MIL-M-38510/25D
8 August 1986
SUPERSEDING
MIL-M-0038510/25C(19)
1 December 1975 and;
MIL-M-38510/25C
3 March 1986 and
MIL-M-38510/25B
18 June 1975

Qualification requirements have been removed for device types 04 and 05 (see 1.1)

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, BIPOLAR, TTL, LOW POWER, COUNTERS, MONOLITHIC SILICON

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, Schottky TTL, positive AND logic gating microcircuits. Qualification requirements are removed for device types 04 and 05. These device types are inactive for new design after the date of this revision. For the remaining device types 01, 02 and 03, two product assurance classes and a choice of case outlines and lead finishes are provided and are reflected in the complete part number.

1.2 Part number. The part number shall be in accordance with MIL-M-38510, with the exception that the "JAN" or "J" certification mark shall not be used for device types 04 and 05.

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

Device type	Circuit
01	Low-power decade counter
02	4-bit binary counter
03	Synchronous 4-bit up/down counter
04 1/	Synchronous BCD decade counter
05 1/	Synchronous 4-bit binary counter

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:

Outline letter	Case outline (see MIL-M-38510, appendix C)
A	F-1 (14-pin, 1/4" x 1/4"), flat package
B	F-3 (14-pin, 3/16" x 1/4"), flat package
C	D-1 (14-pin, 1/4" x 3/4"), dual-in-line package
D	F-2 (14-pin, 1/4" x 3/8"), flat package
E	D-2 (16-pin, 1/4" x 7/8"), dual-in-line package
F	F-5 (16-pin, 1/4" x 3/8"), flat package

1/ Qualification requirements are removed for these device types.

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.

AMSC N/A
FSC 5962

1.3 Absolute maximum ratings.

Supply voltage range	0 V dc to 8.0 V dc
Input voltage range	0 V dc to 5.5 V dc
Storage temperature range	-65°C to +150°C
Maximum power dissipation (P_D) 2/:	
Device type 01	65 mW dc
Device type 02	60 mW dc
Device type 03	131 mW dc
Device types 04 and 05 3/	172 mW dc
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Cases A, B, C, D, E, F	(See MIL-M-38510, appendix C)
Junction temperature (T_J) 4/	+175°C

1.4 Recommended operating conditions.

Supply voltage(VCC)	4.5 V dc minimum to 5.5 V dc maximum
Minimum high-level input voltage (VIH)	2.0 V dc
Maximum low-level input voltage (VIL)	0.7 V dc
Normalized fanout (each output) 5/	
Device types 01, 02, 03	10 maximum
Device types 04, 05 3/	5 maximum
Width of input count pulse, t_p(in)	
Device types 01, 02	200 ns minimum
Width of any input pulse, t_w	
Device type 03	200 ns minimum
Width of reset pulse, t_p(reset)	
Device types 01, 02	200 ns minimum
Width of master reset pulse	
Device types 04, 05 3/	35 ns minimum
Width of clock pulse, t_w(clock)	
Device types 04, 05 3/	25 ns minimum
Input clock frequency	
Device types 01, 02, 03	3 MHz
Device types 04, 05 3/	13 MHz
Input hold time	0 ns
Case operating temperature range (T_C)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specification and standard. The following specification and standard, form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

MILITARY

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

STANDARD

MILITARY

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

2/ Must withstand the added P_D due to short circuit conditions (e.g., I_{OS}) at one output for 5 seconds duration.
3/ Qualification requirements are removed for these device types.
4/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening.
5/ Device will fanout in both high and low levels to the specified number of inputs of the same device type as that being tested.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

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 Logic diagram and terminal connections. The logic diagram and terminal connections shall be as specified on figure 1.

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

3.2.3 Schematic circuits. Schematic circuits shall be submitted to the preparing activity prior to inclusion of a manufacturer's device in the specification and shall be submitted to the qualifying activity and agent activity (DESC-ECS), as a prerequisite for qualification. All qualified manufacturers' schematics shall be maintained by the agent activity and will be available upon request.

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

3.3 Lead material and finish. The lead material and finish shall be in accordance with MIL-M-38510 and 6.4 herein.

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

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$	Device type	Limits Min	Limits Max	Unit
High-level output voltage	V_{OH}	V_{CC} = 4.5 V, V_{IH} = 2.0 V, I_{OH} = -100 µA, V_{IL} = 0.7 V	01,02, 03	2.4	---	V
			04,05 7/			
Low-level output voltage	V_{OL}	V_{CC} = 4.5 V, V_{IH} = 2.0 V, I_{OL} = 2 mA, V_{IL} = 0.7 V	01,02, 03	---	0.3	V
			04,05 7/			
High-level input current	I_{IH1}	V_{CC} = 5.5 V, V_{IN} = 2.4 V 1/	01,02, 03	---	10	µA
	I_{IH2}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 1/	01,02, 03	---	100	µA

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \leq T_C \leq +125°C$	Device type	Limits Min	Limits Max	Unit
High-level input current	I_{IH3}	V_{CC} = 5.5 V, V_{IN} = 2.4 V 2/	01	---	30	µA
			02	---	20	
	I_{IH4}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 2/	01	---	300	µA
			02	---	200	
High-level input current at input BD	I_{IH5}	V_{CC} = 5.5 V, V_{IN} = 2.4 V	01	---	60	µA
	I_{IH6}	V_{CC} = 5.5 V, V_{IN} = 5.5 V	01	---	600	µA
High-level input current	I_{IH7}	V_{CC} = 5.5 V, V_{IN} = 2.4 V 3/	04,05, 7/	---	20	µA
	I_{IH8}	V_{CC} = 5.5 V, V_{IN} = 2.4 V 4/	04,05, 7/	---	40	µA
High-level input current at inputs P_0, P_1, P_2, or P_3	I_{IH9}	V_{CC} = 5.5 V, V_{IN} = 2.4 V	04,05, 7/	---	14	µA
High-level input current at any input	I_{IH10}	V_{CC} = 5.5 V, V_{IN} = 2.4 V	04,05, 7/	---	14	µA
Low-level input current at any reset input	I_{IL1}	V_{CC} = 5.5 V, V_{IN} = 0.3 V	01,02	-0.06	-0.18	mA
Low-level input current	I_{IL2}	V_{CC} = 5.5 V, V_{IN} = 0.3 V 5/	01	-0.12	-0.54	mA
			02	-0.12	-0.36	mA
Low-level input current at input BD	I_{IL3}	V_{CC} = 5.5 V, V_{IN} = 0.3 V	01	-0.29	-1.08	mA
Low-level input current at any input	I_{IL4}	V_{CC} = 5.5 V, V_{IN} = 0.3 V	03	---	-0.16	mA
Low-level input current at inputs $\overline{MR}$ or CEP	I_{IL5}	V_{CC} = 5.5 V, V_{IN} = 0.3 V	04,05, 7/	---	-0.40	mA
Low-level input current at inputs CP, $\overline{PE}$, or CET	I_{IL6}	V_{CC} = 5.5 V, V_{IN} = 0.3 V	04,05, 7/	---	-0.80	mA

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \leq T_C \leq +125°C$	Device type	Limits Min	Limits Max	Unit
Low-level input current at inputs P_0, P_1, P_2, or P_3	I_{IL7}	V_{CC} = 5.5 V, V_{IN} = 0.3 V	04,05 7/	---	-0.27	mA
Short-circuit output current	I_{OS}	V_{CC} = 5.5 V 6/	01,02	-3	-15	mA
			03	-3.5	-14.5	mA
			04,05 7/	-2.5	-25	mA
Supply current	I_{CC}	V_{CC} = 5.5 V	01	---	7.2	mA
			02	---	6.6	mA
Supply current	I_{CC}	V_{CC} = 5.5 V	03	---	14.9	mA
Supply current	I_{CC}	V_{CC} = 5.5 V	04,05 7/	---	27.5	mA
Frequency of input count pulse	f_{MAX}	V_{CC} = 5.0 V C_L = 50 pF R_L = 4 kΩ	01,02	2.5	---	MHz
Frequency of input count pulses	f_{MAX}		03	14	---	MHz
	f_{MAX}		04,05 7/	13	---	MHz
Propagation delay time, low-to-high level, from input A	t_{PLH1}		01	---	510	ns
Propagation delay time, high-to-low level output, from input A	t_{PHL1}		01	---	510	ns
Propagation delay time, low-to-high level from input count pulse to output	t_{PLH2}		02	---	675	ns
Propagation delay time, high-to-low level from input count pulse to output	t_{PHL2}		02	---	675	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \leq T_C \leq +125°C$	Device type	Limits Min	Limits Max	Unit
Propagation delay time, low-to-high level output from input count pulse to output	t_{PLH3}	V_{CC} = 5.0 V C_L = 50 pF R_L = 4 kΩ	03	---	295	ns
Propagation delay time, high-to low level output, from input count pulse to output	t_{PHL3}		03	---	295	ns
Propagation delay time, low-to-high level from input A	t_{PLH5}		03	---	300	ns
Propagation delay time, high-to-low level from input A	t_{PHL5}		03	---	360	ns
Propagation delay time, low-to-high level output, from input CET	t_{PLH7}		04,05 7/	---	80	ns
Propagation delay time, high-to-low level output, from input CET	t_{PHL7}		04,05 7/	---	87	ns
Propagation delay time, low-to-high level, TC output from CP input	t_{PLH8}		04,05 7/	---	125	ns
Propagation delay time, high-to-low level Q out from $\overline{MR}$ input	t_{PHL8}		04,05 7/	---	130	ns

1/ Input conditions: Any reset inputs for device type 01,02; any input for device type 03.
2/ Input conditions: Input A for device type 02; inputs A or B for device type 02.
3/ Input conditions: Inputs $\overline{MR}$ or CEP.
4/ Input conditions: Inputs CP, $\overline{PE}$, or CET.
5/ Input conditions: Input A for device type 01; input A or B for device type 02.
6/ Not more than one output should be shorted at a time.
7/ Qualification requirements are removed for device 04 and 05.

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

3.6 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 for device types 04 and 05.

3.7 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 8 (see MIL-M-38510, appendix E).

3.8 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. This shall apply only for device types 04 and 05.

3.9 Certification. Certification in accordance with MIL-M-38510 is not required for device types 04 and 05, but shall be retained for device types 01, 02 and 03.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (see table III)	
	Class S devices	Class B devices
Interim electrical parameters (method 5004)	1	1
Final electrical test parameters (method 5004)	1*,2,3,7,9,10,11	1*,2,3,7,9
Group A test requirements (method 5005)	1,2,3,7,8,9,10,11	1,2,3,7,8,9,10,11
Group B test requirements (method 5005) 2/	1,2,3,7,8,9,10,11	N/A
Group C end-point electrical parameters (method 5005)	N/A	1,2,3
Additional electrical subgroups for group C periodic inspections	N/A	None
Group D end-point electrical parameters (method 5005)	1,2,3	1,2,3

*PDA applies to subgroup 1 (see 4.2c).
1/ Class S product assurance class is not applicable for device types 04 and 05.
2/ Group B test shall apply to device types 01, 02 and 03 only.

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 device types 01, 02 and 03 prior to qualification and quality conformance inspection, and on device types 04 and 05, prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in (method 1015 of MIL-STD-883).

(1) Test condition D, E, or F using the circuit shown on figure 3, or equivalent.

(2) T_A = +125°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) shall be as specified in MIL-M-38510.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-M-38510. 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). Qualification inspection is not required for device types 04 and 05.

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510. 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 inspection. 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. Electrical test requirements shall be as specified in table II herein.

b. Subgroups 4, 5, and 6 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 test requirements for device types 01, 02 and 03 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 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, E, or F, using the circuit shown on figure 3, or equivalent.

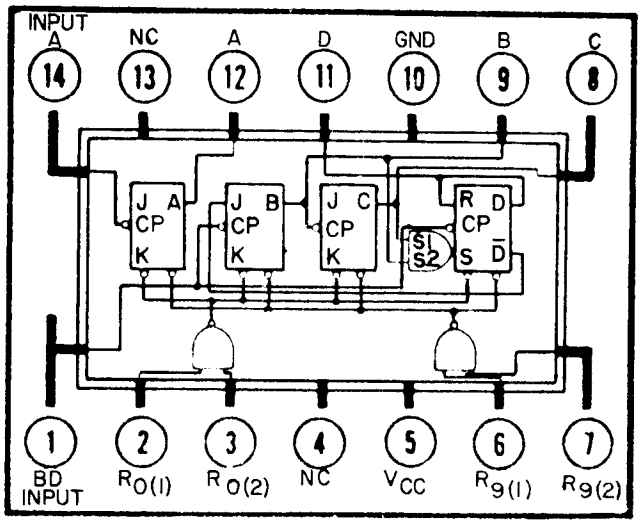
(2) T_A = +125°C minimum.

(3) Test duration: 1,000 hours, except as permitted by and method 1005 of MIL-STD-883.

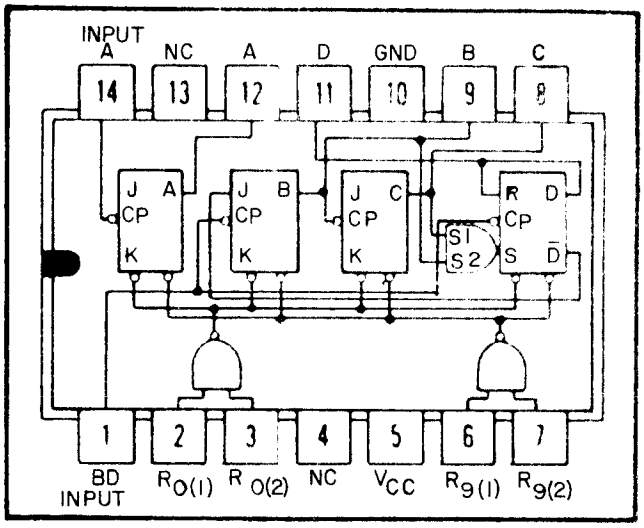
4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical parameters shall be as specified in table II herein.

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.

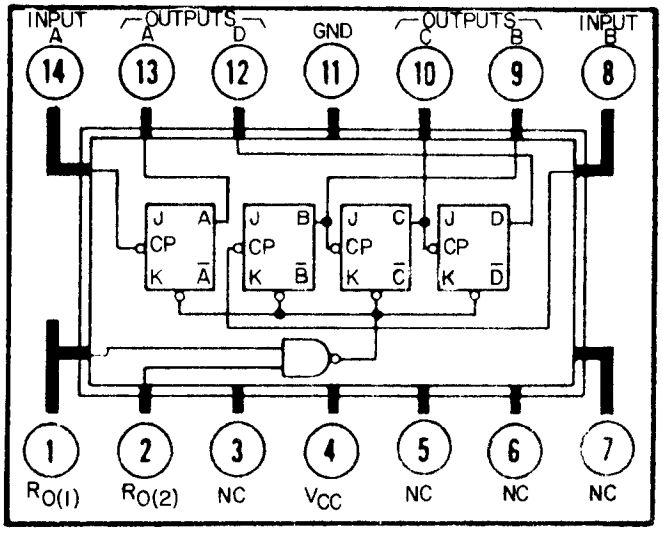


CASES A, B AND D

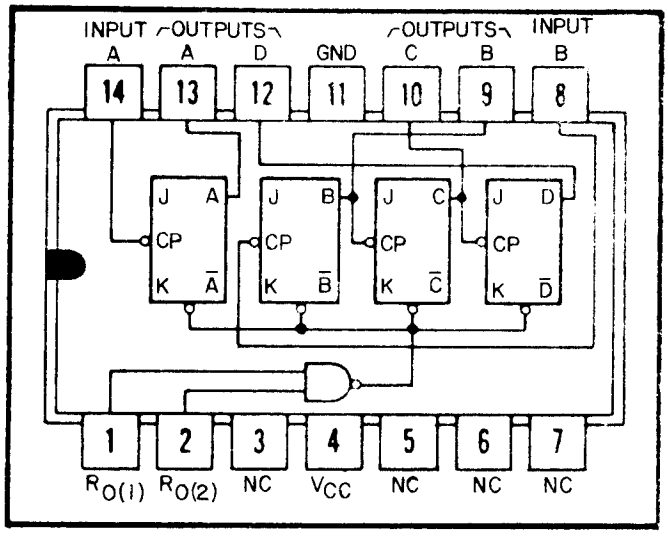


CASE C

DEVICE TYPE 01



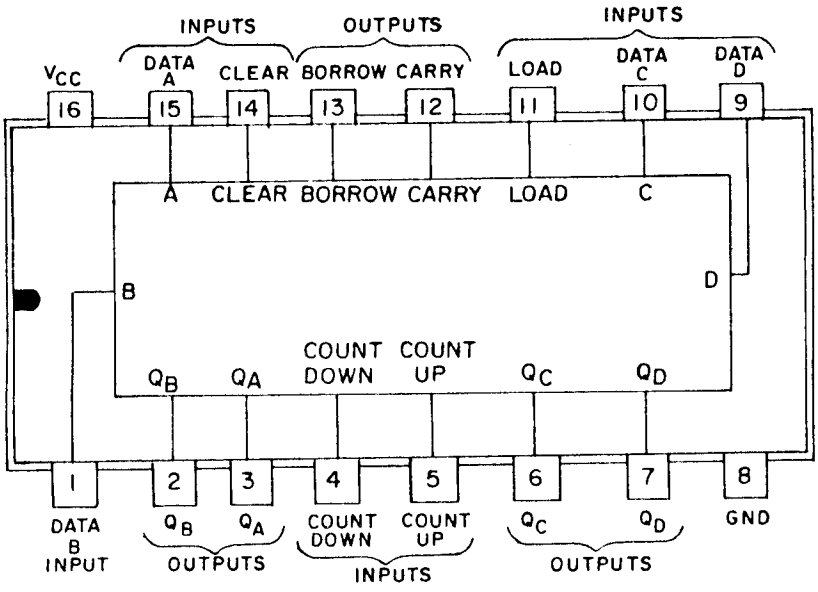
CASES A, B AND D



CASE C

DEVICE TYPE 02

FIGURE 1. Logic diagram and terminal connections (topview).

