INCH-POUND

MIL-M-38510/2G
8 February 2005
SUPERSEDING
MIL-M-38510/2E
24 December 1974
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24 OCTOBER 1975

MILITARY SPECIFICATION

# MICROCIRCUITS, DIGITAL, TTL, FLIP-FLOPS, MONOLITHIC SILICON

Inactive for new design after 7 September 1995

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

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

## 1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, TTL, bistable logic microcircuits. Three product assurance classes and a choice of case outlines/lead finish are provided for each type and are reflected in the complete part number. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.4).

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

1.2.1 Device types. The device types are as follows:

| Device type | Circuit |
|---|---|
| 01 | Single J-K master-slave flip-flop |
| 02 | Dual J-K master-slave flip-flop, no preset |
| 03 | Dual J-K master-slave flip-flop, no preset |
| 04 | Dual J-K master-slave flip-flop |
| 05 | Dual D-type edge-triggered flip-flop |
| 06 | Single edge-triggered J-K flip-flop |
| 07 | Dual D-type edge-triggered flip-flop, buffered output |

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

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

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

| Outline letter | Descriptive designator | Terminals | Package style |
|---|---|---|---|
| A | GDFP5-F14 or CDFP6-F14 | 14 | Flat pack |
| B | GDFP4-F14 | 14 | Flat pack |
| C | GDIP1-T14 or CDIP2-T14 | 14 | Dual-in-line |
| D | GDFP1-F14 or CDFP2-F14 | 14 | Flat pack |
| E | GDIP1-T16 or CDIP2-T16 | 16 | Dual-in-line |
| F | GDFP2-F16 or CDFP3-F16 | 16 | Flat pack |

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° to +150°C
Maximum power dissipation, ($P_D$)
flip-flop, 1/..... 110 mW 1/
Lead temperature (soldering, 10 seconds)..... 300°C
Thermal resistance, junction to case ($\theta_{JC}$):..... 0.09°C/mW for flat packs
0.08°C/mW for dual-in-line pack
Junction temperature ($T_J$)..... 175°C

1.4 Recommended operating conditions.

Supply voltage ($V_{CC}$) ..... 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
Normalized fanout (each output) 2/..... 10 maximum
Case operating temperature range ($T_C$) ..... -55 °C to +125 °C
Input set up time:
Device type 01, 02, 03 and 04, ..... $\geq$ clock pulse width
Device type 05, 06, and 07..... 20 ns
Input hold time
Device types 01, 02, 03 and 04..... 0 ns
Device type 05, 06 and 07 ..... 5 ns

2. APPLICABLE DOCUMENTS

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

1/ Must withstand the added $P_D$ due to short circuit condition (e.g. $I_{OS}$) at one output for 5 seconds duration
2/ Device will fanout in both high and low levels to the specified number of $I_{IL1}/I_{IH1}$ inputs of the same device type as that being tested.

2.2 Government documents.

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

DEPARTMENT OF DEFENSE SPECIFICATIONS

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard for Microelectronics.
MIL-STD-1835 - Interface Standard Electronic Component Case Outlines

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Microcircuits furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.3 and 6.3).

3.2 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

3.3 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein.

3.3.1 Terminal connections and logic diagrams. The terminal connections and logic diagrams shall be as specified on figures 1.

3.3.2 Truth tables and logic equations. The truth tables and logic equations shall be as specified on figure 2.

3.3.3 Schematic circuits. The schematic circuits shall be maintained by the manufacturer and made available to the qualifying activity and the preparing activity (DSCC-VAS) upon request.

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

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

3.5 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.

3.6 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. Subgroups 7 and 8 testing requires only a summary of attributes data.

3.7 Marking. Marking shall be in accordance with MIL-PRF-38535.

TABLE I. Electrical performance characteristics.

| Test | Symbol | Conditions 9/ | Device Type | Limits | | Units |
|---|---|---|---|---|---|---|
| | | | | Min | Max | |
| High-level output voltage | $V_{OH}$ | $V_{CC}$=4.5 V<br>$I_{OH}$ = -400 µA | All | 2.4 | -- | Volts |
| Low-level output voltage | $V_{OL}$ | $V_{CC}$ = 4.5 V, $I_{OL}$=16 mA | All | | 0.4 | Volts |
| Input clamp voltage | $V_{IC}$ | $V_{CC}$ = 4.5 V, $I_{IC}$ = -12 mA<br>$T_C$ = 25ºC | All | | -1.5 | Volts |
| Low-level input current | $I_{IL1}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 0.4 V 1/ | 01, 02, 03, 04, 05, 06 | -0.7 | -1.6 | mA |
| | | | 07 | -0.5 | -1.6 | mA |
| Low-level input current | $I_{IL2}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 0.4 V 2/ | 01, 02, 03, 04, 05 | -1.4 | -3.2 | mA |
| | | | 07 | -1.0 | -3.2 | mA |
| Low-level input current | $I_{IL3}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 0.4 V 6/ | 01, 02, 03, 04 | -0.7 | -3.2 | mA |
| High-level input current | $I_{IH1}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 2.4 V 5/ | All | | 40 | µA |
| High-level input current | $I_{IH2}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 5.5 V 5/ | All | | 100 | µA |
| High-level input current | $I_{IH3}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 2.4 V 3/ | All 11/ | | 80 | µA |
| High-level input current | $I_{IH4}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 5.5 V 3/ 7/ | All | | 200 | µA |
| High-level input current | $I_{IH5}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 2.4 V 7/ 8/ | 01, 02, 03, 04, 05, 07 | -50 | -850<br>120 | µA<br>µA |
| High-level input current | $I_{IH6}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 5.5 V 8/ | 05, 07 | | 300 | µA |
| Short-circuit output current | $I_{OS}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 0 4/ | All | -20 | -57 | mA |
| Supply current per device | $I_{CC}$ | $V_{CC}$ = 5.5 V<br>$V_{IN}$ = 5 V | 01 | | 20 | mA |
| | | | 02, 03, 04 | | 40 | |
| | | | 05, 06, 07 | | 30 | |
| Maximum clock frequency 10/ | $f_{MAX}$ | $V_{CC}$ = 5 V<br>CL = 50 pF minimum<br>RL = 390Ω ± 5% | 01, 02, 03 04, 05, 07 | 10 | | MHz |
| | | | 06 | 15 | | |
| Propagation delay to high logic level (clear or preset to output) | $t_{PLH}$ | | 01, 02, 03, 04, 05 | 5 | 39 | ns |
| | | | 06 | 5 | 62 | |
| | | | 07 | 5 | 31 | |
| Propagation delay to low logic level (clear or preset to output) | $t_{PHL}$ | | 01, 02, 03, 04, 05 | 5 | 50 | ns |
| | | | 06 | 5 | 62 | |
| | | | 07 | 5 | 39 | |
| Propagation delay to high logic level (clock to output) | $t_{PLH}$ | | 06 | 5 | 62 | ns |
| | | | 01, 02, 03, 04, 05 | 5 | 39 | |
| | | | 07 | 5 | 31 | |
| Propagation delay to low logic level (clock to output) | $t_{PHL}$ | | 06 | 5 | 62 | ns |
| | | | 01, 02, 03, 04, 05 | 5 | 50 | |
| | | | 07 | 5 | 39 | |

1/ Input condition – J or K for device types 01, 02, 03, 04, 06, and preset or D for device types 05 and 07, and clock, clear or preset for device type 06.
2/ Input condition – Clock for device types 01, 02, 03 and 04, and clear or clock for device types 05 and 07.
3/ Input condition – Clear or preset for device types 01, 02, 03, 04, 05, 06 and 07 and clock for device types 05 and 07.
4/ No more than one output should be shorted at a time.
5/ Input condition – J or K for device types 01, 02, 03, 04, 06, and D for device types 05 and 07, and clock for device type 06.
6/ Input condition – Clear or preset for device types 01, 02, 03 and 04.
7/ Input condition – Clock for device types 01, 02, 03 and 04.

8/ Input condition – Clear for device types 05 and 07.
9/ See table III for complete terminal conditions.
10/ Minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.
11/ For device types 02 and 03,limits are 0 to 120 μA.

TABLE II. Electrical test requirements.

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

*PDA applies to subgroup 1.

4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38535 and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

a. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

b. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.

c. Additional screening for space level product shall be as specified in MIL-PRF-38535, appendix B.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.

4.4 Technology Conformance inspection (TCI). Technology conformance inspection shall be in accordance with MIL-PRF-38535 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table III of MIL-PRF-38535 and as follows:

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, and 6 shall be omitted.

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

4.4.3 Group C inspection. Group C inspection shall be in accordance with table IV of MIL-PRF-38535 and as follows:

a. End-point electrical parameters shall be as specified in table II herein.

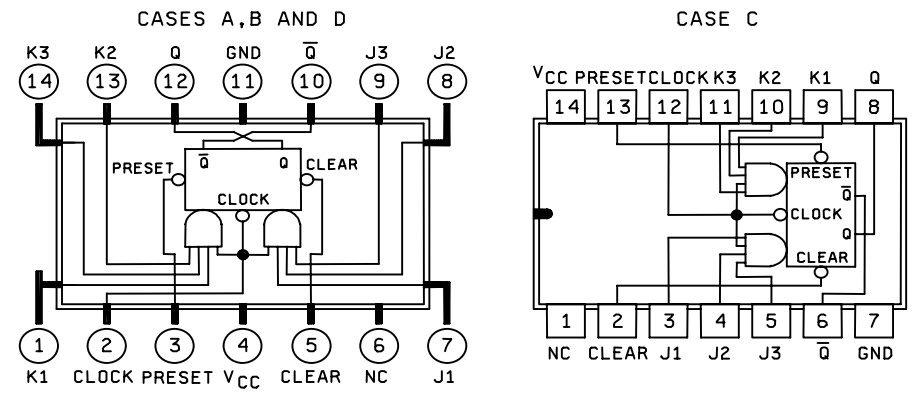
b. The steady-state life test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

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

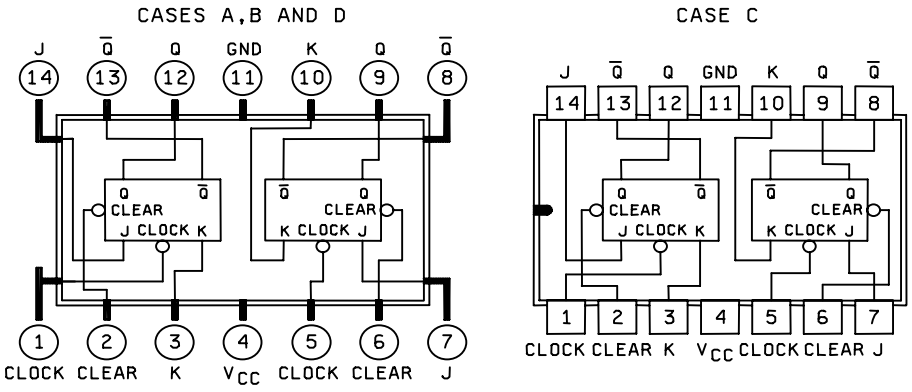
4.5 Methods of inspection. Methods of inspection shall be specified and as follows:

4.5.1 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.

DEVICE TYPE 01




DEVICE TYPE 02




DEVICE TYPE 03

CASE C

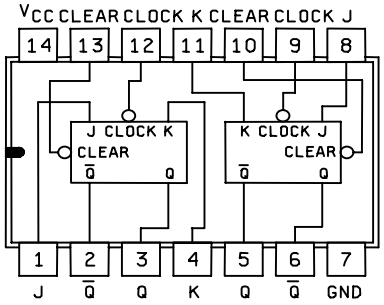
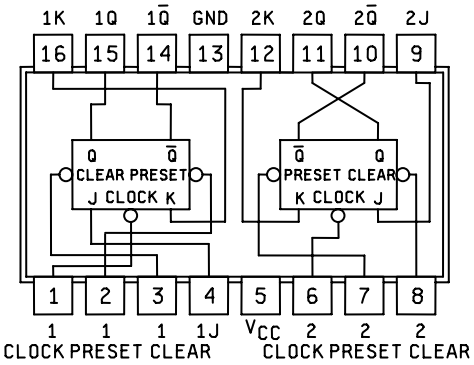



FIGURE 1. Logic diagram and terminal connections.

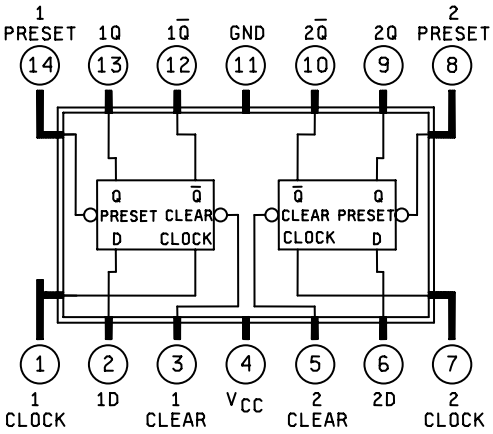
DEVICE TYPE 04

CASES E AND F

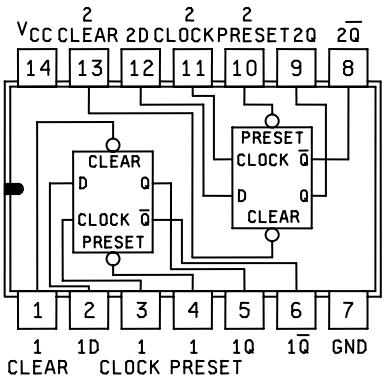



DEVICE TYPES 05 AND 07

CASES A,B AND D

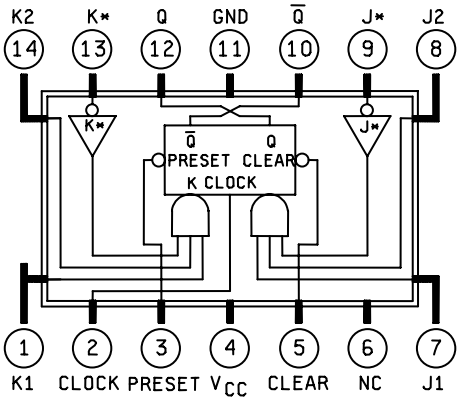



CASE C




DEVICE TYPE 06

CASES A,B AND D




CASE C

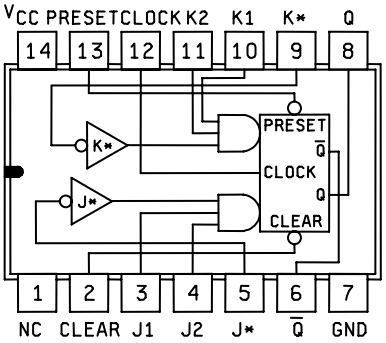



FIGURE 1. Logic diagram and terminal connections – Continued.

Device type 01

| Truth table | | |
|---|---|---|
| $t_n$ | | $t_n + 1$ |
| J | K | Q |
| L | L | $Q_n$ |
| L | H | L |
| H | L | H |
| H | H | $\overline{Q}_n$ |

Positive logic: Low input to preset sets Q to high-level
Low input to clear sets Q to low-level
Preset and clear are independent of clock and dominate regardless of the state of clock or J of K inputs.

NOTES: 1. J = J1 • J2 • J3
2. K = K1 • K2 • K3
3. $t_n$ = Bit time before clock pulse.
4. $t_n + 1$ = Bit time after clock pulse.

Device type 02 and 03

| Truth table each flip-flop | | |
|---|---|---|
| $t_n$ | | $t_n + 1$ |
| J | K | Q |
| L | L | $Q_n$ |
| L | H | L |
| H | L | H |
| H | H | $\overline{Q}_n$ |

Positive logic: Low input to clear sets Q to low-level
Clear is independent of clock and dominate regardless of the state of clock or J or K inputs.

NOTES: 1. $t_n$ = Bit time before clock pulse.
2. $t_n + 1$ = Bit time after clock pulse.

FIGURE 2. Truth tables.

Device type 04

| Truth table each flip-flop | | |
|---|---|---|
| $t_n$ | | $t_n + 1$ |
| J | K | Q |
| L | L | $Q_n$ |
| L | H | L |
| H | L | H |
| H | H | $\overline{Q}_n$ |

Positive logic: Low input to preset sets Q to high-level
Low input to clear sets Q to low-level
Preset and clear are independent of clock and dominate regardless of the state of clock or J of K inputs.

NOTES: 1. $t_n$ = Bit time before clock pulse.
2. $t_n + 1$ = Bit time after clock pulse.

Device type 05 and 07

| Truth table each flip-flop | | |
|---|---|---|
| $t_n$ | $t_n + 1$ | |
| INPUT D | OUTPUT Q | OUTPUT $\overline{Q}$ |
| L | L | H |
| H | H | L |

Positive logic: Low input to preset sets Q to high-level
Low input to clear sets Q to low-level
Preset and clear are independent of clock and dominate regardless of the state of clock or D input.

NOTES: 1. $t_n$ = Bit time before clock pulse.
2. $t_n + 1$ = Bit time after clock pulse.

FIGURE 2. Truth tables – Continued.

Device type 06

| Truth table | | |
|---|---|---|
| $t_n$ | | $t_n + 1$ |
| J | K | Q |
| L | L | $Q_n$ |
| L | H | L |
| H | L | H |
| H | H | $\overline{Q}_n$ |

Positive logic: Low input to preset sets Q to high-level
Low input to clear sets Q to low-level
Preset or clear function can occur only
When clock input is low.

NOTES: 1. $J = J1 \bullet J2 \bullet \overline{J^*}$
2. $K = K1 \bullet K2 \bullet \overline{K^*}$
3. $t_n$ = Bit time before clock pulse.
4. $t_n + 1$ = Bit time after clock pulse.
5. If inputs J* or K* are not used must be grounded.

FIGURE 2. Truth tables – Continued.

