"					"	15.0V	"	"	V <sub>SS</sub>		"		"			u
	"	32								"					15.0V	15.0V	"	"	$V_{SS}$		"		"			ш

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

Symbol	MIL-	Cases	<u> </u>							Tern	ninal co	nditions 4	./						Measured			l ir	nits			Unit
5,	STD- 883	E,F,N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 4 25°C					1
	method	Test no.	1 OUT	0 OUT	2 OUT	5 OUT	6 OUT	NC	3 OUT	V <sub>SS</sub>	NC	7 OUT	4 OUT	CARRY OUT	CLOCK ENABLE	CLOCK	RESET	$V_{DD}$	1	Min	Max	Min	Max	Min	Max	1
C <sub>1</sub> <u>2</u> /	3012	33								GND					IN	IN	IN	GND	EACH INPUT		12					pF
	ı		1	ı	1								I			ı	ı		1 111 01	Subgi	roup 7 25°C	T <sub>C</sub> = 1		oup 8	EE°C	
																				Min	Max	Min	Max	Min	Max	
Truth table	3014	34 35	L	H	L	L	L L		L	GND "		L	L	H	GND "	5.0V 5.0V	5.0V GND	5.0V	EACH OUTPUT							
test	"	36 37	H	Ļ	L H	L	L	L	L	"		L	L	H H	"	PA "	"	"	u							
<u>3</u> /	"	38 39	Ļ	Ĺ	Ë	Ĺ	Ē		Ĥ	"	L	Ē	L H	H	"	"	"	u	"							
	"	40	Ļ	Ļ	Ļ	H			ן וְ	"		Ļ	Ë	Ļ	"	u	"	"	"							
	"	41 42	L	L	L	L	H L		L	"		H	L	L	и	"	и	"	"							
	44	43 44	L H	H	L	L	L		L	"		L L	L	H H	"	"	u	u	"							
	££	45 46	H	L	Ļ	Ļ	L		Ļ	"		Ļ	L	H	5.0V 5.0V	5.0V GND	"	u	"							
	"	47	ļΫ	Ē	Ŀ	Ļ	Ļ		ן וַ	"		Ļ	L	Н	5.0V	5.0V	"	u	"							
	"	48 49	X	L X	H X	X	X		X	"		X	L X	H X	GND "	5.0V PB	"	u	"							
	"	50 51	L	L	L	L	L		L	"		L L	H H	L L	u u	5.0V GND	"	u	"							
	££	52 53	Ļ	H	Ļ	Ĺ	L		Ē	"		Ĺ	Ĺ	H	"	GND GND	5.0V GND	"	"							
	"	54	H	Ĺ	Ĺ	Ĺ	Ĺ		Ĺ	"		Ĺ	Ĺ	H	"	5.0V	"	"	"							
	"	55 56	X L	X L	X L	X L	X L		X L	"		X L	X H	X L	"	PC 5.0V	"	"	"							
	44	57 58	L	H	L	L	L L		L L	u		L L	L L	H H	"	5.0V 5.0V	5.0V GND	u	"							
			•		•												,	•	•		roup 9 25°C	Subgro		Subgro		
+ 1/0/	1 2002	F0	ı	1	ı	ı	1	1	1	CND		1	ı	OUT	CND	LINI	LOND	I = 0\/	ICLOCK TO	Min	Max	Min	Max	Min	Max	
t <sub>PHL1</sub> <u>1</u> / <u>2</u> / t <sub>PHL1</sub>	3003	59 60	OUT	OUT	OUT	OUT	OUT		OUT	GND		OUT	OUT	OUT	GND "	IN "	GND	5.0V	CLOCK TO OUTPUT	и	1.20 2.25	.018	1.80 3.38	.013	1.20 2.25	μS "
t <sub>PLH1</sub> t <sub>PLH1</sub>	"	61 62	OUT	OUT	OUT	OUT	OUT		OUT	"		OUT	OUT	OUT	"	"	GND "	"	CLOCK TO OUTPUT	"	1.20 2.25	"	1.80 3.38	"	1.20 2.25	"
t <sub>PLH2</sub> t <sub>PLH2</sub>	"	63 64								u				OUT	u	u	IN "	u	RESET TO OUTPUT	"	2.25 1.20	"	3.38 1.80	"	2.25 1.20	"
t <sub>PHL2</sub>	ee	65	OMOTO	Т	OUT	OUT	OUT		OUT	"		OUT	OUT		ш	и	IN	ш	RESET TO OUTPUT	u	2.25	ee	3.38	u	2.25	u
t <sub>THL</sub>	3004	66 67	OUT	OUT	OUT	OUT	OUT		OUT	u		OUT	OUT	OUT	"	"	GND "	u	OUTPUT	10	500 500	14	750 750	10	500 500	ns ns
t <sub>TLH</sub>	66	68 69	OUT	OUT		OUT	OUT		OUT	ш		OUT	OUT	OUT	и	ш	GND "	u	OUTPUT	u	600 600	er er	900 900	ш	600 600	ns ns
t <sub>TLH</sub>	ш	70	001	001	001	001	001		001	и		001	001	OUT	IN	и	и	и	CLOCK		500		900		000	ns
							_												ENABLE TO CLOCK			750		500		
t <sub>SHL1</sub>	44	71	OUT	OUT	OUT	OUT	OUT		OUT	"		OUT	OUT		IN	и	"	"	CLOCK ENABLE		750	730	1125	500	750	ns
t	и	72	OUT	OUT						и					GND	и	IN	и	TO CLOCK RESET TO				1125		750	ns
t <sub>SHL2</sub>		12	501	501											GIVID		IIN		CLOCK				1123		730	113

Symbol	MIL-	Cases						Term	inal con	ditions 4	4/						Measured			Lim	its			Unit
	STD- 883	A,B,C,D T,X,Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14	terminal	Subgr T <sub>C</sub> =		Subgro		Subgr		
	method	Test no.	CLOCK	RESET	Q7	Q6	Q5	Q4	V <sub>SS</sub>	NC	Q3	NC	Q2	Q1	NC	$V_{DD}$		Min	Max	Min	Max	Min	Max	Ì
V <sub>IC</sub>		1	1 mA	1 mA												GND	EACH		1.5					V
(POS)									ONE								INPUT		0.0					<u> </u>
V <sub>IC</sub>		2	-1 mA	-1 mA					GND								EACH INPUT		-6.0					V
I <sub>IL 6/</sub>	3009	3	GND	GND					íí.							15.0V	CLOCK				-100.0			nA
I <sub>IL</sub>	3009	4	GND	GND					"							"	RESET		-100.0		-100.0			"
I <sub>IH</sub>	3010 3010	5	15.0V GND	GND					"							"	CLOCK RESET	-100	100.0		100.0 100.0			"
I <sub>IH</sub>		6 7		15.0V					"							E 0\/		4.500			100.0			V
V <sub>OH1</sub> <u>2</u> /	3006	/	IN	IN	I <sub>OH2</sub>	I <sub>OH2</sub>	I <sub>OH2</sub>	I <sub>OH2</sub>			I <sub>OH2</sub>		OH2	I <sub>OH2</sub>		5.0V	EACH OUTPUT	4.500	.0					V
V <sub>OL1</sub>	3007	8	66	ű	I <sub>OL5</sub>	I <sub>OL5</sub>	I <sub>OL5</sub>	I <sub>OL5</sub>	"		I <sub>OL5</sub>	- 1	OL5	I <sub>OL5</sub>			EACH OUTPUT		4.5		500 4.5		500	mV
V <sub>OH2</sub>	3006	9	66	u	OUT	OUT	OUT	OUT	"		OUT	I	OUT	OUT	5.0\	12.5V		11. <u>25</u> 0						V
V <sub>OL2</sub>	3007	10	u	и	и	u	"	"	"		"		"	и		12.5V	EACH		1.25.2	_	1.25.2	5	1.25	"
V OL2	3007	10														12.50	OUTPUT		1.20.2	,	1.20.2	.5	1.20	
V <sub>IL</sub> <u>1</u> / <u>2</u> /	Fig. 6	11	и	u	**	tt.	u	u	u		u		u	u		5.0V	CLOCK	1.10				1.35		u
$V_{IH}$	Fig. 6	12	u	u	**	££	66	"	"		u		66	"		и	CLOCK		3.80		3.60		3.95	"
$V_{IL}$	Fig. 5	13	"	"	"	u	"	"	"		"		"	"		u	RESET	1.10	0.85			1.35		"
$V_{IH}$	Fig. 5	14	"	ű	ee .	íí.	"	u	u		"		"	"		"	RESET		3.80		3.60		3.95	"
I <sub>SS</sub> <u>3</u> /	3005	15	GND	15.0V					"							15.0V	$V_{SS}$		-0ტგ5		и			μΑ
	"	16	GND	GND "					"							"	Vss		"		"			"
		17	PI	"					"								None			-5.0	"			"
	"	18	15.0V GND	u					"							"	V <sub>SS</sub> None		"		"			"
	44	19 20	PI	u					"							"	None		44		"			"
	"	21	GND	"					"							"	V <sub>SS</sub>		"		"			"
			0.12				l	I			l		l	I	1		. 33	Subgr						
																		T <sub>C</sub> =	Max					-
C <sub>i</sub> <u>2</u> /	3012	22	IN	IN					GND							GND	EACH INPUT		12					pF