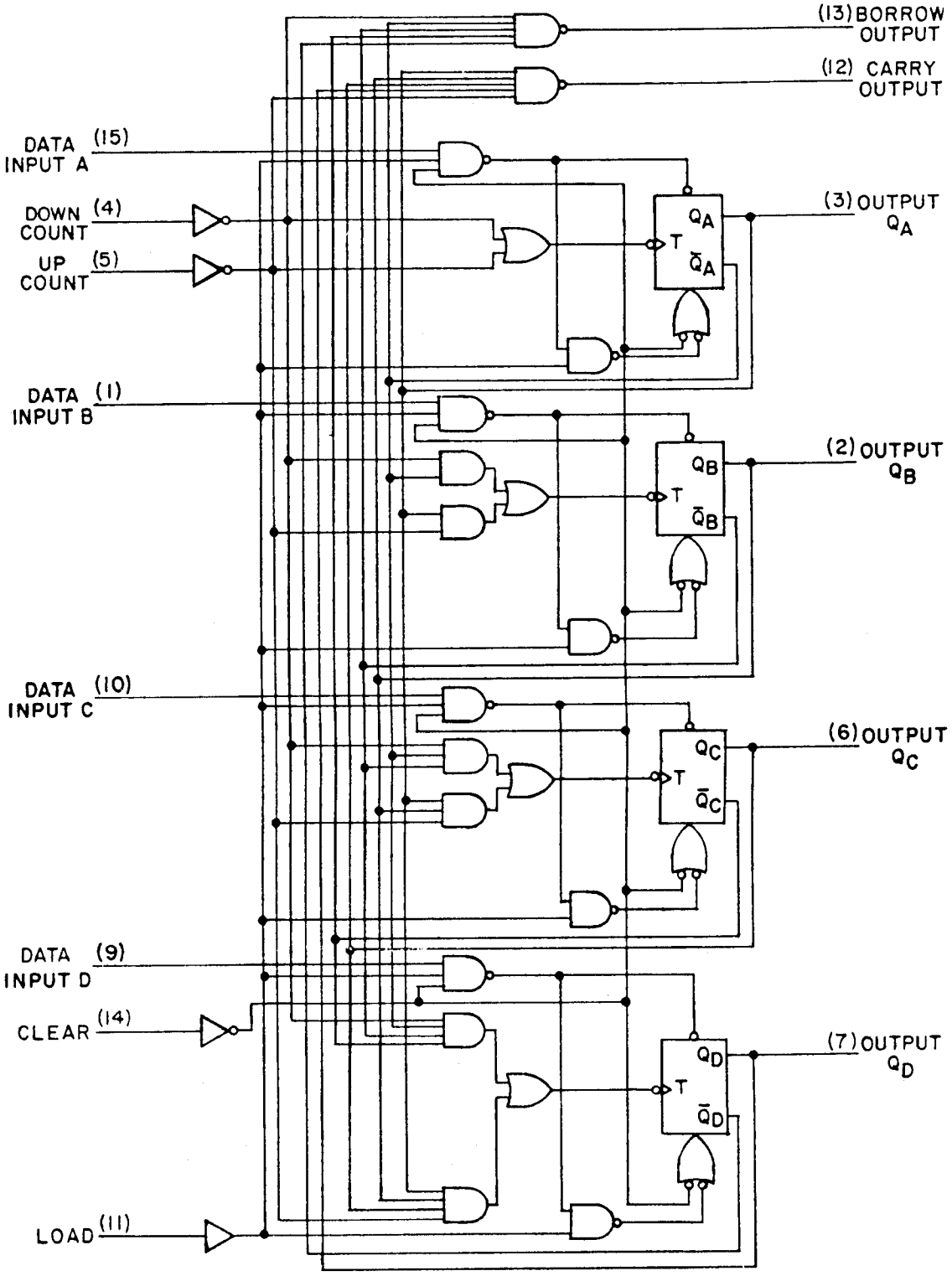


CASES E AND F

LOGIC: Low input to load sets Q_A = A, Q_B = B, Q_C = C, and Q_D = D

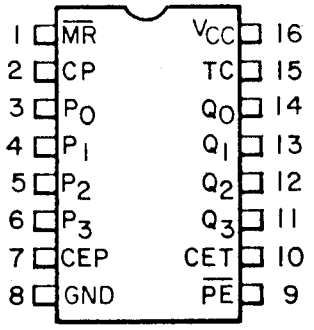
DEVICE TYPE 03

FIGURE 1. Logic diagram and terminal connections (topview) - continued.

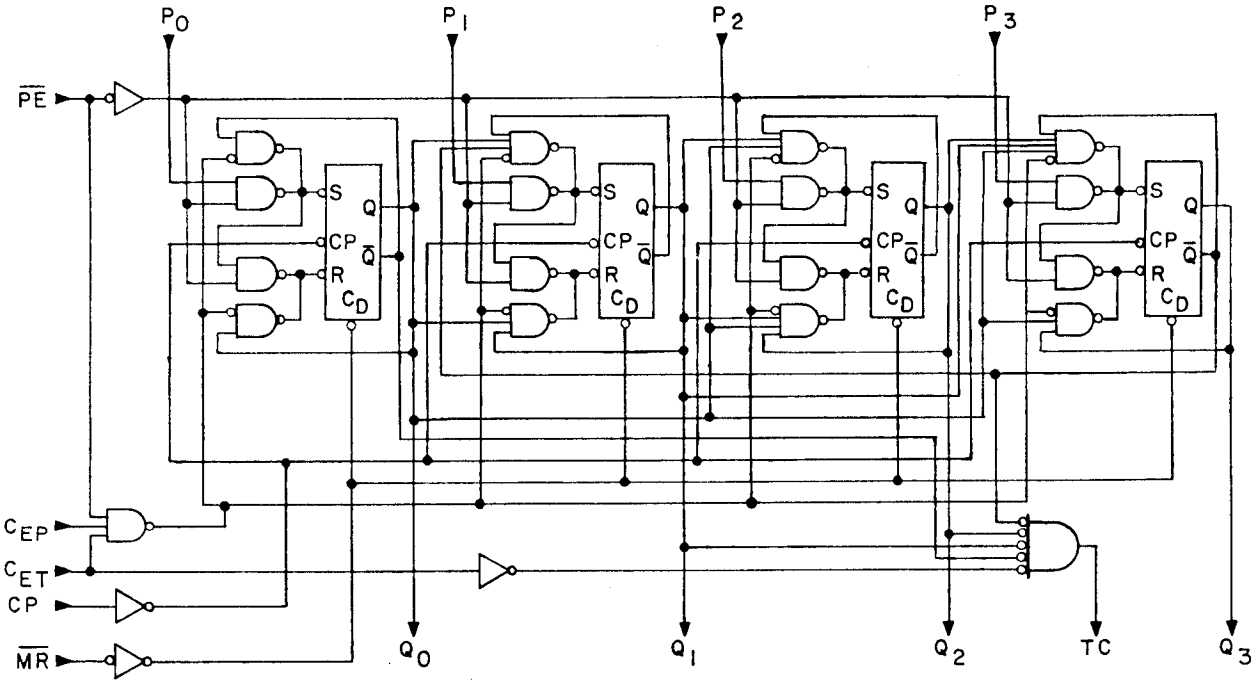


DEVICE TYPE 03

FIGURE 1. Logic diagram and terminal connections (topview) - continued.



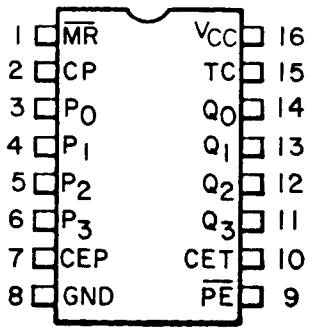
CASES E AND F



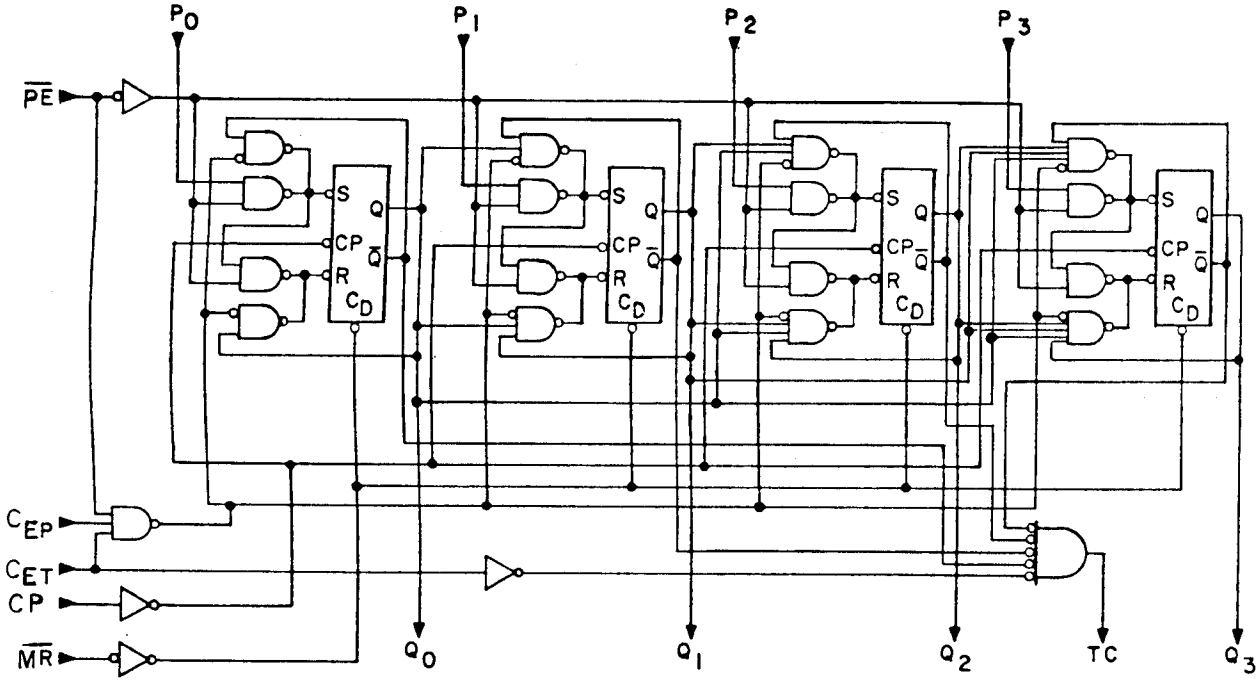
Device type 04 1/

1/ Qualification requirements have been removed for this device type.

FIGURE 1. Logic diagram and terminal connections (topview) - continued.



CASES E AND F



Device type 05 1/

1/ Qualification requirements have been removed for this device type.

FIGURE 1. Logic diagram and terminal connections (topview) - continued.

BCD COUNT SEQUENCE
(see note 1)

Count	Output			
	D	C	B	A
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H

Bi-Quinary (5-2)
(see note 2)

Count	Output			
	A	D	C	B
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	H	L	L	L
6	H	L	L	H
7	H	L	H	L
8	H	L	H	H
9	H	H	L	L

RESET/COUNT FUNCTION TABLE

RESET INPUTS				OUTPUT			
$R_{o(1)}$	$R_{o(2)}$	$R_{9(1)}$	$R_{9(2)}$	D	C	B	A
H	H	L	X	L	L	L	L
H	H	X	L	L	L	L	L
X	X	H	H	H	L	L	H
X	L	X	L	COUNT			
L	X	L	X	COUNT			
L	X	X	L	COUNT			
X	L	L	X	COUNT			

DEVICE TYPE 01

NOTES:
1. Output A is connected to input BD for BCD count.
2. Output D is connected to input A for BiQuinary count.
3. H = high level, L = low level, X = irrelevent.

FIGURE 2. Truth tables.

Count	Output			
	D	C	B	A
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H
10	H	L	H	L
11	H	L	H	H
12	H	H	L	L
13	H	H	L	H
14	H	H	H	L
15	H	H	H	H

DEVICE TYPE 02

NOTES:
1. Output A connected to input B.
2. To reset all outputs to logical L, both $R_{o(1)}$ and $R_{o(2)}$ inputs must be at logical H.
3. Either (or both) reset inputs $R_{o(1)}$ and $R_{o(2)}$ must be at logical L to count.

FIGURE 2. Truth tables - (continued).

Inputs at time t_n								Outputs at time T_{n+1}							
Count up	Count down	Load	A	B	C	D	Clear	Q_A	Q_B	Q_C	Q_D	Carry		Borrow	
H	H	H	X	X	X	X	L	NC	NC	NC	NC	H		H	
H	H	H	X	X	X	X	H	L	L	L	L	H		H	
H	H	L	X	X	X	X	L	A	B	C	D	Count up L if count = 15 H if count > 15	Count down NC	Count up NC	Count down L if count = 0 H if count ≠ 0
P	H	H	X	X	X	X	L	Previous count plus 1 (note 1)				L if count = 15 H if count > 15	NA	NC	NA
H	P	H	X	X	X	X	L	Previous count minus 1 (note 2)				NA	NC	NA	L is count = 0 H if count ≠ 0

DEVICE TYPE 03 TRUTH TABLE

NOTES:
1. See up count sequence table.
2. See down count sequence table.
3. L = V_{IL} for inputs, V_{OL} for outputs.
4. H = V_{IH} for inputs, V_{OH} for outputs.
5. X = V_{IH} or V_{OH}.
6. NC = no change.
7. NA = not applicable.
8. P = Positive going pulse.

FIGURE 2. Truth tables - continued.

UP COUNT SEQUENCE TABLE

Q_A (LSB)	Q_B	Q_C	Q_D (MSB)	Carry
L	L	L	L	H
H	L	L	L	H
L	H	L	L	H
H	H	L	L	H
L	L	H	L	H
H	L	H	L	H
L	H	H	L	H
H	H	H	L	H
L	L	L	H	H
H	L	L	H	H
L	H	L	H	H
H	H	L	H	H
L	L	H	H	H
H	L	H	H	H
L	H	H	H	H
H	H	H	H	L

DOWN COUNT SEQUENCE TABLE

Q_A (LSB)	Q_B	Q_C	Q_D (MSB)	Borrow
H	H	H	H	H
L	H	H	H	H
H	L	H	H	H
L	L	H	H	H
H	H	L	H	H
L	H	L	H	H
H	L	L	H	H
L	L	L	H	H
H	H	H	L	H
L	H	H	L	H
H	L	H	L	H
L	L	H	L	H
H	H	L	L	H
L	H	L	L	H
H	L	L	L	H
L	L	L	L	L

DEVICE TYPE 03

FIGURE 2. Truth tables - continued.

MODE SELECTION

$\overline{PE}$	CEP	CET	MODE
L	L	L	Preset
L	L	H	Preset
L	H	L	Preset
L	H	H	Preset
H	L	L	No Change
H	L	H	No Change
H	H	L	No Change
H	H	H	Count

($\overline{MR}$ = HIGH)

TERMINAL COUNT GENERATION

CET	93L10 (Q_0 $\overline{Q}_1$ $\overline{Q}_2$ Q_3)	93L16 (Q_0 Q_1 Q_2 Q_3)	TC
L	L	L	L
L	H	H	L
H	L	L	L
H	H	H	H

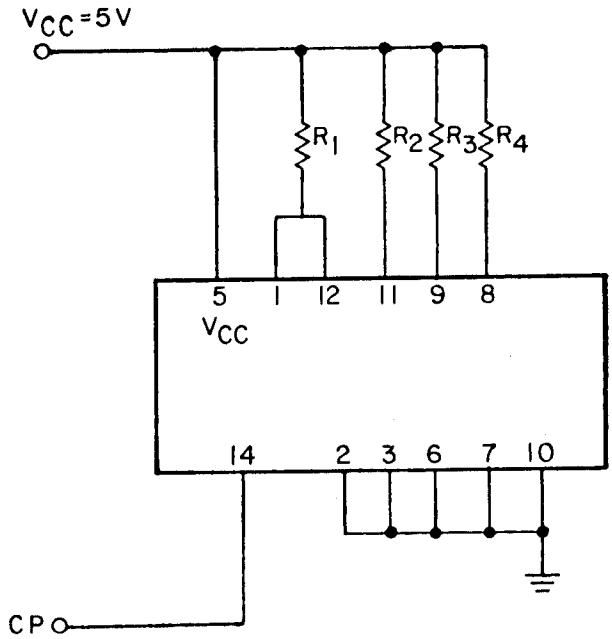
TC = CET Q_0 $\overline{Q}_1$ $\overline{Q}_2$ Q_3 (93L10)
TC = CET Q_0 Q_1 Q_2 Q_3 (93L16)

POSITIVE LOGIC = H = HIGH Voltage Level
L = LOW Voltage Level

Device types 04 and 05 1/

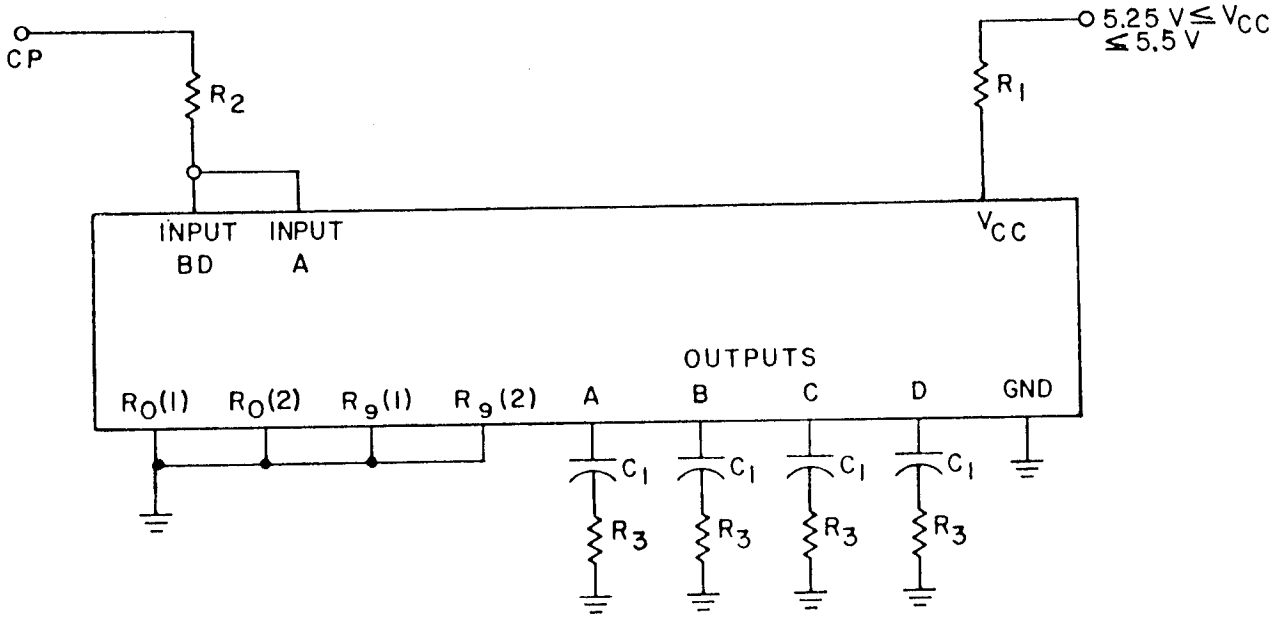
1/ Qualification requirements are removed for these device types.