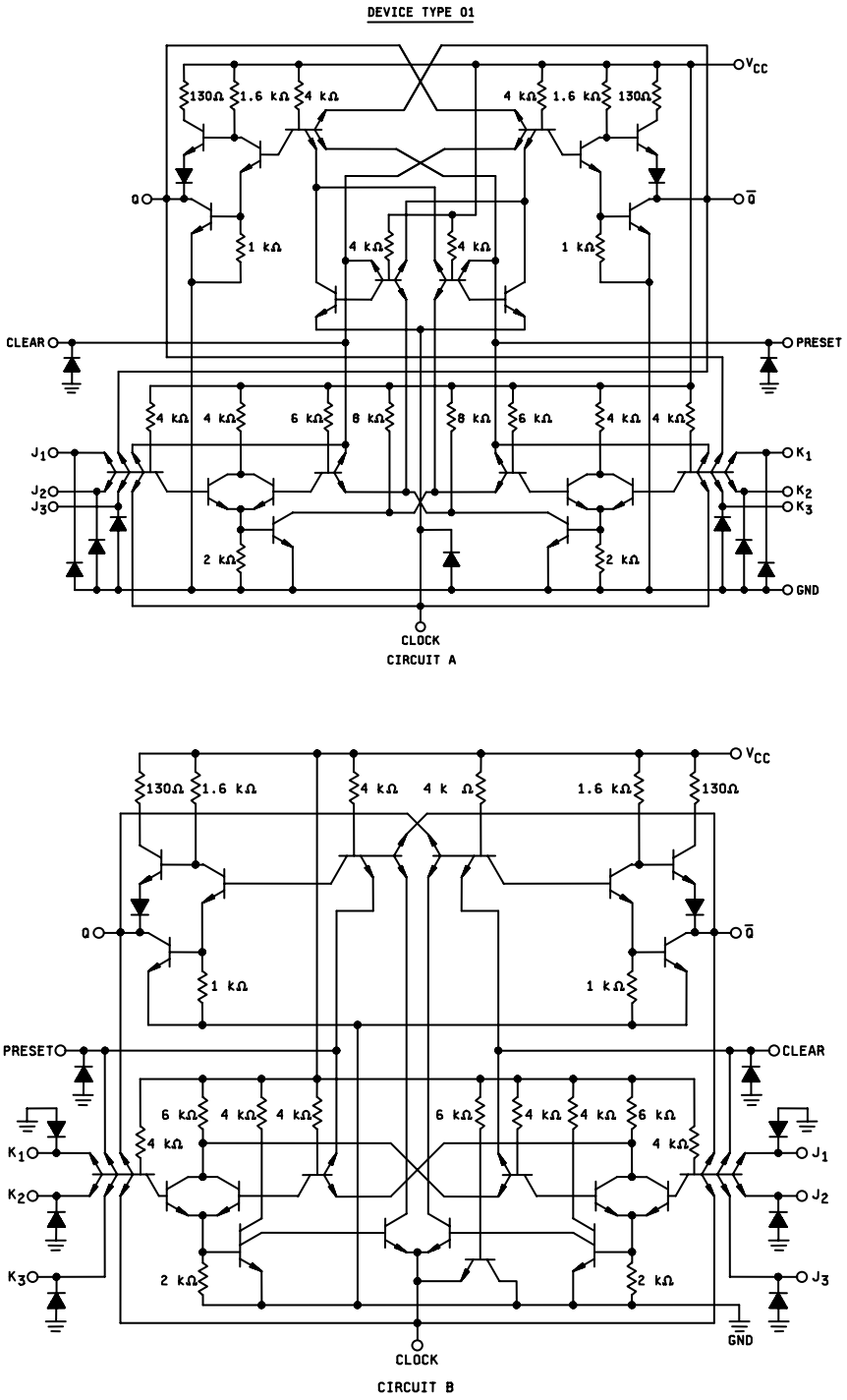



FIGURE 3. Schematic circuits.

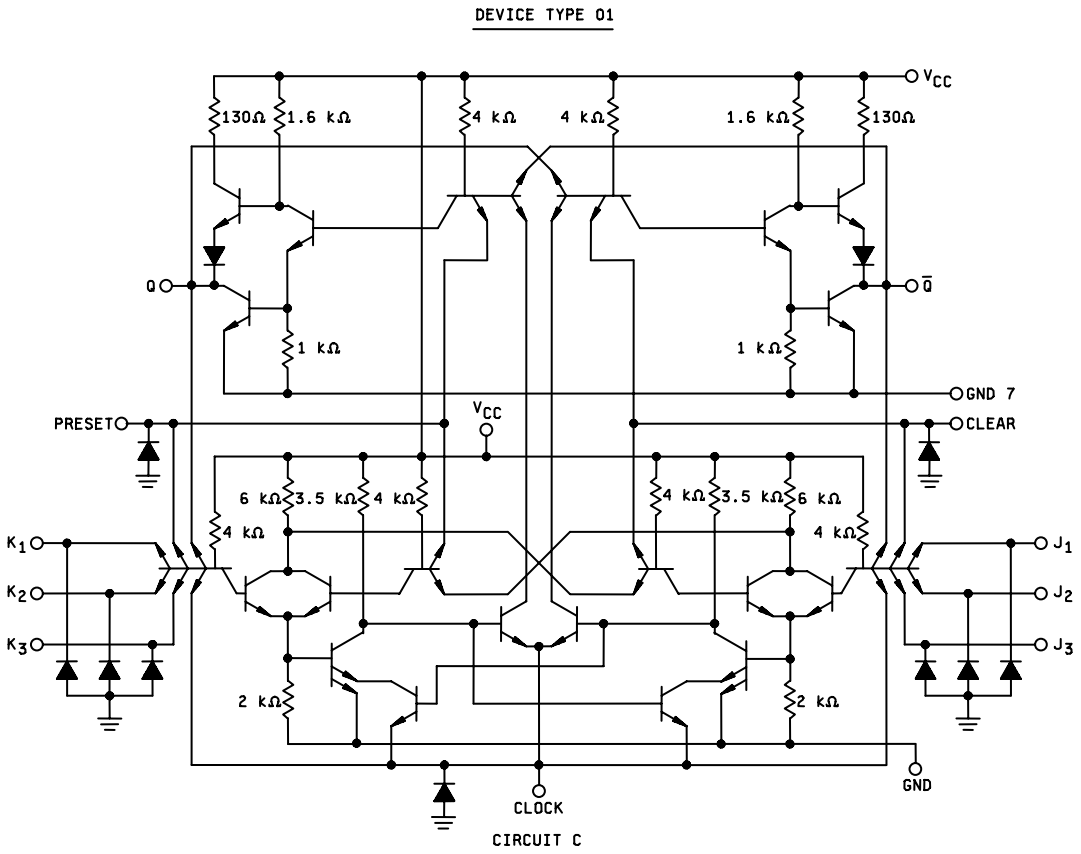



FIGURE 3. Schematic circuits – Continued.

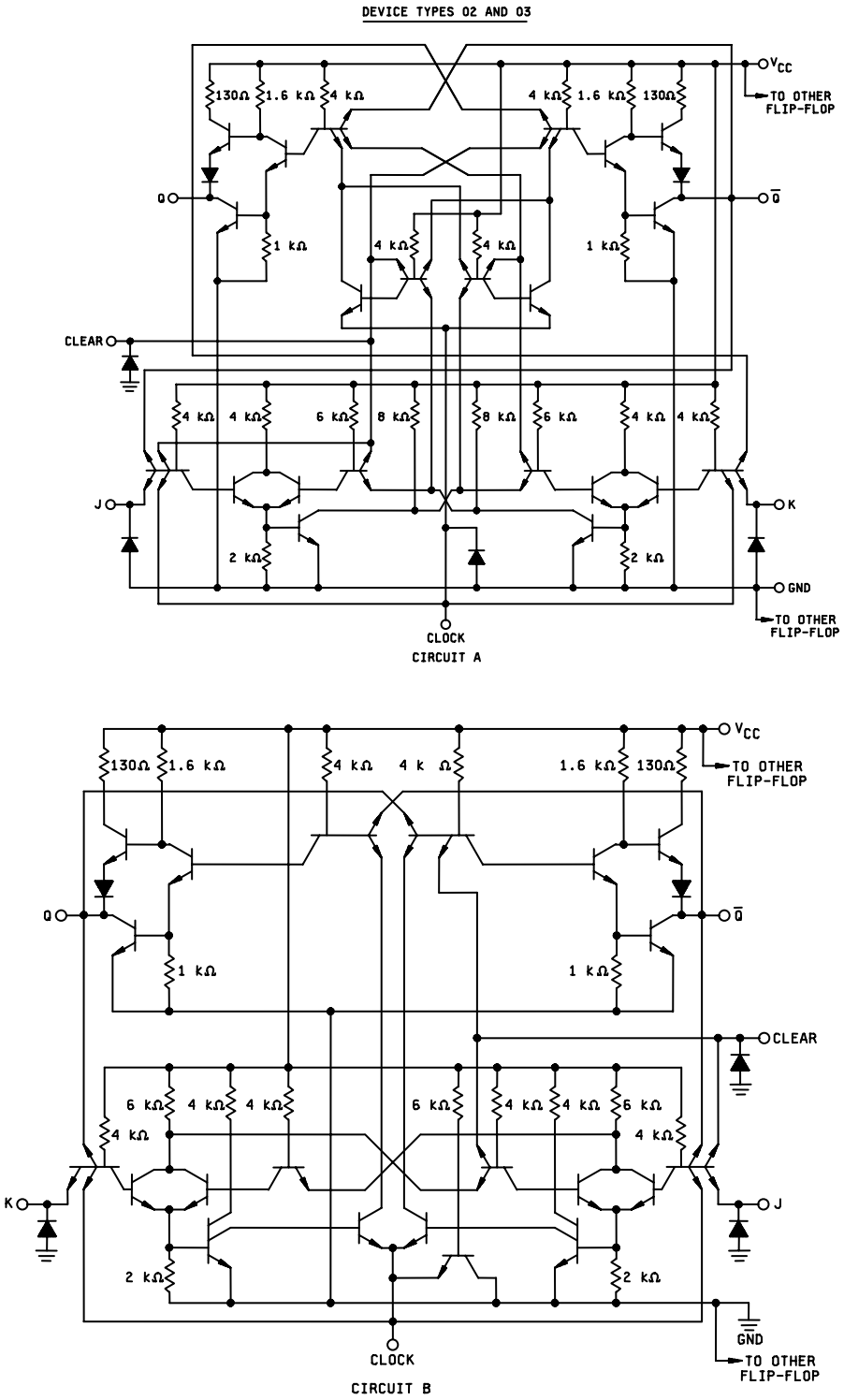
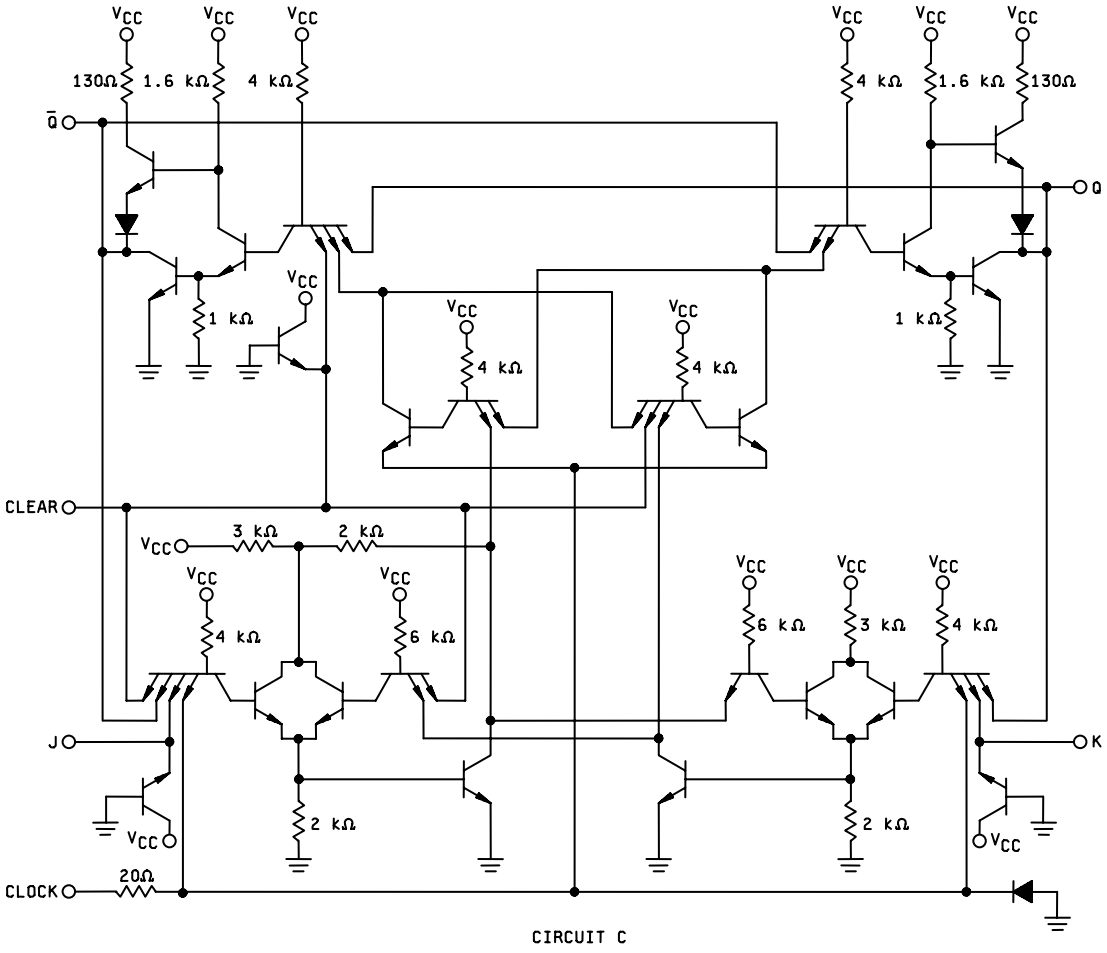



FIGURE 3. Schematic circuits – Continued.

DEVICE TYPES 02 AND 03




CIRCUIT C

NOTES:
1. Circuits A, B, and C are the only acceptable variations for device types 02 and 03.
2. All resistance values shown are nominal.

FIGURE 3. Schematic circuits – Continued.

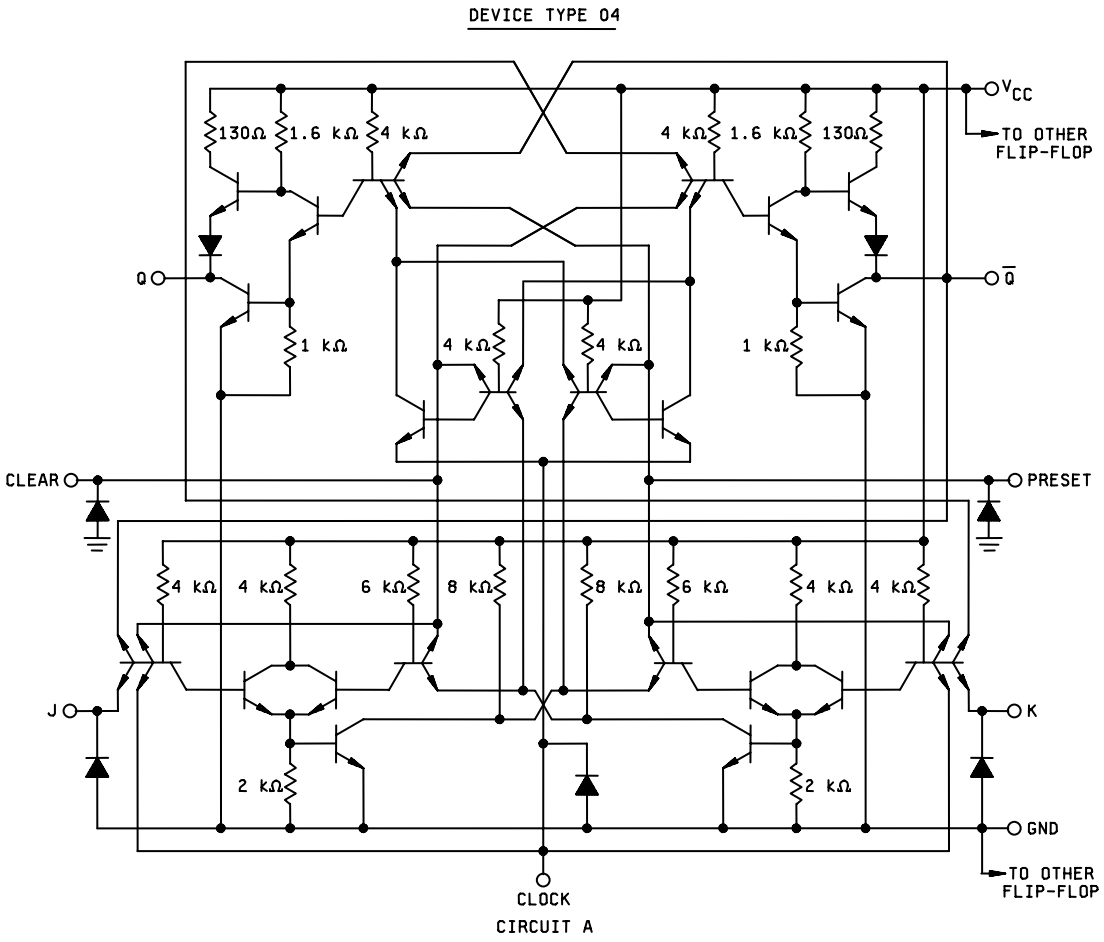



FIGURE 3. Schematic circuits – Continued.