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

Symbol	MIL-	Cases	1					Term	inal cond	ditions 4	1/						Measured			Lin	nite			Unit
Cyllibol	STD-	A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	terminal	Subar	roup 7		Subgr	oup 8		Ornic
	883	T,X,Y		_	Ĭ	•			•		"								25°C	T <sub>C</sub> = 1	125°C	T <sub>C</sub> = -	55°C	
	method	Test no.	CLOCK	RESET	Q7	Q6	Q5	Q4	V <sub>SS</sub>	NC	Q3	NC	Q2	Q1	NC	$V_{DD}$	† i	Min	Max	Min	Max	Min	Max	
Truth	3014	23	GND	5.0V	Ĺ	L	L	Ĺ	GND					Ĺ			Each							
table	u	24	GND	GND	L	L	L	L	u		L		L	L		"	output							
test	u	25	5.0V	u	L	L	L	L	"		L		L	L	5.0\	<i>,</i> "	"							
<u>3</u> /	"	26	GND	"	L	L	L	L	u	L	L	L	L	Н	0.01	"	"							
	"	27	5.0V	"	L	L	L	L	u		L		L	Н		"	44							
	u	28	GND	u	L	L	L	L	"		L		Н	L		"	"							
	"	29	5.0V	"	L	L	L	L	"		L		Н	L		"	"							
	"	30	GND	"	L	L	L	L	"		L		Н	Н		"	"							
	"	31	5.0V	"	L	L	L	L			L		H	H		"								
	"	32	GND	"	L	L	L	L	"		Н		L	L		"	"							
	"	33 34	PC 5.0V	"	X L	X L	X L	X L	u		X H		X H	X H		"	66							
	"	35	GND	"	Ŀ	Ĺ	Ĺ	H	"		Ľ		Ľ			"	66							
	u	36	PF	u	X	X	X	X	"		X		X	X		"	66							
	"	37	5.0V	"	Ĺ	Ĺ	Ĺ	Ĥ	"		ΙĤ		Ĥ	Ĥ		"	66							
	u	38	GND	u	Ĺ	Ĺ	н	Ë	"		lϊ		Ë	lϊ		"	66							
	"	39	PG	"	X	X	X	X	u		x		X	X		"	66							
	u	40	5.0V	u	Ĺ	Ĺ	Н	H	"		H		Н	H		"	66							
	"	41	GND	"	L	Н	L	L	u		L		L	L		"	66							
	"	42	PH	"	Х	X	X	X	"		Х		X	Х		"	66							
	u	43	5.0V	u	L	Н	Н	Н	"		Н		Н	Н		"	"							
	"	44	GND	"	Н	L	L	L	"		L		L	L		"	66							
	"	45	PJ	"	Х	X	X	X	"		Х		X	Х		"	66							
	"	46	5.0V	"	Н	Н	Н	Н	"		Н		Н	Н		u	"							
		47	GND	"	L	L	L	L			L		L	L		"	"							
	"	48	PI	"	X	X	X	X			X		X	X		"	"							
	"	49	GND		Ļ	H	L	H	"		L		H	<u> </u>		"								
	"	50	GND	5.0V	L	L	L	L	"		Ŀ		Ļ	<u> </u>		"	"							
	"	51 52	GND PK	GND GND	L X	L X	L X	L X	u		L X		L X	L X		"	66							
	"	53	GND	GND	Ĥ	Ĺ	Ĥ	Ĺ	u		Ĥ		Ĺ	Ĥ		"	66							
	"	54	GND	5.0V	l ï	Ĺ	;;	Ĺ	u		l ï			l 'i'		"	"							
	"	55	GND	GND	ΙĒ	ī	ī	ΙĒ	"		Ιī		Ī	Ιī		"	44							
			0.15	0.15						l		l					1	Subar	roup 9	Subgro	วนก 10	Subgro	oup 11	
																		T <sub>C</sub> =		$T_C = 1$		$T_C = -$		
																	Ì	Min	Max	Min	Max	Min	Max	
t <sub>PHL1</sub>	3003	56	IN	GND					GND					OUT		5.0V	CLOCK TO	.013	0.44	.018	0.66	.013	0.44	μS
<u>1</u> / <u>2</u> /	"	57	"	"					"				OUT			"	OUTPUT	.026	0.88	.036	1.32	.026	0.88	."
_	u	58	u	u					íí.		OUT					u	"	.039	1.32	.054	1.98	.039	1.32	"
	"	59	"	"				OUT	tt.							"	cc	.052	1.76	.072	2.64	.052	1.76	"
		60		"			OUT		"							"	"	.065	2.20	.090	3.30	.065	2.20	
		61	"	"		OUT			"							u	u	.078	2.64	.108	3.96	.078	2.64	"
		62		"	OUT				"					0117		"		.091	3.10	.126	4.65	.091	3.10	
t <sub>PLH1</sub>	"	63	"	"					"				OUT	OUT		"	"	.013	0.44	.018	0.66	.013	0.44	
	"	64	"						"		OUT		OUT			"	"	.026	0.88	.036	1.32	.026	0.88	
	"	65	"	"				OUT	"		OUT					"	"	.039	1.32	.054	1.98	.039	1.32	"
	"	66 67	"	"			OUT	OUT	и							u	44	.052 .065	1.76 2.20	.072 .090	2.64 3.30	.052 .065	1.76 2.20	"
	"	68	"	"		OUT	001		"							"	44	.005	2.20	.108	3.30	.065	2.20	"
	u	69	u	и	OUT	001			"							u	44	.078	3.10	.108	4.65	.078	3.10	"
t <sub>PHL2</sub>	и	70	и	IN	OUT	OUT	OUT	OUT	u		OUT		OUT	OUT		и	RESET TO	.013	1.50	.018	2.25	.013	1.50	μS
VPHL2		70		IIN	001	001	501	001			001		001	001			OUTPUT	.013	1.50	.010	2.23	.013	1.50	μδ
t <sub>THL</sub>	3004	71	u	GND	"	и	и	"	и		"		и	"		и	OUTPUT	10	430	14	645	10	430	ns
t <sub>TLH</sub>	3004	72	и	GND	"	u	u	"	u		и		u	"		и	OUTPUT	10	700	14	1050	10	700	ns
YILH	JJU-		<u> </u>	0.10	l			1		ı	ı	·		l	1		001101		, , , ,		.000	.0	, 50	

See footnotes on next page.

- Unless otherwise specified, separately monitor or measure as required, each device terminal designated "OUT", "I<sub>OH</sub>", and "I<sub>OL</sub>" in the terminal condition columns of table III. Values for "I<sub>OH</sub>" and "I<sub>OL</sub>" are specified in footnote 5.
- Terminals designated "IN" indicate conditions and test methods are specified in footnote 5 and figures 4 through 8 or for "C<sub>i</sub>" measurement, 4.4.1c.
- This  $I_{SS}$  and functional tests shall be performed in the test number sequence shown with no intervening changes to terminal conditions. The functional test shall be performed with  $V_{IH}$  and  $V_{DD} \le 5.0$  V and  $\ge 15.0$  V. Table III shows the lower of these two voltages. During the functional test, input terminals designated "PA", "PB", etc., shall have applied thereto a specified number of single pulses with the following parameters: Pulse amplitude =  $V_{DD}$  maximum to  $V_{DD} = 4\%$  minimum. These pulses are enumerated as follows:

<u>Symbol</u>	<u>Pulses</u>	<u>Symbol</u>	<u>Pulses</u>	<u>Symbol</u>	<u>Pulses</u>	Symbol	<u>Pulses</u>
PA	1	PF	7	PK	85	PS	2047
PB	2	PG	15	PL	127	PT	4095
PC	3	PH	31	PM	255	PU	5461
PD	4	PI	42	PN	511	PV	8191
PE	5	PJ	63	PR	1023	PY	10922

During the functional tests, device output voltages are: don't care "X", high "H", or low "L" as specified in the terminal conditions columns. The output voltage limits over the specified temperature range are "H" =  $V_{DD}$  –0.50 V minimum and "L" =  $V_{SS}$  +0.50 V maximum.

- 4/ Undesignated terminal conditions indicate terminal may be high-level logic, low-level logic, or open except as follows:

  | IC(POS)| tests, the V<sub>SS</sub> terminals shall be open; V<sub>IC(NEG)</sub> tests, the V<sub>DD</sub> terminals shall be open; I<sub>SS</sub> tests, the output terminals shall be open.
- 1 The following input voltages and output currents are terminal conditions for group A inspection:

							Symb	ol						
Temperature	V <sub>IH1</sub> Max (V)	V <sub>IL1</sub> Min (V)	V <sub>IH2</sub> Max (V)	V <sub>IL2</sub> Min (V)	I <sub>OH1</sub> (μ <b>A</b> )	I <sub>OH2</sub> (μ <b>A</b> )	I <sub>OH3</sub> (μ <b>A</b> )	I <sub>OH4</sub> (μ <b>A</b> )	I <sub>OH5</sub> (μ <b>A</b> )	I <sub>OL1</sub> (μ <b>A</b> )	I <sub>OL2</sub> (μΑ)	Ι <sub>ΟL3</sub> (μΑ)	I <sub>OL4</sub> (μ <b>A</b> )	I <sub>OL5</sub> (μ <b>A</b> )
25°C	3.80	1.10	9.50	2.80	-30	-150	-60	-90	-30	50	150	100	50	250
125°C	3.60	0.85	9.25	2.55	-21	-105	-40	-65	-21	35	105	90	35	175
-55°C	3.95	1.35	9.75	3.05	-38.0	-185	-75	-110	-38	60	185	125	60	310

- 6/ The device manufacturer may, at his option, measure I<sub>IL</sub> and I<sub>IH</sub> at 25°C for each individual input or measure all inputs together.
- 7/ Data pin need only be toggled high or low to allow outputs to achieve the proper setup state required to verify the indicated test parameter.

TABLE III. Group A inspection for device type 51.

Symbol	MIL-	Cases								Term	nal con	ditions	1/						Measured			L	imits			Unit
,		E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		group 1 = 25°C	Subg	roup 2 125°C	Subgr		
	method	Test no.	5 OUT	1 OUT	0 OUT	2 OUT	6 OUT	7 OUT	3 OUT	V <sub>SS</sub>	8 OUT	4 OUT	9 OUT	CARRY	CLOCK ENABLE	CLOCK	RESET	V <sub>DD</sub>		Min	Max	Min	Max	Min	Max	-
V <sub>IC</sub> (POS)		1												001	1 mA	1 mA	1 mA	GND	EACH INPUT		1.5					V
V <sub>IC</sub> (NEG)		2								GND					-1 mA	-1 mA	-1 mA		EACH INPUT		-6.0					V
I <sub>IL1</sub> <u>2</u> /	3009	3								ш					GND	GND	GND	18.0 V	ALL INPUTS TOGETHER		-300.0					nA
I <sub>IL2</sub>	3009	4								"					GND	GND	GND	u	EACH INPUT		-100.0		-100.0			66
I <sub>IH1</sub>	3010	5								и					18.0 V	18.0 V	18.0 V	u	ALL INPUTS TOGETHER		300.0					ш
I <sub>IH2</sub>	3010	6								es					18.0 V	18.0 V	18.0 V	u	EACH INPUT		100.0		100.0			"
I <sub>OL</sub>		7	<u>4</u> /	и	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	EACH INPUT	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	mA										
I <sub>OH</sub>		8	u	и	u	u	ee .	u	u	u	u	ш	u	ű	и	u	и	u	u	"	u	u	и	u	и	mA
Vol	3007	9	"	u	"	"	"	"	u	u	u	u	"	ű	ű	"	u	"	и	"	"	u	"	u	"	V
V <sub>OH</sub>	3006	10	"	u	u	"	"	"	и	"	"	u	"	"	u	"	u	"	и	"	"	"	"	u	"	"
V <sub>IL</sub>		11	и	и	и	"	"	и	и	66	66	и	ee	es .	u	ш	и	и	EACH INPUT	66	ee	u	и	и	и	ee
$V_{IH}$		12	"	и	ii .	ű	"	"	u	u	u	и	ű	"	u	u	и	u	EACH INPUT	44	cc	ű	u	и	и	ű
Iss <u>5</u> /	3005 	13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32													GND	GND GND 18.0V GND 18.0V GND 18.0V GND 18.0V GND 18.0V GND 18.0V GND 18.0V GND 18.0V GND	18.0 V GND "" "" "" "" "" "" "" "" "" "" "" "" ""	18.0V	Vss Vss Vss None Vss None Vss None Vss None Vss None Vss None Vss None Vss None Vss None		-0.5	-5.(				μΑ « « « « « « « « « « « « « « « « « « «

TABLE III. Group A inspection for device type 51 – Continued.