FIGURE 2. Truth tables - Continued.



CP: 100 kHz square wave; 0-3 V
R_1 thru R_4 = 220Ω ±5%

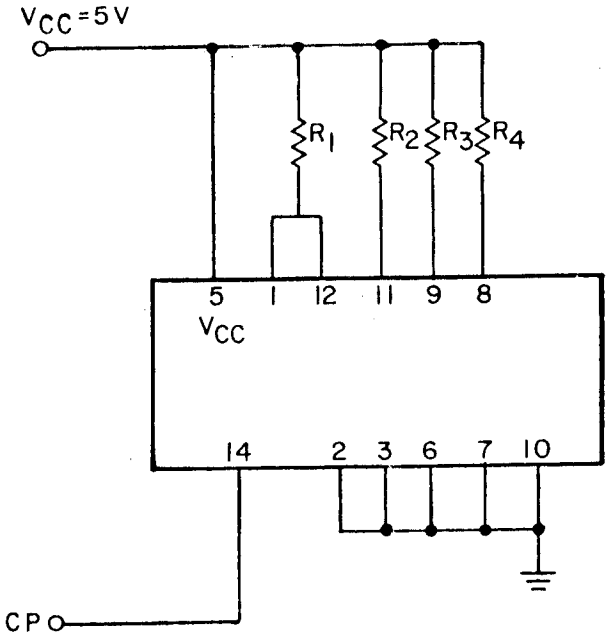
DEVICE TYPE 01



CP = 100 kHz, 0-3 V square wave, 50% duty cycle
R_1 = 10Ω
R_2 = 27Ω
R_3 = 1 kΩ
C_1 = .022 μF

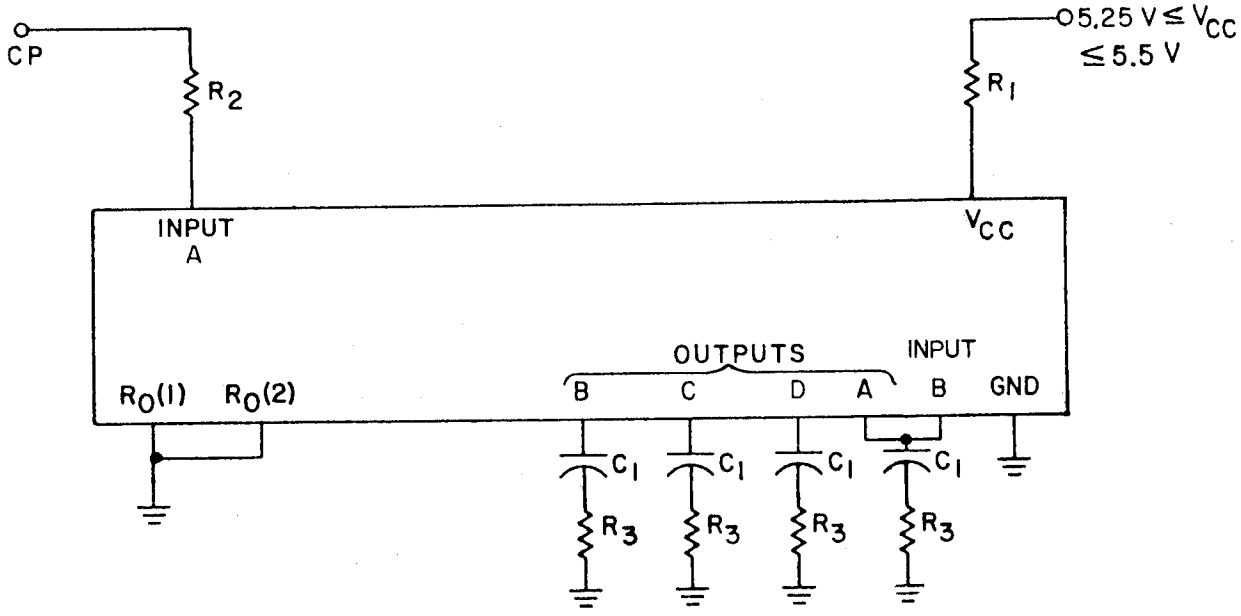
DEVICE TYPE 01 - ALTERNATE CIRCUIT

FIGURE 3. Burn-in and life test circuits.



CP: 100 kHz square wave; 0-3 V
R_1 thru R_4 = 220Ω ±5%

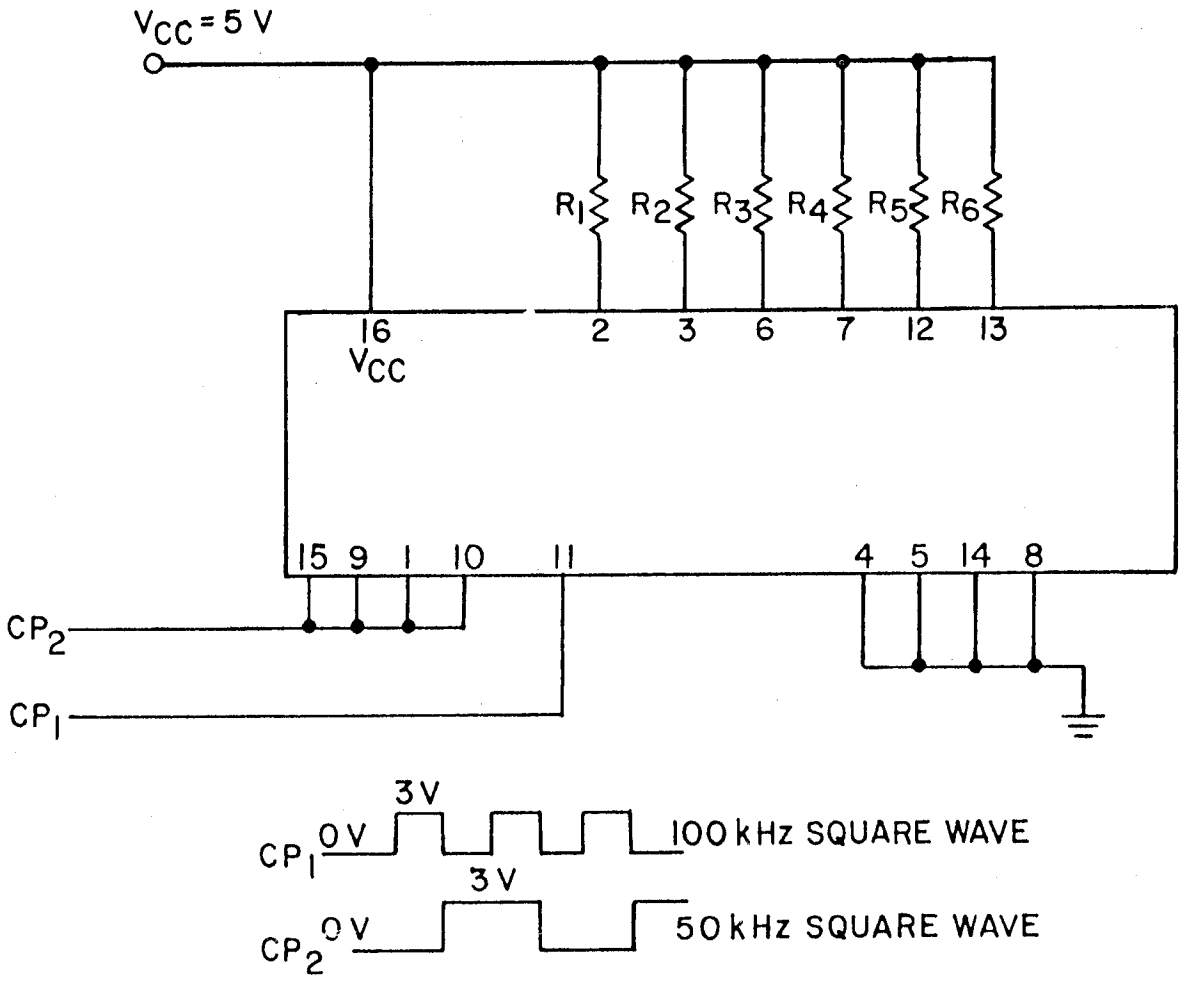
DEVICE TYPE 02



CP = 100 kHz, 0-3 V square wave, 50% duty cycle
R_1 = 27Ω
R_2 = 27Ω
R_3 = 976Ω
C_1 = .0047 μF

DEVICE TYPE 02 - ALTERNATE CIRCUIT

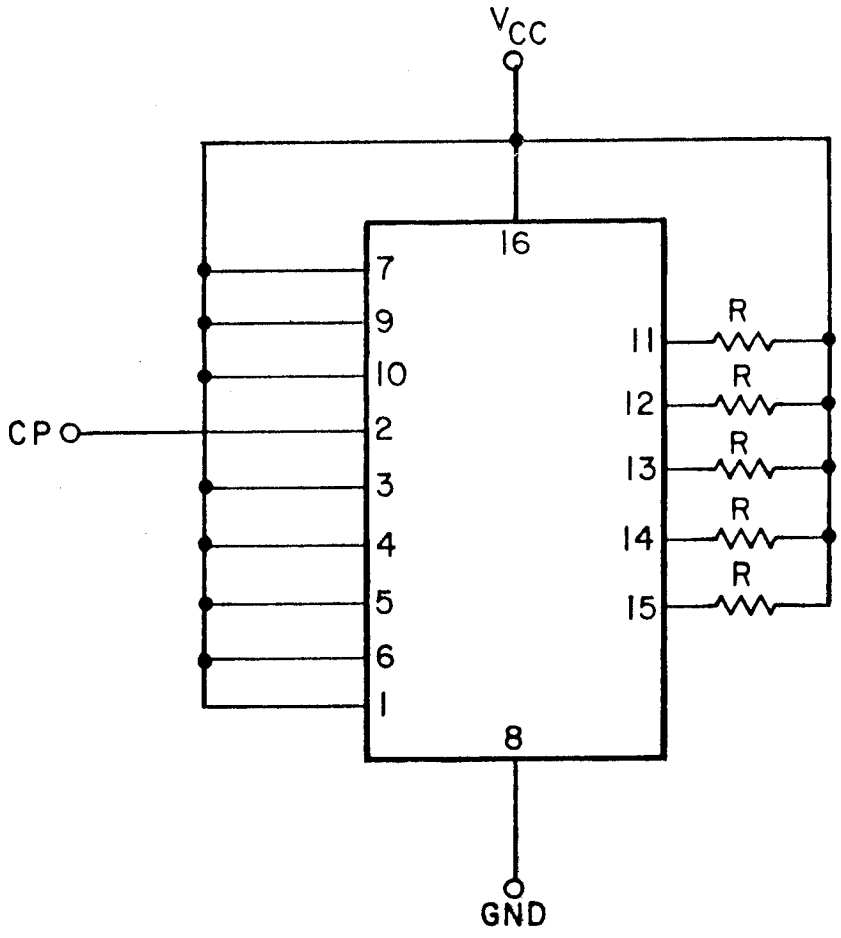
FIGURE 3. Burn-in and life test circuits - continued.



R_1 thru R_6 = 270Ω ±5%

DEVICE TYPE 03

FIGURE 3. Burn-in and life test circuits - continued.

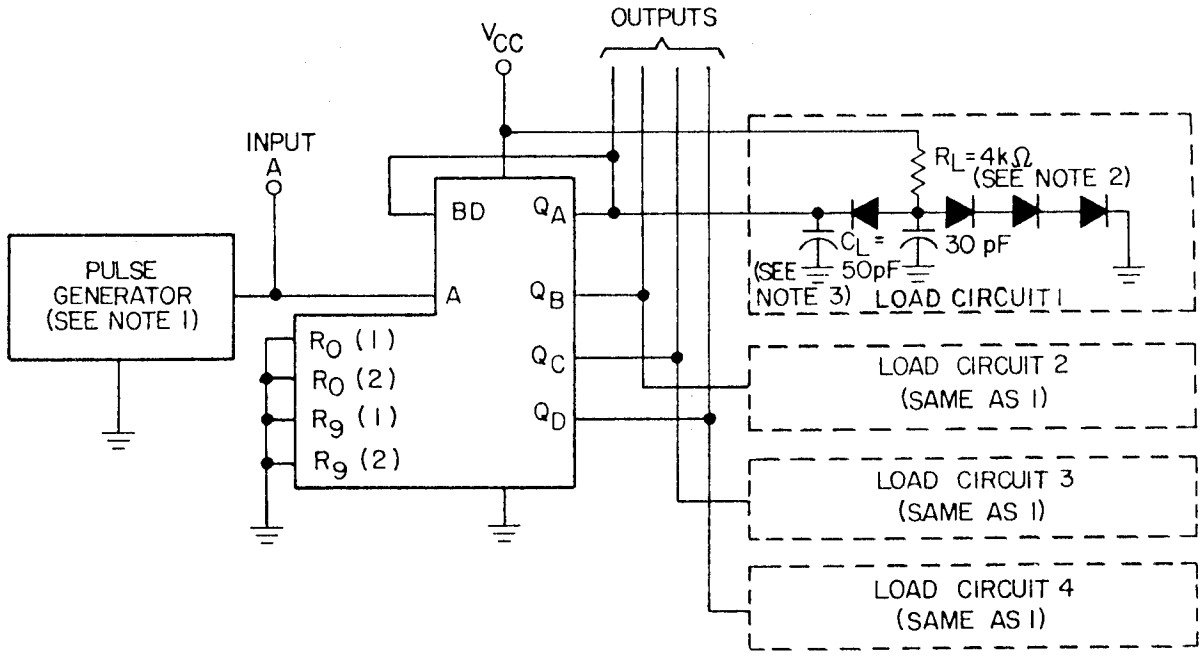


CP = 1 MHz, +3.0 V, 50% duty cycle
V_{CC} = 5.25 V (min), 5.5 V (max)

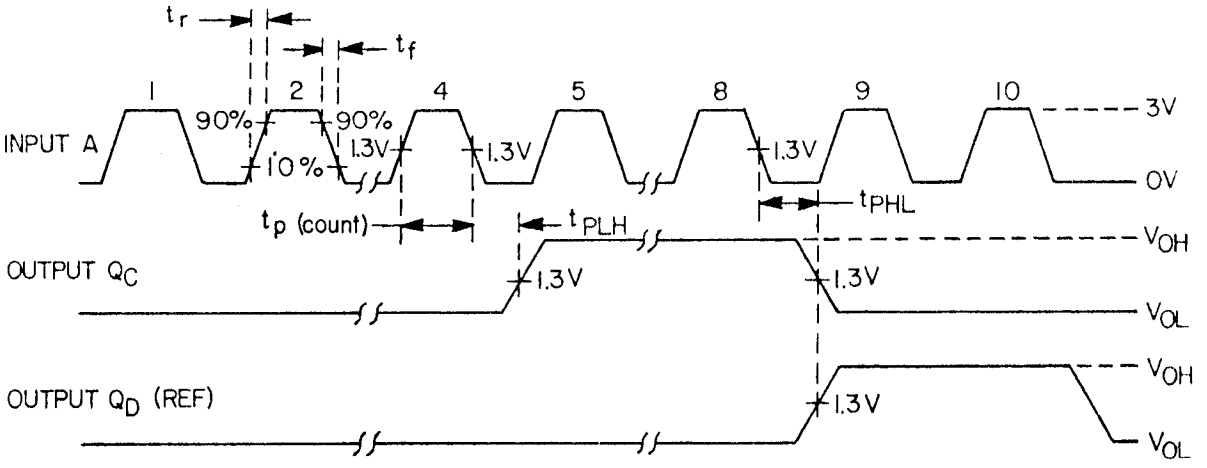
Device types 04 and 05 1/

1/ Qualification requirements have been removed for these device types.

FIGURE 3. Burn-in and life test circuits - continued.



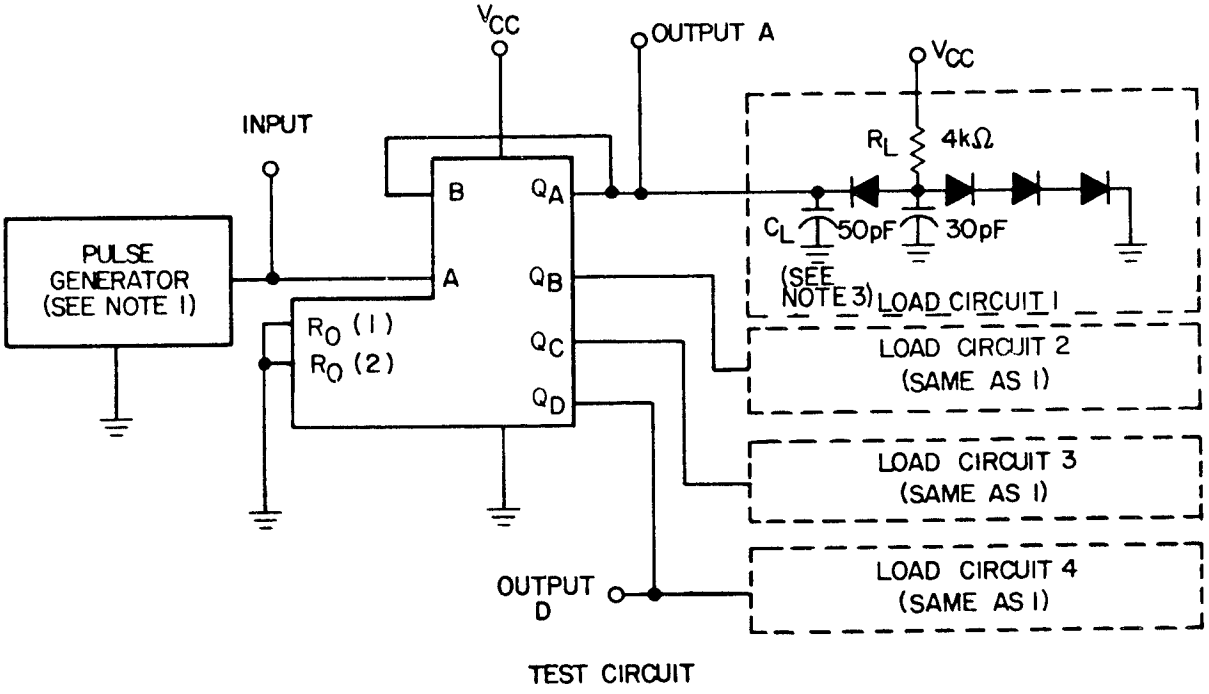
TEST CIRCUIT



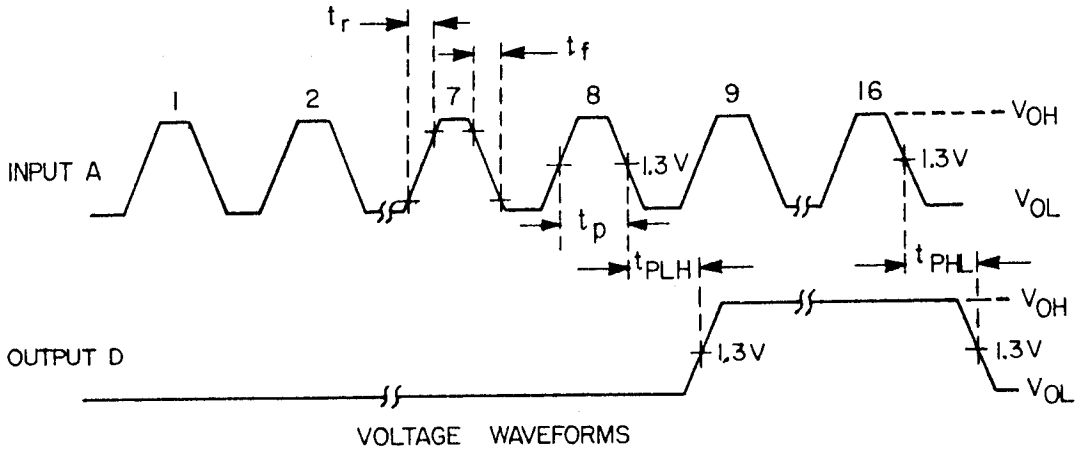
VOLTAGE WAVEFORMS

NOTES:
1. The pulse generator has the following characteristics: $t_p \geq 200$ ns, PRR = 500 kHz, $Z_{out} \approx 50\Omega$, $t_r \leq t_f \leq 15$ ns.
2. All diodes are 1N3064 or equivalent.
3. C_L includes probe and jig capacitance.
4. When testing f_{MAX}: PRR = 3 MHz for subgroup A-9 and 2.5 MHz for subgroups A-10 and A-11. Omit load circuits 2, 3 and 4 and remove connection from output Q_A to input BD.