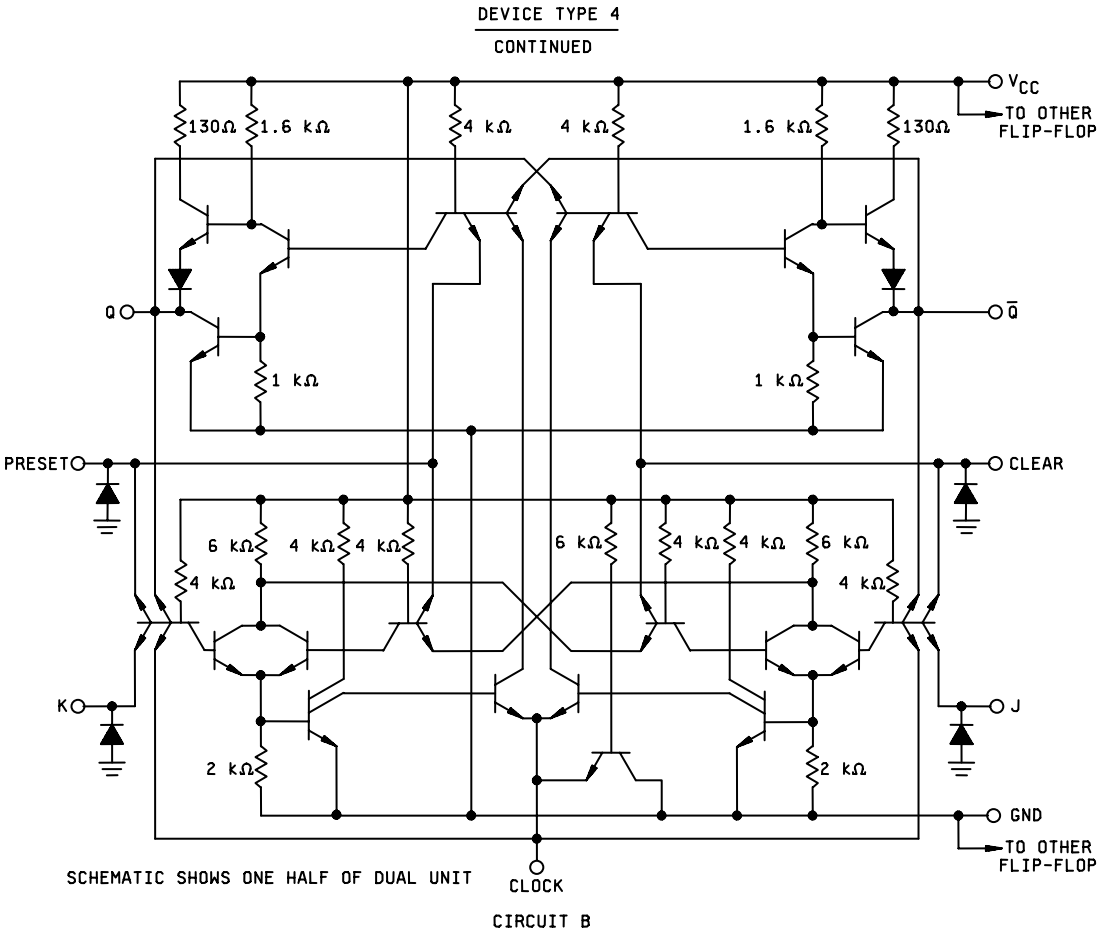
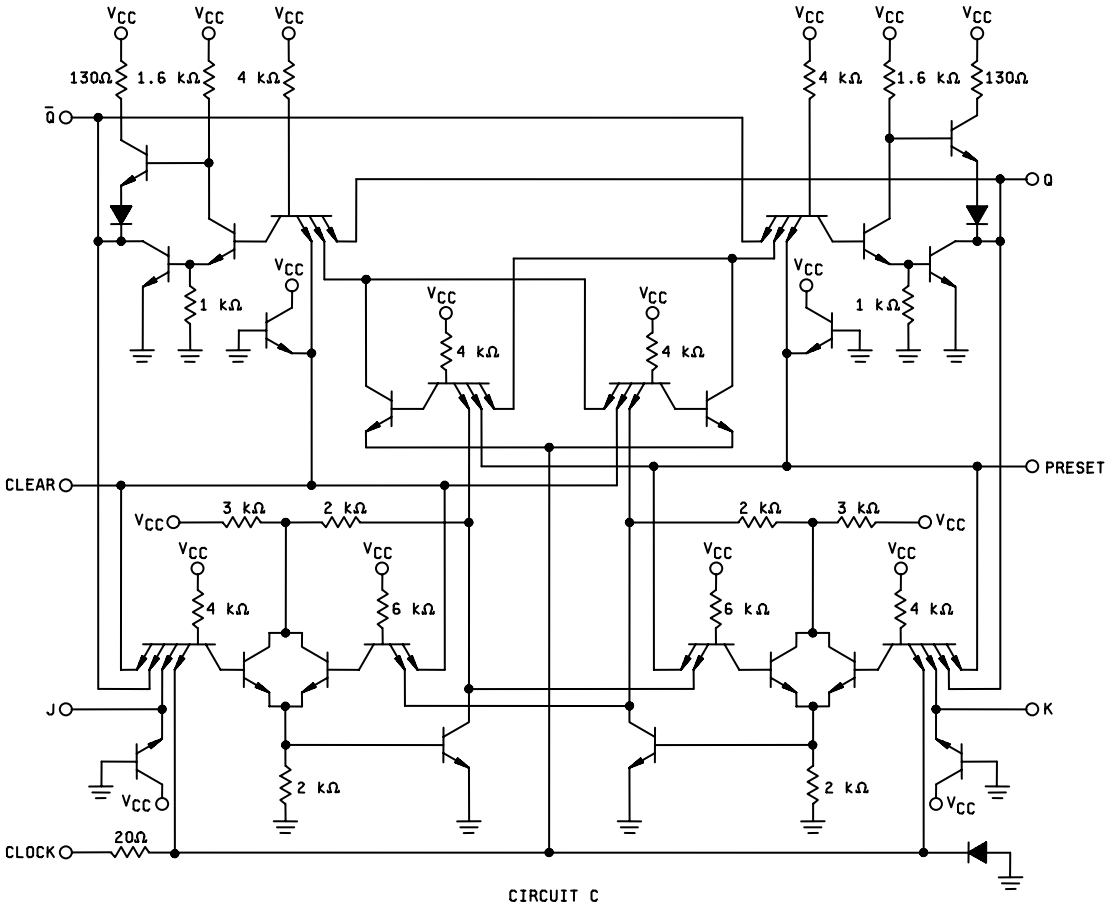



FIGURE 3. Schematic circuits – Continued.

DEVICE TYPE 04
CONTINUED

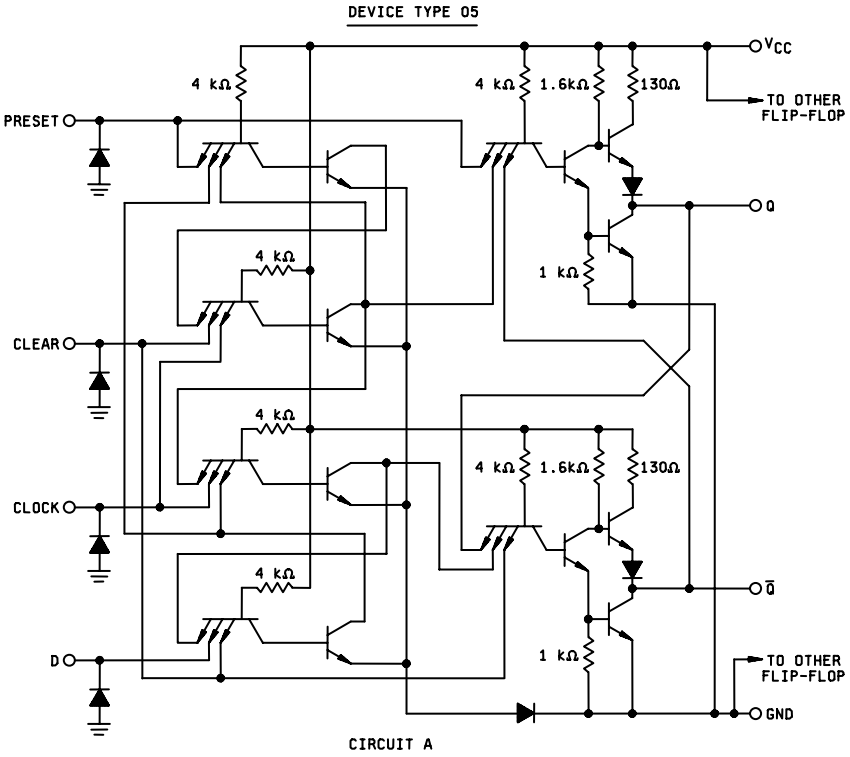



CIRCUIT C

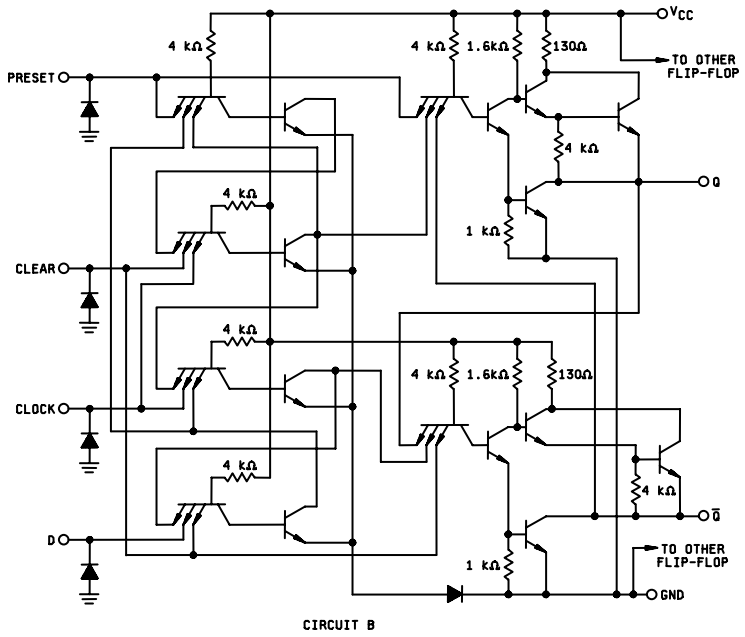
NOTES:
1. Circuits A, B and C are the only acceptable variation for device type 04.
2. All resistance values shown are nominal.

FIGURE 3. Schematic circuits – Continued.

DEVICE TYPE 05




CIRCUIT A




CIRCUIT B

NOTES:
1. Circuits A, B, and C are the only acceptable variations for device type 05.
2. All resistance values shown are nominal.

FIGURE 3. Schematic circuits – Continued.

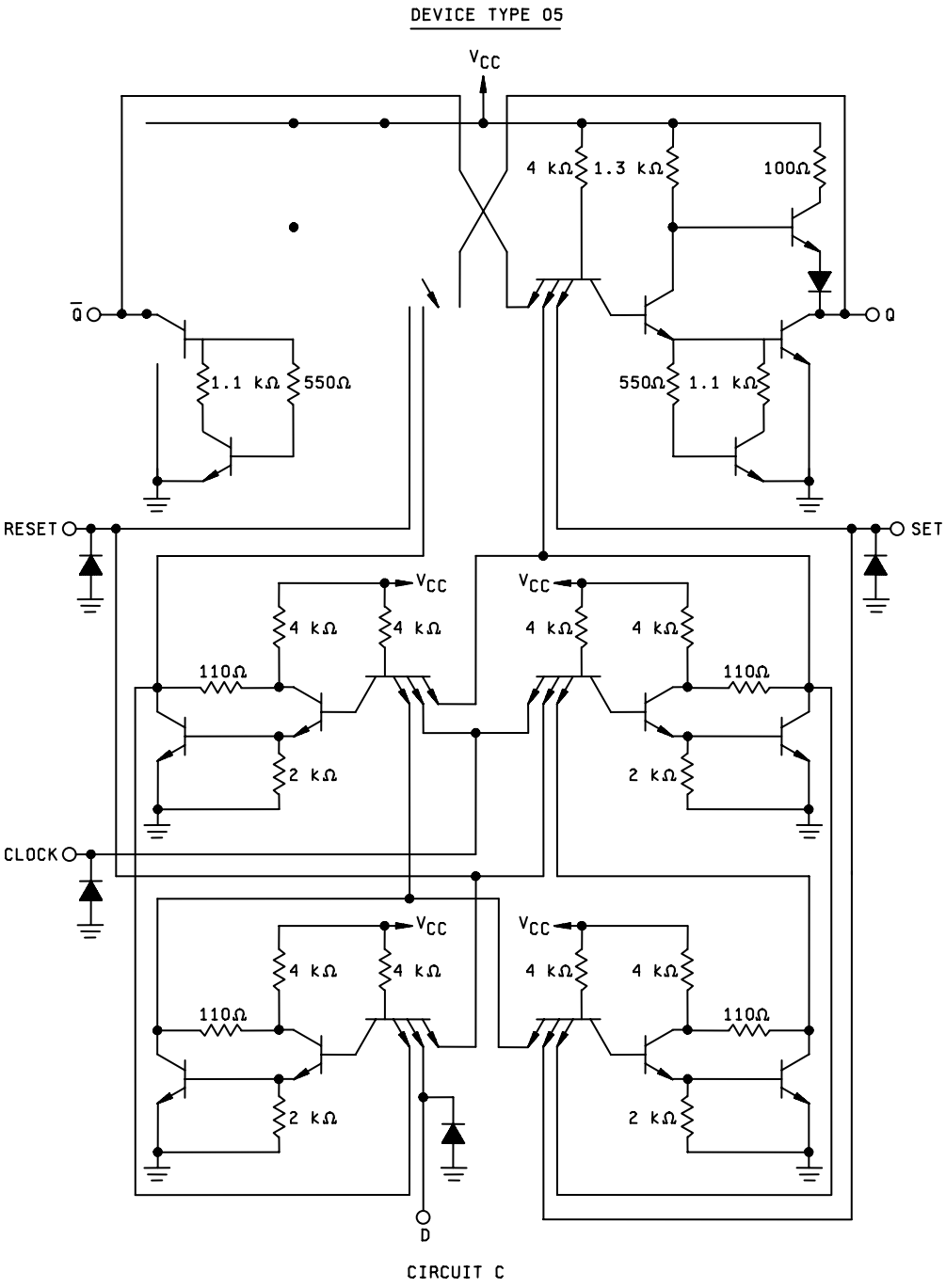
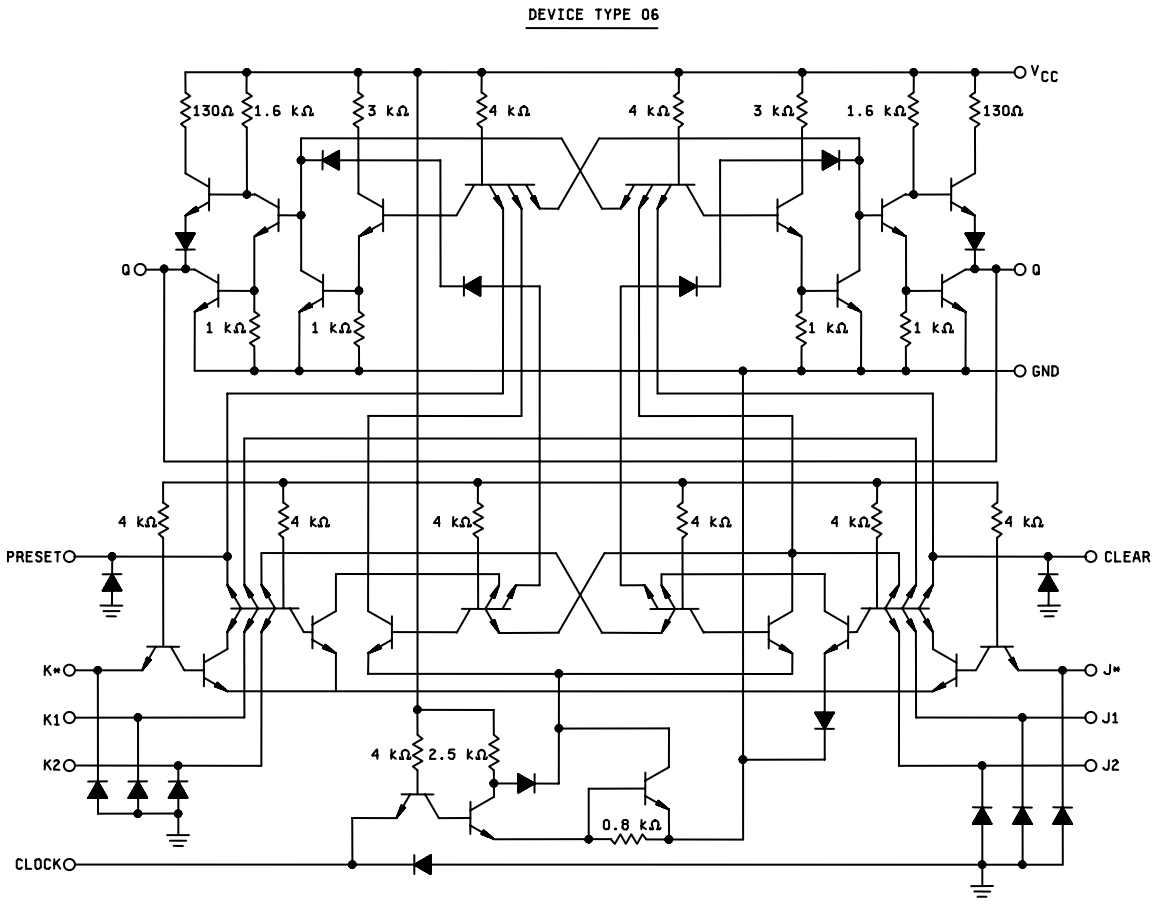
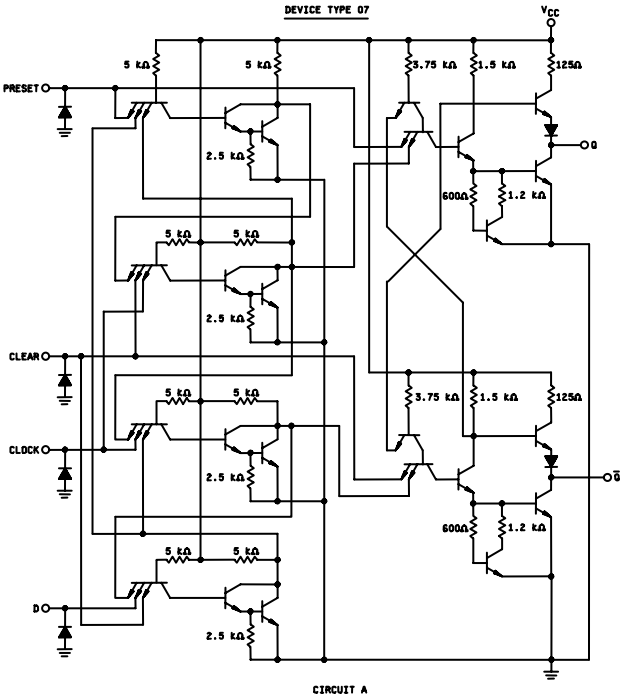



FIGURE 3. Schematic circuits – Continued.