Symbol	MIL-	Cases	l							Termi	inal con	ditions	1/						Measured			l in	nits			Unit
Cymbol	STD-	E,F,N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 4					Oill
	883 method	Z	E OUT	4 OUT	0.011	0.011	COLIT	7 OUT	2 OUT	\ /	0.011	4 OUT	0.011	CADDV			DECET				25°C	N diam		N 4:	Mari	
	memou	Test no.	5 001	1 OUT	0 001	2 001	6 00 1	7 001	3 001	$V_{SS}$	8 001	4 001	9 OUT	CARRY	CLOCK ENABLE	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	
C <sub>1</sub> 3/	3012	33								GND					IN	IN	IN	GND	EACH INPUT		12.0					pF
																					roup 7			roup 8		
																					25°C		125°C			
Truth	3014	34			Н				г г	GND				Н	GND	5.0 V	5.0 V	5.0 V	EACH	Min	Max	Min	Max	Min	Max	
table	u	35 36	Ĺ	ΙĹ	H	Ĺ	Ĺ	ΙĒ	Ĺ	GND "	ΙĒ	Ĺ	Ĺ	Н	"	5.0 V	GND	5.0 V	OUTPUT							
test <u>5</u> /	"	36	Ŀ	H	Ļ	L	Ŀ	Ŀ	Ŀ	"	Ŀ	Ļ	Ļ	H	u	PA "	u	"	"							
	"	37 38	-	L L	L	H	<u> </u>	<u> </u> -	H	"		L	L	H H	"	u	u	"	"							
	"	39	ΙĖ	l È	l	Ĺ	ΙĒ	ΙĖ	l ¦'	**	ΙĖ	н	ΙĖ	Η̈́	u	u	u	"	"							
	u	40	Η̈́	L	Ĺ	L	Ē	Ē	Ē	"	Ē	Ë	L	L	44	u	u	"	"							
	"	41	Ļ	Ļ	Ļ	Ļ	H	Ŀ	Ļ	"	Ŀ	Ļ	Ļ	Ļ	"	"	"	"	"							
	"	42 43	-	L	L	L	-	H	ŀ	"	L	<u> </u> -	L	L	"	u	u	"	44							
	"	43	ΙĖ	ΙĖ	Ĺ	ΙĿ	ΙĖ	ΙĿ	ΙĿ	**	l [	Ĺ	Ь'n	Ŀ	"	u	u	"	"							
	"	44 45	Ē	L	Ā	L	L	Ĺ	Ĺ	"	Ĺ	L	Ĺ	H	u	"	"	"	"							
	"	46	Ŀ	H	Ļ	Ļ	Ļ	Ļ	Ļ	"	Ŀ	Ļ	Ļ	H	" 5 0 ) /	501/	u	"	"							
	"	47 48	<u> </u> -	H		L	-	L	-	"	L	ŀ	L	H H	5.0 V 5.0 V	5.0 V PA	"	"	"							
	u	49	ΙĒ	l ï	ΙĒ	н	ΙĒ	ΙĖ	ΙĖ	**	ΙĖ	li	ΙĖ	H	GND	5.0 V	u	"	"							
	u	50	x	Х	x	X	x	x	x	"	X	X	X	Χ	"	PC	u	"	44							
	u	51	H	Ŀ	Ļ	Ļ	Ļ	Ŀ	Ļ	"	Ļ	Ļ	Ļ	Ļ	"	5.0 V	"	"	"							
	"	52 53	H	L	L H	L	1 1	Ļ	-	"	L		L	L H	"	GND GND	5.0 V	"	"							
	"	54	ΙĒ	ΙĒ	Η̈́	ΙĒ	ΙĒ	Ιī	ΙĒ	"	ΙĒ	ΙĒ	ΙĒ	Н	u	GND	GND	"	"							
	u	55	L	Н	L	L	L	L	L	"	L	L	L	Н	"	5.0 V	"	"	"							
	u	56 57	X	X	X	X	X	X	X	"	X	X	X	X	"	PD 5.0 V	u	"	"							
	u	57 58	H	L	H	L	F	Ļ	-	**	L	-	l ŀ	H	"	5.0 V 5.0 V	5.0 V	"	"							
	"	59	Ĺ	Ĺ	H	Ĺ	Ĺ	Ĺ	Ĺ	"	Ĺ	Ĺ	Ĺ	H	u	5.0 V	GND	"	44							
																								Subgro		
																				I <sub>C</sub> =	25°C Max	Min	125°C Max	T <sub>C</sub> = -	Max	
t <sub>PHL1</sub> 6/	3003	60	l					l		GND	l			OUT	GND	IN	GND	5.0 V	CLOCK TO	.013	0.80	.018	1.12	.013	0.80	μS
t <sub>PHL1</sub>	"	61	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	OUT	OUT	OUT		"	u	u	"	OUTPUT	"	1.0	"	1.40	и	1.0	""
t <sub>PLH1</sub>	"	62 63	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	OUT	OUT	OUT	OUT	"	"	"	"	CLOCK TO OUTPUT	u	0.80 1.0	"	1.12 1.40	"	0.80 1.0	"
t <sub>PLH1</sub>	и	64	001	001	001	001	001	001	001	u	001	001	001		и	и	IN	и	RESET TO	"	1.0	"	1.40	и	1.0	u
t <sub>PLH2</sub>	"	65								"				OUT	"	"	"	"	OUTPUT	"	0.80	"	1.12	u	0.80	u
t <sub>PHL2</sub>		66	OUT	OMIO.	Γ	OUT	OUT	OUT	OUT		OUT	OUT	OUT						RESET TO OUTPUT		1.0		1.40		1.0	
t <sub>THI</sub>	3004	67		1						и				OUT	и	u u	GND	"	OUTPUT	10	200	14	280	10	200	ns
t <sub>THL</sub>	"	68	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	OUT	OUT	OUT	OUT.	u	"	"	"	OUTPUT	10	200	14	280	10	200	"
t <sub>⊤∟H</sub> t <sub>⊤i H</sub>	3004	69 70	OUT	OUT	OUT	OUT	OUT	OUT	OUT	"	OUT	OUT	OUT	OUT	"	"	"	"	OUTPUT	10 10	360 360	14 14	504 504	10 10	360 360	"
t <sub>SHL1</sub>	See	71	501	001	301	501	501	301	301	**	301	501	501	OUT	IN	"	u	и	CLOCK	10	300	'-	307	10	300	и
-OILI	Fig. 8														** *				ENABLE							
_	<u>6</u> /	70	QU-	OUT	OUT	Q1.1 <del>-</del>	OL IT	0117	OUT	"	QU-	OUT-	Q.1. <del></del>		INI	"	"	"	TO CLOCK	240	240	336	222	240	040	"
t <sub>SHL1</sub>		72	OUT	OUT	OUT	OUT	OUT	OUT	OUT		OUT	OUT	OUT		IN	l		"	CLOCK ENABLE		240		336	0	240	
																			TO CLOCK							
t <sub>SHL2</sub>		73								и					GND	и	IN	и	RESET TO				560		400	u
																			CLOCK							

MIL-M-38510/56G

MIL-M-38510/56G

TABLE III. Group A inspection for device type 52.

Symbol	MIL-	Cases								Termi	inal cond	litions 1/							Measured			Lir	nits			Unit
	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		group 1 = 25°C	Subgr T <sub>C</sub> = 1		Subgro		
	method	Test no.	DATA	JAM 1	JAM 2	Q2	Q1	Q3	JAM 3	V <sub>SS</sub>	JAM 4	PRESET ENABLE	Q4	JAM 5	Q5	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub> (POS)		1	1mA	1mA	1mA				1mA		1mA	1mA		1mA		1mA	1mA	GND	EACH INPUT		1.5					V
V <sub>IC</sub> (NEG)		2	-1mA	-1mA	-1mA				-1mA	GND	-1mA	-1mA		-1mA		-1mA	-1mA		EACH INPUT		-6.0					V
I <sub>IL1</sub> 2/	3009	3	GND	GND	GND				GND	u	GND	GND		GND		GND	GND	18.0V	ALL INPUTS TOGETHER		-900.0					nA
$I_{IL2}$	3009	4	GND	GND	GND				GND	ee	GND	GND		GND		GND	u	18.0V	EACH INPUT		-100.0		-100.0			u
I <sub>IH1</sub>	3010	5	18.0V	18.0V	18.0V				18.0V	и	18.0V	18.0V		18.0V		18.0V	18.0V	и	ALL INPUTS TOGETHER		900.0					и
I <sub>IH2</sub>	3010	6	18.0V	18.0V	18.0V				18.0V	ű	18.0V	18.0V		18.0V		18.0V	18.0V	66	EACH INPUT		100.0		100.0			u
I <sub>OL</sub>		7	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	"	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	EACH OUTPUT	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	mA
I <sub>OH</sub>		8	"	"	**	66	"	"	u	"	u	u	"	u	u	u	ű	u	и	"	u	u	и	u	tt.	u
V <sub>OL</sub>	3007	9	"	**	u	"	u	"	и	ee	u	u	**	и	ee	u	u	u	u	"	ii .	"	u	u	u	V
V <sub>OH</sub>	3006	10	"	**	u	"	u	"	и	ee	u	u	**	и	ee	u	u	u	u	"	ii .	"	u	u	u	u
V <sub>IL</sub>		11	"	u	"	u	tt	u	и	u	и	и	u	66	u	ш	и	ee	EACH INPUT	u	66	ee	u	и	u	"
V <sub>IH</sub>		12	66	u	"	ű	u	ű	и	ű	и	и	u	66	ű	ш	cc .	ee	EACH INPUT	"	44	ee	ш	и	u	ee
I <sub>SS</sub> <u>5</u> /	3005	13 14 15 16 17 18 19 20 21	GND " " 18.0V	18.0V " " GND "	18.0V 18.0V GND GND GND 18.0V				18.0V GND 18.0V 18.0V 18.0V GND GND GND 18.0V	« « « « « « «	18.0V GND " " 18.0V	18.0V " " GND 18.0V 18.0V GND 18.0V	18.	0V " " GND "	GN	GND D GND 18.0V 18.0V GND 18.0V 18.0V 18.0V	18.0V GND "	18.0V	V <sub>SS</sub> V <sub>SS</sub> V <sub>SS</sub> None V <sub>SS</sub> None V <sub>SS</sub> V <sub>SS</sub> None V <sub>SS</sub>	-0.		-5.0	ec ec ec ec			μ <b>A</b> " " "

