

QUALIFICATION
REQUIREMENTS
REMOVED

MIL-M-38510/160A
9 August 1983
SUPERSEDING
MIL-M-38510/160(USAF)
27 February 1976

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, TTL, ADDRESSABLE LATCHES,
MONOLITHIC SILICON

INACTIVE FOR NEW DESIGN AFTER DATE OF THIS REVISION

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

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, TTL, addressable latch microcircuits. One product assurance class and a choice of case outlines and lead finishes are provided and are reflected in the complete part number.

1.2 Part number. The complete part number shall be in accordance with MIL-M-38510, except the "JAN" or "J" certification shall not be used.

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

<u>Device type</u>	<u>Circuit</u>
01	8-bit addressable latch

1.2.2 Device class. The device class shall be the product assurance level as defined in MIL-M-38510.

1.2.3 Case outline. The case outline shall be designated as follows:

<u>Outline letter</u>	<u>Case outline (see MIL-M-38510, appendix C)</u>
E	D-2 (16-lead, 1/4" x 7/8"), dual-in-line package
F	F-5 (16-lead, 1/4" x 3/8"), flat package

1.3 Absolute maximum ratings.

Supply voltage range	- - - - -	-0.5 V dc to +7.0 V dc
Input voltage range	- - - - -	-1.5 V dc at -12 mA to +5.5 V dc
Storage temperature range	- - - - -	-65°C to +150°C
Maximum power dissipation, (P _D) 1/	- - - - -	473 mW dc
Lead temperature (soldering, 10 seconds)	- - - - -	+300°C
Thermal resistance, junction-to-case (θ _{JC}):		
Case E	- - - - -	0.08°C/mW
Case F	- - - - -	0.09°C/mW
Junction temperature (T _J)	- - - - -	+175°C

1/ Must withstand the added P_D due to short circuit test (e.g., I_{OS}).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Rome Air Development Center (RBE-2), Griffiss AFB, NY 13441, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

1.4 Recommended operating conditions.

Supply voltage range (V_{CC}) - - - - -	+4.5 V dc minimum to +5.5 V dc maximum
Minimum high-level input voltage (V_{IH}) -	+2.0 V dc
Maximum low-level input voltage (V_{IL}) -	+0.8 V dc
Case operating temperature range (T_C) -	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specifications and standards. Unless otherwise specified, the following specifications and standards, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Detail specification. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Case outlines. The case outlines shall be as specified in MIL-M-38510, and in 1.2.3 herein.

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

3.2.3 Truth tables. The truth tables shall be as specified on figure 2.

3.2.4 Logic diagram. The logic diagram shall be as specified on figure 3.

3.3 Lead material and finish. The lead material and finish shall be in accordance with MIL-M-38510 (see 6.5).

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

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

3.6 Marking. Marking shall be in accordance with MIL-M-38510 and 1.2 herein. At the option of the manufacturer, marking of the country of origin may be omitted from the body of the microcircuit, but shall be retained on the initial container. The "JAN" or "J" certification mark shall not be used.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions	Limits		
			Min	Max	Unit
High-level output voltage	V_{OH}	$V_{CC} = 4.5 \text{ Vdc};$ $I_{OH} = -720 \text{ } \mu\text{A}$	2.4		Volts
Low-level output voltage	V_{OL}	$V_{CC} = 4.5 \text{ V};$ $I_{OL} = 9.6 \text{ mA}$		0.4	Volts
Input clamp voltage	V_{IC}	$V_{CC} = 4.5 \text{ V}; I_{IN} = -12 \text{ mA}$		-1.5	Volts
Low-level input current all inputs except $\bar{E}$	I_{IL1}	$V_{CC} = 5.5 \text{ V}; V_{IN} = 0.4 \text{ V}$	-0.7	-1.6	mA
Low-level input current, $\bar{E}$	I_{IL2}	$V_{CC} = 5.5 \text{ V}; V_{IN} = 0.4 \text{ V}$	-1.05	-2.4	mA
High-level input current, all inputs except $\bar{E}$	I_{IH1}	$V_{CC} = 5.5 \text{ V}; V_{IN} = 2.4 \text{ V}$		40	μA
High-level input current, $\bar{E}$	I_{IH2}	$V_{CC} = 5.5 \text{ V}; V_{IN} = 2.4 \text{ V}$		60	μA
High-level input current, all inputs except $\bar{E}$	I_{IH3}	$V_{CC} = 5.5 \text{ V}; V_{IN} = 5.5 \text{ V}$		100	μA
High-level input current, $\bar{E}$	I_{IH4}	$V_{CC} = 5.5 \text{ V}; V_{IN} = 5.5 \text{ V}$		150	μA
Short-circuit output current	I_{OS}	$V_{CC} = 5.5 \text{ V } 1/$	-30	-100	mA
Supply current	I_{CC}	$V_{CC} = 5.5 \text{ V}$		86	mA
To high level, from address to output	t_{PLH1}	$C_L = 50 \text{ pF};$ $R_L = 530 \text{ ohms}$	10	50	ns
To low level, from address to output	t_{PHL1}		10	47	ns
To low level, from clear to output	t_{PHL2}		10	55	ns
To low level, from data to output	t_{PHL3}		6	40	ns
To high level, from data to output	t_{PLH3}		6	56	ns
To low level, from enable to output	t_{PHL4}		6	35	ns
To high level from enable to output	t_{PLH4}		6	39	ns

1/ All unspecified inputs grounded.

3.7 Manufacturer eligibility. To be eligible to supply microcircuits to this specification, a manufacturer shall have a manufacturer certification in accordance with MIL-M-38510 for at least one line, not necessarily the line producing the device type described herein.

3.8 Certification. Certification in accordance with MIL-M-38510 is not required for this device.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (see table III)
	Class B devices
Interim electrical parameters (pre burn-in) (method 5004)	1
Final electrical test parameters (method 5004)	1*,2,3,7,9
Group A test requirements (method 5005)	1,2,3,7,9,10,11
Groups C and D end-point electrical parameters (method 5005)	1,2,3
Additional electrical subgroups for group C periodic inspections	None

*PDA applies to subgroup 1 (see 4.2c).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and methods 5005 and 5007, as applicable, of MIL-STD-883, except as modified herein.