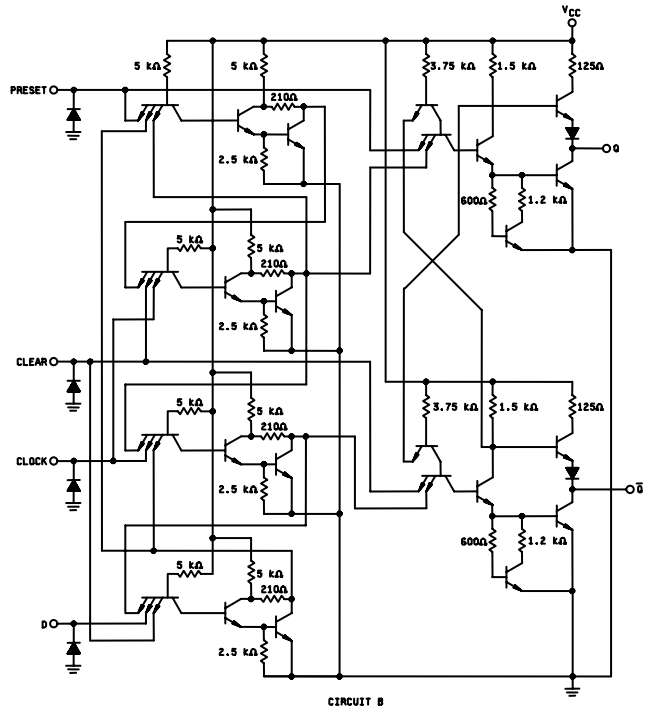



NOTE: All resistance values shown are nominal.

FIGURE 3. Schematic circuits – Continued.



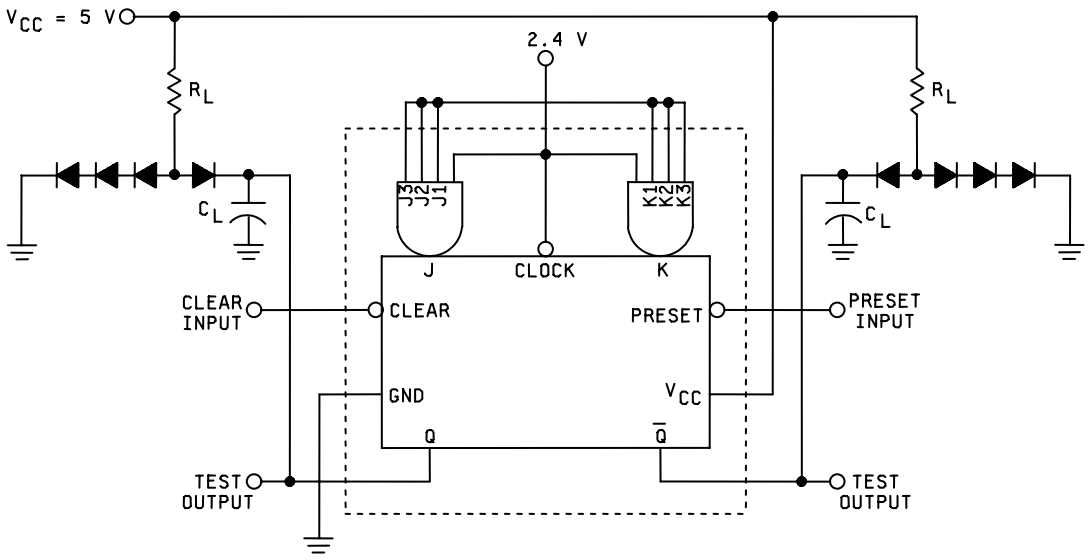

CIRCUIT A



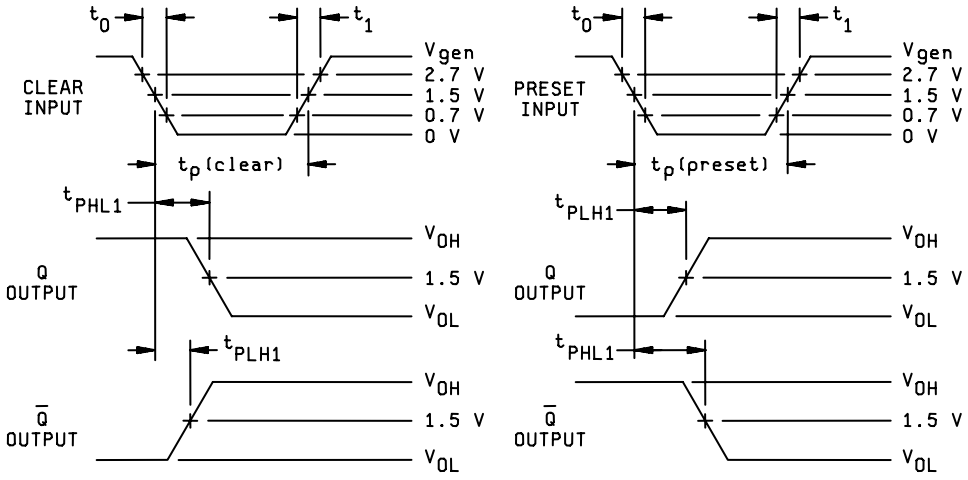

CIRCUIT B

NOTES:
1. Circuits A and B are the only acceptable variations for device type 07.
2. All resistance values shown are nominal.

FIGURE 3. Schematic circuits – Continued.



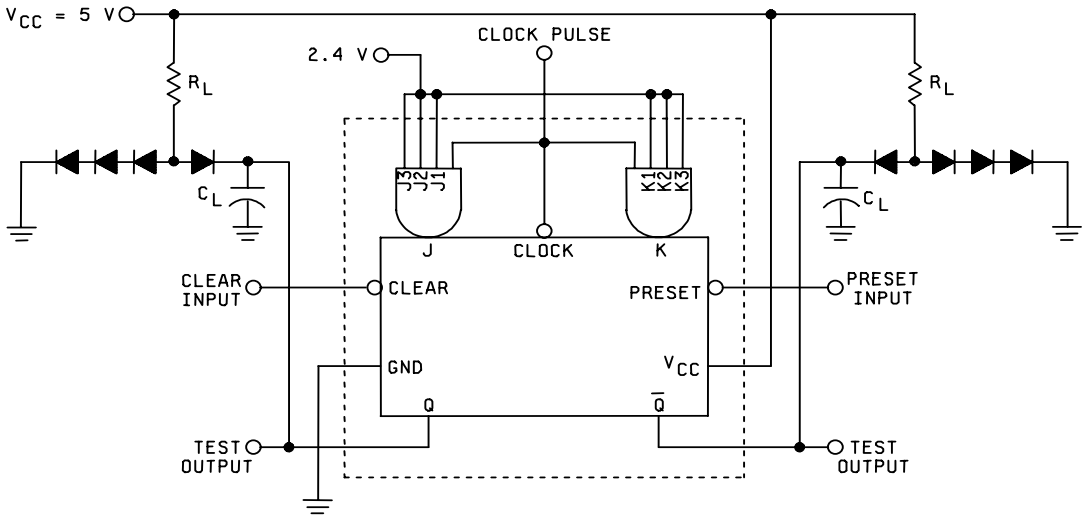

TEST CIRCUIT



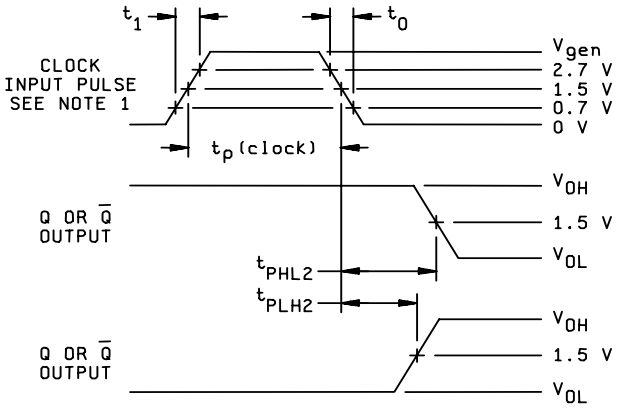

VOLTAGE WAVEFORMS

NOTES:
1. Clear or preset inputs dominate regardless of the state of clock or J-K inputs.
2. Clear or preset input pulse characteristics: $V_{gen}$ = 3 V, $t_0 = t_1$ = 10 ns, $t_p$(clear) = $t_p$(preset) = 30 ns, PRR = 1 MHz, and $Z_{OUT} \approx 50\Omega$.
3. $C_L$ = 50 pF, minimum ($C_L$ includes probe and jig capacitance).
4. $R_L = 390\Omega \pm 5\%$.
5. All diodes are 1N3064, or equivalent.
6. When testing clear to output switching, preset input shall have a negative pulse. When testing preset output switching, clear shall have a negative pulse (see table III).

FIGURE 4. Clear and preset switching test circuit and waveforms for device type 01.



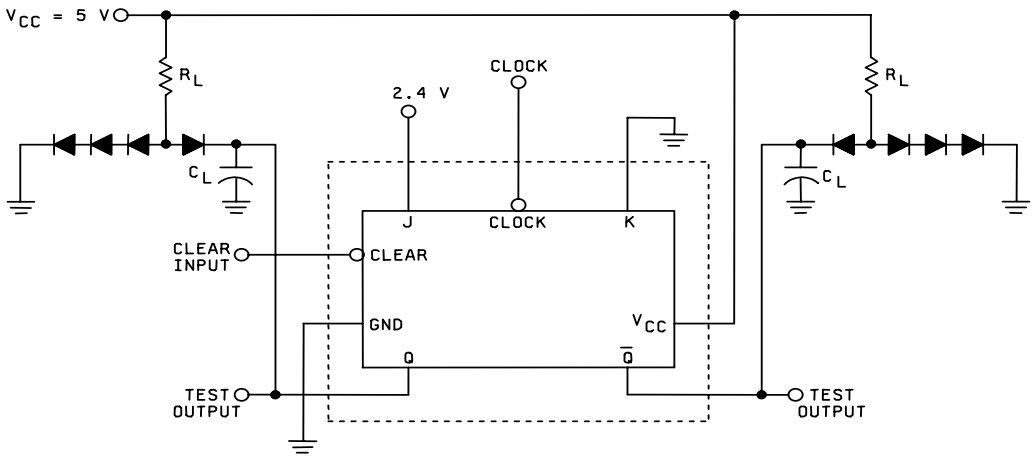

TEST CIRCUIT



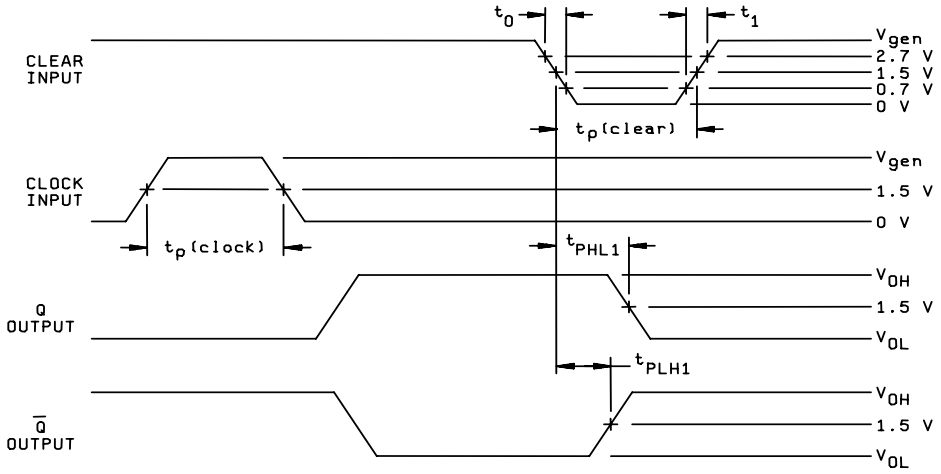

VOLTAGE WAVEFORMS

NOTES:
1. Clock input characteristics for $t_{PLH}$, $t_{PHL}$ (clock to output), $V_{gen}$ = 3 V, $t_1 = t_0 \leq 10$ ns, $t_p$ (clock) = 25 ns, and PRR = 1 MHz. All J and K inputs are at 2.4 V. When testing $f_{MAX}$ the clock input characteristics are $V_{gen}$ = 3 V, $t_1 = t_0 \leq 10$ ns, $t_p$ (clock) = 20 ns, and PRR = see table III.
2. J = J1 • J2 • J3; and K = K1 • K2 • K3
3. All diodes are 1N3064, or equivalent.
4. $C_L$ = 50 pF minimum ($C_L$ includes probe and jig capacitance).
5. $R_L$ = 390Ω ±5%

FIGURE 5. Synchronous switching test circuit for device type 01.



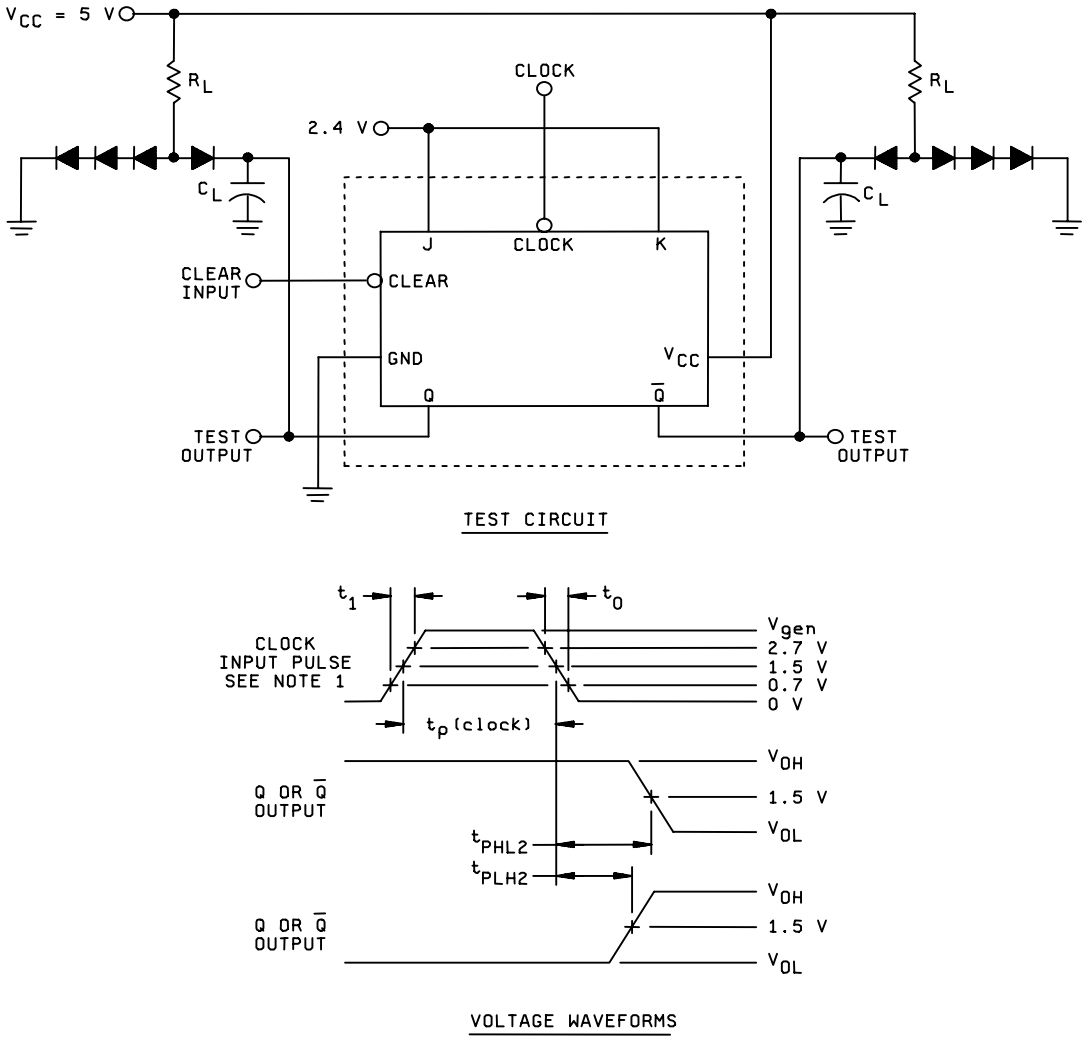

TEST CIRCUIT




VOLTAGE WAVEFORMS

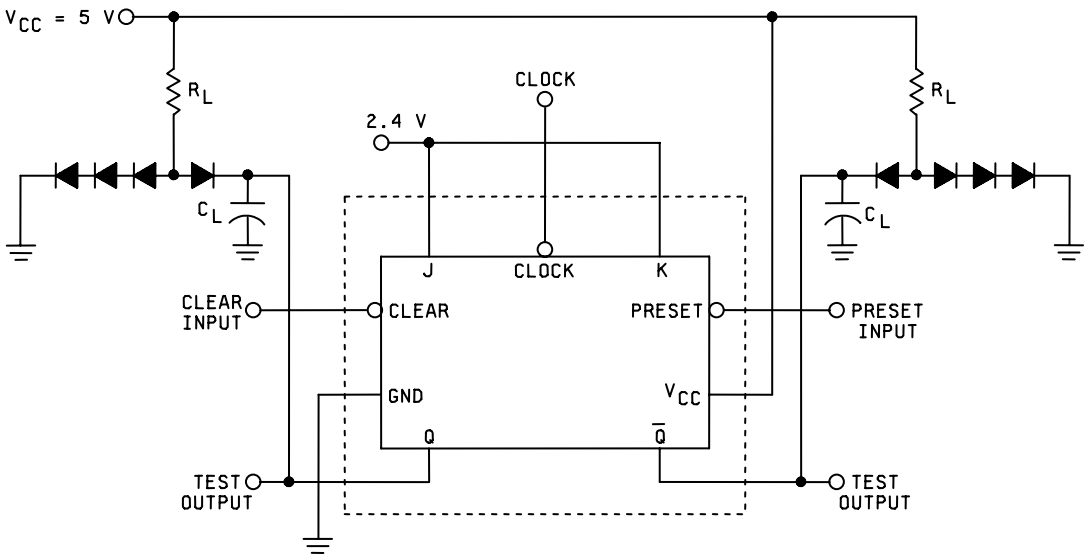
NOTES:
1. Clear inputs dominate regardless of the state of clock or J-K inputs.
2. Clear input pulse characteristics: $V_{gen}$ = 3 V, $t_0 = t_1$ = 10 ns, $t_p$(clear) = 30 ns, PRR = 1 MHz.
3. All diodes are 1N3064, or equivalent.
4. $C_L$ = 50 pF, minimum ($C_L$ includes probe and jig capacitance).
5. $R_L$ = 390Ω ±5%.
6. Clock input pulse characteristics: $V_{gen}$ = 3 V, $t_p$ (clock) ≥ 25 ns, PRR = 1 MHz.