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

	MIL-	Cases								Term	inal con	ditions 1/							Measured			Lim	its			Unit
	STD- 883	E,F,N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 4 25°C					
	method	Test no.	DATA	JAM 1	JAM 2	Q2	Q1	Q3	JAM 3	V <sub>SS</sub>	JAM 4	PRESET ENABLE	Q4	JAM 5	Q5	CLOCK	RESET	$V_{DD}$	-	Min	Max	Min	Max	Min	Max	
C <sub>i</sub> <u>3</u> /	3012	22	IN	IN	IN				IN	GND	IN	IN		IN		IN	IN	GND	EACH INPUT		12.0					pF
				l .	l l						ı					I			INFOT	Subq	roup 7		Subgr	oup 8		<u> </u>
																					25°C	T <sub>C</sub> = 1		T <sub>C</sub> = -	55°C	1
																			,	Min	Max	Min	Max	Min	Max	
Truth	3014	23	5.0V	5.0V	5.0V	L	L	L	5.0V	GND "	5.0V	5.0V	L	5.0V	L	5.0V	GND	5.0V	EACH							
table test 5/	"	24 25	5.0V 5.0V	5.0V GND	5.0V GND	H H	H	H	5.0V GND	u	5.0V GND	5.0V GND	H H	5.0V GND	H	и	5.0V 5.0V	"	OUTPUT "							
1001 <u>0</u> /	"	26	GND	GND	"	H	H	H	GND	u	"	GND	H	GND	H	"	GND	"	ű							
	"	27	5.0V	5.0V	"	Н	Н	Н	5.0V	"	"	GND	Н	5.0V	Н	"	"	"	"							
	"	28 29	"	5.0V	"	Н	L	L L	5.0V 5.0V	"	"	5.0V GND	Н	5.0V	L	"	"	"	u u							
	"	30	u	5.0V GND	"	H H	L	L	GND	u	"	GND "	H H	5.0V GND	L L	GND	"	"	"							
	"	31	u	"	"	L	Ĺ	H	"	u	"	u	Ĺ	"	H	5.0V	"	"	ű							
	"	32	GND	"	"	L	L	Н	"	"	"	"	L	"	Н	5.0V	"	"	"							
	"	33 34	GND GND	"	"	L	L H	H L	"	"	"	"	L H	44	Н	GND 5.0V	"	"	"							
	"	35	5.0V	u	"	L L	Н	L	"	u	u	и	Н	66	L L	5.0V 5.0V	"	"	u							
	"	36	"	u	"	Ĺ	H	Ĺ	"	u	"	u	H	66	Ĺ	GND	"	"	ű							
	"	37	"	"	"	Н	L	L	"	"	u	"	L	66	Н	5.0V	"	"	u							
	"	38 39	"	"	"	H H	H	H	"	"	u	"	H H	44	H	5.0V 5.0V	5.0V GND	"	"							
	"	40	u	5.0V	5.0V	Н	Н	Н	"	u	5.0V	u	Н	u	Н	GND	GND "	"	"							
	"	41	u	5.0V	5.0V	L	L	H	"	u	5.0V	5.0V	Ľ	66	H	"	"	"	ű							
	"	42	u	5.0V	5.0V	L	L	Н	"	"	5.0V	GND	L	u	Н	"	"	"	"							
	"	43	"	GND	GND "	L	L	H	5.0V	"	GND	GND 5.0V	L	5.0V	Н	"	"	"	"							
	"	44 45	u	u	"	H H	H	L L	"	u	u	GND	H H	66	L L	и	"	"	u							
	"	46	u	u	"	H	H	Ĺ	"	u	"	5.0V	H	66	Ĺ	"	"	"	ű							
	"	47	"	"	44	Н	Н	L	"	"	"	5.0V	Н	"	L	5.0V	"	"	"							
	"	48 49	GND	l	F 0\/	Н	H	L L	GND	"	5.0V	GND GND	H H	GND	L L	5.0V GND	"	"	"							
	"	50	GIND "	5.0V	5.0V "	H L	L	Н	GIND "	u	3.0 V	5.0V	Ľ	GIND "	Н	GND "	"	"	"							
	"	51	u	u	"	Ĺ	Ĺ	H	"	u	"	GND	Ĺ	66	H	"	"	"	ű							
	"	52	"	"	"	L	L	Н	"	"	"	5.0V	L	"	Н	"	u	"	"							
	"	53 54	"	u	"	L	L	H H	"	"	"	5.0V GND	L	"	Н	5.0V 5.0V	"	"	"							
	"	54 55	5.0V	GND	"	L L	Н	Н	"	u	ш	5.0V	L L	66	H	GND	"	"	u							
	"	56	0.0 V	GND	"	Ĺ	н	Н.	"	u	u	GND	Ĺ	u	Н.	GND	и	"	"							
	"	57	"	GND	"	Н	L	Н	"	"	u	GND	Н	66	L	5.0V	"	"	u							
	"	58	"	5.0V	GND	Н	L	Н	"	"	"	5.0V	Ļ	"	Н	GND	"	"	"							
	"	59 60	u	5.0V 5.0V	GND GND	H H	L	H H	"	u	"	5.0V GND	L L	"	H	5.0V 5.0V	"	"	ű							
	"	61	GND	3.0 v	"	H	Н	Н	u	u	"	"	H	66	H	5.0V	5.0V	"	u							
	44	62	u	ш	66	Н	Н	Н	u	u	"	и	Н	u	Н	GND	"	"	ű							
	"	63	"	"	"	Н	H	Н	"	"	"	"	Н	"	Н	5.0V	"	"	"							
	"	64 65	"	"	"	H H	H	H H	"	"	"	"	H H		H	GND 5.0V	"	"	"							

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

Symbol	MIL-	Cases								Term	inal cond	ditions 1/							Measured			Lim	its			Unit
	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 9 25°C		oup 10 125°C			
	method	Test no.	DATA	JAM 1	JAM 2	Q2	Q1	Q3	JAM 3	V <sub>SS</sub>	JAM 4	PRESET ENABLE	Q4	JAM 5	Q5	CLOCK	RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	Ì
t <sub>PHL1</sub> 6/ t <sub>PHL1</sub>	3003	66 67	IN "	GND "	GND "	OUT	OUT	OUT	GND "	GND "	GND "	GND "	OUT	GND "	OUT	IN "	GND "	5.0V	CLOCK TO OUTPUT	13 13	700 700	18 18	980 980	13 13	700 700	ns "
t <sub>PLH1</sub> t <sub>PLH1</sub>	"	68 69	"	"	"	OUT	OUT	OUT	"	u	"	ш	OUT	u	OUT	u	u	"	CLOCK TO OUTPUT	13 13	700 700	18 18	980 980	13 13	700 700	"
t <sub>PLH2</sub>	"	70 71	"	"	66	OUT	OUT	OUT	"	u	"	u	OUT	u	OUT	u	IN IN	u	RESET TO OUTPUT	13 13	700 700	18 18	980 980	13 13	700 700	u
t <sub>THL</sub>	3004	72 73	"	"	"	OUT	OUT	OUT	"	"	"	u u	OUT	u	OUT	u	GND "	"	OUTPUT	10 10	250 250	14 14	350 350	10 10	250 250	u u
t <sub>TLH</sub>	u	74 75	u	u	66	OUT	OUT	OUT	u	u	"	u	OUT	u	OUT	IN "	GND "	"	OUTPUT OUTPUT	10 10	250 250	14 14	350 350	10 10	250 250	u
t <sub>SHL1</sub> 6/		76	ш	u	66	и	и	"	и	ű	и	IN	и	и	"	ш	и	"	PRESET TO CLOCK		400					и
t <sub>SHL2</sub>		77	"	u	ee	и	и	"	ű	ű	и	GND	и	u	ű	u	IN	"	RESET TO CLOCK		400	560		400		и
t <sub>SHL3</sub>		78	и	ш	66	и	и	и	u	и	и	GND	и	u	"	44	GND	"	DATA TO CLOCK		200	560		400		и
t <sub>SLH3</sub>		79	ш	u	66	и	и	"	и	и	и	GND	ш	и	"	и	GND	**	DATA TO CLOCK		200	280		200		u
		1	L		1													1			1	280	1	200		

TABLE III. Group A inspection for device type 53.

Symbol	MIL-	Cases								Termina	I conditi	ons 1/							Measured			Lin	nits			Unit
,	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 1 : 25°C	Subgr T <sub>C</sub> = 1		Subgro		
	method	Test no.	Q12	Q13	Q14	Q6	Q5	Q7	Q4	V <sub>SS</sub>	Q1	CLOCK	RESET	Q9	Q8	Q10	Q11	$V_{DD}$		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub> (POS)		1										1mA	1mA					GND	EACH INPUT		1.5					V
V <sub>IC</sub> 2/ (NEG)		2								GND		-1mA	-1mA						EACH INPUT		-6					V
I <sub>IL1</sub> <u>6</u> /	3009	3								ш		GND	GND					18.0V	ALL INPUTS TOGETHER		-200.0					nA
I <sub>IL2</sub>	3009	4								"		GND	GND					и	EACH INPUT		-100.0		-100.0			44
I <sub>IH1</sub>	3010	5								и		18.0V	18.0V					ш	ALL INPUTS TOGETHER		200.0					и
I <sub>IH2</sub>	3010	6								"		18.0V	18.0V					ш	EACH INPUT		100.0		100.0			66
I <sub>OL</sub>		7	<u>4</u> /	"	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	EACH OUTPUT	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	mA						
I <sub>OH</sub>		8	"	и	"	"	u	"	"	"	"	"	"	"	"	**	и	"	"	66	er.	u	"	и	u	mA
$V_{OL}$	3007	9	"	и	"	"	ű	"	"	"	"	"	и	"	"	"	u	и	и	"	"	и	"	"	и	V
$V_{OH}$	3006	10	"	и	"	"	u	"	"	44	"	"	и	"	"	"	"	и	и	"	"	и	"	"	и	"
$V_{IL}$		11	"	"	"	"	"	"	"	ш	66	ш	ű	"	"	"	и	"	EACH INPUT	66	и	44	"	ű	"	и
$V_{IH}$		12	66	и	"	66	ec .	66	"	и	cc	"	u	"	"	"	и	"	EACH INPUT	u	cc	ee	44	ee .	"	44
I <sub>SS</sub> <u>5</u> /	3005	13 14 15 16 17								« «	GN	GND PU GND PU	18.0V GND "					18.0V "	V <sub>SS</sub> V <sub>SS</sub> None V <sub>SS</sub> None	-1.0	66	-10.	" O " "			μ <b>A</b> "
	"	18										18.0V	и					66	V <sub>SS</sub>		group 4 25°C Max		ш			"
C <sub>i</sub> <u>3</u> /		19								GND		IN	IN					GND	EACH INPUT		12					pF

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TABLE III. Group A inspection for device type 53 – Continued.