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

- a. Burn-in test (method 1015 of MIL-STD-883).
 - (1) Test condition D or E, using the circuit shown on figure 4, or equivalent.
 - (2) $T_A = +125^{\circ}\text{C}$ minimum.
- b. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.
- c. The percent defective allowable (PDA) for class B devices shall be 10 percent based on failures from group A, subgroup 1 test after cooldown as final electrical test in accordance with method 5004 of MIL-STD-883, and with no intervening electrical measurements. If interim electrical parameter tests are performed prior to burn-in, failures resulting from pre burn-in screening may be excluded from the PDA. If interim electrical parameter tests prior to burn-in are omitted, then all screening failures shall be included in the PDA. The verified failures of group A, subgroup 1, after burn-in divided by the total number of devices submitted for burn-in in that lot shall be used to determine the percent defective for that lot, and the lot shall be accepted or rejected based on the PDA for the applicable device class.

4.3 Qualification inspection. Qualification inspection is not required.

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510, and as specified herein. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4). Generic test data (see 6.6) may be used to satisfy the requirements for groups C and D inspections. Quality conformance inspection shall be completed on the specific devices covered by this specification before they are shipped.

4.4.1 Group A inspection. Group A inspection shall be in accordance with table I of method 5005 of MIL-STD-883 and as follows:

- a. Tests shall be as specified in table II herein.
- b. Subgroups 4, 5, 6, and 8 of table I of method 5005 of MIL-STD-883 shall be omitted.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II of method 5005 of MIL-STD-883. Electrical parameters shall be as specified in table II herein.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table III of method 5005 of MIL-STD-883 and as follows:

- a. End-point electrical test parameters shall be as specified in table II herein.
- b. Steady-state life test (method 1005 of MIL-STD-883) conditions:
 - (1) Test condition D or E, using the circuit shown on figure 4, or equivalent.
 - (2) $T_A = +125^\circ\text{C}$ minimum.
 - (3) Test duration: 1,000 hours, except as permitted by appendix B of MIL-M-38510.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical parameters shall be as specified in table II herein.

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

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

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging of microcircuits shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Notes. The notes specified in MIL-M-38510 are applicable to this specification.

6.2 Intended use. Microcircuits conforming to this specification are intended for logistic support of existing equipment.

Device type 01

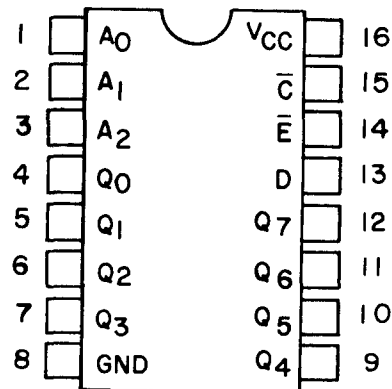
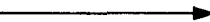


FIGURE 1. Terminal connections.

MODE SELECTION

$\bar{E}$	$\bar{C}$	MODE
L	H	Addressable latch
H	H	Memory
L	L	Active HIGH eight-channel demultiplexer
H	L	Clear

Device type 01

TRUTH TABLE						PRESENT OUTPUT STATES									MODE
$\bar{C}$	$\bar{E}$	D	A ₀	A ₁	A ₂	Q ₀	Q ₁	Q ₂	Q ₃	Q ₄	Q ₅	Q ₆	Q ₇		
L	H	X	X	X	X	L	L	L	L	L	L	L	L	CLEAR DEMULTIPLEX	
L	L	L	L	L	L	L	L	L	L	L	L	L	L		
L	L	H	L	L	L	H	L	L	L	L	L	L	L		
L	L	L	H	L	L	L	L	L	L	L	L	L	L		
L	L	H	H	L	L	L	H	L	L	L	L	L	L		
.	.	.	.	.	.				.						
L	L	H	H	H	H	L	L	L	L	L	L	L	H		
H	H	X	X	X	X	Q_{N-1}								MEMORY	
H	L	L	L	L	L	L	Q_{N-1}	Q_{N-1}	Q_{N-1}					ADDRESSABLE LATCH	
H	L	H	L	L	L	H	Q_{N-1}	Q_{N-1}							
H	L	L	H	L	L	Q_{N-1}	L	Q_{N-1}							
H	L	H	H	L	L	Q_{N-1}	H	Q_{N-1}							
.	.	.	.	.	.			.							
H	L	L	H	H	H	Q_{N-1}					Q_{N-1}	L			
H	L	H	H	H	H	Q_{N-1}					Q_{N-1}	H			

X = Don't care condition
 L = LOW voltage level
 H = HIGH voltage level
 Q_{N-1} = Previous output state

FIGURE 2. Truth table.