FIGURE 6. Clear switching test circuit and waveforms for device types 02 and 03.

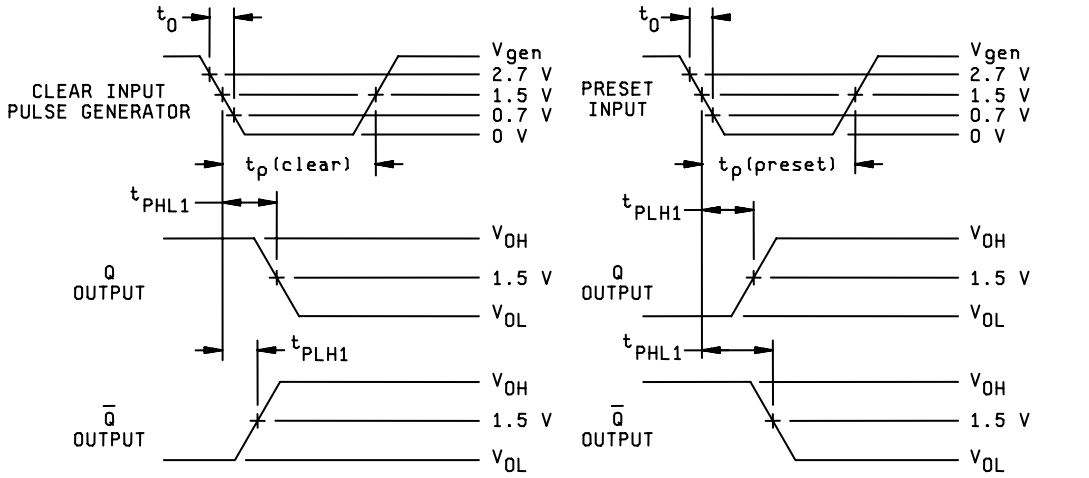



NOTES:
1. Clock input characteristics for $t_{PLH}$, $t_{PHL}$ (clock to output), $V_{gen}$ = 3 V, $t_1 = t_0 \leq 10$ ns, $t_p$ (clock) = 25 ns, and PRR = 1 MHz. All J and K inputs are at 2.4 V. When testing $f_{MAX}$ the clock input characteristics are $V_{gen}$ = 3 V, $t_1 = t_0 \leq 10$ ns, $t_p$ (clock) = 20 ns, and PRR = 10 MHz for subgroups 9, 10, and 11.
2. All diodes are 1N3064, or equivalent.
3. $C_L$ = 50 pF minimum (including jig and probe capacitance).
4. $R_L$ = 390Ω ±5%

FIGURE 7. Synchronous switching test circuit for device type 02 and 03.



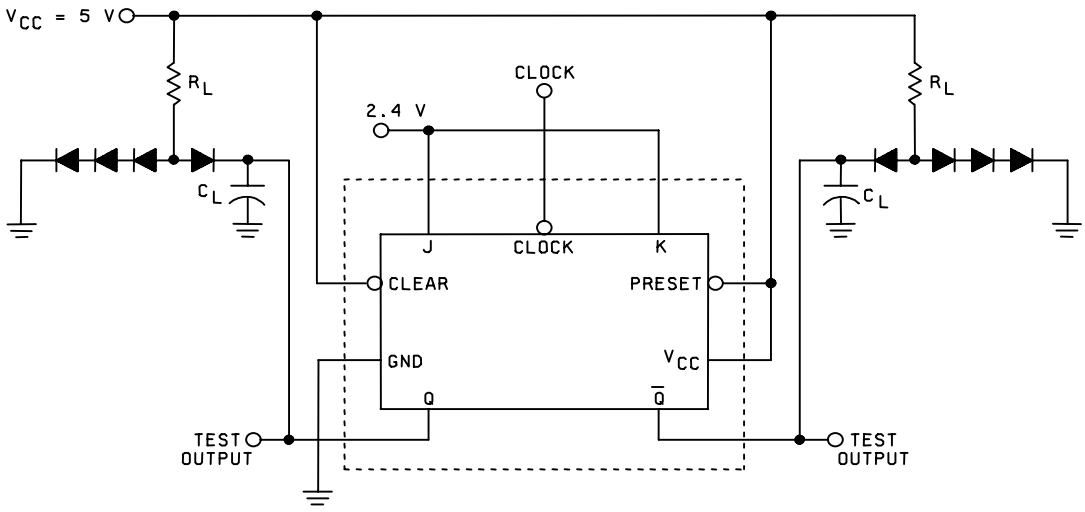

TEST CIRCUIT



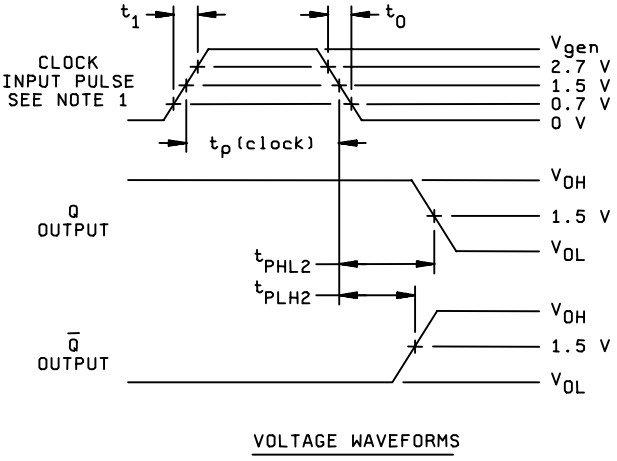

VOLTAGE WAVEFORMS

NOTES:
1. Clear or preset inputs dominate regardless of the state of clock or J-K inputs.
2. Clear or preset input pulse characteristics: $V_{gen}$ = 3 V, $t_0 = t_1$ = 10 ns, $t_p$(clear) = $t_p$(preset) = 30 ns, PRR = 1 MHz, and $Z_{OUT} \approx 50\Omega$.
3. $C_L$ = 50 pF, minimum (including jig and probe capacitance).
4. $R_L = 390\Omega \pm 5\%$.
5. All diodes are 1N3064, or equivalent.
6. When testing clear to output switching, preset input shall have a negative pulse. When testing preset to output switching, clear input shall have a negative pulse (see table III).

FIGURE 8. Clear and preset switching test circuit and waveforms for device type 04.



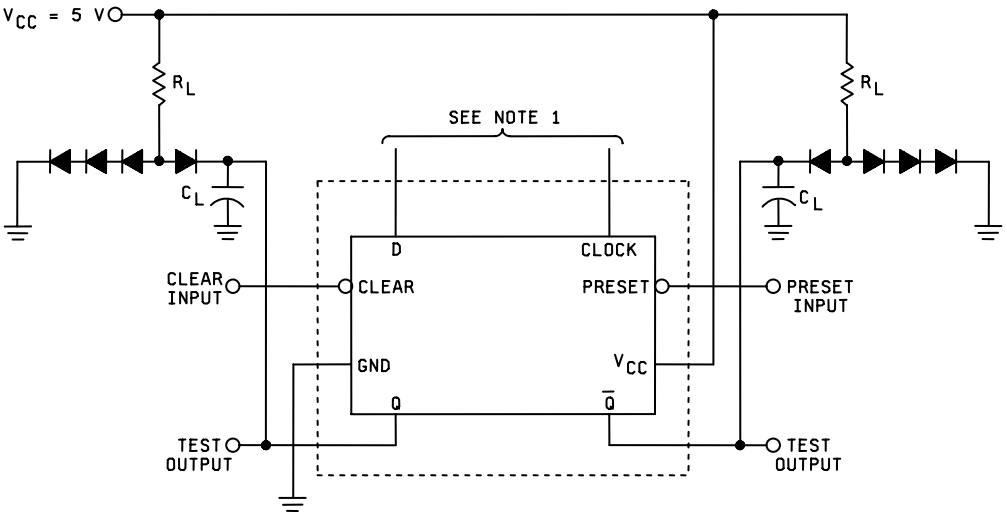

TEST CIRCUIT



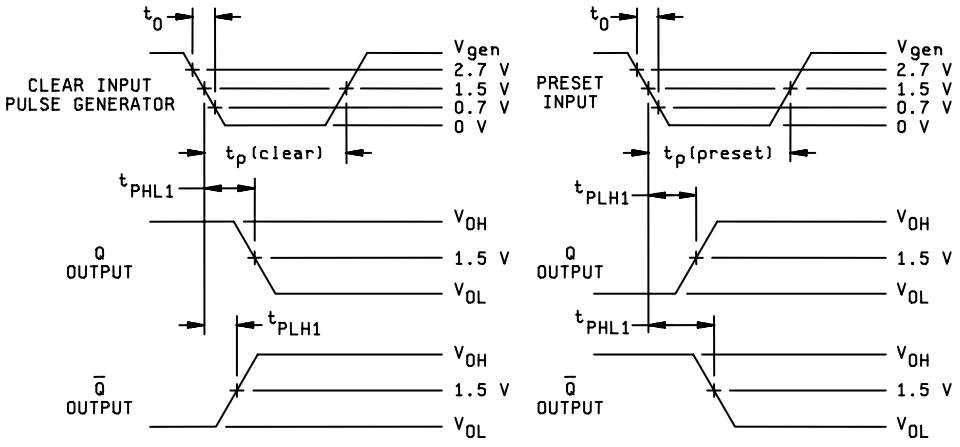

VOLTAGE WAVEFORMS

NOTES:
1. Clock input characteristics for $t_{PLH}$, $t_{PHL}$ (clock to output), $V_{gen}$ = 3 V, $t_1 = t_0 \leq 10$ ns, $t_p$ (clock) = 25 ns, and PRR = 1 MHz. All J and K inputs are at 2.4 V. When testing $f_{MAX}$ the clock input characteristics are $V_{gen}$ = 3 V, $t_1 = t_0 \leq 10$ ns, $t_p$ (clock) = 20 ns, and PRR = see table III.
2. All diodes are 1N3064, or equivalent.
3. $C_L$ = 50 pF minimum (including jig and probe capacitance).
4. $R_L$ = 390Ω ±5%

FIGURE 9. Synchronous switching test circuit for device type 04.



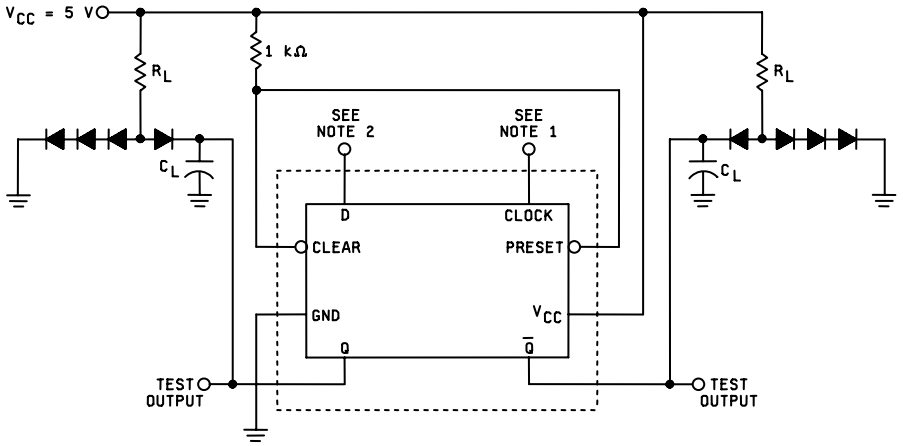

TEST CIRCUIT



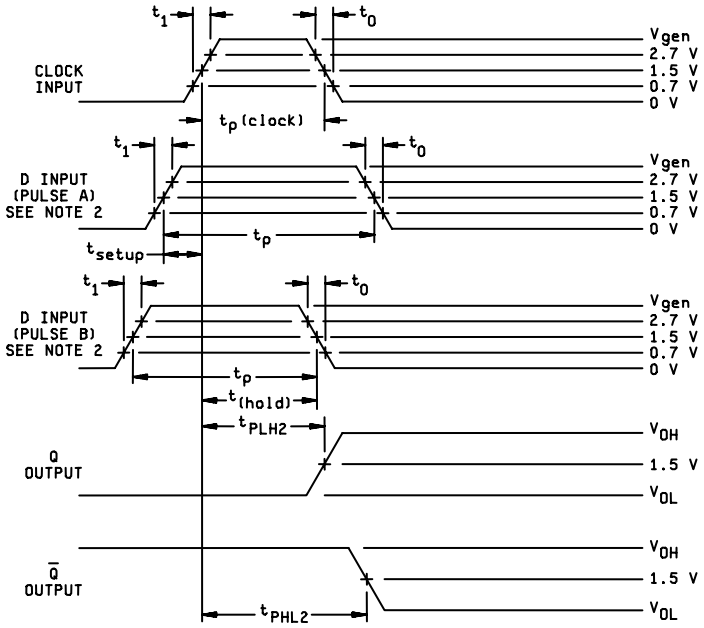

VOLTAGE WAVEFORMS

NOTES:
1. Clear and preset inputs dominate regardless of the state of clock or D inputs.
2. All diodes are 1N3064, or equivalent.
3. Clear or preset input pulse characteristics: $V_{gen}$ = 3 V, $t_o \leq 7$ ns, $t_p$ (clear) = $t_p$ (preset) = 35 ns, and PRR = 1 MHz.
4. $C_L$ = 50 pF, minimum (including jig and probe capacitance).
5. $R_L$ = 390Ω ±5%.
6. When testing clear to output switching, preset input shall have a negative pulse. When testing preset to output switching, clear input shall have a negative pulse (see table III).

FIGURE 10. Clear and preset switching test circuit and waveforms for device types 05 and 07.




TEST CIRCUIT




VOLTAGE WAVEFORMS

NOTES:

1. Clock input pulse has the following characteristics: $V_{gen}$ = 3 V, $t_o = t_1 \leq 10$ ns, $t_p$ (clock) = 30 ns, and PRR = 1 MHz. When testing $f_{MAX}$, PRR = see table III.
2. D input (pulse A ) has the following characteristics: $V_{gen}$ = 3 V, $t_o = t_1 \leq 10$ ns, $t_{SETUP}$ = 25 ns, $t_p$ = 60 ns, and PRR is 50% of the clock PRR. D input (pulse B) has the following characteristics: $V_{gen}$ = 3 V, $t_o = t_1 < 7$ ns, $t_{hold}$ = 6 ns, $t_p$ = 60 ns, and PRR is 50% of the clock PRR.
3. All diodes are 1N3064, or equivalent.
4. $C_L$ = 50 pF minimum (including jig and probe capacitance).
5. $R_L$ = 390Ω ±5%

FIGURE 11. Synchronous switching test circuit (high level data) for device types 05 and 07.