Symbol	MIL-	Cases							-	Termina	I condit	ions 1/							Measured			Lin	nits			Unit
	STD-	E,F, N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal	Subg	roup 7		Subgr	oup 8		1
	883	Z																		T <sub>C</sub> =	25°C	$T_C = 1$	25°C	T <sub>C</sub> = -	55°C	
	method	Test	Q12	Q13	Q14	Q6	Q5	Q7	Q4	$V_{SS}$	Q1	CLOCK	RESET	Q9	Q8	Q10	Q11	$V_{DD}$		Min	Max	Min	Max	Min	Max	
		no.																								
Truth	3014	20	L	L	L	L	L	L	L	GND	L	GND	5.0V	L	L	L	L	5.0V	EACH							
table test	"	21 22	L L	L	L	L	L L	L	L L	"	L	GND 5.0V	GND "	L L	L L	L	L	"	OUTPUT							
5/	u	23	Ĺ	Ĺ	Ĺ	L	L	L	L	"	Н	GND	44	Ĺ	L	L	L	66	"							
<u> </u>	"	24	Ĺ	ΙĒ	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	"	H	5.0V	es .	Ĺ	Ĺ	ΙĒ	Ĺ	"	"							
	u	25	L	L	L	L	Ĺ	L	L	"	L	GND	u	Ĺ	L	L	L	es .	44							
	u	26	Х	Х	Х	Х	Х	Х	X	44	Х	PE	u	Χ	X	X	X	es .	"							
	"	27	L	L	L	L	L	L	L	"	Н	5.0V	"	L	L	L	L	44	66							
	"	28	L	L	L	L	L	L	Н	"	L	GND	"	L	L	L	L	"	"							
	"	29	X	X	X	X	X	X	X	"	X	PF	"	X	X	X	X	"								
	"	30 31	L L	L	L	L	L H	L	H L	66	L	5.0V GND	"	L L	L L	L	L	66	"							
	"	32	X	X	X	X	X	X	X	"	X	PG	"	X	X	X	X	"	44							
	"	33	Ĺ	Ê	Ĺ	Ĺ	Ĥ	Ĺ	Ĥ	"	Ĥ	5.0V	"	Ĺ	Ĺ	Ĺ	Ê	"	"							
	"	34	L	L	L	Н	L	L	L	"	L	GND	u	L	L	L	L	"	"							
	"	35	Х	Х	X	Х	Х	Х	X	"	Х	PH	"	Χ	X	X	X	"	44							
	"	36	L	L	L	Н	Н	L	Н	"	Н	5.0V	"	L	L	L	L	"	"							
	"	37	L	L	L	L	L	Н	L	"	L	GND	"	L	L	L	L	"	"							
	"	38 39	X	X	X	X	X H	X H	X	"	X	PJ	"	X	X	X	X	"	"							
	"	40	L	L	L	H L	L	L	H L	"	L	5.0V GND	"	L	L H	L	L	"	66							
	"	41	X	X	X	X	X	X	X	"	X	PL	"	X	X	X	X	"	44							
	"	42	Ĺ	Ê	Ĺ	Ĥ	Ĥ	Ĥ	H	"	Ĥ	5.0V	"	Ĺ	Ĥ	Ĺ	Ê	"	"							
	"	43	L	L	L	L	L	L	L	"	L	GND	"	Н	L	L	L	"	"							
	"	44	Х	X	X	Х	X	Х	X	"	Х	PM	"	Χ	X	X	X	"	44							
	"	45	L	L	L	Н	Н	Н	Н	"	Н	5.0V	"	Н	Н	L	L	"	"							
	"	46	L	L	L	L	L	L	L	"	L	GND	"	L	L	Н	L	"								
	"	47 48	X L	X L	X L	X H	X H	X H	X H	"	X H	PN 5.0V	"	X H	X H	X H	X L	"	"							
	u	49	L	[	Ĺ	Ľ	Ľ	L	L	"	Ľ	GND	44	L	L	L	Н	44	"							
	"	50	X	X	X	X	X	X	X	"	X	PR	u	X	X	X	X	"	"							
	"	51	L	L	L	Н	Н	Н	Н	66	Н	5.0V	ű	Н	Н	Н	Н	44	44							
	"	52	Н	L	L	L	L	L	L	"	L	GND	"	L	L	L	L	"	44							
	"	53	Х	X	Х	Х	Х	Х	X	"	Х	PS	"	Χ	X	Х	X	44	66							
	"	54	H	L	L	H	H	H	H	"	Н	5.0V	"	H	H	H	H	"	"							
	"	55 56	L X	H	L X	L X	L X	L X	L	44	L	GND PT	"	L	L X	L	L X	"	"							
	"	56 57	Ĥ	X	Ĺ	H	H	Ĥ	X H	"	X H	5.0V	"	X H	H	X H	H	"	66							
	"	58	l 'i'	l 'i'	Ь'n	Ľ	Ľ	Ľ	Ľ	"	Ľ	GND	"	Ľ	L	L	l 'i'	"	44							
	"	59	X	X	X	X	X	X	X	"	x	PV	"	X	X	X	X	"	"							
	"	60	H	Ĥ	H	Ĥ	H	H	H	44	Ĥ	5.0V	"	H	Ĥ	H	H	44	44							
	"	61	L	L	L	L	L	L	L	66	L	GND	"	L	L	L	L	"	"							
	"	62	X	X	X	Х	X	Х	X	"	Х	PY	"	X	X	X	X	"	"							
	"	63	H	L	H	H	L	L	H	"	L	GND		L	Н	H	L	"	"							
	"	64	L	L	L	L	L	L	L	"	L	GND	5.0V	L	L	L	L	"	"							
	"	65 66	L	L	L	L	L	L	L	"	L	GND PU	GND GND	L	L	L	L	"	"							
	"	66 67	X L	X	X L	X L	X H	X	X L	"	X	GND	GND	X H	X L	X L	X	"	"							
	"	68	Ĺ	L	Ĺ	L	L	L	L	"	L	GND	5.0V	L	L	L	L	"	"							
	"	69	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	Ĺ	"	ΙĒ	GND	GND	Ĺ	Ĺ	Ĺ	Ĺ	"	"							

TABLE III. Group A inspection for device type 53 – Continued.

Symbol	MIL-	Cases							Т	ermina	I conditi	ons <u>1</u> /							Measured			Lir	nits			Unit
-	STD-	E,F, N,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal	Subg	roup 9	Subgr	oup 10	Subgro	oup 11	
	883	Z																		T <sub>C</sub> =	25°C	T <sub>C</sub> =	125°C	T <sub>C</sub> = -	-55°C	
	method	Test	Q12	Q13	Q14	Q6	Q5	Q7	Q4	$V_{SS}$	Q1	CLOCK	RESET	Q9	Q8	Q10	Q11	$V_{DD}$		Min	Max	Min	Max	Min	Max	
		no.																								
t <sub>PHL1</sub> 6/	3003	70								GND	OUT	IN	GND					5.0V	CLOCK TO	.013	0.55	.018	0.77	.013	0.55	μS
	er .	71							OUT	**		"	"					"	OUTPUT	.052	1.54	.072	2.15	.052	1.54	"
	er .	72					OUT			**		u	"					"	"	.065	1.87	.090	2.62	.065	1.87	"
	"	73				OUT				**		u	"					"	"	.078	2.20	.108	3.08	.078	2.20	"
	er .	74						OUT		**		u	"					"	"	.091	2.53	.126	3.54	.091	2.53	"
	"	75								"		"	"		OUT			"	"	.104	2.86	.144	4.00	.104	2.86	"
	"	76								**		"	u	OUT				"	"	.117	3.19	.162	4.47	.117	3.19	"
	"	77								"		"	"			OUT		44	"	.130	3.52	.180	4.93	.130	3.52	"
	"	78								"		"	"				OUT	"	"	.143	3.85	.198	5.39	.143	3.85	"
	"	79	OUT							**		ű	"					"	"	.156	4.18	.216	5.85	.156	4.18	"
	"	80		OUT						**		u	"					"	и	.169	4.51	.234	6.31	.169	4.51	"
	ű	81			OUT					"		"	"					"	ű	.182	4.84	.252	6.78	.182	4.84	"
t <sub>PLH1</sub>	"	82								"	OUT	u	u					"	"	.013	0.55	.018	0.77	.013	0.55	"
	"	83							OUT	"		u	u					44	"	.052	1.54	.072	2.15	.052	1.54	"
	ű	84					OUT			"		ű	"					"	"	.065	1.87	.090	2.62	.065	1.87	"
	"	85				OUT				"		"	"					"	"	.078	2.20	.108	3.08	.078	2.20	"
	ű	86						OUT		**		ű	er .					"	"	.091	2.53	.126	3.54	.091	2.53	"
	"	87								"					OUT				"	.104	2.86	.144	4.00	.104	2.86	
		88								-		"	"	OUT				"	"	.117	3.19	.162	4.47	.117	3.19	"
	"	89										"	"			OUT		"	"	.130	3.52	.180	4.93	.130	3.52	
		90															OUT			.143	3.85	.198	5.39	.143	3.85	
	"	91	OUT							"		"	"					"	"	.156	4.18	.216	5.85	.156	4.18	"
		92		OUT						"		"						"	"	.169	4.51	.234	6.31	.169	4.51	"
<u> </u>		93			OUT					**		"						"		.182	4.84	.252	6.78	.182	4.84	
$t_{PHL2}$		94	OUT	OUT	**	OUT	OUT	OUT	OUT		OUT	"	IN	OUT	OUT	OUT	OUT	**	RESET TO	13	450	18	630	13	450	ns
			"		"						"					"			OUTPUT							1
t <sub>THL</sub>	3004	95		"		"	"	"	"	"		u	GND	"	"		"	"	OUTPUT	10	200	14	280	10	280	ns
$t_{TLH}$	3004	96	u	"	"	"	u	ii.	"	ii.	u	ű	GND	u	ű	"	ee .	"	OUTPUT	10	200	14	280	10	280	ns

TABLE III. Group A inspection for device type 54.