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



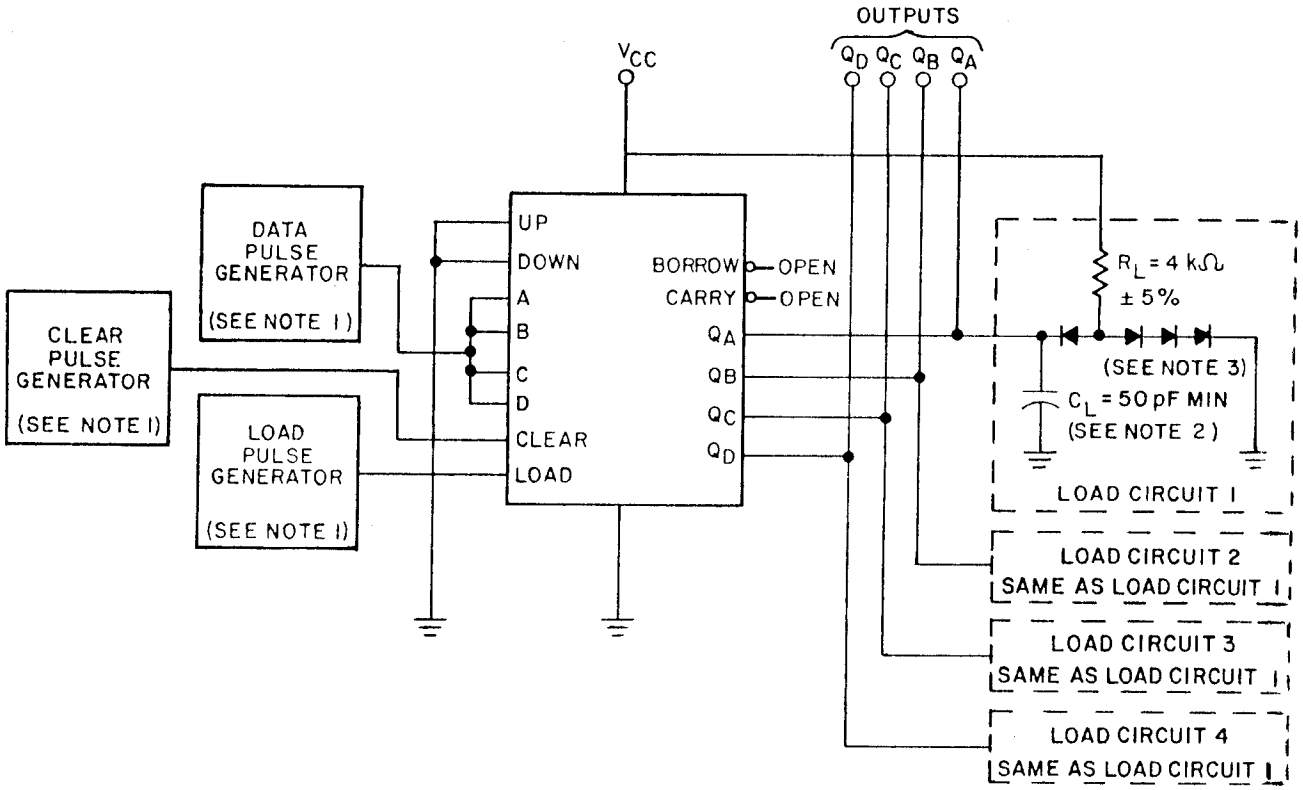
TEST CIRCUIT



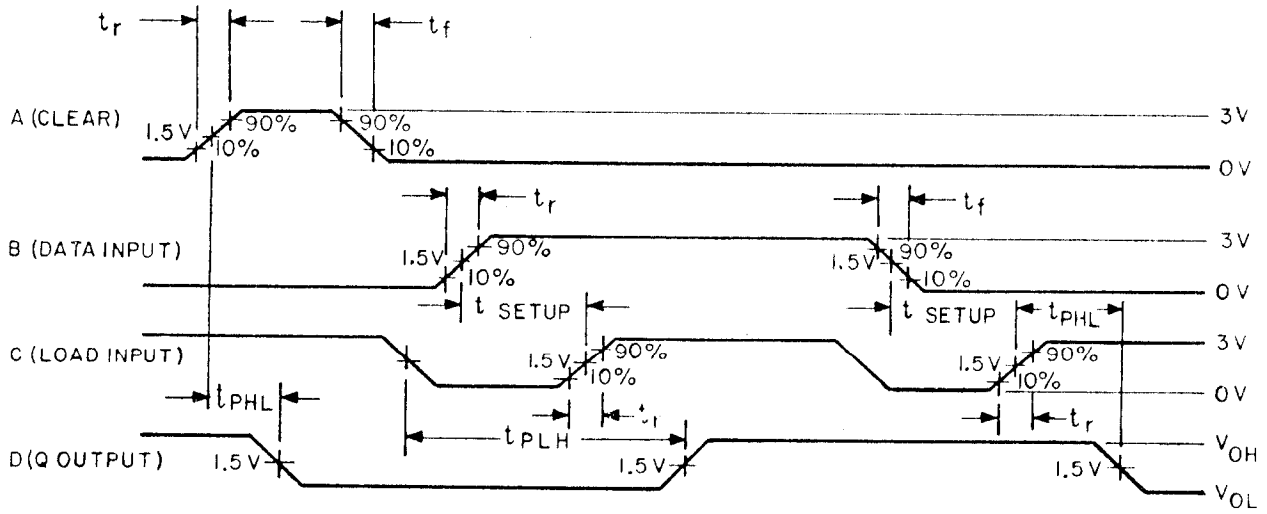
VOLTAGE WAVEFORMS

NOTES:
1. Pulse generator has the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, PRR = 500 kHz, $Z_{out} \approx 50\Omega$.
2. Voltage values are with respect to network ground terminal.
3. C_L = 50 pF minimum including scope probe, wiring, and stray capacitance, without package in test fixture.
4. All diodes are 1N3064 or equivalent.
5. When testing f_{MAX}; PRR = 3 MHz for tests at 25°C, and 2.5 MHz for tests at 125°C and -55°C. Also, omit load circuits 2, 3, and 4 and remove connection from output A to input B.

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



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES:
1. The pulse generators have the following characteristics: $Z_{out} \approx 50\Omega$; for the data pulse generator, PRR = 500 kHz, duty cycle = 50%; for the load pulse generator, PRR = 1 MHz, duty cycle = 50%.
2. C_L includes probe and jig capacitance.
3. All diodes are 1N3064, or equivalent.

FIGURE 6A. Switching time test circuits and waveforms for device type 03.

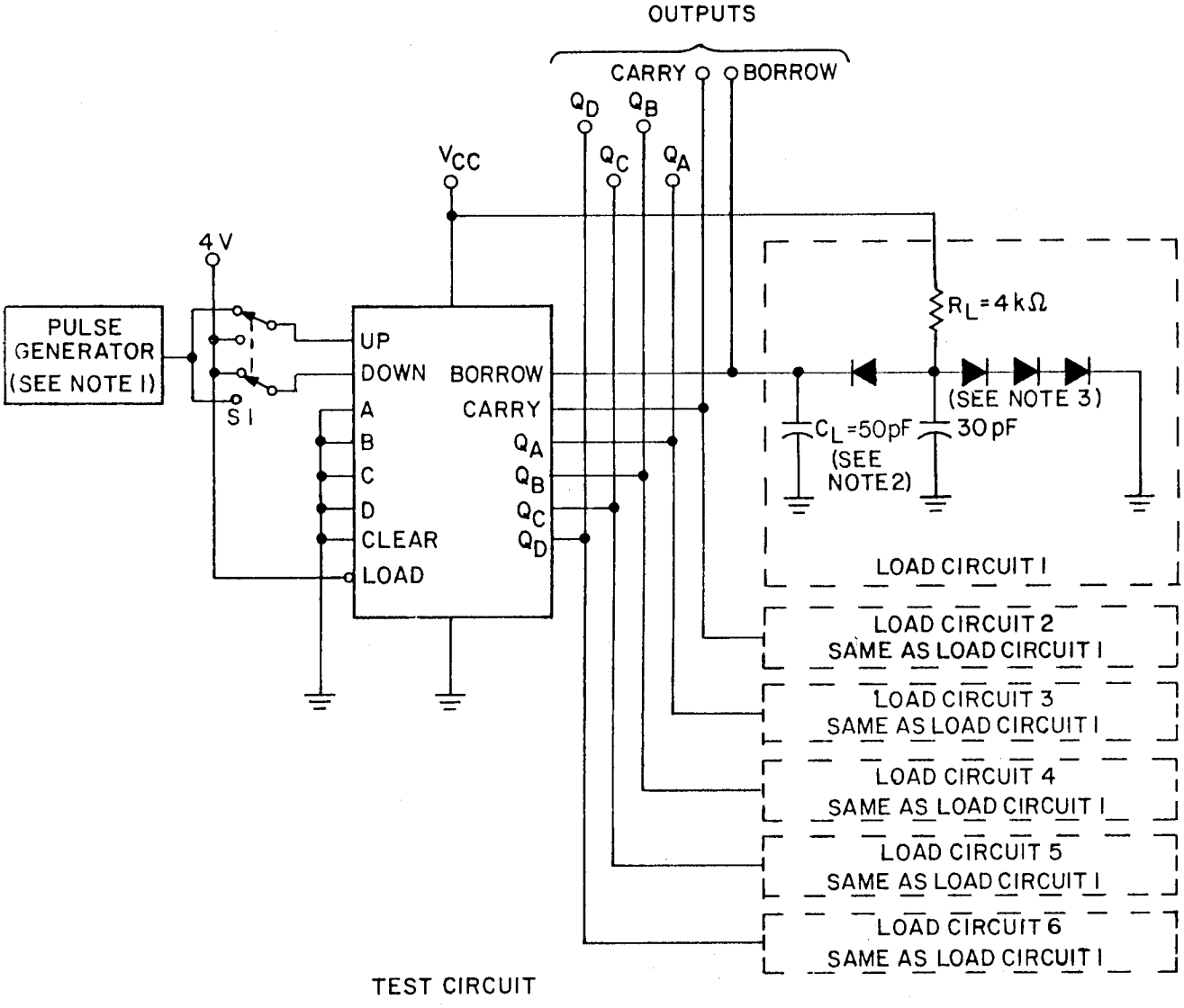
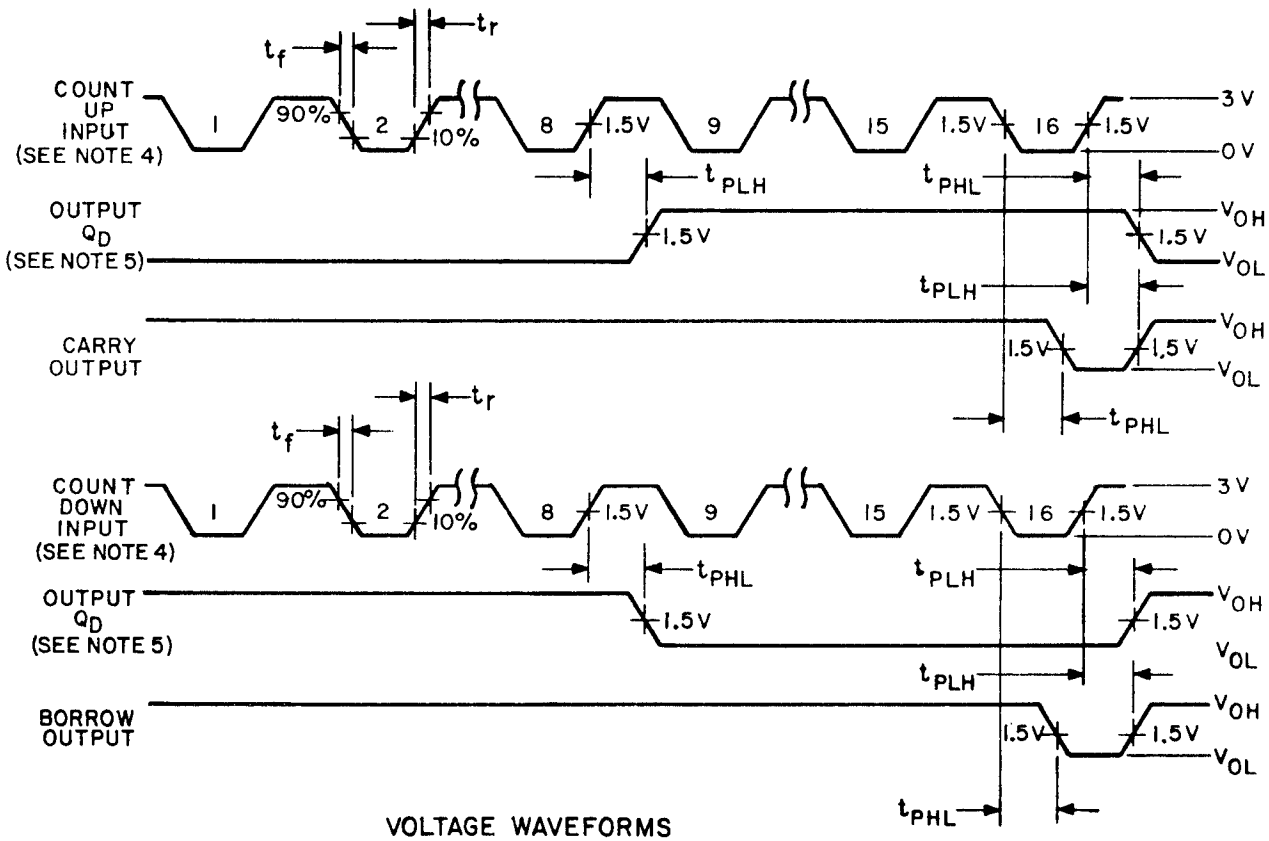


FIGURE 6B. Switching time test circuit and waveforms for device type 03.



VOLTAGE WAVEFORMS

NOTES:
1. The pulse generator has the following characteristics: PRR $\leq$ 1 MHz, $Z_{out} \approx 50\Omega$, duty cycle = 50%.
2. C_L includes probe and jig capacitance.
3. Diodes are 1N3064, or equivalent.
4. Count-up and count-down pulse shown are for device type 03.
5. Waveforms for outputs Q_A, Q_B, and Q_C are omitted to simplify the drawing.
6. t_r and $t_f \leq 25$ ns.

FIGURE 6B. Switching time test circuit and waveforms for device type 03 - continued.