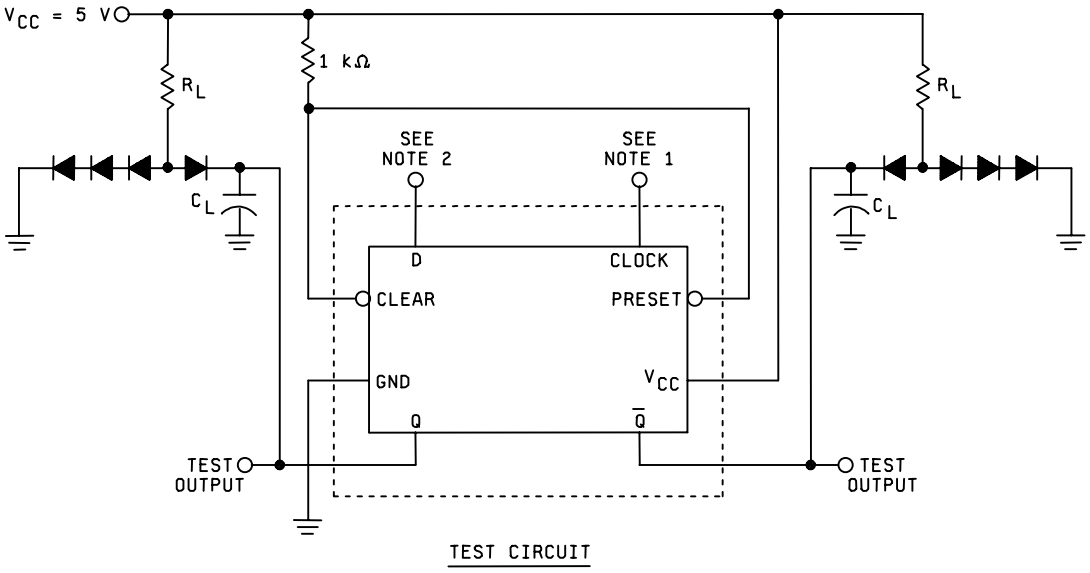
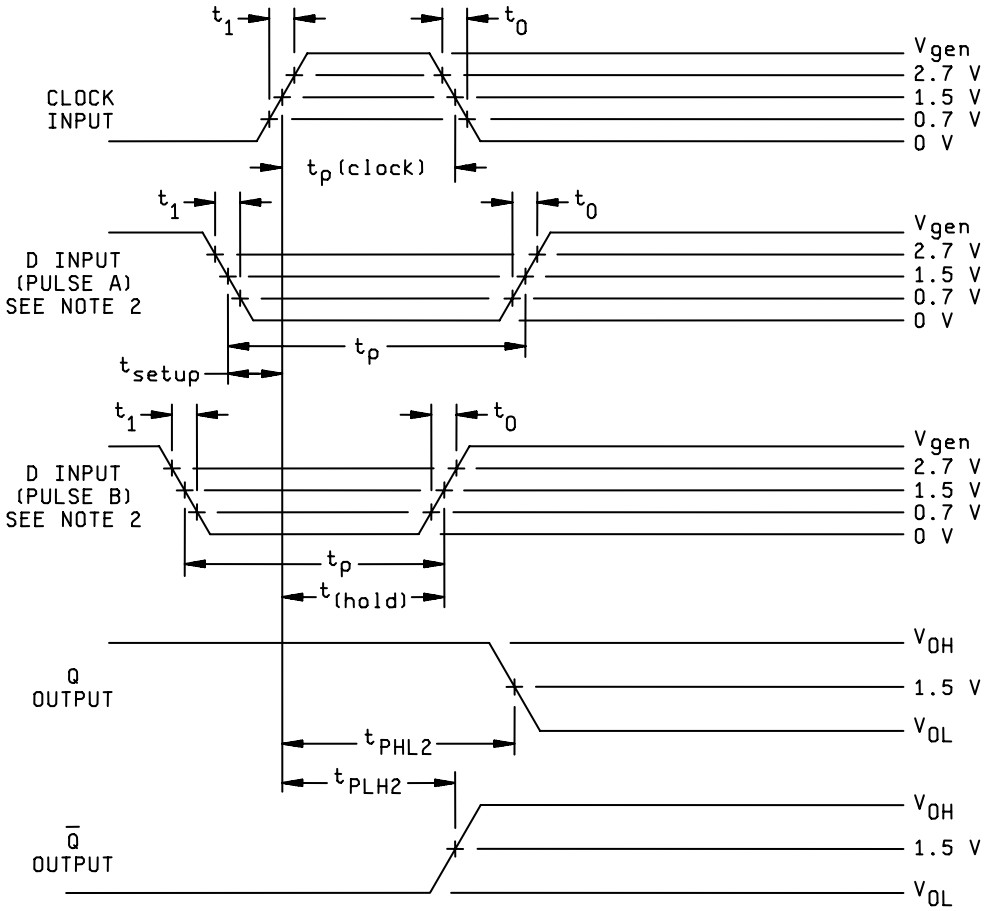


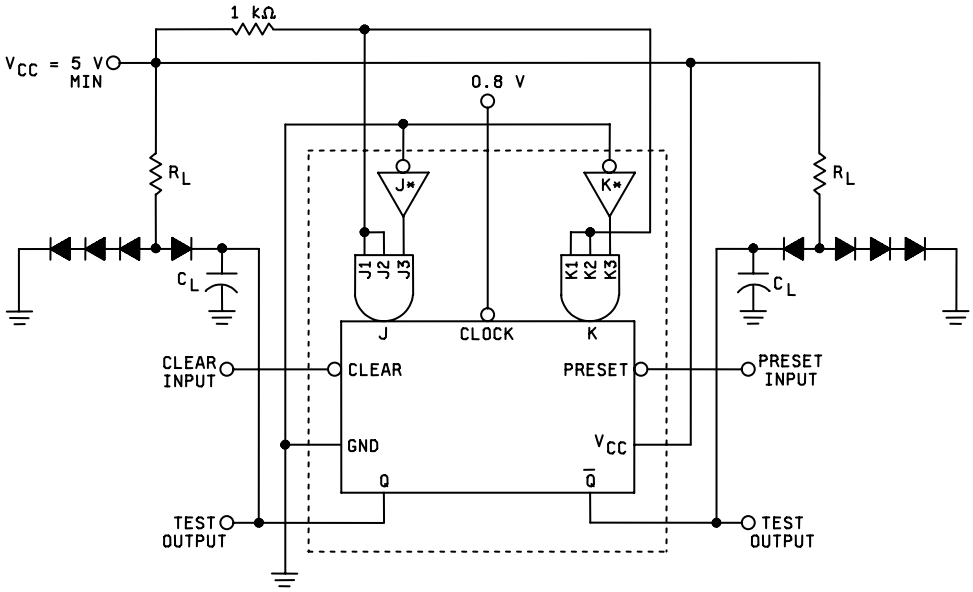

FIGURE 12. Synchronous switching test circuit (low-level data) for device types 05 and 07.



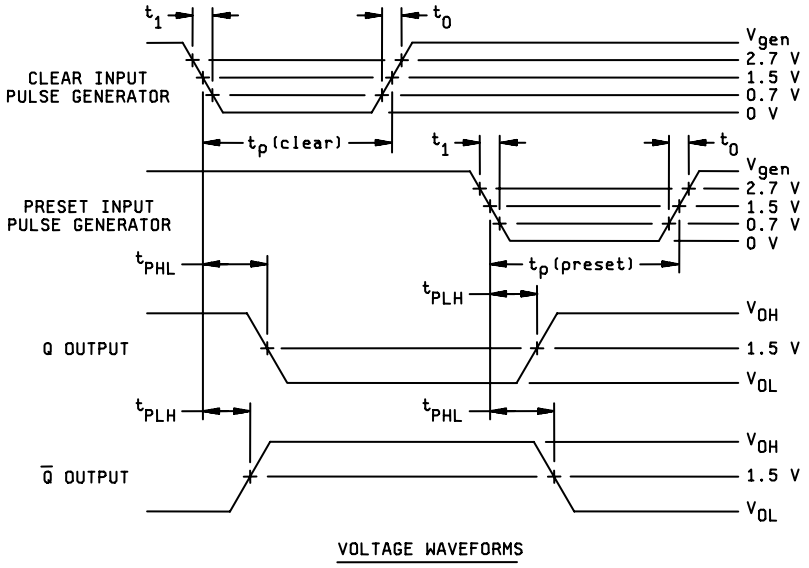

VOLTAGE WAVEFORMS

NOTES:
1. Clock input pulse has the following characteristics: $V_{gen}$ = 3 V, $t_o = t_1 < 10$ ns, $t_p$ (clock) = 30 ns, and PRR = 1 MHz.
2. D input (pulse A ) has the following characteristics: $V_{gen}$ = 3 V, $t_o = t_1 \leq 10$ ns, $t_{SETUP}$ = 25 ns, $t_p$ = 60 ns, and PRR is 50% of the clock PRR. D input (pulse B) has the following characteristics: $V_{gen}$ = 3 V, $t_o = t_1 < 10$ ns, $t_{hold}$ = 6 ns, $t_p$ = 60 ns, and PRR is 50% of the clock PRR.
3. All diodes are 1N3064, or equivalent.
4. $C_L$ = 50 pF minimum (including jig and probe capacitance).
5. $R_L$ = 390Ω ±5%

FIGURE 12. Synchronous switching test circuit (low-level data) for device types 05 and 07 – Continued.



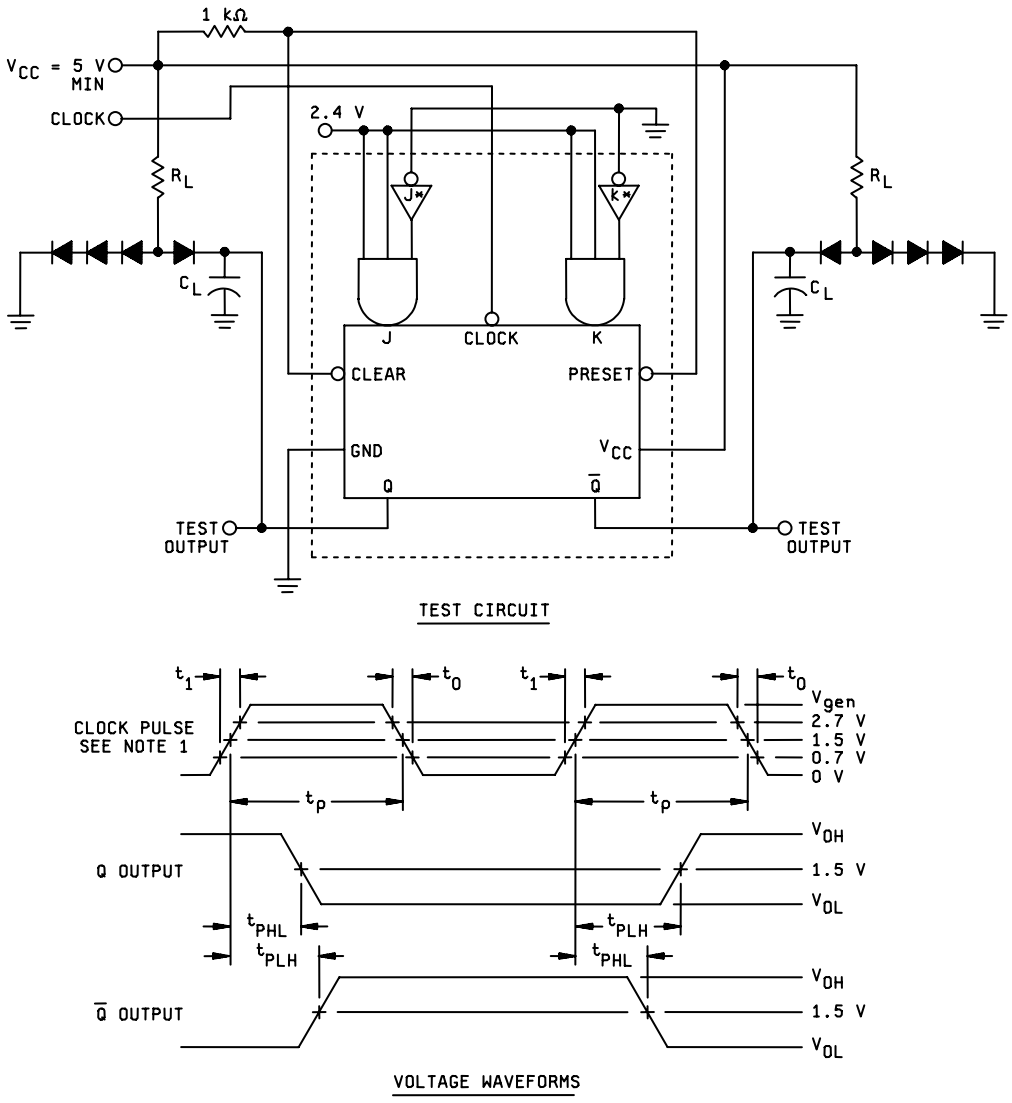

TEST CIRCUIT




VOLTAGE WAVEFORMS

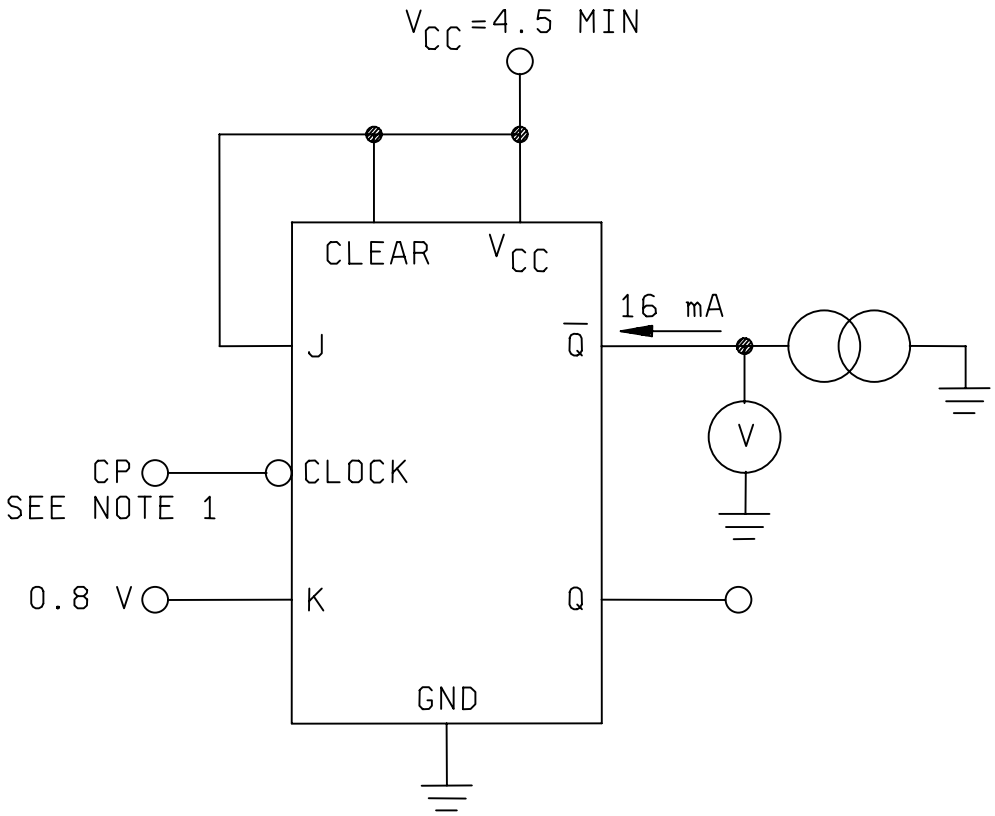
NOTES:
1. Preset or clear function can occur only when clock input is low. Gated inputs are inhibited.
2. All diodes are 1N3064, or equivalent.
3. $C_L$ = 50 pF, minimum, including jig and probe capacitance.
4. Clear or preset input pulse characteristics: $V_{gen}$ = 3.0 V, $t_o$ = 5 ns, $t_1 \leq 10$ ns, $t_p$ = 25 ns.
5. $R_L$ = 390Ω ±5%.

FIGURE 13. Clear and preset switching test circuit and waveforms for device types 06.




NOTES:
1. Clock input pulse has the following characteristics: $V_{gen}$ = 3 V, $t_1 = t_0 \leq 10$ ns, $t_p$ = 30 ns, and PRR = 1 MHz. When testing $f_{MAX}$, PRR = see table III.
2. All diodes are 1N3064, or equivalent.
3. $C_L$ = 50 pF minimum including jig and probe capacitance.
4. $R_L$ = 390Ω ±5%

FIGURE 14. Synchronous switching test circuit for device type 06.




NOTES:
1. Apply normal clock pulse, then sink -12 mA on the clock input.
2. The output $\overline{Q}$ is measured after -12 mA is applied to the clock to insure it is still in the low state.

FIGURE 15. Input clamp voltage test circuit for device types 01, 02, 03, and 04 (circuit B).