Device type 01

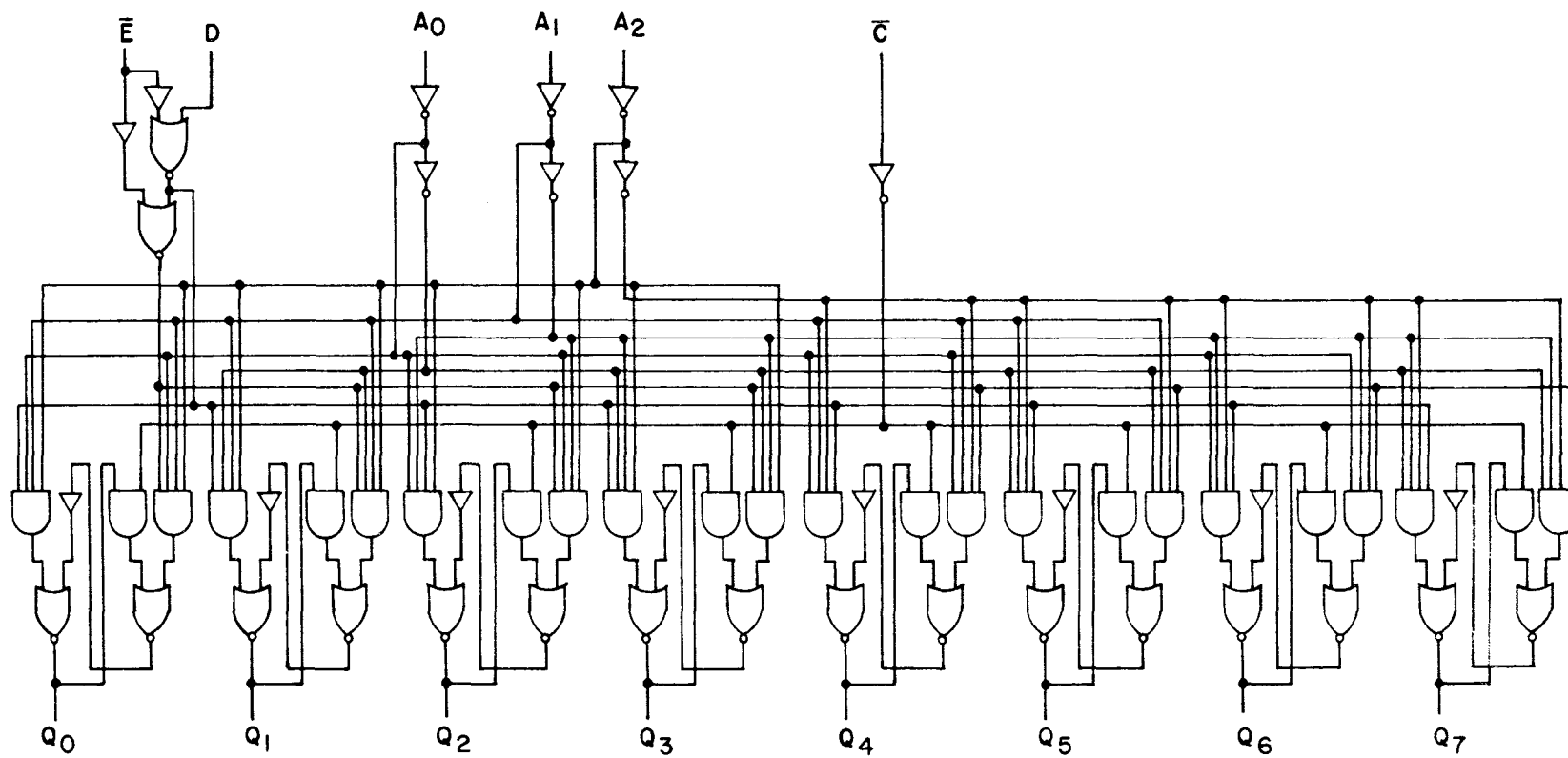
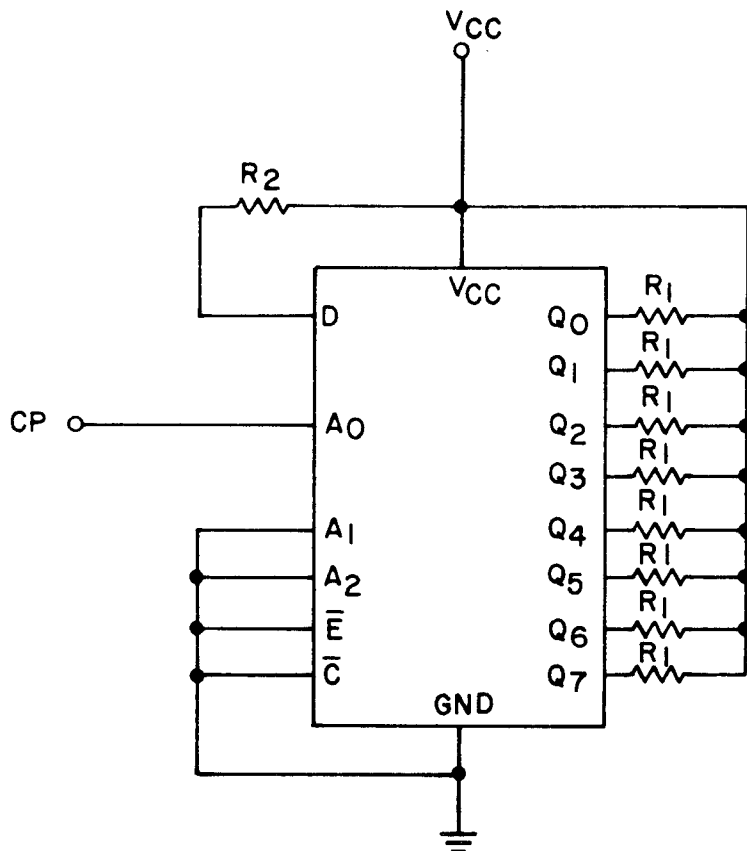


FIGURE 3. Logic diagram.