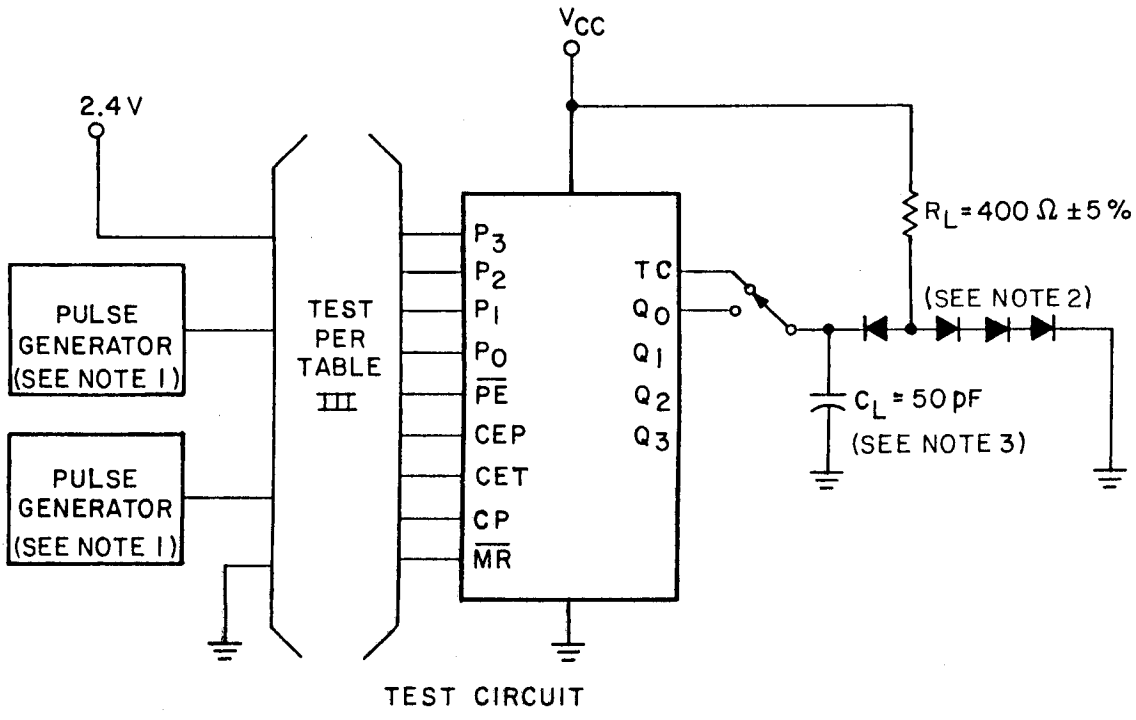
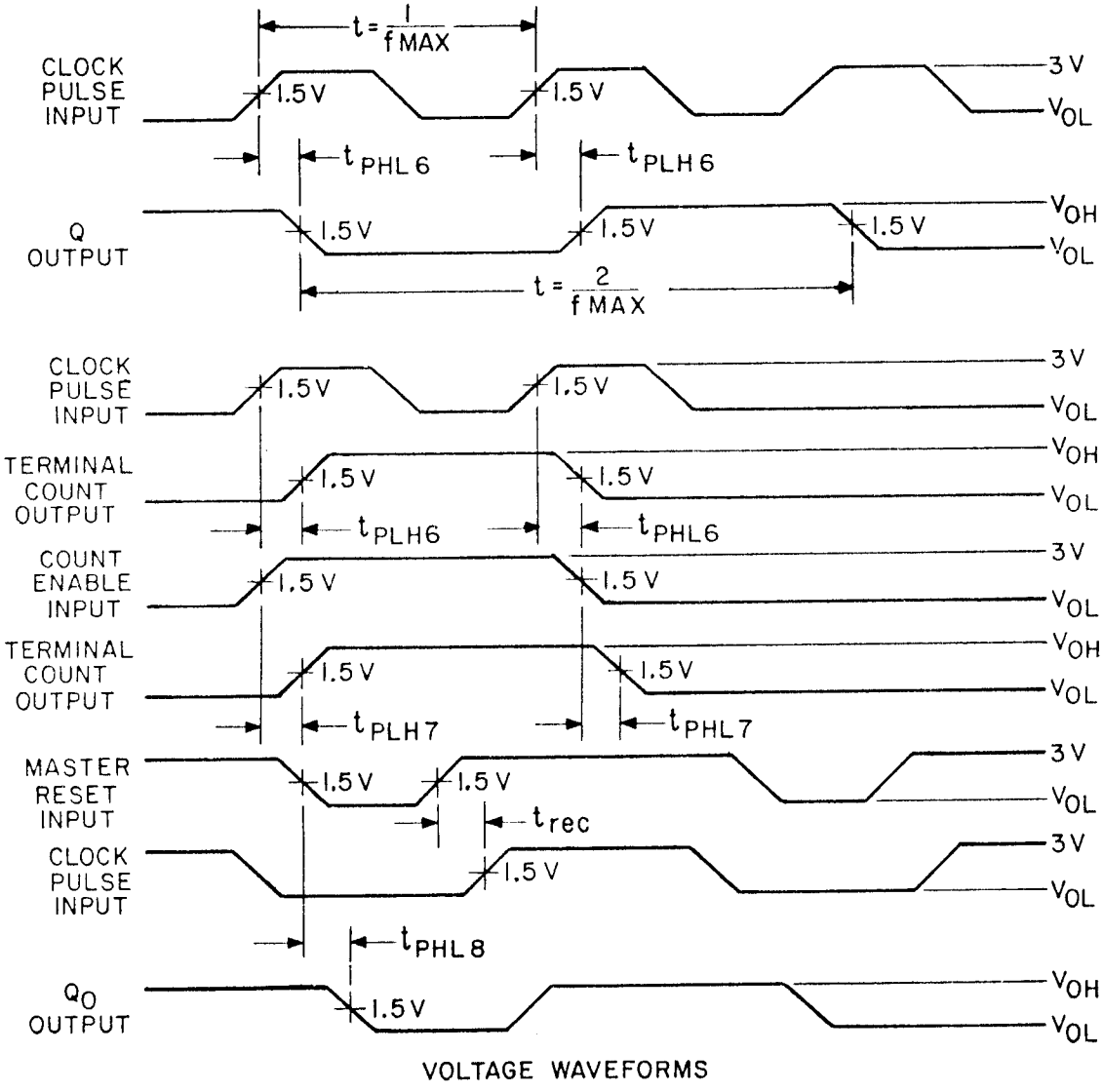


FIGURE 7. Switching time test circuit and waveforms for device types 04 and 05.



VOLTAGE WAVEFORMS

NOTES:
1. The pulse generators have the following characteristics: $t_r \leq 10$ ns, $t_f \leq 10$ ns, PRR $\leq$ 10 MHz, duty cycle < 50%, $Z_{OUT} \approx 50\Omega$.
2. All diodes are 1N3064, or equivalent.
3. C_L includes probe and jig capacitance.
4. Voltage values are with respect to ground terminal.
5. Qualification requirements have been removed for these device types.

FIGURE 7. Switching time test circuit and waveforms for device types 04 and 05 - Continued.

TABLE III. Group A inspection for device type 01.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
			Test no.	BD	$R_{O(1)}$	$R_{O(2)}$	NC	V_{CC}	$R_{9(1)}$	$R_{9(2)}$	Q_C	Q_B	GND	Q_D	Q_A	NC	Input A		Min	Max	
1 T_C = 25°C	V_{OL}	3007	1	2.0 V	2.0 V	2.0 V		4.5 V	GND	GND	2 mA		GND				GND	Q_C		0.3	V
		"	2	"	"	"		"	GND	GND		2 mA	"				"	Q_B		"	"
		"	3	"	"	"		"	4.5 V	0.7 V			"	2 mA			"	Q_D		"	"
		"	4	GND	"	"		"	0.7 V	4.5 V			"		2 mA		2.0 V	Q_A		"	"
		"	5	2.0 V	4.5 V	0.7 V		"	2.0 V	2.0 V	2 mA		"				GND	Q_C		"	"
		"	6	2.0 V	0.7 V	4.5 V		"	2.0 V	2.0 V		2 mA	"				GND	Q_B		"	"
	V_{OH}	3006	7	2.0 V	4.5 V	0.7 V		"	"	"			"	-0.1 mA			GND	Q_D	2.4		"
		"	8	GND	0.7 V	4.5 V		"	"	"			"		-0.1 mA		2.0 V	Q_A	"		"
		"	9	2.0 V	0.7 V	0.7 V		"	2.0 V	2.0 V			"	-0.1 mA			GND	Q_D	"		"
		"	10	GND	0.7 V	0.7 V		"	2.0 V	2.0 V			"		-0.1 mA		2.0 V	Q_A	"		"
		"	11					"	0.7 V	0.7 V	-0.1 mA		"				GND	Q_C	"		"
		"	12					"	0.7 V	0.7 V		-0.1 mA	"				GND	Q_B	"		"
	I_{IL1}	3009	13		0.3 V	4.5 V		5.5 V					"					$R_{O(1)}$	-0.06	-0.18	mA
		"	14		4.5 V	0.3 V		"					"					$R_{O(2)}$	"	"	"
		"	15					"	0.3 V	4.5 V			"					$R_{9(1)}$	"	"	"
		"	16					"	4.5 V	0.3 V			"					$R_{9(2)}$	"	"	"
	I_{IL2}	"	17		GND	GND		"	GND	GND			"				0.3 V	Input A	-0.12	-0.54	mA
	I_{IL3}	"	18	0.3 V	GND	GND		"	GND	GND			"					BD	-0.29	-1.08	mA
	I_{IH1}	3010	19		2.4 V	GND		"					"					$R_{O(1)}$		10	µA
		"	20		GND	2.4 V		"					"					$R_{O(2)}$		"	"
		"	21					"	2.4 V	GND			"					$R_{9(1)}$		"	"
		"	22					"	GND	2.4 V			"					$R_{9(2)}$		"	"
	I_{IH2}	"	23		5.5 V	GND		"					"					$R_{O(1)}$		100	"
		"	24		GND	5.5 V		"					"					$R_{O(2)}$		"	"
		"	25					"	5.5 V	GND			"					$R_{9(1)}$		"	"
		"	26					"	GND	5.5 V			"					$R_{9(2)}$		"	"
	I_{IH3}	"	27		GND	GND		"	GND	GND			"				2.4 V	Input A		30	"
	I_{IH4}	"	28		GND	GND		"	GND	GND			"				5.5 V	Input A		300	"
	I_{IH5}	"	29	2.4 V	GND	GND		"	GND	GND			"					BD		60	"
	I_{IH6}	"	30	5.5 V	GND	GND		"	GND	GND			"					BD		600	"
	I_{OS}	3011	31		GND	GND		"	4.5 V	4.5 V			"	GND				Q_D	-3	-15	mA
		"	32		GND	GND		"	4.5 V	4.5 V			"		GND			Q_A	"	"	"
		"	33	2/	1/	1/		"	GND	GND		GND	"					Q_B	"	"	"
		"	34	3/	1/	1/		"	GND	GND	GND		"					Q_C	"	"	"
	I_{CC}		35	GND	1/	1/		"	GND	GND			"				GND	V_{CC}		7.2	"
2	Same tests, terminal conditions and limits as for subgroup 1, except T_C = +125°C.																				
3	Same tests, terminal conditions and limits as for subgroup 1, except T_C = -55°C.																				

See notes at end of device type 01.

TABLE III. Group A inspection for for device type 01 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,3,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
			Test no.	$B\bar{D}$	$R_{0(1)}$	$R_{0(2)}$	NC	V_{CC}	$R_{9(1)}$	$R_{9(2)}$	Q_C	Q_B	GND	Q_D	Q_A	NC	Input A		Min	Max	
7	Truth		36	A 5/	A 5/	A 5/		4.5 V	A 5/	A 5/	L	L	GND	H	H		B 5/	All	H or L		
T_C = 25°C	table		37	A	"	"		"	"	"	L	L	"	H	H		A	outputs	as shown 4/		
	tests		38	A	"	"		"	"	"	L	L	"	H	H		B	"	"		
	6/		39	B	"	"		"	"	"	L	L	"	H	H		B	"	"		
			40	B	"	"		"	B	B	L	L	"	L	L		B	"	"		
			41	A	B	B		"	A	A	L	L	"	H	H		B	"	"		
			42	B	"	"		"	"	"	L	L	"	H	H		A	"	"		
			43	A	"	"		"	"	"	L	L	"	H	H		B	"	"		
			44	B	A	A		"	B	B	L	L	"	L	L		B	"	"		
			45	A	"	"		"	"	B	L	L	"	L	L		A	"	"		
			46	B	"	"		"	"	B	L	L	"	L	L		B	"	"		
			47	B	B	"		"	"	A	L	L	"	L	L		B	"	"		
			48	B	"	"		"	"	"	L	L	"	L	L		A	"	"		
			49	A	"	"		"	"	"	L	L	"	L	H		B	"	"		
			50	A	"	"		"	"	"	L	L	"	L	H		A	"	"		
			51	B	"	"		"	"	"	L	H	"	L	L		B	"	"		
			52	B	"	"		"	"	"	L	H	"	L	L		A	"	"		
			53	A	"	"		"	"	"	L	H	"	L	H		B	"	"		
			54	A	"	"		"	"	"	L	H	"	L	H		A	"	"		
			55	B	"	"		"	"	"	H	L	"	L	L		B	"	"		
			56	B	"	"		"	"	"	H	L	"	L	L		A	"	"		
			57	A	"	"		"	"	"	H	L	"	L	H		B	"	"		
			58	A	"	"		"	"	"	H	L	"	L	H		A	"	"		
			59	B	"	"		"	"	"	H	H	"	L	L		B	"	"		
			60	B	"	"		"	"	"	H	H	"	L	L		A	"	"		
			61	A	"	"		"	"	"	H	H	"	L	H		B	"	"		
			62	A	"	"		"	"	"	H	H	"	L	H		A	"	"		
			63	B	"	"		"	"	"	L	L	"	H	L		B	"	"		
			64	B	"	"		"	"	"	L	L	"	H	L		A	"	"		
			65	A	"	"		"	"	"	L	L	"	H	H		B	"	"		
			66	A	"	"		"	"	"	L	L	"	H	H		A	"	"		
			67	B	"	"		"	"	"	L	L	"	L	L		B	"	"		
			68	B	"	B		"	"	B	L	L	"	L	L		A	"	"		
			69	A	"	"		"	A	"	L	L	"	L	H		B	"	"		
			70	A	"	"		"	"	"	L	L	"	L	H		A	"	"		
			71	B	A	"		"	"	"	L	H	"	L	L		B	"	"		
			72	B	"	"		"	"	"	L	H	"	L	L		A	"	"		
			73	A	"	"		"	"	"	L	H	"	L	L		B	"	"		
			74	A	"	"		"	"	"	L	H	"	L	L		A	"	"		
			75	B	"	"		"	"	"	H	L	"	L	L		B	"	"		
			76	B	"	"		"	"	"	H	L	"	L	L		A	"	"		
			77	A	"	"		"	"	"	H	L	"	L	H		B	"	"		
			78	A	"	"		"	"	"	H	L	"	L	H		A	"	"		
			79	B	"	"		"	"	"	H	H	"	L	L		B	"	"		
			80	B	"	"		"	"	"	H	H	"	L	L		A	"	"		
			81	A	"	"		"	"	"	H	H	"	L	H		B	"	"		
			82	A	"	"		"	"	"	H	H	"	L	H		A	"	"		
			83	B	"	"		"	"	"	L	L	"	H	L		B	"	"		
			84	B	"	"		"	"	"	L	L	"	H	L		A	"	"		
			85	A	"	"		"	"	"	L	L	"	H	H		B	"	"		
			86	A	"	"		"	"	"	L	L	"	H	H		A	"	"		
			87	B	"	"		"	"	"	L	L	"	L	L		B	"	"		

See notes at end of device type 01.

TABLE III. Group A inspection for for device type 01 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Limits		
			Test no.	BD	$R_{O(1)}$	$R_{O(2)}$	NC	V_{CC}	$R_{9(1)}$	$R_{9(2)}$	Q_C	Q_B	GND	Q_D	Q_A	NC	Input A	Measured terminal	Min	Max	Unit
7 T_C = 25°C	Truth table tests 6/		88	B 5/	B 5/	B 5/		4.5 V	B 5/	B 5/	L	L	GND	L	L		A 5/	All outputs	H or L as shown 4/		
			89	A	B	"		"	"	"	L	L	"	L	H		B	"			
			90	A	B	"		"	"	"	L	L	"	L	H		A	"			
			91	B	A	"		"	"	A	L	H	"	L	L		B	"			
			92	B	"	"		"	"	"	L	H	"	L	L		A	"			
			93	A	"	"		"	"	"	L	H	"	L	H		B	"			
			94	A	"	"		"	"	"	L	H	"	L	H		A	"			
			95	B	"	"		"	"	"	H	L	"	L	L		B	"			
			96	B	"	"		"	"	"	H	L	"	L	L		A	"			
			97	A	"	"		"	"	"	H	L	"	L	H		B	"			
			98	A	"	"		"	"	"	H	L	"	L	H		A	"			
			99	B	"	"		"	"	"	H	H	"	L	L		B	"			
			100	B	"	A		"	"	B	L	L	"	L	L		B	"			
			101	B	B	"		"	A	"	L	L	"	L	L		B	"			
			102	B	"	"		"	"	"	L	L	"	L	L		A	"			
			103	A	"	"		"	"	"	L	H	"	L	H		B	"			
			104	A	"	"		"	"	"	L	H	"	L	H		A	"			
			105	B	"	"		"	"	"	L	H	"	L	L		B	"			
			106	B	"	"		"	"	"	L	H	"	L	L		A	"			
			107	A	"	"		"	"	"	L	H	"	L	H		B	"			
			108	A	"	"		"	"	"	L	H	"	L	H		A	"			
			109	B	"	"		"	"	"	H	L	"	L	L		B	"			
			110	B	"	"		"	"	"	H	L	"	L	L		A	"			
			111	A	"	"		"	"	"	H	L	"	L	H		B	"			
			112	A	"	"		"	"	"	H	L	"	L	H		A	"			
			113	B	"	"		"	"	"	H	H	"	L	L		B	"			
			114	A	"	B		"	"	A	L	L	"	H	H		B	"			
			115	A	"	B		"	B	B	L	L	"	H	H		B	"			
			116	A	A	A		"	"	"	L	L	"	L	L		A	"			
			117	B	A	A		"	"	"	L	L	"	L	L		B	"			
			118	B	A	A		"	"	"	L	L	"	L	L		A	"			
			119	A	B	B		"	"	"	L	L	"	L	H		B	"			
			120	A	"	"		"	"	"	L	L	"	L	H		A	"			
			121	B	"	"		"	"	"	L	H	"	L	L		B	"			
			122	B	"	"		"	"	"	L	H	"	L	L		A	"			
			123	A	"	"		"	"	"	L	H	"	L	H		B	"			
			124	A	"	"		"	"	"	L	H	"	L	H		A	"			
			125	B	"	"		"	"	"	H	L	"	L	L		B	"			
			126	B	"	"		"	"	"	H	L	"	L	L		A	"			
			127	A	"	"		"	"	"	H	L	"	L	H		B	"			
			128	A	"	"		"	"	"	H	L	"	L	H		A	"			
			129	B	"	"		"	"	"	H	H	"	L	L		B	"			
			130	B	"	"		"	"	"	H	H	"	L	L		A	"			
			131	A	"	"		"	"	"	H	H	"	L	H		B	"			
			132	B	A	A		"	"	"	L	L	"	L	L		B	"			
			133	B	B	B		"	"	"	L	L	"	L	L		A	"			
			134	A	"	"		"	"	"	L	L	"	L	H		B	"			
			135	A	"	"		"	"	"	L	L	"	L	H		A	"			
			136	B	"	"		"	"	"	L	H	"	L	L		B	"			

See notes at end of device type 01.