Symbol	MIL-	Cases								Terr	ninal co	onditions 1	/						Measured			L	imits			Unit
	STD- 883	E,F, N, Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		roup 1 : 25°C	Subgr	roup 2 125°C	Subgr		
	method	Test no.	1 OUT	0 OUT	2 OUT	5 OUT	6 OUT	NC	3 OUT	V <sub>SS</sub>	NC	7 OUT	4 OUT	CARRY OUT	CLOCK ENABLE		RESET	$V_{DD}$		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub> (POS)		1													1 mA	1 mA	1 mA	GND	EACH INPUT		1.5					V
V <sub>IC</sub> (NEG)		2								GND					-1 mA	-1 mA	-1 mA		EACH INPUT		-6.0					V
I <sub>IL1</sub> 2/	3009	3								u					GND	GND	GND	18.0V	ALL INPUTS TOGETHER		-300.0					nA
I <sub>IL2</sub>	3009	4								и					GND	GND	GND	"	EACH INPUT		-100.0		-100.0			и
I <sub>IH1</sub>	3010	5								и					18.0V	18.0V	18.0V	и	ALL INPUTS TOGETHER		300.0					и
I <sub>IH2</sub>	3010	6								и					18.0V	18.0V	18.0V	и	EACH INPUT		100.0		100.0			и
I <sub>OL</sub>		7	<u>4</u> /		<u>4</u> /	u		<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	EACH OUTPUT	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	mA				
I <sub>OH</sub>		8	er.	"	u	u	"		"	"		u	и	и	и	и	и	"	ű	"	ii.	u	ű.	"	u	mA
$V_{OL}$	3007	9	"	"	"	u	"		"	"		u	íí.	и	u	и	и	"	ű	и	"	"	es .	и	u	V
V <sub>OH</sub>	3006	10	"	"	"	"	u		u	"		и	и	"	ű	u	u	"	u	"	"	"	"	u	"	"
V <sub>IL</sub>		11	и	ш	"	и	и		ee	"			и	u	ee	и	и	u	EACH INPUT		"	"	66	ш	"	и
V <sub>IH</sub>		12	ű	"	ű	"	"		и	"		и	"	u	ű	и	и	"	EACH INPUT	66	"	ű	ec	44	и	и
Iss <u>5</u> /	3005 « « « « « « « « « « « « « « « « « « «	13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28								44 44 44 44 44 44 44 44 44 44 44 44 44					GND	GND GND 18.0V GND 18.0V GND 18.0V GND 18.0V GND 18.0V GND 18.0V 18.0V	18.0V GND " " " " " " " " " " " " " " " " " " "	18.0V	V <sub>SS</sub> V <sub>SS</sub> None V <sub>SS</sub>		-0.5	-5.C				μΑ « « « « « « « « « « « « « « « « « « «

TABLE III. Group A inspection for device type 54 – Continued.

Symbol	MIL-	Cases								Tern	ninal co	onditions 1	/						Measured			L	imits			Uni
,	STD-	E,F,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	terminal		group 4	_				1
	883 method	Z,N	1 OUT	0 OLIT	2 OLIT	E OUT	6 OUT	NC	3 OUT	1/	NC	7 OUT	4 OUT	CARRY	CLOCK	CLOCK	RESET	\/		T <sub>C</sub> =	25°C Max	Min	Max	Min	Max	-
	memou	Test no.	1001	0 001	2 001	5 001	6 001	INC	3 001	$V_{SS}$	NC	7 001	4 001	OUT	ENABLE		KESEI	$V_{DD}$		IVIII	IVIAX	IVIII	IVIAX	IVIIII	Max	
C <sub>13.</sub> /	3012	29								GND					IN	IN	IN	GND	EACH INPUT		12					рF
																		•			roup 7			roup 8		
																					25°C		125°C	T <sub>C</sub> = -		
T414	2044	20								OND		1			OND	5 OV /	5 OV /	5 OV /	EAGL	Min	Max	Min	Max	Min	Max	╄
Truth table	3014	30 31	L	H	L	L	L		L	GND "			L	H	GND "	5.0V 5.0V	5.0V GND	5.0V	EACH OUTPUT							
test <u>5</u> /	"	32	H	L	ΙĒ	Ĺ	ΙĒ		Ĺ	"		ΙĒ	ΙĒ	Н.	u	PA	"	"	0011 01							
_	"	33	L	L	Н	L	L	_	L	"	L	L	L	Н	и	"	"	"	"							
	"	34	L	L	L	L	L		Н	"		L	L	Н	"	u	"	"	"							
	"	35	L	L	Ļ	L	L		L	"		l F	Н	Ļ	"	"	"	"	"							
	"	36 37	L	L L	L	H	L H		L	"		L	L	L	u	"	"	и	66							
	u	38	Ē	Ĺ	ΙĒ	Ĺ	Ë		Ĺ	"		Ь	ΙĒ	ΙĒ	u	"	"	u	44							
	"	39	L	H	L	L	L		L	"		L	L	Н	"	и	и	"	66							
	"	40	Н	L	L	L	L		L	"		L	L	Н	"	"	u	"	44							
	"	41	Н	L	Ŀ	L	L		L	"		L	L	H	5.0V	5.0V	"	"	44							
	"	42 43	H	L L	L	L	L		L	"		L	L L	H H	5.0V 5.0V	GND 5.0V	"	"	44							
	"	44	ï	Ĺ	H	Ĺ	[		Ĺ	"		l i	Ĺ	Н	GND	5.0V	"	ш	66							
	"	45	X	X	X	X	X		X	"		X	X	X	"	PB	"	u	44							
	"	46	L	L	L	L	L		L	"		L	Н	L	"	5.0V	"	u	u							
	"	47	Ļ	L	Ŀ	Ŀ	Ŀ		L	"		L	H	L.	и	GND	- 0) /	"	"							
	"	48 49	L	H	L	L	L		L	"		L	L L	H H	"	GND GND	5.0V GND	"	"							
	"	50	Н	L	l	Ĺ	[		Ĺ	"		l i	Ĺ	H	и	5.0V	GND "	ш	66							
	"	51	X	X	X	X	X		X	"		X	X	X	u	PC	"	u	44							
	"	52	L	L	L	L	L		L	"		L	Н	L	"	5.0V	u	u	"							
	"	53	Ļ	Н	Ŀ	Ŀ	Ŀ		L	"		L	L	H	"	5.0V	5.0V	"	"							
	-	54	L	Н	L	<u> </u>	L		L	-		<u> </u>	L	Н	-	5.0V	GND		-	Cuba	roup 9	Cubar	oup 10	Subgro	oup 11	+
																					: 25°C		125°C	$T_C = -$		
																					Max	Min	Max	Min	Max	1
t <sub>PHL1 6</sub> /	3003	55								GND				OUT	GND	IN	GND	5.0V	CLOCK TO	.013	.829	.018	1.16	.013	.829	μS
t <sub>PHL1</sub>	"	56	OUT	OUT	OUT	OUT	OUT		OUT	"		OUT	OUT	07:-	"	u	"	"	OUTPUT	.013	1.00	.018	1.40	.013	1.00	"
t <sub>PLH1</sub>	"	57 50	OUT	OUT	OUT	OUT	OUT		OUT	"		OUT	OUT	OUT	"	"	GND "	"	CLOCK TO	.013	.829	.018	1.16	.013	.829	"
t <sub>PLH1</sub>	и	58 59	OUT	OUT	OUT	OUT	OUT		OUT	и		OUT	OUT		"	и	IN	u	OUTPUT RESET TO	.013	1.00	.018	1.40 1.40	.013	1.00	ш
t <sub>PLH2</sub> t <sub>PLH2</sub>	"	60								u				OUT	"	"	"	"	OUTPUT	.013	0.80	.018	1.12	.013	0.80	"
t <sub>PHL2</sub>	"	61	OOH	Г	OUT	OUT	OUT		OUT	u		OUT	OUT		и	u	IN	44	RESET TO	.013	1.00	.18	1.40	.013	1.00	u
																			OUTPUT							<u> </u>
t <sub>THL</sub>	3004	62	O. :-	Q1 :=					O. :-				0::-	OUT	"	"	GND	"	OUTPUT	10	200	14	280	10	200	ns
t <sub>THL</sub>	"	63	OUT	OUT	OUT	OUT	OUT		OUT	u		OUT	OUT	OUT.	u	u	CNID.	"	OUTPUT	10	200	14	280	10	200	ns
t <sub>тьн</sub> t <sub>тгн</sub>	"	64 65	OUT	OUT	OUT	OUT	OUT		OUT	"		OUT	OUT	OUT	"	"	GND "	"	OUTPUT OUTPUT	10 10	360 360	14 14	504 504	10 10	360 360	ns ns
t <sub>SHL</sub>	"	66	001	001	001	001	001		001	и		- 501	501	OUT	IN	"	"	u	CLOCK	10	500	1**	JU <del>4</del>	10	500	ns
-OIIL																			ENABLE							
							l					_							TO CLOCK	25		350		250		
t <sub>SHL1</sub>	"	67	OUT	OUT	OUT	OUT	OUT		OUT	"		OUT	OUT		IN	"	"	u	CLOCK		250		350		250	ns
																			ENABLE TO CLOCK							
	u	68	OUT	OUT		<del>                                     </del>	<b> </b>			и		<del>                                     </del>			GND	и	IN	и	RESET TO				560		400	ns
t <sub>SHL2</sub>																									700	1 113

TABLE III. Group A inspection for device type 55.