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

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 9 | 12 | 13 | 14 | 2 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | | | | |
| | | | Test No. | K1 | Clock | Preset | $V_{CC}$ | Clear | NC | J1 | J2 | J3 | $\overline{Q}$ | GND | Q | K2 | K3 | | Min | Max | Unit |
| 1 2/ $T_C$ = 25°C | $V_{OH}$ | 3006 | 1 | 0.8 V | A | | 4.5 V | | | 2.0 V | 2.0 V | 2.0 V | | " | -.4 mA | 0.8 V | 0.8 V | Q | 2.4 | | V |
| " | " | " | 2 | 2.0 V | A | | " | | | 0.8 V | 0.8 V | 0.8 V | -.4 mA | " | | 2.0 V | 2.0 V | $\overline{Q}$ | " | | " |
| " | " | " | 3 | | | 0.8 V | " | 2.0 V | | | | | | " | -.4 mA | | | Q | " | | " |
| " | " | " | 4 | | | 2.0 V | " | 0.8 V | | | | | -.4 mA | " | | | | $\overline{Q}$ | " | | " |
| " | $V_{OL}$ | 3007 | 5 | 2.0 V | A | | " | | | 0.8 V | 0.8 V | 0.8 V | | " | 16 mA | 2.0 V | 2.0 V | Q | | 0.4 | " |
| " | " | " | 6 | 0.8 V | A | | " | | | 2.0 V | 2.0 V | 2.0 V | 16 mA | " | | 0.8 V | 0.8 V | $\overline{Q}$ | | " | " |
| " | " | " | 7 | | | 0.8 V | " | 2.0 V | | | | | 16 mA | " | | | | $\overline{Q}$ | | " | " |
| " | " | " | 8 | | | 2.0 V | " | 0.8 V | | | | | | " | 16 mA | | | Q | | " | " |
| " | $V_{IC}$ | " | 9 | | | | " | | | -12 mA | | | | " | | | | J1 | | -1.5 | " |
| " | " | " | 10 | | | | " | | | | -12 mA | | | " | | | | J2 | | " | " |
| " | " | " | 11 | | | | " | | | | | -12 mA | | " | | | | J3 | | " | " |
| " | " | " | 12 | -12 mA | | | " | | | | | | | " | | | | K1 | | " | " |
| " | " | " | 13 | | | | " | | | | | | | " | | -12 mA | | K2 | | " | " |
| " | " | " | 14 | | | | " | | | | | | | " | | | -12 mA | K3 | | " | " |
| " | " | " | 15 | | | | " | -12 mA | | | | | | " | | | | Clear | | " | " |
| " | " | " | 16 | | | -12 mA | " | | | | | | | " | | | | Preset | | " | " |
| " | " | " | 17 | | -12 mA | | " | | | | | | | " | | | | Clock | | " | " |
| " | " | " | 17 CKT B | 0.8 V | A* | | " | 4.5 V | | 4.5 V | 4.5 V | 4.5 V | | | | 0.8 V | 0.8 V | Clock | | 0.5 | " |
| " | $I_{IL1}$ | 3009 | 18 | GND | 4.5 V | | 5.5 V | B | | 0.4 V | 4.5 V | 4.5 V | | " | | GND | GND | J1 | -0.7 | -1.6 | mA |
| " | " | " | 19 | " | " | | " | B | | 4.5 V | 0.4 V | 4.5 V | | " | | GND | GND | J2 | " | " | " |
| " | " | " | 20 | " | " | | " | B | | 4.5 V | 4.5 V | 0.4 V | | " | | GND | GND | J3 | " | " | " |
| " | " | " | 21 | 0.4 V | " | B | " | | | GND | GND | GND | | " | | 4.5 V | 4.5 V | K1 | " | " | " |
| " | " | " | 22 | 4.5 V | " | B | " | | | GND | GND | GND | | " | | 0.4 V | 4.5 V | K2 | " | " | " |
| " | " | " | 23 | 4.5 V | " | B | " | | | GND | GND | GND | | " | | 4.5 V | 0.4 V | K3 | " | " | " |
| " | $I_{IL2}$ | " | 24 | 4.5 V | 0.4 V | B | " | | | 4.5 V | 4.5 V | 4.5 V | | " | | 4.5 V | 4.5 V | Clock | -1.4 | -3.2 | mA |
| " | $I_{IL2}$ | " | 25 | " | 0.4 V | | " | B | | " | " | " | | " | | " | " | Clock | -1.4 | -3.2 | " |
| " | $I_{IL3}$ | " | 26 CKT A | " | 4.5 V | 0.4 V | " | | | " | " | " | | " | | " | " | Preset | -0.7 | -1.6 | " |
| " | " | " | 26 CKT B | " | " | 0.4 V | " | | | " | " | " | | " | | " | " | Preset | -1.4 | -3.2 | " |
| " | " | " | 27 CKT A | " | " | | " | 0.4 V | | " | " | " | | " | | " | " | Clear | -0.7 | -1.6 | " |
| " | " | " | 27 CKT B | " | " | | " | 0.4 V | | " | " | " | | " | | " | " | Clear | -1.4 | -3.2 | " |
| " | $I_{IH1}$ | 3010 | 28 | | GND | | " | GND | | 2.4 V | GND | GND | | " | | | | J1 | | 40 | µA |
| " | " | " | 29 | | " | | " | GND | | GND | 2.4 V | GND | | " | | | | J2 | | " | " |
| " | " | " | 30 | | " | | " | GND | | GND | GND | 2.4 V | | " | | | | J3 | | " | " |
| " | " | " | 31 | 2.4 V | " | GND | " | | | | | | | " | | GND | GND | K1 | | " | " |
| " | " | " | 32 | GND | " | GND | " | | | | | | | " | | 2.4 V | GND | K2 | | " | " |
| " | " | " | 33 | GND | " | GND | " | | | | | | | " | | GND | 2.4 V | K3 | | " | " |
| " | $I_{IH2}$ | " | 34 | | " | | " | GND | | 5.5 V | GND | GND | | " | | | | J1 | | 100 | " |
| " | " | " | 35 | | " | | " | GND | | GND | 5.5 V | GND | | " | | | | J2 | | " | " |
| " | " | " | 36 | | " | | " | GND | | GND | GND | 5.5 V | | " | | | | J3 | | " | " |
| " | " | " | 37 | 5.5 V | " | GND | " | | | | | | | " | | GND | GND | K1 | | " | " |
| " | " | " | 38 | GND | " | GND | " | | | | | | | " | | 5.5 V | GND | K2 | | " | " |
| " | " | " | 39 | GND | " | GND | " | | | | | | | " | | GND | 5.5 V | K3 | | " | " |
| " | $I_{IH3}$ | " | 40 | 4.5 V | A | | " | 2.4 V | | GND | GND | GND | | " | | 4.5 V | 4.5 V | Clear | | 80 | " |
| " | $I_{IH3}$ | " | 41 | GND | A | 2.4 V | " | GND | | 4.5 V | 4.5 V | 4.5 V | | " | | GND | GND | Preset | | 80 | " |
| " | $I_{IH4}$ | " | 42 | GND | A | 5.5 V | " | GND | | 4.5 V | 4.5 V | 4.5 V | | " | | GND | GND | Preset | | 200 | " |
| " | " | " | 43 | 4.5 V | A | | " | 5.5 V | | GND | GND | GND | | " | | 4.5 V | 4.5 V | Clear | | " | " |
| " | " | " | 44 | GND | 5.5 V | | " | GND | | GND | GND | GND | | " | | GND | GND | Clock | | " | " |
| " | " | " | 45 | GND | 5.5 V | GND | " | | | GND | GND | GND | | " | | GND | GND | Clock | | " | " |

See notes at end of device type 01.

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

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 9 | 12 | 13 | 14 | 2 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | | Min | Max | Unit |
| | | | Test No. | K1 | Clock | Preset | $V_{CC}$ | Clear | NC | J1 | J2 | J3 | $\overline{Q}$ | GND | Q | K2 | K3 | | | | |
| 1 | $I_{IH5}$ | 3010 | 46 CKT A | GND | 2.4 V | | 5.5 V | GND | | GND | GND | GND | | GND | | GND | GND | Clock | -50 | -700 | µA |
| $T_C$ = 25°C | " | " | 46 CKT B | " | " | | " | GND | | " | " | " | | " | | " | " | " | -200 | -850 | " |
| " | " | " | 46 CKT C | " | " | | " | GND | | " | " | " | | " | | " | " | " | -400 | -1000 | " |
| " | " | " | 47 CKT A | " | " | GND | " | | | " | " | " | | " | | " | " | " | -50 | -700 | " |
| " | " | " | 47 CKT B | " | " | GND | " | | | " | " | " | | " | | " | " | " | -200 | -850 | " |
| " | " | " | 47 CKT C | " | " | GND | " | | | " | " | " | | " | | " | " | " | -400 | -1000 | " |
| " | $I_{OS}$ | 3011 | 48 | 4.5 V | GND | GND | 5.5 V | | | 4.5 V | 4.5 V | 4.5 V | | " | | 4.5 V | 4.5 V | Q | -20 | -57 | mA |
| " | $I_{OS}$ | 3011 | 49 | 4.5 V | " | | " | GND | | 4.5 V | 4.5 V | 4.5 V | GND | " | | 4.5 V | 4.5 V | $\overline{Q}$ | -20 | -57 | " |
| " | $I_{CC}$ | 3005 | 50 | GND | " | GND | " | | | GND | GND | GND | | " | | GND | GND | $V_{CC}$ | | 20 | " |
| " | $I_{CC}$ | 3005 | 51 | GND | " | | " | GND | | GND | GND | GND | | " | | GND | GND | $V_{CC}$ | | 20 | " |
| 2 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = 125ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = -55ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 7 2/ 4 | | | 52 | B | B | A | 4.5 V | B | B | B | B | B | H 3/ | GND | L 3/ | B | B | All output | H or L as shown 3/ | | |
| $T_C$ = 25°C | | | 53 | B | B | B | " | A | B | B | B | B | L | " | H | B | B | | | | |
| " | | | 54 | B | B | A | " | A | B | B | B | B | L | " | H | A | A | " | " | | |
| " | | | 55 | B | A | A | " | A | B | B | B | B | L | " | H | A | A | " | " | | |
| " | | | 56 | B | B | A | " | A | B | B | B | B | L | " | H | A | A | " | " | | |
| " | | | 57 | A | B | A | " | A | B | B | B | B | L | " | H | B | A | " | " | | |
| " | | | 58 | A | A | A | " | A | B | B | B | B | L | " | H | B | A | " | " | | |
| " | | | 59 | A | B | A | " | A | B | B | B | B | L | " | H | B | A | " | " | | |
| " | | | 60 | A | B | A | " | A | B | B | B | B | L | " | H | A | B | " | " | | |
| " | | | 61 | A | A | A | " | A | B | B | B | B | L | " | H | A | B | " | " | | |
| " | | | 62 | A | B | A | " | A | B | B | B | B | L | " | H | A | B | " | " | | |
| " | | | 63 | A | B | A | " | B | B | B | B | B | H | " | L | A | B | " | " | | |
| " | | | 64 | B | B | A | " | A | B | B | A | A | H | " | L | B | B | " | " | | |
| " | | | 65 | B | A | A | " | A | B | B | A | A | H | " | L | B | B | " | " | | |
| " | | | 66 | B | B | A | " | A | B | B | A | A | H | " | L | B | B | " | " | | |
| " | | | 67 | B | B | A | " | A | B | A | B | A | H | " | L | B | B | " | " | | |
| " | | | 68 | B | A | A | " | A | B | A | B | A | H | " | L | B | B | " | " | | |
| " | | | 69 | B | B | A | " | A | B | A | B | A | H | " | L | B | B | " | " | | |
| " | | | 70 | B | B | A | " | A | B | A | A | B | H | " | L | B | B | " | " | | |
| " | | | 71 | B | A | A | " | A | B | A | A | B | H | " | L | B | B | " | " | | |
| " | | | 72 | B | B | A | " | A | B | A | A | B | H | " | L | B | B | " | " | | |
| " | | | 73 | A | B | A | " | A | B | A | A | A | H | " | L | A | A | " | " | | |
| " | | | 74 | A | A | A | " | A | B | A | A | A | H | " | L | A | A | " | " | | |
| " | | | 75 | A | B | A | " | A | B | A | A | A | L | " | H | A | A | " | " | | |
| " | | | 76 | A | A | A | " | A | B | A | A | A | L | " | H | A | A | " | " | | |
| " | | | 77 | A | B | A | " | A | B | A | A | A | H | " | L | A | A | " | " | | |
| " | | | 78 | A | B | A | " | B | B | A | A | A | H | " | L | A | A | " | " | | |
| " | | | 79 | A | A | A | " | B | B | A | A | A | H | " | L | A | A | " | " | | |
| " | | | 80 | A | B | A | " | B | B | A | A | A | H | " | L | A | A | " | " | | |
| " | | | 81 | A | B | B | " | B | B | A | A | A | H | " | H | A | A | " | " | | |
| " | | | 82 | A | A | B | " | B | B | A | A | A | H | " | H | A | A | " | " | | |
| " | | | 83 | A | B | B | " | B | B | A | A | A | H | " | H | A | A | " | " | | |
| " | | | 84 | A | A | B | " | A | B | A | A | A | L | " | H | A | A | " | " | | |
| " | | | 85 | A | A | A | " | A | B | A | A | A | L | " | H | A | A | " | " | | |
| " | | | 86 | B | A | A | " | A | B | A | A | A | L | " | H | A | A | " | " | | |
| " | | | 87 | B | A | A | " | A | B | B | A | A | L | " | H | A | A | " | " | | |
| " | | | 88 | B | B | A | " | A | B | B | A | A | H | " | L | A | A | " | " | | |
| " | | | 89 | A | A | A | " | A | B | A | A | A | H | " | L | A | A | " | " | | |
| " | | | 90 | A | A | A | " | A | B | B | A | A | H | " | L | A | A | " | " | | |

See notes at end of device type 01.

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

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 9 | 12 | 13 | 14 | 2 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | | | | |
| | | | Test No. | K1 | Clock | Preset | $V_{CC}$ | Clear | NC | J1 | J2 | J3 | $\overline{Q}$ | GND | Q | K2 | K3 | | Min | Max | Unit |
| 7 2/ 4/ | | | 91 | B | A | A | 4.5 V | A | B | B | A | A | H | GND | L | A | A | All | H or L | | |
| $T_C$ = 25°C | | | 92 | B | B | A | 4.5 V | A | B | B | A | A | L | GND | H | A | A | output | As shown 3/ | | |
| 8 2/ 4/ | Same tests, terminal conditions and limits as for subgroup 7, except $T_C$ = 125 and -55°C. | | | | | | | | | | | | | | | | | | | | |
| 9 | $F_{MAX}$ 5/ | (Fig. 5) | 93 | 2.4 V | IN | 5.0 V | 5.0 V | 5.0 V | | 2.4 V | 2.4 V | 2.4 V | | GND | OUT | 2.4 V | 2.4 V | Q | 10 | | MHz |
| $T_C$ = 25°C | $F_{MAX}$ 5/ | (Fig. 5) | 94 | " | IN | 5.0 V | " | 5.0 V | | " | " | " | OUT | " | | " | " | $\overline{Q}$ | 10 | | MHz |
| " | $t_{PLH1}$ | 3003 | 95 | " | 2.4 V | J | " | IN | | " | " | " | OUT | " | | " | " | Clear to Q | 5 | 25 | ns |
| " | $t_{PLH1}$ | (Fig. 4) | 96 | " | " | IN | " | J | | " | " | " | | " | OUT | " | " | Preset to Q | " | 25 | " |
| " | $t_{PHL1}$ | " | 97 | " | " | J | " | IN | | " | " | " | | " | OUT | " | " | Clear to Q | " | 40 | " |
| " | $t_{PHL1}$ | " | 98 | " | " | IN | " | J | | " | " | " | OUT | " | | " | " | Preset to $\overline{Q}$ | " | 40 | " |
| " | $t_{PLH2}$ | 3003 (Fig 5 | 99 | " | IN | 5.0 V | " | 5.0 V | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | 30 | ns |
| " | $t_{PLH2}$ | " | 100 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Clock to Q | " | 30 | " |
| " | $t_{PHL2}$ | " | 101 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | 40 | " |
| " | $t_{PHL2}$ | " | 102 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Clock to Q | | 40 | " |
| 10 | $F_{MAX}$ 5/ | (Fig 5) | 103 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Q | 10 | | MHz |
| $T_C$ = 125°C | $F_{MAX}$ 5/ | (Fig 5) | 104 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | $\overline{Q}$ | 10 | | MHz |
| " | $t_{PLH1}$ | 3003 (Fig. 4) | 105 | " | 2.4 V | J | " | IN | | " | " | " | OUT | " | | " | " | Clear to $\overline{Q}$ | 5 | 39 | ns |
| " | $t_{PLH1}$ | " | 106 | " | " | IN | " | J | | " | " | " | | " | OUT | " | " | Preset to Q | " | 39 | " |
| " | $t_{PHL1}$ | " | 107 | " | " | J | " | IN | | " | " | " | | | OUT | " | " | Clear to Q | " | 50 | " |
| " | $t_{PHL1}$ | " | 108 | " | " | IN | " | J | | " | " | " | OUT | " | | " | " | Preset to $\overline{Q}$ | " | 50 | " |
| " | $t_{PLH2}$ | (Fig 5) | 109 | " | IN | 5.0 V | " | 5.0 V | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | 39 | ns |
| " | $t_{PLH2}$ | " | 110 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Clock to Q | " | 39 | " |
| " | $t_{PHL2}$ | " | 111 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | 50 | " |
| " | $t_{PHL2}$ | " | 112 | " | " | " | " | " | | " | | " | | " | OUT | " | " | Clock to Q | " | 50 | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | |

NOTES:

A = Normal clock pulse.
B = Momentary GND, then 4.5 V.
J = Input pulse $t_p$ = 100 ns, PRR = 1 MHz, $V_{OL}$ = 0 V, $V_{OH}$ = 4.5 V

*After clock pulse apply –12 mA to clock pin to insure $\overline{Q}$ is still in the low state (see figure 15).