TABLE III. Group A inspection for for device type 01 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Limits		
			Test no.	BD	$R_{0(1)}$	$R_{0(2)}$	NC	V_{CC}	$R_{9(1)}$	$R_{9(2)}$	Q_C	Q_B	GND	Q_D	Q_A	NC	Input A	Measured terminal	Min	Max	Unit
7 T_C = 25°C	Truth table tests 6/		137	B 5/	B 5/	B 5/		4.5 V	B 5/	B 5/	L	H	GND	L	L		A 5/	All outputs	H or L as shown 4/		
			138	A	"	"		"	"	"	L	H	"	L	H		B	"	"		
			139	A	"	"		"	"	"	L	H	"	L	H		A	"	"		
			140	B	"	"		"	"	"	H	L	"	L	L		B	"	"		
			141	B	"	"		"	"	"	H	L	"	L	L		A	"	"		
			142	A	"	"		"	"	"	H	L	"	L	H		B	"	"		
			143	A	"	"		"	"	"	H	L	"	L	H		A	"	"		
			144	B	"	"		"	"	"	H	H	"	L	L		B	"	"		
			145	B	"	"		"	"	"	H	H	"	L	L		A	"	"		
			146	A	"	"		"	"	"	H	H	"	L	H		B	"	"		
			147	A	"	"		"	A	A	L	L	"	H	H		A	"	"		
			148	A	"	"		"	A	A	L	L	"	H	H		A	"	"		
			149	B	"	"		"	A	A	L	L	"	H	H		B	"	"		
			150	B	"	"		"	B	B	L	L	"	H	H		A	"	"		
			151	A	"	"		"	"	"	L	L	"	H	L		B	"	"		
			152	A	A	A		"	"	"	L	L	"	L	L		A	"	"		
			153	B	A	A		"	"	"	L	L	"	L	L		B	"	"		
8	Same tests, terminal conditions and limits as for subgroup 7 except T_C = 125°C and -55°C.																				
9 T_C = 25°C	f_{MAX} 7/	(Fig. 4)	154		GND	GND		5.0 V	GND	GND			GND		OUT		IN	Q_A	6		MHz
	t_{PLH1}	3003 (Fig. 4)	155	Q_A	"	"		"	"	"		OUT	"		OUT		"	Q_A		85	ns
		"	156	"	"	"		"	"	"			"				"	Q_B		170	"
		"	157	"	"	"		"	"	"	OUT		"				"	Q_C		255	"
		"	158	"	"	"		"	"	"			"	OUT			"	Q_D		340	"
	t_{PHL1}	"	159	"	"	"		"	"	"			"		OUT		"	Q_A		85	"
		"	160	"	"	"		"	"	"		OUT	"				"	Q_B		170	"
		"	161	"	"	"		"	"	"	OUT		"				"	Q_C		255	"
		"	162	"	"	"		"	"	"			"	OUT			"	Q_D		340	"
10 T_C = 125°C	f_{MAX} 7/	"	163		"	"		"	"	"			"		OUT		"	Q_A	5		MHz
	t_{PLH1}	"	164	Q_A	"	"		"	"	"			"		OUT		"	Q_A		125	ns
		"	165	"	"	"		"	"	"		OUT	"				"	Q_B		255	"
		"	166	"	"	"		"	"	"	OUT		"				"	Q_C		380	"
		"	167	"	"	"		"	"	"			"	OUT			"	Q_D		510	"
	t_{PHL1}	"	168	"	"	"		"	"	"			"		OUT		"	Q_A		125	"
		"	169	"	"	"		"	"	"		OUT	"				"	Q_B		255	"
		"	170	"	"	"		"	"	"	OUT		"				"	Q_C		380	"
		"	171	"	"	"		"	"	"			"	OUT			"	Q_D		510	"
11	Same tests, terminal conditions and limits as for subgroup 10, except T_C = -55°C.																				

1/ Momentarily apply 2.0 V, then ground prior to taking measurements to set the device in desired state. Maintain ground for measurement.
2/ Same as 1/, except apply one pulase after reset (R_0) pulses.
3/ Same as 1/, except apply two pulses after reset (R_0) pulses.
4/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.3 V maximum when using a high speed checker double comparator; or (b) H ≥ 1.5 V and L ≤ 1.5 V when using a high speed checker single comparator.
5/ Input voltages shown are: A = 2.4 V; B = 0.3 V.
6/ Only a summary of attributes data is required.
7/ f_{MAX}, minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 02.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits Min	Limits Max	Unit
				$R_{O(1)}$	$R_{O(2)}$	NC	V_{CC}	NC	NC	NC	Input B	Q_B	Q_C	GND	Q_D	Q_A	Input A				
1 T_C = 25°C	V_{OL}	3007	1	2.0 V	2.0 V		4.5 V				GND	2 mA	2 mA	GND	2 mA	2 mA	2.0 V	Q_A		0.3	V
		"	2	"	"		"				2.0 V			"			GND	Q_B		"	"
		"	3	"	"		"				"			"			"	Q_C		"	"
		"	4				"				"			"			"	Q_D		"	"
	V_{OH}	3006	5	1/	1/		"				GND	-0.1 mA	-0.1 mA	"	-0.1 mA	-0.1 mA	GND	Q_A	2.4		"
		"	6	"	"		"				2/			"			"	Q_B	"		"
		"	7	"	"		"				3/			"			"	Q_C	"		"
		"	8				"				4/			"			"	Q_D	"		"
	I_{OS}	3011	9	"	"		5.5 V				GND	GND	GND	"	GND	GND	GND	Q_A	-3	-15	mA
		"	10	"	"		"				2/			"			"	Q_B	"	"	"
		"	11	"	"		"				3/			"			"	Q_C	"	"	"
		"	12				"				4/			"			"	Q_D	"	"	"
	I_{IH1}	3010	13	2.4 V	GND		"							"				$R_{O(1)}$		10	µA
		"	14	GND	2.4 V		"							"				$R_{O(2)}$		10	"
	I_{IH2}	"	15	5.5 V	GND		"							"				$R_{O(1)}$		100	"
		"	16	GND	5.5 V		"							"				$R_{O(2)}$		100	"
	I_{IH3}	"	17				"				2.4 V			"			2.4 V	Input A		20	"
		"	18				"							"				Input B		20	"
	I_{IH4}	"	19				"				5.5 V			"			5.5 V	Input A		200	"
		"	20				"							"				Input B		200	"
	I_{IL1}	3009	21	0.3 V	4.5 V		"							"				$R_{O(1)}$	-0.06	-0.18	mA
		"	22	4.5 V	0.3 V		"							"				$R_{O(2)}$	-0.06	-0.18	"
	I_{IL2}	"	23				"				0.3 V			"			0.3 V	Input A	-0.12	-0.36	"
		"	24				"							"				Input B	-0.12	-0.36	"
	I_{CC}	3005	25				"							"				V_{CC}		6.6	"
2	Same tests, terminal conditions and limits as for subgroup 1, except T_C = 125°C.																				
3	Same tests, terminal conditions and limits as for subgroup 1, except T_C = -55°C.																				
7 T_C = 25°C	Truth table tests 7/		26	A 6/	A 6/		4.5 V				B 6/	L	L	GND	L	L	B 6/	All outputs	H or L as shown 5/		
			27	"	"		"				A	"	"	"	"	"	"	"	"		
			28	"	"		"				B	"	"	"	"	"	"	"	"		
			29	"	B		"				B	"	"	"	"	"	"	"	"		
			30	"	"		"				A	"	"	"	"	"	"	"	"		
			31	"	A		"				B	H	"	"	"	"	"	"	"		
			32	"	"		"				B	L	"	"	"	"	"	"	"		
			33	"	"		"				B	"	H	"	"	"	"	"	"		
			34	"	"		"				A	"	L	"	"	"	"	"	"		
			35	"	"		"				B	"	H	"	"	"	"	"	"		
			36	"	"		"				B	"	L	"	"	"	"	"	"		
			37	"	"		"				A	"	H	"	"	"	"	"	"		
			38	"	"		"				B	"	L	"	"	"	"	B	"		
			39	"	"		"				A	"	H	"	"	"	"	"	"		

See notes at end of device type 02.

TABLE III. Group A inspection for for device type 02 - Continued.
Terminal conditions (pins not designated may be H $\geq$ 2.0 V, L $\leq$ 0.8 V, or open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1 $R_{O(1)}$	2 $R_{O(2)}$	3 NC	4 V_{CC}	5 NC	6 NC	7 NC	8 Input B	9 Q_B	10 Q_C	11 GND	12 Q_D	13 Q_A	14 Input A	Measured terminal	Limits Min	Limits Max	Unit
7 T_C = 25°C	Truth table tests 7/		40	B 6/	B 6/		4.5 V				B 6/	L	H	GND	L	L	B 6/	All outputs	H or L as shown 5/		
			41	"	"		"				A	L	"	"	"	"	"	"	"		
			42	"	"		"				B	H	"	"	"	"	"	"	"		
			43	"	"		"				A	H	"	"	"	"	"	"	"		
			44	"	"		"				B	L	L	"	H	"	"	"	"		
			45	"	"		"				A	L	"	"	"	"	"	"	"		
			46	"	"		"				B	H	"	"	"	"	"	"	"		
			47	"	"		"				A	H	"	"	"	"	"	"	"		
			48	"	"		"				B	L	H	"	"	"	"	"	"		
			49	"	"		"				A	L	"	"	"	"	"	"	"		
			50	"	"		"				B	H	"	"	"	"	"	"	"		
			51	"	"		"				A	H	"	"	"	"	"	"	"		
			52	"	"		"				B	L	L	"	L	"	"	"	"		
			53	"	"		"				A	L	"	"	"	"	"	"	"		
			54	"	"		"				B	H	"	"	"	"	"	"	"		
			55	"	"		"				A	H	"	"	"	"	"	"	"		
			56	"	"		"				B	L	H	"	"	"	"	"	"		
			57	"	"		"				A	L	"	"	"	"	"	"	"		
			58	"	"		"				B	H	"	"	"	"	"	"	"		
			59	"	"		"				A	H	"	"	"	"	"	"	"		
			60	"	"		"				B	L	L	"	H	"	"	"	"		
			61	"	"		"				A	L	"	"	"	"	"	"	"		
			62	A	"		"				B	H	"	"	"	"	"	"	"		
			63	"	"		"				A	H	"	"	"	"	"	"	"		
			64	"	"		"				B	L	H	"	"	"	"	"	"		
			65	"	"		"				A	L	"	"	"	"	"	"	"		
			66	"	"		"				B	H	"	"	"	"	"	"	"		
			67	"	"		"				A	H	"	"	"	"	"	"	"		
			68	"	A		"				A	L	L	"	L	"	"	"	"		
			69	"	"		"				B	"	"	"	"	"	"	"	"		
			70	"	"		"				"	"	"	"	"	"	A	"	"		
			71	"	"		"				"	"	"	"	"	H	B	"	"		
			72	"	"		"				"	"	"	"	"	H	A	"	"		
			73	"	"		"				"	"	"	"	"	L	B	"	"		
8	Same tests, terminal conditions, and limits as for subgroup 7 except T_C = 125°C and -55°C.																				
9 T_C = 25°C	f_{MAX} 8/	(Fig. 5)	74	GND	GND		5.0 V							GND		OUT	IN	Q_A	6		MHz
	t_{PLH2}	3003 (Fig. 5)	75	"	"		"				OUT A	OUT		"		OUT	"	Q_A		110	ns
		"	76	"	"		"				"			"			"	Q_B		220	"
		"	77	"	"		"				"		OUT	"			"	Q_C		330	"
		"	78	"	"		"				"			"	OUT		"	Q_D		450	"
	t_{PHL2}	"	80	"	"		"				"	OUT		"		OUT	"	Q_A		110	"
		"	81	"	"		"				"			"			"	Q_B		220	"
		"	82	"	"		"				"		OUT	"			"	Q_C		330	"
		"	83	"	"		"				"			"	OUT		"	Q_D		450	"

TABLE III. Group A inspection for for device type 02 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
			Test no.	$R_0(1)$	$R_0(2)$	NC	V_{CC}	NC	NC	NC	Input 3	Q_B	Q_C	GND	Q_D	Q_A	Input A		Min	Max	
10 T_C = 125°C	f_{MAX} 8/	3003 (Fig. 5)	84	GND	GND		GND							GND		OUT	IN	Q_A	5		MHz
	t_{PLH2}	" " " "	85 86 87 88	" " " "	" " " "		" " " "				OUT A " " "	OUT	OUT	" " " "	OUT	OUT	" " " "	Q_A Q_B Q_C Q_D		165 330 500 675	ns " " "
	t_{PHL2}	" " " "	89 91 92 93	" " " "	" " " "		" " " "				" " " "	OUT	OUT	" " " "	OUT	OUT	" " " "	Q_A Q_B Q_C Q_D		165 330 500 675	" " " "
11	Same tests, terminal conditions and limits as for subgroup 10, except T_C = -55°C.																				

1/ Momentarily apply 2.0 V, then ground prior to taking measurements to set the device in desired state. Maintain ground for measurement.
2/ Same as 1/, except apply one pulse after reset (R_0) pulses.
3/ Same as 1/, except apply two pulses after reset (R_0) pulses.
4/ Same as 1/, except apply four pulses after reset (R_0) pulses.
5/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.3 V maximum when using a high speed checker double comparator; or (b) H ≥ 1.5 V and L ≤ 1.5 V when using a high speed checker single comparator.
6/ Input voltages shown are: A = 2.4 V; B = 0.3 V.
7/ Only a summary of attributes data is required.
8/ f_{MAX}, minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

TABLE III. Group A inspection for device type 03.
Terminal conditions (pins not designated may be H $\geq$ 2.0 V, L $\leq$ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F Test no.	1 Input B	2 Q_B	3 Q_A	4 Count down	5 Count up	6 Q_C	7 Q_D	8 GND	9 Input D	10 Input C	11 Load	12 Carry	13 Borrow	14 Clear	15 Input A	16 V_{CC}	Measured terminal	Test limit Min	Test limit Max	Unit
1 T_C = 25°C	I_{IH1}	3010	1								GND			4.5 V			4.5 V	2.4 V	5.5 V	Input A		10	µA
		"	2	2.4 V							"			"			"		"	Input B		"	"
		"	3								"		2.4 V	"			"		"	Input C		"	"
		"	4								"	2.4 V		"			"		"	Input D		"	"
		"	5	GND			GND	2.4 V			"	GND	GND	GND			GND	GND	"	Count up		"	"
		"	6	"			2.4 V	GND			"	"	"	GND			"	"	"	Count down		"	"
		"	7	"			GND	"			"	"	"	2.4 V			"	"	"	Load		"	"
		"	8	"			GND	"			"	"	"	GND			2.4 V	"	"	Clear		"	"
	I_{IH2}	"	9								"			4.5 V			4.5 V	5.5 V	"	Input A		100	µA
		"	10	5.5 V							"			"			"		"	Input B		"	"
		"	11								"		5.5 V	"			"		"	Input C		"	"
		"	12								"	5.5 V		"			"		"	Input D		"	"
		"	13	GND			GND	5.5 V			"	GND	GND	GND			GND	GND	"	Count up		"	"
		"	14	"			5.5 V	GND			"	"	"	GND			"	"	"	Count down		"	"
		"	15	"			GND	"			"	"	"	5.5 V			"	"	"	Load		"	"
		"	16	"			GND	"			"	"	"	GND			5.5 V	"	"	Clear		"	"
	V_{OL}	3007	17	2.0 V		2.6 mA	4.5 V	4.5 V			"	2.0 V	2.0 V	"			1/	0.7 V	4.5 V	Q_A		0.3	V
		"	18	0.7 V	2.6 mA		"	"			"	"	2.0 V	"			"	2.0 V	"	Q_B		"	"
		"	19	2.0 V			"	"	2.6 mA		"	"	0.7 V	"			"	"	"	Q_C		"	"
		"	20	"			"	"		2.6 mA	"	0.7 V	2.0 V	"			"	"	"	Q_D		"	"
		"	21	"			"	0.7 V			"	2.0 V	2.0 V	"	2.6 mA		"	"	"	Carry		"	"
		"	22	0.7 V			0.7 V	4.5 V			"	0.7 V	0.7 V	"		2.6 mA	"	0.7 V	"	Borrow		"	"
	V_{OH}	3006	23	0.7 V		-110 µA	4.5 V	"			"	"	"	"			"	2.0 V	"	Q_A	2.4		"
		"	24	2.0 V	-110 µA		"	"			"	"	"	"			"	0.7 V	"	Q_B	"		"
		"	25	0.7 V			"	"	-110 µA		"	2.0 V	"	"			"	"	"	Q_C	"		"
		"	26	0.7 V			"	"		-110 µA	"	2.0 V	"	"			"	"	"	Q_D	"		"
		"	27	2.0 V			"	0.7 V			"	0.7 V	2.0 V	"	-110 µA		"	2.0 V	"	Carry	"		"
		"	28	0.7 V			0.7 V	4.5 V			"	2.0 V	0.7 V	"		-110 µA	"	0.7 V	"	Borrow	"		"
	I_{IL4}	3009	29	GND			GND	GND			"	GND	GND	"			GND	0.3 V	5.5 V	Input A		-160	µA
		"	30	0.3 V			"	"			"	GND	GND	"			"	"	"	Input B		"	"
		"	31	GND			"	"			"	0.3 V	0.3 V	"			"	"	"	Input C		"	"
		"	32	"			"	"			"	GND	GND	"			"	"	"	Input D		"	"
		"	33	"			"	0.3 V			"	"	"	"			"	"	"	Count up		"	"
		"	34	"			0.3 V	GND			"	"	"	"			"	"	"	Count down		"	"
		"	35	"			GND	"			"	"	"	0.3 V			"	"	"	Load		"	"
		"	36	"			GND	"			"	"	"	GND			0.3 V	"	"	Clear		"	"
	I_{OS}	3011	37	4.5 V		GND	4.5 V	4.5 V			"	4.5 V	4.5 V	"			GND	4.5 V	"	Q_A	-3.5	-14.5	mA
		"	38	"	GND		"	"			"	"	"	"			"	"	"	Q_B	"	"	"
		"	39	"			"	"	GND		"	"	"	"			"	"	"	Q_C	"	"	"
		"	40	"			"	"		GND	"	"	"	"			"	"	"	Q_D	"	"	"
		"	41	"			"	"			"	"	"	"	GND		"	"	"	Carry	"	"	"
		"	42	"			"	"			"	"	"	"		GND	"	"	"	Borrow	"	"	"
	I_{CC}		43	"			"	"			"	"	"	"			"	"	"	V_{CC}		14.9	"