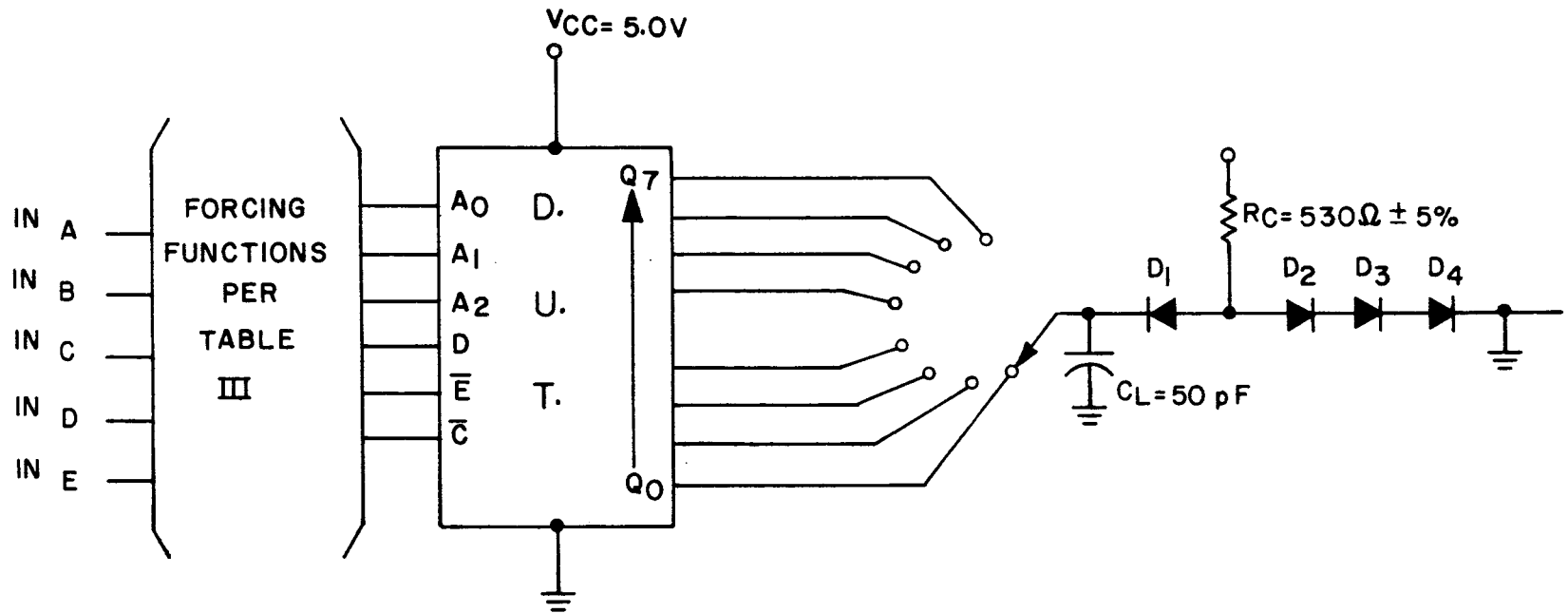
Device type 01



NOTES:

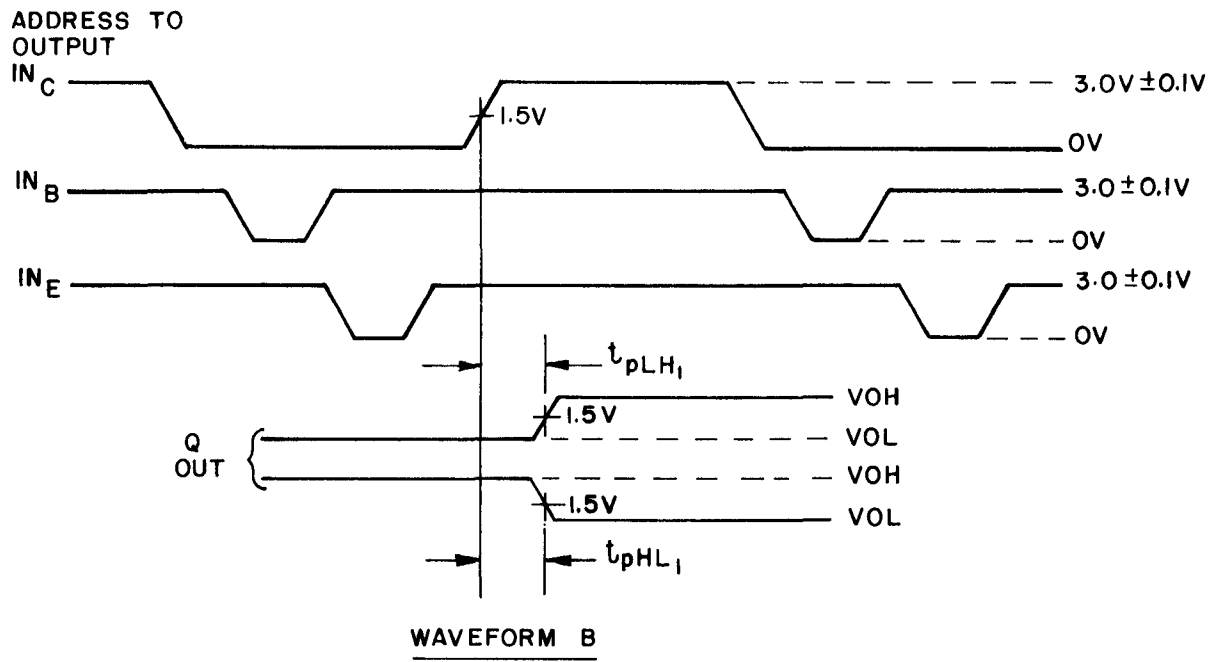
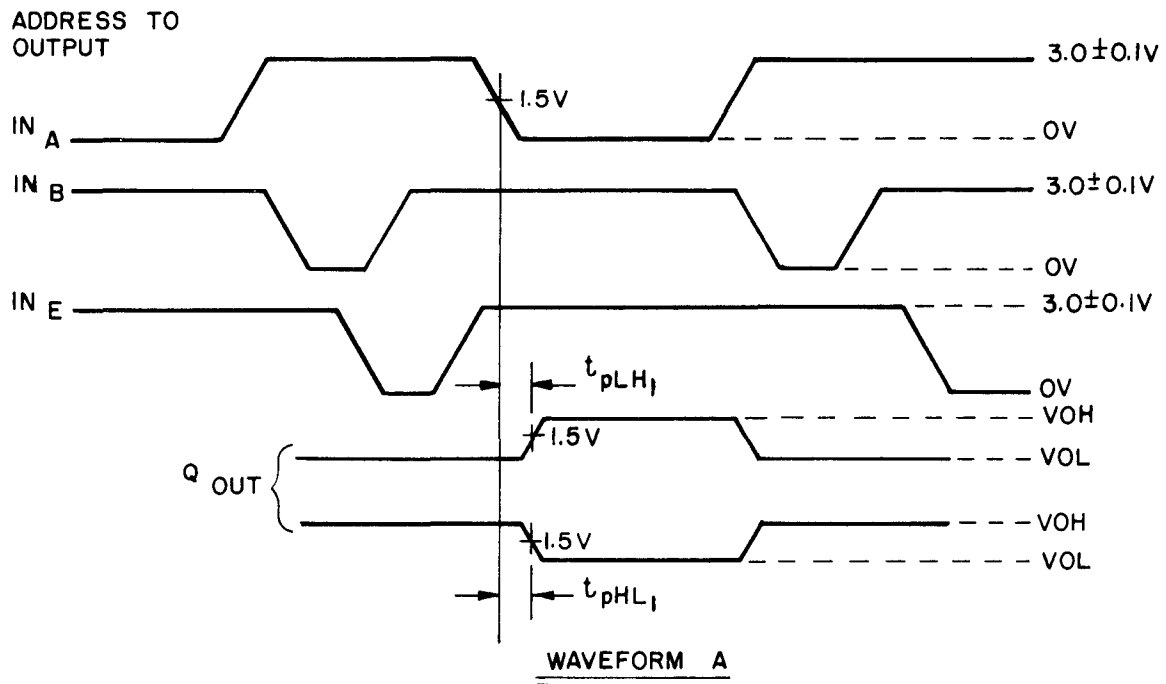
1. $V_{CC} = 5.5 \text{ V}$.
2. $R_1 = 560\Omega \pm 5\%$; $R_2 = 4 \text{ k}\Omega \pm 5\%$.
3. CP = 1 MHz $\pm 50\%$ square wave; duty cycle = 50 $\pm 15\%$; $V_{IH} = 2.0 \text{ V to } 5.5 \text{ V}$;
 $V_{IL} = -0.5 \text{ V to } 0.8 \text{ V}$.