Symbol	MIL-STD-	Cases						Term	inal con	ditions	1/						Measured			Lim	nits			Unit
	883 method	A,B,C,D T,X,Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14	terminal	Subgr		Subgr T <sub>C</sub> = 1		Subgr T <sub>C</sub> = -		
		Test no.	CLOCK	RESET	Q7	Q6	Q5	Q4	V <sub>SS</sub>	NC	Q3	NC	Q2	Q1	NC	$V_{DD}$		Min	Max	Min	Max	Min	Max	
V <sub>IC</sub> (POS)		1	1 mA	1 mA												GND	EACH INPUT		1.5					V
V <sub>IC</sub> (NEG)		2	-1 mA	-1 mA					GND								EACH INPUT		-6.0					V
I <sub>IL</sub> <u>2</u> / I <sub>IL</sub>	3009 3009	3 4	GND GND	GND GND					"							18.0V "	CLOCK RESET		-100.0		-100.0 -100.0			nA "
I <sub>IH</sub>	3010 3010	5 6	18.0V GND	GND 18.0V					"							u	CLOCK RESET	-100	100.0		100.0 100.0			"
I <sub>OL</sub>		7	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	"		<u>4</u> /		<u>4</u> /	<u>4</u> /		<u>4</u> /	EACH OUTPUT	<u>4</u> 100	_	<u>4</u> /	<u>4</u> /	<u>4</u> /	<u>4</u> /	mA
I <sub>OH</sub>		8	íí.	ű.	íí.	ű	ű	"	"		и		íí.	"		ű	"	ii .	"	íí	u	"	"	mA
$V_{OL}$	3007	9	u	u	íí.	u	u	"	"		u		íí.	"		u	66	es .	u	í,	u	"	и	V
$V_{OH}$	3006	10	ű	ű	íí.	ű	и	"	"		u		"	"		ű	ű	es .	u	ű	u	"	"	u
V <sub>IL</sub>		11	и	ш	"	ű	"	44	ш		44		"	ш		ű	EACH INPUT	ű	"	и	и	"	"	ш
V <sub>IH</sub>		12	и	ш	ű	и	"	"	ш		ш		ű	ш		и	EACH INPUT	ű	"	и	и	и	66	ш
I <sub>SS</sub> <u>5</u> /	3005	13 14	GND GND	18.0V GND					"							18.0V	V <sub>SS</sub> V <sub>SS</sub>		-0.5		и			μ <b>A</b> "
	u	15	PI	u					"							u	None		"	-5.0	u			"
	"	16	18.0V	"					"							"	Vss		"	0.0	"			"
	u	17	GND	"												"	None		"		"			"
	"	18 19	PI	"					"							"	None		"		"			"
		19	GND									1			1		$V_{SS}$	0 1						<del></del>
																		Subgr T <sub>C</sub> =	25°C					
L						1	1	1		1	1	1			1			Min	Max					<u> </u>
C <sub>i</sub> <u>3</u> /	3012	20	IN	IN					GND							GND	EACH INPUT		12					pF

TABLE III. Group A inspection for device type 55 – Continued.

Symbol	MIL-STD-	Cases						Term	inal cond	ditions	1/						Measured			Lin	nits			Unit
Cy	883	A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	terminal	Subgr	oup 7			oup 8		1 0
	method	T,X,Y					_	_		_	_							T <sub>C</sub> =		T <sub>C</sub> = 1	125°C	T <sub>C</sub> = -	55°C	1
		Test no.	CLOCK	RESET	Q7	Q6	Q5	Q4	Vss	NC	Q3	NC	Q2	Q1	NC	$V_{DD}$	ĺ	Min	Max	Min	Max	Min	Max	1
Truth	3014	21	GND	5.0V	L	L	L	L	GND					L			EACH							
table	"	22	GND	GND	L	L	L	L	er .		L		L	L		"	OUTPUT							
test <u>5</u> /	и	23	5.0V	"	L	L	L	L	"		L		L	L	5.0\	, "	66							
	"	24	GND	"	L	L	L	L	"	L	L	L	L	Н		"	"							
	u	25	5.0V	44	L L	Ŀ	Ŀ	Ļ	"		L.		L	H		"	"							
	"	26	GND	"	Ļ	L	Ļ	L	"		L		Н	L		"	"							
	"	27 28	5.0V GND	"	L	L	L	-	"		L		H	L H		"	"							
	и	26 29	5.0V	"			L	Ļ	"				H	Н		"	66							
	u	30	GND	"	L	[	ΙĒ		"		Ь		l ¦	l 'i'		"	"							
	u	31	PC	"	X	X	X	X	"		X		X	X		"	44							
	u	32	5.0V	"	Ĺ	Ê	Ĺ	Ĺ	"		Ĥ		Ĥ	Ĥ		"	"							
	u	33	GND	"	L	Ĺ	Ĺ	H	"		Ĺ		Ĺ	Ĺ		"	"							
	u	34	PF	"	Х	Х	Х	X	"		Х		Х	Х		"	ű							
	u	35	5.0V	"	L	L	L	Н	"		Н		Н	Н		"	"							
	u	36	GND	"	L	L	Н	L	"		L		L	L		"	66							
		37	PG	u	Х	Х	Х	X	"		X		Х	X		"	"							
	"	38	5.0V	u	L L	L L	H	H	"		H		H	H		"	"							
	u	39	GND	"	L	Н	L	L	"		L		L	L		"	"							
	"	40 41	PH 5.0V	"	X L	X H	X H	X	"		X H		X H	X H		"	"							
	u	41	GND	"	Ь		L	H L	"		L			L		"	"							
	u	43	PJ	"	X	X	X	X	"		X		X	X		"	u							
	u	44	5.0V	"	Ĥ	Ĥ	Ĥ	ΙĤ	"		ΙĤ		ΙĤ	ΙĤ		и	"							
	u	45	GND	"	L L	L L	Ë	L L	"		Ë		L ::	Ë		u	66							
	u	46	PI	"	X	X	X	X	"		X		X	x		"	"							
	u	47	GND	"	L	Н	L	Н	"		L		Н	L		"	ű							
	u	48	GND	5.0V	L	L	L	L	"		L		L	L		"	"							
	u	49	GND	GND	L	L	L	L	"		L		L	L		"	66							
	"	50	PK	GND	X	Х	Х	X	"		X		Х	X		"	"							
	"	51	GND	GND	Н	L	Н	L	"		H		L	H		"	"							
	"	52	GND	5.0V	L L	Ŀ	Ŀ	Ļ	"		L.		Ŀ	L.		"	"							
	-	53	GND	GND	L	L	L	L	-		L	Į	L	L				0		Cultura	10	C. da ann	11	
																		Subgr			oup 10 125°C	Subgro		
																		Min	Max	Min	Max	Min	Max	1
t <sub>PHL1</sub> <u>6</u> /	3003	54	IN	GND					GND					OUT		5.0V	CLOCK TO	.013	0.35	.018	0.49	.013	0.35	μS
4PHL1 <u>9</u> /	"	55	"	"					"				OUT			# "	OUTPUT	.026	0.55	.036	0.77	.026	0.55	"
	u	56	"	"					"		OUT		-5.			"		.039	0.75	.054	1.05	.039	0.75	"
	u	57	"	"				OUT	"							"	66	.052	0.95	.072	1.33	.052	0.95	"
	и	58	"	ű			OUT		ű							"	"	.065	1.15	.090	1.61	.065	1.15	"
	ш	59	"	"		OUT			"							"	66	.078	1.35	.108	1.89	.078	1.35	"
	u	60	"	ű	OUT				ű							и		.091	1.55	.126	2.17	.091	1.55	"
t <sub>PLH1</sub>	"	61		"					"					OUT		"	"	.013	0.35	.018	0.49	.013	0.35	"
	"	62		"									OUT				"	.026	0.55	.036	0.77	.026	0.55	
	"	63	"	"				01.1-	u		OUT					"	"	.039	0.75	.054	1.05	.039	0.75	"
	"	64 65	"	u			OUT	OUT	"							"	"	.052	0.95	.072	1.33	.052	0.95	"
	u	65 66	"	"		OUT	OUT		"							"	44	.065 .078	1.15 1.35	.090	1.61 1.89	.065 .078	1.15 1.35	"
	"	67	"	u	OUT	001			"							"	ű	.078	1.55	.108	2.17	.078	1.55	"
toure	"	68	"	IN	OUT	OUT	OUT	OUT	u				OUT	OUT		и	RESET TO	13	350	18	490	13	350	ns
t <sub>PHL2</sub>		00		IIN	001	001	501	001					001	001			OUTPUT	13	330	10	490	13	330	113
t <sub>THL</sub>	3004	69	"	GND	"	"	"	и	"	OU.	"			"		и	OUTPUT	10	200	14	280	10	200	ns
t <sub>TI H</sub>	3004	70	"	GND	"	u	"	и	u	- 00	"			"		"	OUTPUT	10	200	14	280	10	200	ns
чтьн	J00 <del>-</del>	70	1	CIVID		l		l			l	l	l	l	l	l	5011.01	10	200	17	200	10	200	113

See footnotes on next page.

- 1/ Pins not designated may be high-level logic, low-level logic, or open. Exceptions are as follows:
  - a.  $V_{IC}(POS)$  tests, the  $V_{SS}$  terminal shall be open.
  - b.  $V_{IC}(NEG)$  tests, the  $V_{DD}$  terminal shall be open.
  - c. I<sub>SS</sub> tests, the output terminal shall be open.
- 2/ The device manufacturer may, at his option, measure I<sub>IL</sub> and I<sub>IH</sub> at 25°C for each individual input or measure all inputs together.
- 3/ See 4.4.1c for  $C_i$  measurement.
- 4/ Procedures for input/output tests of the device parameters specified below are described in figures 4, 5, 6, and 7. Included with the specified parameters are test conditions and test limits at three temperatures. These tests shall be performed at each specified V<sub>DD</sub> voltage at the specified conditions. V<sub>IL</sub>/V<sub>IH</sub> test maybe performed as final attributes data.