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	Input B	Q_B	Q_A	Count down	Count up	Q_C	Q_D	GND	Input D	Input C	Load	Carry	Borrow	Clear	Input A	V_{CC}		Min	Max	
1 T_C = 25°C	V_{IC}	3010	44	-12 mA							GND								4.5 V	Input B		-1.4	V
			45				-12 mA				"								"	Count down		"	"
			46					-12 mA			"								"	Count up		"	"
			47								"	-12 mA							"	Input D		"	"
			48								"		-12 mA						"	Input C		"	"
			49								"			-12 mA					"	Load		"	"
			50								"						-12 mA		"	Clear		"	"
			51								"							-12 mA	"	Input A		"	"
2	Same tests, terminal conditions and limits as for subgroup 1, except T_C = 125C.																						
3	Same tests, terminal conditions and limits as for subgroup 1, except T_C = -55C.																						
7 T_C = 25°C	Truth table tests 4/		52	B 3/	L	L	A 3/	A 3/	L	L	GND	B 3/	B 3/	B 3/	H	H	B 3/	B 3/	5.0 V	All outputs	H or L as shown 2/		
			53	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			54	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			55	"	"	H	"	"	"	"	"	"	"	A	"	"	"	A	"	"	"		
			56	A	H	L	"	"	"	"	"	"	"	B	"	"	"	B	"	"	"		
			57	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			58	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			59	"	"	H	"	"	"	"	"	"	"	A	"	"	"	A	"	"	"		
			60	B	L	L	"	"	H	"	"	"	A	B	"	"	"	B	"	"	"		
			61	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			62	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			63	"	"	H	"	"	"	"	"	"	"	A	"	"	"	A	"	"	"		
			64	A	H	L	"	"	"	"	"	"	"	B	"	"	"	B	"	"	"		
			65	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			66	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			67	"	"	H	"	"	"	"	"	"	"	A	"	"	"	A	"	"	"		
			68	B	L	L	"	"	L	H	"	A	B	B	"	"	"	B	"	"	"		
			69	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			70	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			71	"	"	H	"	"	"	"	"	"	"	A	"	"	"	A	"	"	"		
			72	A	H	L	"	"	"	"	"	"	"	B	"	"	"	B	"	"	"		
			73	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			74	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			75	"	"	H	"	"	"	"	"	"	"	A	"	"	"	A	"	"	"		
			76	B	L	L	"	"	H	"	"	"	A	B	"	"	"	B	"	"	"		
			77	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			78	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			79	"	"	H	"	"	"	"	"	"	"	A	"	"	"	A	"	"	"		
			80	A	H	L	"	"	"	"	"	"	"	B	"	"	"	B	"	"	"		
			81	"	"	L	"	"	"	"	"	"	"	A	"	"	"	B	"	"	"		
			82	"	"	H	"	"	"	"	"	"	"	B	"	"	"	A	"	"	"		
			83	"	L	L	"	"	L	L	"	"	"	B	"	"	A	"	"	"	"		
			84	"	"	L	"	"	"	"	"	"	"	A	"	"	A	"	"	"	"		
			85	"	"	H	"	"	"	"	"	"	"	"	"	"	B	"	"	"	"		
			86	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			87	"	H	H	A	"	H	H	"	"	"	"	"	H	"	"	"	"		
			88	"	H	H	B	"	H	H	"	"	"	"	"	H	"	"	"	"		
			89	"	H	L	A	"	H	H	"	"	"	"	"	H	"	"	"	"		

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	Input B	Q_B	Q_A	Count down	Count up	Q_C	Q_D	GND	Input D	Input C	Load	Carry	Borrow	Clear	Input A	V_{CC}		Min	Max	
7 T_C = 25°C	Truth table tests 4/		90	A 3/	H	L	B 3/	A 3/	H	H	GND	A 3/	A 3/	A 3/	H	H	B 3/	A 3/	5.0 V	All outputs	H or L as shown 2/		
			91	"	L	H	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			92	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			93	"	"	L	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			94	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			95	"	H	H	A	"	L	"	"	"	"	"	"	"	"	"	"	"	"		
			96	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			97	"	"	L	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			98	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			99	"	L	H	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			100	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			101	"	"	L	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			102	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			103	"	H	H	A	"	H	L	"	"	"	"	"	"	"	"	"	"	"		
			104	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			105	"	"	L	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			106	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			107	"	L	H	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			108	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			109	"	"	L	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			110	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			111	"	H	H	A	"	L	"	"	"	"	"	"	"	"	"	"	"	"		
			112	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			113	"	"	L	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			114	"	"	L	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			115	"	L	H	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			116	"	"	H	B	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			117	"	"	L	A	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
			118	"	"	L	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			119	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			120	"	"	H	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			121	"	H	L	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			122	"	"	L	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			123	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			124	"	"	H	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			125	"	L	L	"	A	H	"	"	"	"	"	"	"	"	"	"	"	"		
			126	"	"	L	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			127	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			128	"	"	H	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			129	"	H	L	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			130	"	"	L	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			131	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			132	"	"	H	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			133	"	L	L	"	A	L	H	"	"	"	"	"	"	"	"	"	"	"		
			134	"	"	L	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			135	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			136	"	"	H	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			137	"	H	L	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		
			138	"	"	L	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			139	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"		

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	Input B	Q_B	Q_A	Count down	Count up	Q_C	Q_D	GND	Input D	Input C	Load	Carry	Borrow	Clear	Input A	V_{CC}		Min	Max	
7 T_C = 25°C	Truth table tests 4/		140	A 3/	H	H	A 3/	B 3/	L	H	GND	A 3/	A 3/	A 3/	H	H	B 3/	A 3/	5.0 V	All outputs	H or L as shown 2/		
			141	"	L	L	"	A	H	"	"	"	"	"	"	"	"	"	"				
			142	"	"	L	"	B	"	"	"	"	"	"	"	"	"	"	"				
			143	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"				
			144	"	"	H	"	B	"	"	"	"	"	"	"	"	"	"	"				
			145	"	H	L	"	A	"	"	"	"	"	"	"	"	"	"	"				
			146	"	L	L	"	B	"	"	"	"	"	"	"	"	"	"	"				
			147	"	"	H	"	A	"	"	"	"	"	"	"	"	"	"	"				
			148	"	"	H	"	B	"	"	"	"	"	"	L	"	"	"	"				
			149	"	L	L	"	A	L	L	"	"	"	"	H	"	"	"	"				
			150	"	"	"	"	A	"	"	"	"	"	"	"	"	A	"	"				
			151	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"				
			152	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"				
			153	"	"	"	B	"	"	"	"	"	"	"	"	L	"	"	"				
			154	"	"	"	A	"	"	"	"	"	"	"	"	H	"	"	"				
			155	"	"	"	"	"	"	"	"	"	"	"	"	"	B	"	"				
			156	"	H	H	"	"	H	H	"	"	"	B	"	"	"	"	"				
			157	"	"	"	"	B	"	"	"	"	"	"	L	"	"	"	"				
			158	"	"	"	"	A	"	"	"	"	"	"	H	"	"	"	"				
			159	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"				
			160	"	"		A	"	"	"	"	"	"	"	"	"	"	"	"				
8	Repeat subgroup 7 at T_C = +125°C and T_C = -55°C.																						
9 T_C = 25°C	f_{MAX} 5/	(Fig. 6B)	161			OUT	3.0 V	IN			GND			3.0 V			GND		5.0 V	Q_A	14		MHz
	t_{PHL3}	3003	162	3.0 V			"	"			"	3.0 V	3.0 V	6/	OUT		"	GND	"	Carry		130	ns
	t_{PLH3}	(Fig.6)	163	3.0 V			"	"			"	3.0 V	3.0 V	"	OUT		"	GND	"	Carry		"	"
	t_{PHL4}	"	164	GND			IN	3.0 V			"	GND	GND	"		OUT	"	3.0 V	"	Borrow		"	"
	t_{PLH4}	"	165	"			IN	3.0 V			"	"	"	"		OUT	"	3.0 V	"	Borrow		"	"
	t_{PHL5}	"	166	"		OUT	3.0 V	IN			"	"	"	3.0 V			6/	GND	"	Q_A		240	"
	t_{PLH5}	"	167	"		OUT	"	"			"	"	"	"			GND	"	"	Q_A		200	"
	t_{PHL5}	"	168	"	OUT		"	"			"	"	"	"			"	"	"	Q_B		240	"
	t_{PLH5}	"	169	"	OUT		"	"			"	"	"	"			"	"	"	Q_B		200	"
	t_{PHL5}	"	170	"			"	"	OUT		"	"	"	"			"	"	"	Q_C		240	"
	t_{PLH5}	"	171	"			"	"	OUT		"	"	"	"			"	"	"	Q_C		200	"
	t_{PHL5}	"	172	"			"	"		OUT	"	"	"	"			"	"	"	Q_D		240	"
	t_{PLH5}	"	173	"			"	"		OUT	"	"	"	"			"	"	"	Q_D		200	"
	t_{PHL5}	"	174	"		OUT	"	3.0 V			"	"	"	6/			"	IN	"	Q_A		240	"
	t_{PLH5}	"	175	"		OUT	"	"			"	"	"	"			"	IN	"	Q_A		200	"
	t_{PHL5}	"	176	IN	OUT		"	"			"	"	"	"			"	GND	"	Q_B		240	"
	t_{PLH5}	"	177	IN	OUT		"	"			"	"	"	"			"	"	"	Q_B		200	"
	t_{PHL5}	"	178	GND			"	"	OUT		"	"	IN	"			"	"	"	Q_C		240	"
	t_{PLH5}	"	179	"			"	"	OUT		"	"	IN	"			"	"	"	Q_C		200	"
	t_{PHL5}	"	180	"			"	"		OUT	"	IN	GND	"			"	"	"	Q_D		240	"
	t_{PLH5}	"	181	"			"	"		OUT	"	IN	GND	"			"	"	"	Q_D		200	"
	t_{PHL5}	"	182	3.0 V		OUT	"	"			"	3.0 V	3.0 V	"			6/	3.0 V	"	Q_A		"	"
	t_{PHL5}	"	183	"	OUT		"	"			"	"	"	"			"	"	"	Q_B		"	"
	t_{PHL5}	"	184	"			"	"	OUT		"	"	"	"			"	"	"	Q_C		"	"
	t_{PHL5}	"	185	"			"	"		OUT	"	"	"	"			"	"	"	Q_D		"	"
10 T_C = 25°C	f_{MAX} 5/		186			OUT	3.0 V	IN			"			3.0 V			GND		"		14		MHz

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	Input B	Q_B	Q_A	Count down	Count up	Q_C	Q_D	GND	Input D	Input C	Load	Carry	Borrow	Clear	Input A	V_{CC}		Min	Max	
10	t_{PHL3}	3003	187	3.0 V			3.0 V	IN			GND	3.0 V	3.0 V	6/	OUT		GND	GND	5.0 V	Carry		295	ns
T_C = 125°C	t_{PLH3}	(Fig. 6)	188	3.0 V			3.0 V	IN			"	3.0 V	3.0 V	"	OUT		"	GND	"	Carry		"	"
	t_{PHL4}	"	189	GND			IN	3.0 V			"	GND	GND	"		OUT	"	3.0 V	"	Borrow		"	"
	t_{PLH4}	"	190	"			IN	3.0 V			"	"	"	"		OUT	"	3.0 V	"	Borrow		"	"
	t_{PHL5}	"	191	"		OUT	3.0 V	IN			"	"	"	3.0 V			6/	GND	"	Q_A		360	"
	t_{PLH5}	"	192	"		OUT	"	"			"	"	"	"			GND	"	"	Q_A		300	"
	t_{PHL5}	"	193	"	OUT		"	"			"	"	"	"			"	"	"	Q_B		360	"
	t_{PLH5}	"	194	"	OUT		"	"			"	"	"	"			"	"	"	Q_B		300	"
	t_{PHL5}	"	195	"			"	"	OUT		"	"	"	"			"	"	"	Q_C		360	"
	t_{PLH5}	"	196	"			"	"	OUT		"	"	"	"			"	"	"	Q_C		300	"
	t_{PHL5}	"	197	"			"	"		OUT	"	"	"	"			"	"	"	Q_D		360	"
	t_{PLH5}	"	198	"			"	"		OUT	"	"	"	"			"	"	"	Q_D		300	"
	t_{PHL5}	"	199	"		OUT	"	3.0 V			"	"	"	6/			"	IN	"	Q_A		360	"
	t_{PLH5}	"	200	"		OUT	"	"			"	"	"	"			"	IN	"	Q_A		300	"
	t_{PHL5}	"	201	IN	OUT		"	"			"	"	"	"			"	GND	"	Q_B		360	"
	t_{PLH5}	"	202	IN	OUT		"	"			"	"	"	"			"	"	"	Q_B		300	"
	t_{PHL5}	"	203	GND			"	"	OUT		"	"	IN	"			"	"	"	Q_C		360	"
	t_{PLH5}	"	204	"			"	"	OUT		"	"	IN	"			"	"	"	Q_C		300	"
	t_{PHL5}	"	205	"			"	"		OUT	"	IN	GND	"			"	"	"	Q_D		360	"
	t_{PLH5}	"	206	"			"	"		OUT	"	IN	GND	"			"	"	"	Q_D		300	"
	t_{PHL5}	"	207	3.0 V		OUT	"	"			"	3.0 V	3.0 V	"			6/	3.0 V	"	Q_A		"	"
	t_{PHL5}	"	208	"	OUT		"	"			"	"	"	"			"	"	"	Q_B		"	"
	t_{PHL5}	"	209	"			"	"	OUT		"	"	"	"			"	"	"	Q_C		"	"
	t_{PHL5}	"	210	"			"	"		OUT	"	"	"	"			"	"	"	Q_D		"	"
11	Same tests, terminal conditions and limits as subgroup 10, except T_C = -55°C.																						

1/ Momentarily apply 4.5 V then ground prior to taking measurements to set the device in desired state. Maintain ground for measurement.

2/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.3 V, maximum when using a high speed checker double comparator; or (b) H ≥ 1.5 V and L ≤ 1.5 V when using a high speed checker single comparator.

3/ Input voltages shown are: A = 2.4 V; B = 0.3 V.

4/ Only a summary of attributes data is required.

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

6/ See figure 6A.

TABLE III. Group A inspection for device type 04. 6/
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F Test no.	1 $\overline{MR}$	2 CP	3 P_0	4 P_1	5 P_2	6 P_3	7 CEP	8 GND	9 $\overline{PE}$	10 CET	11 Q_3	12 Q_2	13 Q_1	14 Q_0	15 TC	16 V_{CC}	Measured terminal	Test limit Min	Test limit Max	Unit
1 T_C = 25°C	V_{OL1}	3007	1	1/	4.5 V	4.5 V				4.5 V	GND	2.0 V	4.5 V				3.2 mA		4.5 V	Q_0		0.3	V
	"	"	2	"	"		4.5 V			"	"	"	"			3.2 mA			"	Q_1		"	"
	"	"	3	"	"			4.5 V		"	"	"	"		3.2 mA				"	Q_2		"	"
	"	"	4	"	"				4.5 V	"	"	"	"	3.2 mA					"	Q_3		"	"
	"	"	5	"	"	4.5 V	0.7 V	0.7 V	4.5 V	"	"	"	"					3.2 mA	"	TC		"	"
	V_{OH}	3006	6	4.5 V	1/	2.0 V					"	0.7 V					-320 µA		"	Q_0	2.4		"
	"	"	7	"	"		2.0 V				"	"			-320 µA				"	Q_1	"		"
	"	"	8	"	"			2.0 V			"	"							"	Q_2	"		"
	"	"	9	"	"				2.0 V		"	"		-320 µA					"	Q_3	"		"
	"	"	10	"	"	4.5 V	GND	GND	4.5 V		"	"	4.5 V		-320 µA			-320 µA	"	TC	"		"
	I_{IH7}	3010	11	2.4 V	"						"								5.5 V	$\overline{MR}$		20	µA
	I_{IH7}	"	12		"					2.4 V	"	GND	GND						"	CEP		20	"
	I_{IH8}	"	13		2.4 V						"								"	CP		40	"
	I_{IH8}	"	14							GND	"	2.4 V	GND						"	$\overline{PE}$		40	"
	I_{IH8}	"	15							GND	"	GND	2.4 V						"	CET		40	"
	I_{IH9}	"	16			2.4 V					"	4.5 V							"	P_0		14	"
	I_{IH9}	"	17				2.4 V				"	"							"	P_1		"	"
	I_{IH9}	"	18					2.4 V			"	"							"	P_2		"	"
	I_{IH9}	"	19						2.4 V		"	"							"	P_3		"	"
	I_{IL5}	3009	20	0.3 V							"								"	$\overline{MR}$		-400	"
	I_{IL5}	"	21							0.3 V	"	4.5 V	4.5 V						"	CEP		-400	"
	I_{IL6}	"	22		0.3 V						"								"	CP		-800	"
	I_{IL6}	"	23							4.5 V	"	0.3 V	4.5 V						"	$\overline{PE}$		-800	"
	I_{IL6}	"	24							4.5 V	"	4.5 V	0.3 V						"	CET		-800	"
	I_{IL7}	"	25			0.3 V				GND	"	GND							"	P_0		-270	"
	I_{IL7}	"	26				0.3 V			"	"	"							"	P_1		-270	"
	I_{IL7}	"	27					0.3 V		"	"	"							"	P_2		-270	"
	I_{IL7}	"	28						0.3 V	"	"	"							"	P_3		-270	"
	I_{OS}	3011	29	4.5 V	1/	4.5 V					"	"					GND		"	Q_0	-2.5	-25	mA
	"	"	30	"	"		4.5 V				"	"				GND			"	Q_1	"	"	"
	"	"	31	"	"			4.5 V			"	"			GND				"	Q_2	"	"	"
	"	"	32	"	"				4.5 V		"	"		GND					"	Q_3	"	"	"
	"	"	33	"	"	4.5 V	GND	GND	4.5 V		"	"	GND					GND	"	TC	"	"	"
	V_{IC}		34	-10 mA							"								4.5 V	$\overline{MR}$		-1.5	V
			35							-10 mA	"								"	CEP		"	"
			36		-10 mA						"								"	CP		"	"
			37								"		-10 mA						"	$\overline{PE}$		"	"
			38								"			-10 mA					"	CET		"	"
			39			-10 mA					"								"	P_0		"	"
			40				-10 mA				"								"	P_1		"	"
			41					-10 mA			"								"	P_2		"	"
			42						-10 mA		"								"	P_3		"	"
	I_{CC}		43	1/							"								5.5 V	V_{CC}		27.5	mA
2	Same tests, terminal conditions and limits as for subgroup 1, except T_C = 125°C and V_{IC} tests are omitted.																						
3	Same tests, terminal conditions and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																						

See footnotes at end of device type 04.