FIGURE 4. Burn-in and life test circuit.

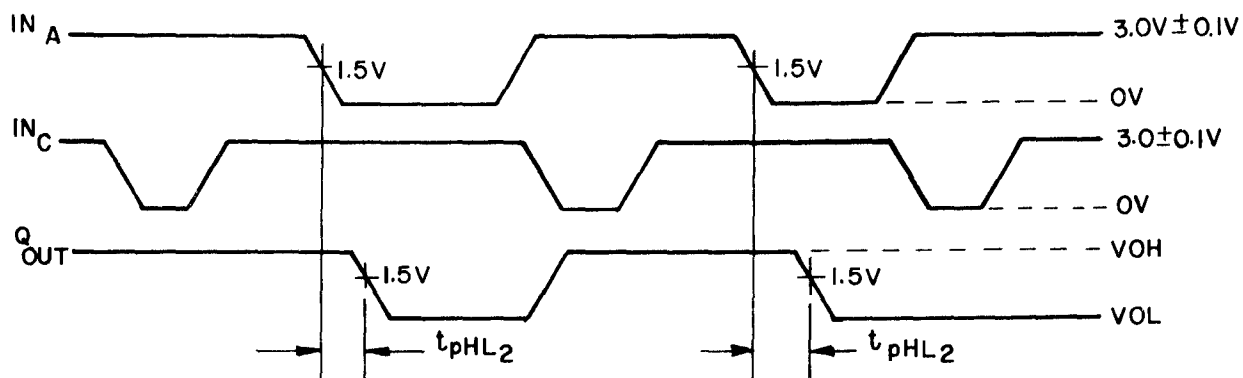


NOTE: All diodes are 1N3064 or equivalent.

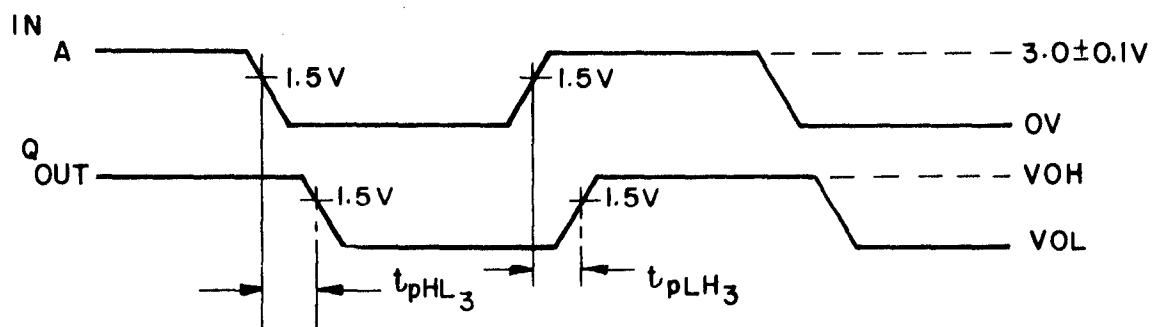
FIGURE 5. Switching waveforms for device type 01.

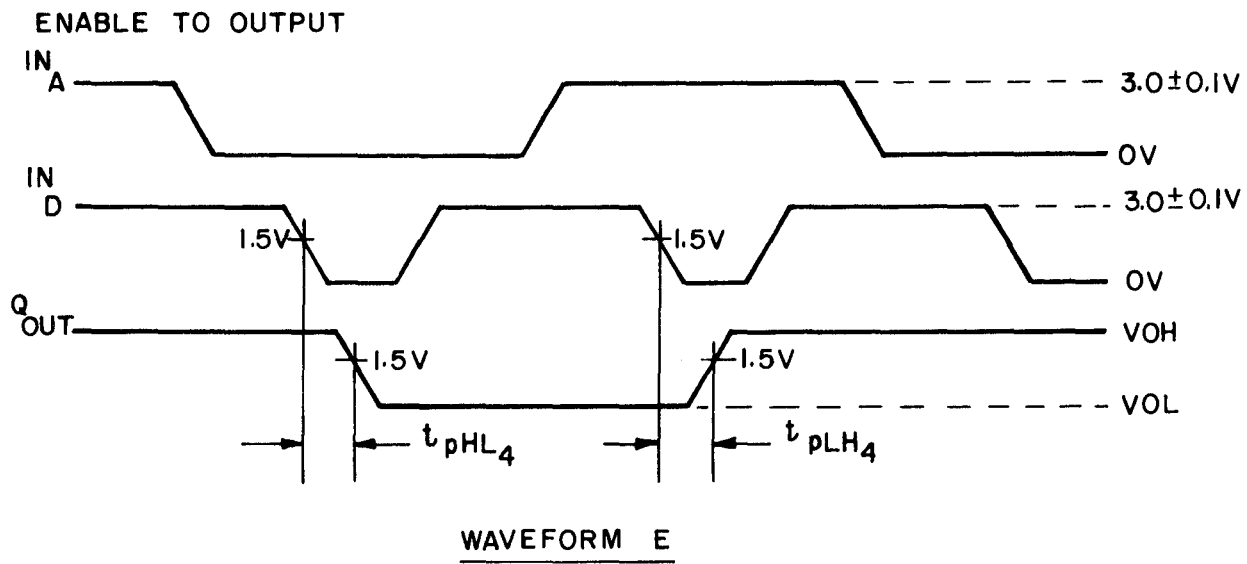
FIGURE 5. Switching waveforms for device type 01 - Continued.