Symbol	Parameter	$V_{DD}$	Conditions			Lin	nits			Unit
		(V dc)		$T_C = -$	-55°C	$T_C =$	25°C	$T_C = $	125°C	
				Min	Max	Min	Max	Min	Max	
$V_{OL}$	Low-level	15	$V_I = V_{SS}$ or $V_{DD}$				0.05		0.05	V
	output voltage		I <sub>O</sub>   ≤ 1 μA							
V <sub>OH</sub>	High-level	15	$V_I = V_{SS}$ or $V_{DD}$	14.95		14.95		14.95		V
	output voltage		I <sub>O</sub>   ≤ 1 μA	0.03						
$V_{IL}$	Input low	5	$V_0 = 0.5 \text{ V or } 4.5 \text{ V}$	1.5						
	voltage	10	$V_0 = 1.0 \text{ V or } 9.0 \text{ V}$	3.0		3.0		3.0		
		15	$V_0 = 1.5 \text{ V or } 13.5 \text{ V}$	4.0		4.0		4.0		
			I <sub>O</sub>   ≤ 1 μA		1.5		1.5		V	
V <sub>IH</sub>	Input high	5	$V_0 = 0.5 \text{ V or } 4.5 \text{ V}$							V
	voltage	10	$V_0 = 1.0 \text{ V or } 9.0 \text{ V}$		7.0		7.0		7.0	
		15	$V_0 = 1.5 \text{ V or } 13.5 \text{ V}$	0.5	11.0		11.0		11.0	
			I <sub>O</sub>   ≤ 1 μA	3.5		3.5		3.5		
I <sub>OL</sub>	Output low	5	$V_0 = 0.4 V$ ,	0.64						
	(sink) current		$V_1 = 0 \text{ or } 5 \text{ V}$							
		15	$V_0 = 1.5 V$ ,	4.2	0.51	3.4	0.36	2.4	mA	
			V <sub>I</sub> = 0 or 15 V		0.51		0.50		IIIA	
I <sub>OH</sub>	Output high	5	$V_0 = 4.6 V$ ,	-0.64						
	(source) current		$V_1 = 0 \text{ or } 5 \text{ V}$							
		15	$V_0 = 13.5 V$ ,	-4.2	-0.51	-3.4	-0.36	3 -2.4	mA	
			$V_1 = 0 \text{ or } 15 \text{ V}$		0.0	-	0.00		IIIA	

- This I<sub>SS</sub> and truth table tests shall be performed in the test number sequence shown with no intervening changes to terminal conditions. The truth table tests shall be performed with  $V_{IH}$  and  $V_{DD} \le 5.0$  V and  $\ge 18.0$  V. Table III shows the lower of these two voltages. During the functional test, input terminals designated "PA", "PB", etc., shall have applied thereto a specified number of single pulses with the following parameters: Pulse amplitude =  $V_{DD}$  maximum to  $V_{DD}$  = 4% minimum. These pulses are enumerated as follows:

Symbol	<u>Pulses</u>	<u>Symbol</u>	<u>Pulses</u>	<u>Symbol</u>	<u>Pulses</u>	Symbol	<u>Pulses</u>
PA	1	PF	7	PK	85	PS	2047
PB	2	PG	15	PL	127	PT	4095
PC	3	PH	31	PM	255	PU	5461
PD	4	PI	42	PN	511	PV	8191
PE	5	PJ	63	PR	1023	PY	10922

Also during the truth table tests, device output voltages are: don't care "X", high "H", and low "L" as specified in the terminal conditions columns. The output voltage limits over the specified temperature range are "H" = V<sub>DD</sub> –0.50 V minimum and "L" = V<sub>SS</sub> +0.50 V maximum.

- See figure 8 for switching time waveforms and test circuit.
- Data pin need only be toggled high or low to allow outputs to achieve the proper setup state required to verify the indicated test parameter.

- 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.
- 4.4.5 <u>Group E inspection</u>. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.7 herein). RHA levels for device classes B and S shall be as specified in MIL-PRF-38535 and 4.5.4 herein.
  - 4.5 Methods of inspection. Methods of inspection shall be specified and as follows:
- 4.5.1 <u>Voltage and current.</u> Unless otherwise specified, all voltages given are referenced to the microcircuit V<sub>SS</sub> terminal. Currents given are conventional current and positive when flowing into the referenced terminal.
- 4.5.2 <u>Burn-in and life test cool down procedures</u>. When the burn-in and life tests are completed and prior to removal of bias voltages, the devices under test (DUT) shall be cooled to a temperature of  $25^{\circ}$ C  $\pm 3^{\circ}$ C; then, electrical parameter endpoint measurements shall be performed.

				Device types		
Parameter <u>1</u> /	$V_{DD}$	01	02	03	04	05
I <sub>SS</sub>	15 V	±125 nA	±125 nA	±250 nA	±125 nA	±125 nA
V <sub>OL1</sub>	5 V	±0.04 V	±0.04 V	±0.04 V	±0.04 V	±0.04 V
V <sub>OH1</sub>	5 V	±0.08 V	±0.08 V	±0.08 V	±0.08 V	±0.08 V

TABLE IV. Delta limits at 25°C.

				Device types		
Parameter <u>1</u> /	$V_{DD}$	51	52	53	54	55
I <sub>SS</sub>	18 V	±125 nA	±125 nA	±250 nA	±125 nA	±125 nA
I <sub>OL</sub>	5 V	±15%	±15%	±15%	±15%	±15%
Іон	5 V	±15%	±15%	±15%	±15%	±15%

- $\underline{1}$ / Each of the above parameters shall be recorded before and after the required burn-in and life tests to determine delta ( $\Delta$ ).
- 4.5.3 Quiescent supply current (I<sub>SS</sub> test). When performing quiescent supply current measurements (I<sub>SS</sub>), the meter shall be placed so that all currents flow through the meter.
- 4.5.4 <u>Radiation hardness assurance (RHA) testing</u>. The RHA testing shall be performed in accordance with test procedures and sampling specified in MIL-PRF-38535 and herein.
  - a. Before irradiation, selected samples shall be assembled in qualified packages and pass the governing electrical parameters (group A subgroup 1 at 25°C) and also be subjected to the threshold-voltage test in table VII in order to calculate the delta threshold ( $\Delta V_T$ ) after irradiation.
  - b. The devices shall be subjected to a total radiation dose as specified in MIL-PRF-38535 for the radiation hardness assurance level being tested, and meet the end-point electrical parameters as defined in table V at 25°C, after exposure. The start and completion of the end-point electrical parameter measurements shall not exceed 2 hours following irradiation.
  - c. Threshold-voltage test circuit conditions shall be as specified in table VII and on figure 9. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VI and the bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.
  - d. After irradiation, the devices shall pass the truth table test as specified in subgroup 7 in table III or if subgroup 7 is not required, then an equivalent truth table test shall be performed.

TABLE V. Radiation hardened end-point electrical parameters at 25°C.

Parameter	Test limits (All device types)	,	$V_{DD}$
		Devi	ce types
		01-05	51-55
$V_{TN}$	0.3 V min	10 V	10 V
$V_{TP}$	2.8 V max	10 V	10 V
$\Delta V_{T}$	1.4 V max	10 V	10 V
I <sub>SS</sub>	100 x max limit	15 V	18 V
t <sub>PLH</sub>	1.35 x max limit	5 V	5 V
t <sub>PHL</sub>	1.35 x max limit	5 V	5 V

TABLE VI. Bias during exposure to radiation.

Device type	Pin connect	tions <u>1</u> /	
	$V_{DD}$ = 10 V dc (through a 30 kΩ to 60 kΩ resistor)	V <sub>SS</sub> = GND	$V_{DD}$ = 10 V dc
01, 51	13, 14, 15	8	16
02, 52	1, 2, 3, 7, 9, 10, 12, 14, 15	8	16
03, 53	10, 11	8	16
04, 54	13, 14, 15	8	16
05, 55	1, 2	7	14

 $<sup>\</sup>underline{1}/$  Pins not designated are open, or tied to 10 V dc through a 30 k $\Omega$  to 60 k $\Omega$  resistor.

# 5. PACKAGING

5.1 <u>Packaging</u>. For acquisition purposes, the packaging requirements are as specified in the contract or order (see 6.2). When 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 Department or Defense Agency, or within the military service's system commands. 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.

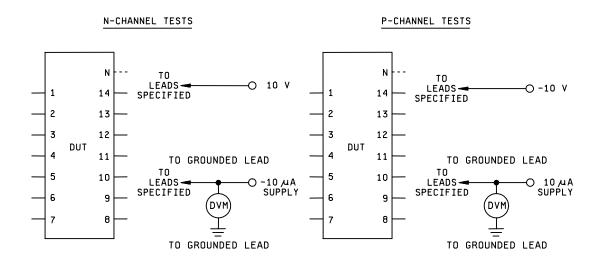


FIGURE 9. Threshold-voltage test circuit.

TABLE VII. Threshold-voltage test circuit conditions.

Device	GND	10 V	V <sub>TN</sub> measured at	GND	-10 V	V <sub>TP</sub> measured at
type			-10 μA supply			10 μA supply
01, 51	15	16	8, 13, 14	15	8	13, 14, 16
02, 52	15	16	1, 2, 3, 7-10, 12, 14	15	1, 2, 3, 7-10, 12,	16
					14	
03, 53	10	8, 11	8, 11	11	16	16
04, 54	14	13, 15, 16	8	14	8, 13, 15	16
05, 55	1	14	2, 7	1	2, 7	14

#### 6. NOTES

(This section contains information of a general or explanatory nature that 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.
    - PIN and compliance identifier, if applicable (see 1.2).
    - c. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
    - d. Requirements for certificate of compliance, if applicable.
    - e. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.
    - f. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.
    - g. Requirements for product assurance and radiation hardness assurance options.
    - h. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements should not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
    - i. Requirements for "JAN" marking.
    - j. Packaging requirements. (see 5.1)
- 6.3 <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 contractors parts lists.
- 6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, P.O. Box 3990, Columbus, Ohio 43218-3990.
- 6.5 <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:

C <sub>I</sub>	Input terminal-to-GND capacitance.
GND	
T <sub>A</sub>	Free air temperature.
V <sub>IC</sub> (pos)	Positive clamping input to V <sub>DD</sub>
V <sub>IC</sub> (neg)	Negative clamping input to V <sub>SS</sub> .
V <sub>ICL</sub>	Clock input voltage.
V <sub>DD</sub>	Positive supply voltage.
V <sub>SS</sub>	Negative supply voltage.
I <sub>SS</sub>	Quiescent supply current.

- 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 S for National Aeronautics and Space Administration or class B for Department of Defense (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.
- 6.7 <u>Data reporting</u>. When specified in the purchase order or contract, a copy of the following data, as applicable, will be supplied.
  - a. Attributes data for all screening tests (see 4.2) and variables data for all static burn-in, dynamic burn-in, and steady-state life tests (see 3.6).
  - b. A copy of each radiograph.
  - c. The technology conformance inspection (TCI) data (see 4.4).
  - d. Parameter distribution data on parameters evaluated during burn-in (see 3.6).
  - e. Final electrical parameters data (see 4.2d).
  - f. RHA delta limits.

6.8 <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, post irradiation performance or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

Military device	Generic-industry
type	type
01	4017A
02	4018A
03	4020A
04	4022A
05	4024A
51	4017B
52	4018B
53	4020B
54	4022B
55	4024B

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 extent of the changes.

Custodians:

Army - CR

Navy - EC

Air Force - 11

DLA - CC

Preparing activity: DLA - CC

(Project 5962-2067)

Review activities:

Army - MI, SM

Navy - AS, CG, MC, SH, TD

Air Force - 03, 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil</a>.