TABLE III. Group A inspecr device type 04 - Continued. 6/
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	$\overline{MR}$	CP	P_0	P_1	P_2	P_3	CEP	GND	$\overline{PE}$	CET	Q_3	Q_2	Q_1	Q_0	TC	V_{CC}		Min	Max	
7 T_C = 25°C	Truth table tests 4/		44	B 3/	A 3/	B 3/	B 3/	B 3/	B 3/	B 3/	GND	A 3/	B 3/	L	L	L	L	L	4.5 V	All outputs	H or L as shown 2/		
			45	A	B	"	"	"	"	A	"	"	A	"	"	"	L	"	"	"	"		
			46	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			47	"	B	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			48	"	A	"	"	"	"	"	"	"	"	"	"	H	L	"	"	"	"		
			49	"	B	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"	"		
			50	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			51	"	B	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			52	"	A	"	"	"	"	"	"	"	"	"	"	H	L	"	"	"	"		
			53	"	B	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"	"		
			54	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			55	"	B	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			56	"	A	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"	"		
			57	"	B	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"	"		
			58	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			59	"	A	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
			60	"	B	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
			61	"	A	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
			62	"	B	"	"	"	"	A	"	"	"	H	L	L	L	"	"	"	"		
			63	"	A	"	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"		
			64	"	B	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"		
			65	"	A	"	"	"	"	"	"	"	"	"	"	"	"	H	H	"	"		
			66	"	A	"	"	"	"	"	"	"	B	"	"	"	"	"	L	"	"		
			67	"	A	"	"	"	"	"	"	"	B	"	"	"	"	"	H	"	"		
			68	"	A	"	"	"	"	"	"	"	A	"	"	"	"	"	H	"	"		
			69	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	L	"	"		
			70	"	B	"	"	"	"	"	"	"	B	L	"	"	"	L	"	"	"		
			71	"	A	"	"	"	"	"	"	"	"	L	"	"	"	L	"	"	"		
			72	"	A	A	A	A	A	"	"	"	"	L	"	"	"	H	"	"	"		
			73	"	B	A	A	A	A	"	"	"	"	H	H	H	H	H	"	"	"		
			74	"	A	A	A	A	A	"	"	"	"	H	H	L	L	H	"	"	"		
			75	"	B	B	B	B	B	"	"	"	"	H	H	L	L	H	"	"	"		
			76	"	A	B	B	B	B	"	"	"	"	L	L	H	H	L	"	"	"		
			77	"	B	A	A	A	A	"	"	"	"	L	L	H	H	L	"	"	"		
			78	"	A	"	"	"	"	"	"	"	"	H	H	L	L	L	"	"	"		
			79	"	B	"	"	"	"	"	"	"	"	H	H	L	L	L	"	"	"		
			80	B	B	"	"	"	"	"	"	"	"	L	L	H	H	H	"	"	"		
			81	A	A	"	"	"	"	"	"	"	"	L	L	H	H	H	"	"	"		
			82	"	A	"	"	"	"	"	"	"	"	H	H	L	L	L	"	"	"		
			83	"	A	"	"	"	"	"	"	"	"	H	H	L	L	L	"	"	"		
			84	"	B	"	"	B	"	"	"	"	A	"	"	"	"	"	"	"	"		
			85	"	A	"	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"		
			86	"	B	"	B	A	"	"	"	"	"	"	L	L	L	L	"	"	"		
			87	"	A	"	B	A	"	"	"	"	"	"	H	L	"	"	"	"	"		
8	Same tests, terminal conditions and limits as for subgroup 7, except T_C = 125°C and -55°C.																						

See footnotes at end of device type 04.

TABLE III. Group A inspecr device type 04 - Continued. 6/
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	$\overline{MR}$	CP	P_0	P_1	P_2	P_3	CEP	GND	$\overline{PE}$	CET	Q_3	Q_2	Q_1	Q_0	TC	V_{CC}		Min	Max	
9 T_C = 25°C	f_{MAX} 5/	(Fig. 7)	88	5.0 V	IN						GND						OUT		5.0 V	Q_0	13		MHz
	t_{PLH6}	3003	89	"	"					5.0 V	"	5.0 V	5.0 V					OUT	"	T_C	18	102	ns
	t_{PHL6}	(Fig. 7)	90	"	"					5.0 V	"	"	5.0 V					OUT	"	T_C	9	52	"
	t_{PLH6}	"	91	"	"						"	"							"	Q_0	9	57	"
	t_{PHL6}	"	92	"	"						"	"					OUT		"	Q_0	9	62	"
	t_{PLH7}	"	93	"	5.0 V					5.0 V	"	"	IN				OUT	OUT	"	T_C	9	62	"
	t_{PHL7}	"	94	"	5.0 V					5.0 V	"	"	IN					OUT	"	T_C	9	67	"
	t_{PHL8}	"	95	IN		5.0 V	5.0 V	5.0 V	5.0 V		"	GND					OUT		"	Q_0	18	102	"
10 T_C = 125°C	f_{MAX} 5/	(Fig. 7)	96	5.0 V	IN						"						OUT		"	Q_0	13		MHz
	t_{PLH6}	"	97	"	"					5.0 V	"	5.0 V	5.0 V					OUT	"	T_C	18	125	ns
	t_{PHL6}	"	98	"	"					5.0 V	"	"	5.0 V					OUT	"	T_C	9	75	"
	t_{PLH6}	"	99	"	"						"	"							"	Q_0	9	72	"
	t_{PHL6}	"	100	"	"						"	"					OUT		"	Q_0	9	85	"
	t_{PLH7}	"	101	"	5.0 V					5.0 V	"	"	IN				OUT	OUT	"	T_C	9	80	"
	t_{PHL7}	"	102	"	5.0 V					5.0 V	"	"	IN					OUT	"	T_C	9	87	"
	t_{PHL8}	"	103	IN		5.0 V	5.0 V	5.0 V	5.0 V		"	GND					OUT		"	Q_0	18	130	"
11	Same tests, terminal conditions and limits as subgroup 10, except T_C = -55°C.																						

1/ Momentarily apply 2.0 V then ground prior to taking measurements to set the device in desired state. Maintain ground for measurement.

2/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.3 V, maximum when using a high speed checker double comparator; or (b) H ≥ 1.5 V and L ≤ 1.5 V when using a high speed checker single comparator.

3/ Input voltages shown are: A = 2.4 V; B = 0.3 V.

4/ Only a summary of attributes data is required.

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

6/ Qualification requirement have been removed for this device type.

TABLE III. Group A inspection for device type 05. 6/
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F Test no.	1 $\overline{MR}$	2 CP	3 P_0	4 P_1	5 P_2	6 P_3	7 CEP	8 GND	9 $\overline{PE}$	10 CET	11 Q_3	12 Q_2	13 Q_1	14 Q_0	15 TC	16 V_{CC}	Measured terminal	Test limit Min	Test limit Max	Unit
1 T_C = 25°C	V_{OL1}	3007	1	1/	4.5 V	4.5 V				4.5 V	GND	2.0 V	4.5 V						4.5 V	Q_0		0.3	V
		"	2	"	"		4.5 V			"	"	"				3.2 mA	3.2 mA		"	Q_1		"	"
		"	3	"	"			4.5 V		"	"	"			3.2 mA				"	Q_2		"	"
		"	4	"	"				4.5 V	"	"	"		3.2 mA					"	Q_3		"	"
		"	5	"	"	4.5 V	4.5 V	4.5 V	4.5 V	"	"	"						3.2 mA	"	TC		"	"
	V_{OH}	3006	6	4.5 V	1/	2.0 V					"	0.7 V							"	Q_0	2.4		"
		"	7	"	"		2.0 V				"	"				-320 µA	-320 µA		"	Q_1	"		"
		"	8	"	"			2.0 V			"	"			-320 µA				"	Q_2	"		"
		"	9	"	"				2.0 V		"	"		-320 µA					"	Q_3	"		"
		"	10	"	"	4.5 V	4.5 V	4.5 V	4.5 V		"	GND	4.5 V					-320 µA	"	TC	"		"
	I_{IH7}	3010	11	2.4 V	"						"								5.5 V	$\overline{MR}$		20	µA
	I_{IH7}	"	12		"					2.4 V	"	GND	GND						"	CEP		20	"
	I_{IH8}	"	13		2.4 V					"	"	"	"						"	CP		40	"
	I_{IH8}	"	14							GND	"	2.4 V	GND						"	$\overline{PE}$		40	"
	I_{IH8}	"	15							GND	"	GND	2.4 V						"	CET		40	"
	I_{IH9}	"	16			2.4 V				"	"	4.5 V							"	P_0		14	"
	I_{IH9}	"	17				2.4 V			"	"	"							"	P_1		"	"
	I_{IH9}	"	18					2.4 V		"	"	"							"	P_2		"	"
	I_{IH9}	"	19						2.4 V	"	"	"							"	P_3		"	"
	I_{IL5}	3009	20	0.3 V	"						"								"	$\overline{MR}$		-400	"
	I_{IL5}	"	21		"					0.3 V	"	4.5 V	4.5 V						"	CEP		-400	"
	I_{IL6}	"	22		0.3 V					"	"	"	"						"	CP		-800	"
	I_{IL6}	"	23							4.5 V	"	0.3 V	4.5 V						"	$\overline{PE}$		-800	"
	I_{IL6}	"	24							4.5 V	"	4.5 V	0.3 V						"	CET		-800	"
	I_{IL7}	"	25			0.3 V				GND	"	GND							"	P_0		-270	"
	I_{IL7}	"	26				0.3 V			"	"	"							"	P_1		-270	"
	I_{IL7}	"	27					0.3 V		"	"	"							"	P_2		-270	"
	I_{IL7}	"	28						0.3 V	"	"	"							"	P_3		-270	"
	I_{OS}	3011	29	4.5 V	1/	4.5 V					"	"							"	Q_0	-2.5	-25	mA
		"	30	"	"		4.5 V				"	"				GND	GND		"	Q_1	"	"	"
		"	31	"	"			4.5 V			"	"			GND				"	Q_2	"	"	"
		"	32	"	"				4.5 V		"	"		GND					"	Q_3	"	"	"
		"	33	"	"	4.5 V	4.5 V	4.5 V	4.5 V		"	"	4.5 V		GND			GND	"	TC	"	"	"
	V_{IC}		34	-10 mA						-10 mA	"								4.5 V	$\overline{MR}$		-1.5	V
			35							"	"								"	CEP		"	"
			36		-10 mA					"	"								"	CP		"	"
			37							"	"	-10 mA							"	$\overline{PE}$		"	"
			38							"	"		-10 mA						"	CET		"	"
			39			-10 mA				"	"								"	P_0		"	"
			40				-10 mA			"	"								"	P_1		"	"
			41					-10 mA		"	"								"	P_2		"	"
			42						-10 mA	"	"								"	P_3		"	"
	I_{CC}		43	1/							"								5.5 V	V_{CC}		27.5	mA
2	Same tests, terminal conditions and limits as for subgroup 1, except T_C = 125°C and V_{IC} tests are omitted.																						
3	Same tests, terminal conditions and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																						

See footnotes at end of device type 05.

TABLE III. Group A inspecr device type 05 - Continued. 6/
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	$\overline{MR}$	CP	P_0	P_1	P_2	P_3	CEP	GND	$\overline{PE}$	CET	Q_3	Q_2	Q_1	Q_0	TC	V_{CC}		Min	Max	
7 T_C = 25°C	Truth table tests 4/		44	B 3/	A 3/	B 3/	B 3/	B 3/	B 3/	B 3/	GND	A 3/	B 3/	L	L	L	L	L	4.5 V	All outputs	H or L as shown 2/		
			45	A	B	"	"	"	"	A	"	"	A	"	"	"	L	"	"	"	"		
			46	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			47	"	B	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			48	"	A	"	"	"	"	"	"	"	"	"	"	H	L	"	"	"	"		
			49	"	B	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"	"		
			50	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			51	"	B	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			52	"	A	"	"	"	"	"	"	"	"	"	H	L	L	"	"	"	"		
			53	"	B	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"	"		
			54	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			55	"	B	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			56	"	A	"	"	"	"	"	"	"	"	"	"	H	L	"	"	"	"		
			57	"	B	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"	"		
			58	"	A	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"	"		
			59	"	A	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
			60	"	B	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
			61	"	A	"	"	"	"	B	"	"	"	"	"	"	"	"	"	"	"		
			62	"	B	"	"	"	"	A	"	"	"	"	"	"	"	"	"	"	"		
			63	"	A	"	"	"	"	"	"	"	"	H	L	L	L	"	"	"	"		
			64	"	B	"	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"		
			65	"	A	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"		
			66	"	B	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"		
			67	"	A	"	"	"	"	"	"	"	"	"	"	"	H	L	"	"	"		
			68	"	B	"	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"		
			69	"	A	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"		
			70	"	B	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"		
			71	"	A	"	"	"	"	"	"	"	"	"	H	L	L	L	"	"	"		
			72	"	B	"	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"		
			73	"	A	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"		
			74	"	B	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"	"		
			75	"	A	"	"	"	"	"	"	"	"	"	"	"	H	L	"	"	"		
			76	"	B	"	"	"	"	"	"	"	"	"	"	"	"	L	"	"	"		
			77	"	A	"	"	"	"	"	"	"	"	"	"	"	"	H	H	"	"		
			78	"	A	"	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"		
			79	"	A	"	"	"	"	"	"	"	B	"	"	"	"	"	L	"	"		
			80	"	B	"	"	"	"	"	"	"	B	"	"	"	"	"	L	"	"		
			81	"	A	"	"	"	"	"	"	"	B	"	"	"	"	"	L	"	"		
			82	"	B	"	"	"	"	"	"	"	A	"	"	"	"	"	H	"	"		
			83	"	B	"	"	"	"	"	"	"	"	"	"	"	"	"	H	"	"		
			84	"	A	"	"	"	"	"	"	"	"	"	L	L	L	L	L	"	"		
			85	"	A	"	"	"	"	"	"	B	"	"	L	L	L	L	L	"	"		
			86	"	B	A	A	A	A	"	"	"	"	"	L	L	L	L	L	"	"		
			87	"	A	"	"	"	"	"	"	"	"	"	H	H	H	H	H	"	"		
			88	"	B	"	"	"	"	"	"	"	"	"	H	H	H	H	H	"	"		
			89	B	B	"	"	"	"	"	"	"	"	"	L	L	L	L	L	"	"		
			90	A	B	"	"	"	"	"	"	"	"	"	L	L	L	L	L	"	"		
			91	"	A	"	"	"	"	"	"	"	"	"	H	H	H	H	H	"	"		
			92	"	B	B	B	B	B	B	"	"	"	"	H	H	H	H	H	"	"		
			93	"	A	B	B	B	B	B	"	"	"	"	L	L	L	L	L	"	"		
			94	"	B	A	A	A	A	A	"	"	"	"	L	L	L	L	L	"	"		
			95	"	A	A	A	A	A	A	"	"	"	"	H	H	H	H	H	"	"		
8	Same tests, terminal conditions and limits as for subgroup 7, except T_C = 125°C and -55°C.																						

See footnotes at end of device type 05.

TABLE III. Group A inspecr device type 05 - Continued. 6/
Terminal conditions (pins not designated may be H ≥ 2.0 V, L ≤ 0.8 V, or open).

Subgroup	Symbol	MIL-STD-883 method	Cases E and F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Measured terminal	Test limit		Unit
			Test no.	$\overline{MR}$	CP	P_0	P_1	P_2	P_3	CEP	GND	$\overline{PE}$	CET	Q_3	Q_2	Q_1	Q_0	TC	V_{CC}		Min	Max	
9 T_C = 25°C	f_{MAX} 5/	(Fig. 7)	96	5.0 V	IN						GND						OUT		5.0 V	Q_0	13		MHz
	t_{PLH6}	3003	97	"	"					5.0 V	"	5.0 V	5.0 V					OUT	"	T_C	18	102	ns
	t_{PHL6}	(Fig. 7)	98	"	"					5.0 V	"	"	5.0 V					OUT	"	T_C	9	52	"
	t_{PLH6}	"	99	"	"						"	"					OUT		"	Q_0	9	57	"
	t_{PHL6}	"	100	"	"						"	"					OUT		"	Q_0	9	62	"
	t_{PLH7}	"	101	"	5.0 V					5.0 V	"	"	IN					OUT	"	T_C	9	62	"
	t_{PHL7}	"	102	"	5.0 V					5.0 V	"	"	IN					OUT	"	T_C	9	67	"
	t_{PHL8}	"	103	IN	1/	5.0 V	5.0 V	5.0 V	5.0 V		"	GND					OUT		"	Q_0	18	102	"
10 T_C = 125°C	f_{MAX} 5/	(Fig. 7)	104	5.0 V	IN						"						OUT		"	Q_0	13		MHz
	t_{PLH6}	"	105	"	"					5.0 V	"	5.0 V	5.0 V					OUT	"	T_C	18	125	ns
	t_{PHL6}	"	106	"	"					5.0 V	"	"	5.0 V					OUT	"	T_C	9	75	"
	t_{PLH6}	"	107	"	"						"	"					OUT		"	Q_0	9	72	"
	t_{PHL6}	"	108	"	"						"	"					OUT		"	Q_0	9	85	"
	t_{PLH7}	"	109	"	5.0 V					5.0 V	"	"	IN					OUT	"	T_C	9	80	"
	t_{PHL7}	"	110	"	5.0 V					5.0 V	"	"	IN					OUT	"	T_C	9	87	"
	t_{PHL8}	"	111	IN	1/	5.0 V	5.0 V	5.0 V	5.0 V		"	GND					OUT		"	Q_0	18	130	"
11	Same tests, terminal conditions and limits as subgroup 10, except T_C = -55°C.																						

1/ Momentarily apply 2.0 V then ground prior to taking measurements to set the device in desired state. Maintain ground for measurement.

2/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.3 V, maximum when using a high speed checker double comparator; or (b) H ≥ 1.5 V and L ≤ 1.5 V when using a high speed checker single comparator.

3/ Input voltages shown are: A = 2.4 V; B = 0.3 V.

4/ Only a summary of attributes data is required.

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

6/ Qualification requirement have been removed for this device type.

5. PACKAGING

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

6. NOTES

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logisitic support of existing equipment. Device types 02 and 04 are intended on for use logistics support of existing equipment.

6.2 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 for device types 04 and 05. In addition to that, notification to the qualifying activity for device types 01, 02 and 03, if applicable.

e. For device types 01, 02 and 03 requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action and reporting of results, if applicable.

f. Requirements for product assurance options, device types 01, 02 and 03. Requirements for packaging and packing, device types 04 and 05.

g. 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.

h. Requirements for "JAN" marking. This shall apply to device types 01, 02 and 03 only.

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

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

6.4 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), lead material and finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

6.5 Generic test data. This shall apply only to device types 04 and 05. 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.

6.6 In-lieu-of documents. MIL-M-0038510/25C(19) was issued as an "in-lieu-of" document for MIL-M-38510/25B. This revision MIL-M-38510/25D supersedes MIL-M-0038510/25C(19), MIL-M-38510/25C, MIL-M-38510/25B.

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.

Military device type	Generic-industry type
01	54LL90
02	54L93
03	54L193
04 6/	93L10
05 6/	93L16

6.8 Ordering guidance. Since the qualification and certification requirements have been removed from the specification for device types 04 and 05, 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.

6/ Qualification requirements have been removed for these device types.

Custodians:
Army - ER
Navy - EC
Air Force - 17

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

User activities:
Army - SM
Navy - AS, CG, MC

Preparing activity:
Air Force - 17

Agent:
DLA - ES

(Project 5962-0956)