CLEAR TO OUTPUT

WAVEFORM C

DATA TO OUTPUT

WAVEFORM DFIGURE 5. Switching waveforms for device type 01 - Continued.



NOTES:

1. $1N_A$ and $1N_C$ have the following characteristics: $V_{gen} = 3.0 \pm 0.1$ V, pulse width = 500 ns, PRR = 1 MHz, rise time = 2 ns (1 V to 2 V), fall time = 2 ns (2 V to 1 V).
2. $1N_B$ and $1N_E$ have the following characteristics: $V_{gen} = 3.0 \pm 0.1$ V; pulse width = 200 ns, PRR = 500 kHz, rise time = 2 ns (1 V to 2 V), fall time = 2 ns (2 V to 1 V).
3. $1N_D$ has the following characteristics: $V_{gen} = 3.0 \pm 0.1$ V, pulse width = 200 ns, PRR = 1 MHz, rise time = 2 ns (1 V to 2 V), fall time = 2 ns (2 V to 1 V).

FIGURE 7. Switching waveforms for device type 01 - Continued.

TABLE III. Group A inspection for device type 01. ^{1/}

Subgroup	Symbol	MIL-STD-883 method	Cases E, F Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Meas. terminal	Test limits		
				A ₀	A ₁	A ₂	Q ₀	Q ₁	Q ₂	Q ₃	GND	Q ₄	Q ₅	Q ₆	Q ₇	D	$\bar{E}$	$\bar{C}$	V _{CC}		Min	Max	Unit
1 T _C =+25°C	V _{OL}	3007	1 2 3 4 5 6 7 8				9.6 mA	9.6 mA	9.6 mA	9.6 mA	GND						4.5 V	GND	4.5 V	Q ₀ Q ₁ Q ₂ Q ₃ Q ₄ Q ₅ Q ₆ Q ₇		0.4	V
	V _{OH}	3006	9 10 11 12 13 14 15 16	GND 4.5 V GND 4.5 V GND 4.5 V GND 4.5 V	GND 4.5 V 4.5 V GND 4.5 V 4.5 V	4.5 V	-720 μA	-720 μA	-720 μA	-720 μA						GND	GND	4.5 V		Q ₀ Q ₁ Q ₂ Q ₃ Q ₄ Q ₅ Q ₆ Q ₇	2.4		
	I _{IL1}	3009	17 18 19 20 21	0.4 V	0.4 V	0.4 V													5.5 V	A ₀ A ₁ A ₂ D C	-0.7	-1.6	mA
	I _{IL2}		22														0.4 V			$\bar{E}$	-1.05	-2.4	
	I _{IH1}	3010	23 24 25 26 27	2.4 V	2.4 V	2.4 V											2.4 V		2.4 V	A ₀ A ₁ A ₂ D $\bar{C}$		40	μA
	I _{IH2}		28														2.4 V			$\bar{E}$		60	
	I _{IH3}		29 30 31 32 33	5.5 V	5.5 V	5.5 V											5.5 V		5.5 V	A ₀ A ₁ A ₂ D $\bar{C}$		100	
	I _{IH4}		34														5.5 V			$\bar{E}$		150	
	I _{OS}	3011	35 36 37 38 39	GND 4.5 V GND 4.5 V GND	GND GND 4.5 V 4.5 V GND	GND	GND	GND	GND	GND							4.5 V	GND	GND	Q ₀ Q ₁ Q ₂ Q ₃ Q ₄	-30	-100	mA

See footnotes at end of table.

TABLE III. Group A inspection for device type 01.^{1/} -Continued

Subgroup	Symbol	MIL-STD-883 method	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Meas. terminal	Test limits			
			Test No.	A ₀	A ₁	A ₂	Q ₀	Q ₁	Q ₂	Q ₃	GND	Q ₄	Q ₅	Q ₆	Q ₇	D	$\bar{E}$	$\bar{C}$	V _{CC}		Min	Max	Unit	
7 T _C =+25 °C	Functional Tests	3014	81	H	L	H	H	H	L	H	GND	L	H	L	H	H	L	H	H	4.5 V	H or L as shown <u>3/</u>			
			82	L	L	H	H	H	L	H		H	H	L	H									
			83		H	H																		
			84			L																		
			85																					
			86																					
			87																					
			88																					
			89																					
			90	H		H																		
			91			H																		
			92		L	L																		
			93	L																				
			94	L			L																	
			95	H				L																
			96		H																			
			97		H																			
			98		L																			
			99		L																			
			100																					
			101																					
			102																					
			103																					
			104																					
			105	H	L																			
			106	H	H																			
			107	H	H																			
			108	H	H																			
			109	L	L																			
9 T _C =+25 °C	t _{PLH1}	3003 (Fig. 5)	110	IN-A	GND	GND	OUT				GND					5.0 V	IN-E	IN-B	5.0 V	A ₀ -Q ₀	10	40	ns	
			111	GND	IN-A	GND	OUT													A ₁ -Q ₀				
			112	GND	GND	IN-A	OUT													A ₂ -Q ₀				
			113	IN-C	GND	GND		OUT													A ₀ -Q ₁			
			114	5.0 V	IN-A	GND		OUT													A ₁ -Q ₁			
			115	5.0 V	GND	IN-A		OUT													A ₂ -Q ₁			
			116	IN-A	5.0 V	GND			OUT												A ₀ -Q ₂			
			117	GND	IN-C	GND			OUT												A ₁ -Q ₂			
			118	GND	5.0 V	IN-A			OUT												A ₂ -Q ₂			
			119	IN-C	5.0 V	GND				OUT											A ₀ -Q ₃			
			120	5.0 V	IN-C	GND				OUT											A ₁ -Q ₃			
			121	5.0 V	5.0 V	IN-A				OUT											A ₂ -Q ₃			
			122	IN-A	GND	5.0 V						OUT									A ₀ -Q ₄			
			123	GND	IN-A	5.0 V						OUT									A ₁ -Q ₄			
			124	GND	GND	IN-C						OUT									A ₂ -Q ₄			
			125	IN-C	GND	5.0 V							OUT								A ₀ -Q ₅			
			126	5.0 V	IN-A	5.0 V								OUT							A ₁ -Q ₅			

See footnotes at end of table.

TABLE III. Group A inspection for device type 01.1/ -Continued

Subgroup	Symbol	MIL-STD-883 method	Cases E, F Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Meas. terminal	Test limits		
				A ₀	A ₁	A ₂	Q ₀	Q ₁	Q ₂	Q ₃	GND	Q ₄	Q ₅	Q ₆	Q ₇	D	E	C	V _{CC}		Min	Max	Unit
9 TC = +25 °C	t _{PLH1}	3003 (Fig. 5)	127 128 129 130 131 132 133	5.0 V IN-A GND GND IN-C 5.0 V 5.0 V	GND 5.0 V IN-C 5.0 V 5.0 V IN-C 5.0 V	IN-C 5.0 V 5.0 V IN-C 5.0 V IN-C					GND		OUT	OUT OUT OUT		5.0 V	IN-E	IN-B	5.0 V	A ₂ - Q ₅ A ₀ - Q ₆ A ₁ - Q ₆ A ₂ - Q ₆ A ₀ - Q ₇ A ₁ - Q ₇ A ₂ - Q ₇	10	40	ns
	t _{PLH3}		134 135 136 137 138 139 140 141	GND 5.0 V GND 5.0 V GND 5.0 V GND 5.0 V	GND GND 5.0 V GND GND 5.0 V 5.0 V	GND 5.0 V 5.0 V 5.0 V	OUT	OUT	OUT	OUT						IN-A	GND	5.0 V		D - Q ₀ D - Q ₁ D - Q ₂ D - Q ₃ D - Q ₄ D - Q ₅ D - Q ₆ D - Q ₇	6	39	
	t _{PLH4}		142 143 144 145 146 147 148 149	GND 5.0 V GND 5.0 V GND 5.0 V GND 5.0 V	GND GND 5.0 V GND GND 5.0 V 5.0 V	GND 5.0 V 5.0 V 5.0 V	OUT	OUT	OUT	OUT							IN-C			E - Q ₀ E - Q ₁ E - Q ₂ E - Q ₃ E - Q ₄ E - Q ₅ E - Q ₆ E - Q ₇		32	
	t _{PHL1}		150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173	IN-A GND GND IN-C 5.0 V 5.0 V IN-A GND GND IN-C 5.0 V IN-A GND GND IN-C 5.0 V 5.0 V IN-A GND IN-C 5.0 V IN-C 5.0 V 5.0 V	GND IN-A GND GND IN-A 5.0 V IN-C 5.0 V IN-A 5.0 V IN-C 5.0 V GND GND GND IN-A 5.0 V IN-C 5.0 V 5.0 V IN-C 5.0 V IN-C	GND GND GND GND IN-A GND IN-A GND IN-A GND IN-A GND 5.0 V 5.0 V 5.0 V 5.0 V 5.0 V 5.0 V 5.0 V 5.0 V 5.0 V 5.0 V	OUT OUT OUT	OUT OUT OUT	OUT OUT OUT	OUT OUT OUT						5.0 V	IN-E	IN-B		A ₀ - Q ₀ A ₁ - Q ₀ A ₂ - Q ₀ A ₀ - Q ₁ A ₁ - Q ₁ A ₂ - Q ₁ A ₀ - Q ₂ A ₁ - Q ₂ A ₂ - Q ₂ A ₀ - Q ₃ A ₁ - Q ₃ A ₂ - Q ₃ A ₀ - Q ₄ A ₁ - Q ₄ A ₂ - Q ₄ A ₀ - Q ₅ A ₁ - Q ₅ A ₂ - Q ₅ A ₀ - Q ₆ A ₁ - Q ₆ A ₂ - Q ₆ A ₀ - Q ₇ A ₁ - Q ₇ A ₂ - Q ₇	10	38	

See footnotes at end of table.

TABLE III. Group A inspection for device type 01.1/-Continued

Subgroup	Symbol	MIL-STD-883 method	Cases E, F Test No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Meas. terminal	Test limits			
				A ₀	A ₁	A ₂	Q ₀	Q ₁	Q ₂	Q ₃	GND	Q ₄	Q ₅	Q ₆	Q ₇	D	E	C	V _{CC}		Min	Max	Unit	
9 T _C =+25°C	t _{PHL2}	3003 (Fig. 5)	174	GND	GND	GND	OUT				GND					5.0 V	IN-B	IN-A	5.0 V	C - Q ₀	10	45	ns	
			175	5.0 V	GND			OUT												C - Q ₁				
			176	GND	5.0 V				OUT											C - Q ₂				
			177	5.0 V	5.0 V															C - Q ₃				
			178	GND	GND	5.0 V				OUT										C - Q ₄				
			179	5.0 V	GND						OUT									C - Q ₅				
			180	GND	5.0 V							OUT	OUT							C - Q ₆				
			181	5.0 V	5.0 V									OUT			OUT			C - Q ₇				
			t _{PHL3}		182	GND	GND	GND	OUT										IN-A	GND	5.0 V		D - Q ₀	6
	183	5.0 V			GND			OUT												D - Q ₁				
	184	GND			5.0 V				OUT											D - Q ₂				
	185	5.0 V			5.0 V					OUT										D - Q ₃				
	186	GND			GND	5.0 V					OUT									D - Q ₄				
	187	GND			GND							OUT	OUT							D - Q ₅				
	188	5.0 V			GND								OUT	OUT						D - Q ₆				
	189	GND			5.0 V										OUT					D - Q ₇				
	t _{PHL4}				190	GND	GND	GND	OUT											IN-C			E - Q ₀	
			191	5.0 V	GND			OUT												E - Q ₁				
			192	GND	5.0 V				OUT											E - Q ₂				
			193	5.0 V	5.0 V					OUT										E - Q ₃				
			194	GND	GND	5.0 V						OUT								E - Q ₄				
			195	5.0 V	GND								OUT	OUT						E - Q ₅				
			196	GND	5.0 V									OUT	OUT					E - Q ₆				
			197	5.0 V	5.0 V											OUT				E - Q ₇				
			10 T _C =+125°C	t _{PLH1}		198	IN-A	GND	GND	OUT									5.0 V	IN-E	IN-B		A ₀ - Q ₀	10
	199	GND				IN-A	GND	OUT													A ₁ - Q ₀			
	200	GND				GND	IN-A														A ₂ - Q ₀			
201	IN-C	GND				GND		OUT	OUT											A ₀ - Q ₁				
202	5.0 V	IN-A				GND		OUT	OUT											A ₁ - Q ₁				
203	5.0 V	GND				IN-A				OUT	OUT									A ₂ - Q ₁				
204	IN-A	5.0 V				GND					OUT	OUT								A ₀ - Q ₂				
205	GND	IN-C				GND						OUT	OUT							A ₁ - Q ₂				
206	GND	5.0 V				IN-A							OUT	OUT						A ₂ - Q ₂				
207	IN-C	5.0 V				GND								OUT	OUT					A ₀ - Q ₃				
208	5.0 V	IN-C				GND									OUT	OUT				A ₁ - Q ₃				
209	5.0 V	5.0 V				IN-A										OUT	OUT			A ₂ - Q ₃				
210	IN-A	GND				5.0 V								OUT	OUT					A ₀ - Q ₄				
211	GND	IN-A				5.0 V									OUT	OUT				A ₁ - Q ₄				
212	GND	GND				IN-C										OUT	OUT			A ₂ - Q ₄				
213	IN-C	GND				5.0 V											OUT	OUT		A ₀ - Q ₅				
214	5.0 V	IN-A				5.0 V												OUT	OUT	A ₁ - Q ₅				
215	5.0 V	GND				IN-C													OUT	A ₂ - Q ₅				
216	IN-A	5.0 V				5.0 V														A ₀ - Q ₆				
217	GND	IN-C				5.0 V														A ₁ - Q ₆				
218	GND	5.0 V				IN-C														A ₂ - Q ₆				
219	IN-C	5.0 V				5.0 V														A ₀ - Q ₇				
220	5.0 V	IN-C				5.0 V														A ₁ - Q ₇				
221	5.0 V	5.0 V				IN-C														A ₂ - Q ₇				

See footnotes at end of table.

TABLE III. Group A inspection for device type 01. ^{1/} -Continued

Subgroup	Symbol	MIL-STD-883 method	Cases E, F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Meas. terminal	Test limits													
			Test No.	A ₀	A ₁	A ₂	Q ₀	Q ₁	Q ₂	Q ₃	GND	Q ₄	Q ₅	Q ₆	Q ₇	D	$\bar{E}$	$\bar{C}$	V _{CC}		Min	Max	Unit											
10 T _C = + 125°C	t _{PHL3}	3003 (Fig. 5)	270	GND	GND	GND	OUT	OUT	OUT	OUT	GND	OUT	OUT	OUT	OUT	IN-A	GND	5.0 V	5.0 V	D - Q ₀	6	40	ns											
			271	5.0 V	GND																												D - Q ₁	
			272	GND	5.0 V																												D - Q ₂	
			273	5.0 V	5.0 V																												D - Q ₃	
			274	GND	GND	5.0 V						OUT							D - Q ₄															
			275	GND	GND								OUT							D - Q ₅														
			276	5.0 V	GND									OUT						D - Q ₆														
			277	GND	5.0 V										OUT						D - Q ₇													
	t _{PHL4}		278	GND	GND	GND	OUT	OUT	OUT	OUT			OUT	OUT	OUT			IN-C			E - Q ₀		35											
			279	5.0 V	GND																													E - Q ₁
			280	GND	5.0 V																													E - Q ₂
			281	5.0 V	5.0 V																													E - Q ₃
			282	GND	GND	5.0 V						OUT							E - Q ₄															
			283	5.0 V	GND								OUT							E - Q ₅														
			284	GND	5.0 V									OUT						E - Q ₆														
			285	5.0 V	5.0 V										OUT	OUT					E - Q ₇													
11	Same tests, terminal conditions and limits as for subgroup 10, except T _C = -55°C.																																	

1/ Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.8 V; or open.

2/ Input voltages shown are: H = 2.0 V and L = 0.8 V.

3/ Output voltages shall be either:

- H = 2.4 volts minimum and L = 0.4 volts maximum when using a high-speed checker double comparator, or
- H > 1.5 volts and L < 1.5 volts when using a high speed checker single comparator.
- Only attributes data are required for subgroups 7 and 8.

6.3 Ordering data. The acquisition document should specify the following:

- a. Complete part number (see 1.2).
- b. 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.
- c. Requirements for certificate of compliance, if applicable.
- d. Requirements for notification of change of product or process to the contracting activity, if applicable.
- e. Requirements for packaging and packing.
- f. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements shall not apply to direct purchase by or direct shipment to the Government.

6.4 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-M-38510, MIL-STD-1331, and as follows:

GND	- - - - -	Electrical ground (common terminal)
I _{IN}	- - - - -	Current flowing into an input terminal
V _{IN}	- - - - -	Voltage level at an input terminal

6.5 Logistic support. Lead materials and finishes (see 3.3), are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2) and lead material and finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

6.6 Generic test data. Generic test data may be used to satisfy the requirements of 4.4.3. Group C generic test data shall be on date codes no more than one year old and on a die in the same microcircuit group (see appendix E of MIL-M-38510) with the same material, design and process and from the same plant as the die represented. Group D (see 4.4.4) generic data shall be on date codes no more than one year old and on the same package type (see terms, definitions, and symbols of MIL-M-38510) and from the same plant as the package represented. The vendor is required to retain the generic data for a period of not less than 36 months from the date of shipment.

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

<u>Military device</u> <u>type</u>	<u>Generic-industry</u> <u>type</u>
01	9334

6.8 Ordering guidance. Since the qualification and certification requirements have been removed from the specification, orders may be placed immediately.

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

Custodians:

Army - ER
Navy - EC
Air Force - 17

Preparing activity:

Air Force - 17
(Project 5962-0591-7)

Review activities:

Army - AR, MI
Navy - OS, SH
Air Force - 11, 19, 85, 99
DLA - ES

User activities:

Army - SM
Navy - AS, CG, MC

Agent:

DLA - ES