1/ Terminal conditions (pins not designated may be H ≥ 2.0 V, or L ≤ 0.8 V, or open).
2/ Input voltages shown are: A= 2.0 volts minimum and B = 0.8 volts maximum.
3/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.4 V, maximum when using a high speed checker double camparator; or (b) H ≥ 1.5 V and L < 1.5 V when using a high speed checker single comparator.
4/ Tests shall be performed in sequence.
5/ $F_{MAX}$, 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. 1/

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | | |
| | | | Test No. | Clock 1 | Clear 1 | K1 | $V_{CC}$ | Clock 2 | Clear 2 | J2 | $\overline{Q}_2$ | Q2 | K2 | GND | Q1 | $\overline{Q}_1$ | J1 | | Min | Max | Unit |
| 1 | $V_{OH}$ | 3006 | 1 | A | | 0.8 V | 4.5 V | | | | | | | GND | -.4 mA | | 2.0 V | Q | 2.4 | | V |
| $T_C$ = 25°C | " | " | 2 | A | | 2.0 V | " | | | | | | | " | | -.4 mA | 0.8 V | $\overline{Q}_1$ | " | | " |
| " | " | " | 3 | | 0.8 V | | " | | | | | | | " | | -.4 mA | | $\overline{Q}_1$ | " | | " |
| " | " | " | 4 | | | | " | A | | 2.0 V | | -.4 mA | 0.8 V | " | | | | Q2 | " | | " |
| " | " | " | 5 | | | | " | A | | 0.8 V | -.4 mA | | 2.0 V | " | | | | $\overline{Q}_2$ | " | | " |
| " | " | " | 6 | | | | " | | 0.8 V | | -.4 mA | | | " | | | | $\overline{Q}_2$ | " | | " |
| " | $V_{OL}$ | 3007 | 7 | A | | 2.0 V | " | | | | | | | " | 16 mA | | 0.8 V | Q1 | | 0.4 | " |
| " | " | " | 8 | A | | 0.8 V | " | | | | | | | " | | 16 mA | 2.0 V | $\overline{Q}_1$ | | " | " |
| " | " | " | 9 | | 0.8 V | | " | | | | | | | " | 16 mA | | | Q1 | | " | " |
| " | " | " | 10 | | | | " | A | | 0.8 V | | 16 mA | 2.0 V | " | | | | Q2 | | " | " |
| " | " | " | 11 | | | | " | A | | 2.0 V | 16 mA | | 0.8 V | " | | | | $\overline{Q}_2$ | | " | " |
| " | " | " | 12 | | | | " | | 0.8 V | | | 16 mA | | " | | | | Q2 | | " | " |
| " | $V_{IC}$ | | 13 | | | | " | | | | | | | " | | | -12 mA | J1 | | -1.5 | " |
| " | " | | 14 | | | | " | | | -12 mA | | | | " | | | | J2 | | " | " |
| " | " | | 15 | | | -12 mA | " | | | | | | | " | | | | K1 | | " | " |
| " | " | | 16 | | | | " | | | | | | -12 mA | " | | | | K2 | | " | " |
| " | " | | 17 | | -12 mA | | " | | | | | | | " | | | | Clear 1 | | " | " |
| | | | 18 | -12 mA | | | " | | | | | | | " | | | | Clock 1 | | " | |
| " | " | | 18 CKT B | A* | 4.5 V | 0.8 V | " | | | | | | | " | | | 4.5 V | Clock 1 | | -0.5 | " |
| " | " | | 19 | | | | " | | -12 mA | | | | | " | | | | Clear 2 | | -1.5 | " |
| " | " | | 20 | | | | " | -12 mA | | | | | | " | | | | Clock 2 | | -1.5 | " |
| " | " | | 20 CKT B | | | | " | A* | 4.5 V | 4.5 V | | | 0.8 V | " | | | | Clock 2 | | -0.5 | |
| " | $I_{IL1}$ | 3009 | 21 | 5/ | 4.5 V | | 5.5 V | | | | | | | " | | | 0.4 V | J1 | -0.7 | -1.6 | mA |
| " | " | " | 22 | 5/ | 4.5 V | 0.4 V | " | | | | | | | " | | | | K1 | " | " | " |
| " | " | " | 23 | | | | " | 5/ | 4.5 V | 0.4 V | | | | " | | | | J2 | " | " | " |
| " | " | " | 24 | | | | " | 5/ | 4.5 V | | | | 0.4 V | " | | | | K2 | " | " | " |
| " | $I_{IL2}$ | " | 25 | 0.4 V | B | 4.5 V | " | | | | | | | " | | | 4.5 V | Clock 1 | -1.4 | -3.2 | " |
| " | $I_{IL2}$ | " | 26 | | | | " | 0.4 V | B | 4.5 V | | | 4.5 V | " | | | | Clock 2 | -1.4 | -3.2 | " |
| " | $I_{IL3}$ | " | 27 CKT A, C | 4.5 V | 0.4 V | | " | | | | | | | " | | | 4.5 V | Clear 1 | -0.7 | -1.6 | " |
| " | " | " | 27 CKT B | 4.5 V | 0.4 V | | " | | | | | | | " | | | 4.5 V | Clear 1 | -1.4 | -3.2 | " |
| " | " | " | 28 CKT A, C | | | | " | 4.5 V | 0.4 V | 4.5 V | | | | " | | | | Clear 2 | -0.7 | -1.6 | " |
| " | " | " | 28 CKT B | | | | " | 4.5 V | 0.4 V | 4.5 V | | | | " | | | | Clear 2 | -1.4 | -3.2 | " |
| " | $I_{IH1}$ | 3010 | 29 | GND | GND | | 5.5 V | | | | | | | " | | | 2.4 V | J1 | | 40 | µA |
| " | " | " | 30 | GND | B | 2.4 V | " | | | | | | | " | | | | K1 | | " | " |
| " | " | " | 31 | | | | " | GND | GND | 2.4 V | | | | " | | | | J2 | | " | " |
| " | " | " | 32 | | | | " | GND | B | | | | 2.4 V | " | | | | K2 | | " | " |
| " | $I_{IH2}$ | " | 33 | GND | GND | | " | | | | | | | " | | | 5.5 V | J1 | | 100 | " |
| " | " | " | 34 | GND | B | 5.5 V | " | | | | | | | " | | | | K1 | | " | " |
| " | " | " | 35 | | | | " | GND | GND | 5.5 V | | | | " | | | | J2 | | " | " |
| " | " | " | 36 | | | | " | GND | B | | | | 5.5 V | " | | | | K2 | | " | " |
| " | $I_{IH3}$ 7/ | " | 37 | GND | E | | " | | | | | | | " | | | GND | Clear 1 | | 80 | " |
| " | $I_{IH3}$ 7/ | " | 38 | | | | " | GND | E | GND | | | | " | | | | Clear 2 | | 80 | " |
| " | $I_{IH4}$ | " | 39 | 5.5 V | 5.5 V | GND | " | | | | | | | " | | | GND | Clock 1 | | 200 | " |
| " | " | " | 40 | GND | E | | " | | | | | | | " | | | GND | Clear 1 | | " | " |
| " | " | " | 41 | | | | " | 5.5 V | 5.5 V | GND | | | GND | " | | | | Clock 2 | | " | " |
| " | " | " | 42 | | | | " | GND | F | GND | | | | " | | | | Clear 2 | | " | " |
| " | $I_{IH5}$ | " | 43 CKT A, C | 2.4 V | E | GND | " | | | | | | | " | | | GND | Clock 1 | -50 | -700 | " |
| " | " | " | 43 CKT B | 2.4 V | 2.4 V | GND | " | | | | | | | " | | | GND | Clock 1 | -200 | -850 | " |
| " | " | " | 44 CKT A, C | | | | " | 2.4 V | E | GND | | | GND | " | | | | Clock 2 | -50 | -700 | " |
| " | " | " | 44 CKT B | | | | " | 2.4 V | 2.4 V | GND | | | GND | " | | | | Clock 2 | -200 | -850 | " |

See notes at end of device type 02.

TABLE III. Group A inspection for device type 02. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | | |
| | | | Test No. | Clock 1 | Clear 1 | K1 | $V_{CC}$ | Clock 2 | Clear 2 | J2 | $\overline{Q}_2$ | Q2 | K2 | GND | Q1 | $\overline{Q}_1$ | J1 | | Min | Max | Unit |
| 1<br>$T_C$ = 25°C | $I_{OS}$ | 3011 | 45 | 2.4 V | GND | 2.4 V | 5.5 V | | | | | | | GND | | GND | 2.4 V | $\overline{Q}_1$ | -20 | -57 | mA |
| " | " | 3011** | 46 | A | 4.5 V | 0 | " | | | | | | | " | GND | | 4.5 V | Q1 | " | " | " |
| " | " | 3011** | 47 | | | | " | GND | 4.5 V | 4.5 V | | GND | 0 V | " | | | | Q2 | " | " | " |
| " | " | 3011 | 48 | | | | " | 2.4 V | GND | 2.4 V | GND | | 2.4 V | " | | | | $\overline{Q}_2$ | " | " | " |
| " | $I_{CC}$ | 3005 | 49 | D | 4.5 V | GND | " | D | 4.5 V | 4.5 V | | | GND | " | | | 4.5 V | $V_{CC}$ | | 40 | " |
| 2 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = 125ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = -55ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 7 2/ 4/<br>$T_C$ = 25°C | | | 50 | B | B | B | 4.5 V | B | B | A | H 3/ | L 3/ | B | GND | L 3/ | H 3/ | A | All output | H or L as shown 3/ | | |
| | | | 51 | A | B | B | " | A | B | A | H | L | B | " | L | H | A | " | " | | |
| " | | | 52 | B | B | B | " | B | B | A | H | L | B | " | L | H | A | " | " | | |
| " | | | 53 | B | B | A | " | B | B | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 54 | A | B | A | " | A | B | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 55 | B | B | A | " | B | B | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 56 | B | A | A | " | B | A | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 57 | A | A | A | " | A | A | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 58 | B | A | A | " | B | A | A | L | H | A | " | H | L | A | " | " | | |
| " | | | 59 | A | A | A | " | A | A | A | L | H | A | " | H | L | A | " | " | | |
| " | | | 60 | B | A | A | " | B | A | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 61 | A | A | A | " | A | A | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 62 | B | A | A | " | B | A | A | L | H | A | " | H | L | A | " | " | | |
| " | | | 63 | B | A | B | " | B | A | B | L | H | B | " | H | L | B | " | " | | |
| " | | | 64 | A | A | B | " | A | A | B | L | H | B | " | H | L | B | " | " | | |
| " | | | 65 | B | A | B | " | B | A | B | L | H | B | " | H | L | B | " | " | | |
| " | | | 66 | B | B | B | " | B | B | B | H | L | B | " | L | H | B | " | " | | |
| " | | | 67 | B | A | B | " | B | A | B | H | L | B | " | L | H | B | " | " | | |
| " | | | 68 | A | A | B | " | A | A | B | H | L | B | " | L | H | B | " | " | | |
| " | | | 69 | B | A | B | " | B | A | B | H | L | B | " | L | H | B | " | " | | |
| " | | | 70 | B | A | B | " | B | A | A | H | L | B | " | L | H | A | " | " | | |
| " | | | 71 | A | A | B | " | A | A | A | H | L | B | " | L | H | A | " | " | | |
| " | | | 72 | B | A | B | " | B | A | A | L | H | B | " | H | L | A | " | " | | |
| " | | | 73 | B | A | A | " | B | A | B | L | H | A | " | H | L | B | " | " | | |
| " | | | 74 | A | A | A | " | A | A | B | L | H | A | " | H | L | B | " | " | | |
| " | | | 75 | B | A | A | " | B | A | B | H | L | A | " | L | H | B | " | " | | |
| " | | | 76 | A | B | A | " | A | B | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 77 | A | A | A | " | A | A | A | H | L | A | " | L | H | A | " | " | | |
| " | | | 78 | A | A | A | " | A | A | B | H | L | A | " | L | H | B | " | " | | |
| " | | | 79 | A | A | B | " | A | A | B | H | L | B | " | L | H | B | " | " | | |
| " | | | 80 | B | A | B | " | B | A | B | L | H | B | " | H | L | B | " | " | | |
| " | | | 81 | A | A | A | " | A | A | A | L | H | A | " | H | L | A | " | " | | |
| " | | | 82 | A | A | B | " | A | A | A | L | H | B | " | H | L | A | " | " | | |
| " | | | 83 | A | A | B | " | A | A | B | L | H | B | " | H | L | B | " | " | | |
| " | | | 84 | B | A | B | " | B | A | B | H | L | B | " | L | H | B | " | " | | |
| " | | | 85 | A | A | B | " | A | A | A | H | L | B | " | L | H | A | " | " | | |
| " | | | 86 | B | A | B | " | B | A | A | L | H | B | " | H | L | A | " | " | | |
| " | | | 87 | A | A | B | " | A | A | A | L | H | B | " | H | L | A | " | " | | |
| " | | | 88 | A | B | B | " | A | B | A | H | L | B | " | L | H | A | " | " | | |
| 8 2/ 4/ | Same tests, terminal conditions and limits as for subgroup 7, except $T_C$ = 125ºC and -55°C. | | | | | | | | | | | | | | | | | | | | |

See notes at end of device type 02.

TABLE III. Group A inspection for device type 02. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | | |
| | | | Test No. | Clock 1 | Clear 1 | K1 | $V_{CC}$ | Clock 2 | Clear 2 | J2 | $\overline{Q}_2$ | Q2 | K2 | GND | Q1 | $\overline{Q}_1$ | J1 | | Min | Max | Unit |
| 9 | $F_{MAX}$ 6/ | (Fig 7) | 89 | IN | | 2.4 V | 5.0 V | | | | | | | GND | OUT | | 2.4 V | $Q_1$ | 10 | | MHz |
| $T_C$ = 25°C | " | " | 90 | IN | | 2.4 V | " | | | | | | | " | | OUT | 2.4 V | $\overline{Q}_1$ | " | | " |
| " | " | " | 91 | | | | " | IN | | 2.4 V | | OUT | 2.4 V | " | | | | $Q_2$ | " | | " |
| " | " | " | 92 | | | | " | IN | | 2.4 V | OUT | | 2.4 V | " | | | | $\overline{Q}_2$ | " | | " |
| " | $t_{PLH1}$ | 3003 (Fig 6) | 93 | IN | IN | GND | " | | | | | | | " | | OUT | 2.4 V | Clear 1 to $\overline{Q}_1$ | 5 | 25 | " |
| " | $t_{PLH1}$ | " | 94 | | | | " | IN | IN | 2.4 V | OUT | | GND | " | | | | Clear 2 to $\overline{Q}_2$ | " | 25 | " |
| " | $t_{PHL1}$ | " | 95 | IN | IN | GND | " | | | | | | | " | OUT | | 2.4 V | Clear 1 to Q1 | " | 40 | " |
| " | $t_{PHL1}$ | " | 96 | | | | " | IN | IN | 2.4 V | | OUT | GND | " | | | | Clear 2 to Q2 | " | 40 | " |
| " | $t_{PLH2}$ | 3003 (Fig 7) | 97 | IN | 5.0 V | 2.4 V | " | | | | | | | " | OUT | | 2.4 V | Clock 1 to Q1 | " | 30 | " |
| " | " | " | 98 | IN | 5.0 V | 2.4 V | " | | | | | | | " | | OUT | 2.4 V | Clock 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 99 | | | | " | IN | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 100 | | | | " | IN | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}_2$ | " | " | " |
| " | $t_{PHL2}$ | " | 101 | IN | 5.0 V | 2.4 V | " | | | | | | | " | OUT | | 2.4 V | Clock 1 to Q1 | " | 40 | " |
| " | " | " | 102 | IN | 5.0 V | 2.4 V | " | | | | | | | " | | OUT | 2.4 V | Clock 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 103 | | | | " | IN | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 104 | | | | " | IN | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}_2$ | " | " | " |
| 10 | $F_{MAX}$ 6/ | (Fig 7) | 105 | IN | | 2.4 V | " | | | | | | | " | OUT | | 2.4 V | Q1 | 10 | | MHz |
| $T_C$ = 125°C | " | " | 106 | IN | | 2.4 V | " | | | | | | | " | | OUT | 2.4 V | $\overline{Q}_1$ | " | | " |
| " | " | " | 107 | | | | " | IN | | 2.4 V | | OUT | 2.4 V | " | | | | Q2 | " | | " |
| " | " | " | 108 | | | | " | IN | | 2.4 V | OUT | | 2.4 V | " | | | | $\overline{Q}_2$ | " | | " |
| " | $t_{PLH1}$ | 3003 (Fig 6) | 109 | IN | IN | GND | " | | | | | | | " | | OUT | 2.4 V | Clear 1 to $\overline{Q}_1$ | 5 | 39 | ns |
| " | $t_{PLH1}$ | " | 110 | | | | " | IN | IN | 2.4 V | OUT | | GND | " | | | | Clear 2 to $\overline{Q}_2$ | " | 39 | " |
| " | $t_{PHL1}$ | " | 111 | IN | IN | GND | " | | | | | | | " | OUT | | 2.4 V | Clear 1 to Q1 | " | 50 | " |
| " | $t_{PHL1}$ | " | 112 | | | | " | IN | IN | 2.4 V | | OUT | GND | " | | | | Clear 2 to Q2 | " | 50 | " |
| " | $t_{PLH2}$ | 3003 (Fig 7) | 113 | IN | 5.0 V | 2.4 V | " | | | | | | | " | OUT | | 2.4 V | Clock 1 to Q1 | " | 39 | " |
| " | " | " | 114 | IN | 5.0 V | 2.4 V | " | | | | | | | " | | OUT | 2.4 V | Clock 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 115 | | | | " | IN | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 116 | | | | " | IN | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}_2$ | " | " | " |

See notes at end of device type 02.

TABLE III. Group A inspection for device type 02. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | | |
| | | | Test No. | Clock 1 | Clear 1 | K1 | $V_{CC}$ | Clock 2 | Clear 2 | J2 | $\overline{Q}_2$ | Q2 | K2 | GND | Q1 | $\overline{Q}_1$ | J1 | | Min | Max | Unit |
| 10<br>$T_C$ = 125°C | $t_{PHL2}$ | 3003 | 117 | IN | 5.0 V | 2.4 V | 5.0 V | | | | | | | GND | OUT | | 2.4 V | Clock 1 to Q1 | 5 | 50 | ns |
| " | " | " | 118 | IN | 5.0 V | 2.4 V | " | | | | | | | " | | OUT | 2.4 V | Clock 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 119 | | | | " | IN | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 120 | | | | " | IN | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}_2$ | " | " | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | |

NOTES:
A = Normal clock pulse.
B = Momentary GND, then 4.5 V.
C = This note has been deleted.
D = Momentary 4.5 V, then GND.
E = Momentary ground, then 2.4 V.
F = Momentary ground, then 5.5 V.
J = This note has been deleted.

* After clock pulse apply –12 mA to clock pin to insure $\overline{Q}$ is still in the low state (see figure 15).
** Test time limit ≤ 100 ms.

1/ Terminal conditions (pins not designated may be H ≥ 2.0 V, or L ≤ 0.8 V, or open.)
2/ Input voltages shown are: A = 2.0 V minimum and B = 0.8 V maximum.
3/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.4 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.
4/ Tests shall be performed in sequence.
5/ Input shall be one normal clock pulse, then 4.5 V
6/ $F_{MAX}$, minimum limit specified is the frequency of the input pulse. The output frequency shall ge one-half of the input frequency.
7/ For CKT A, $I_{IH3}$ limits are 0 to 120 μA.

TABLE III. Group A inspection for device type 03. 1/

| Subgroup | Symbol | MIL-STD-883 method | Case C Test No. | 1 J1 | 2 $\overline{Q}_1$ | 3 Q1 | 4 K1 | 5 Q2 | 6 $\overline{Q}_2$ | 7 GND | 8 J2 | 9 Clock 2 | 10 Clear 2 | 11 K2 | 12 Clock 1 | 13 Clear 1 | 14 $V_{CC}$ | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $V_{OH}$ | 3006 | 1 | 2.0 V | | -.4 mA | 0.8 V | | | GND | | | | | A | | 4.5 V | Q1 | 2.4 | | V |
| $T_C$ = 25°C | " | " | 2 | 0.8 V | -.4 mA | | 2.0 V | | | " | | | | | A | | " | $\overline{Q}_1$ | " | | " |
| " | " | " | 3 | | -.4 mA | | | | | " | | | | | | 0.8 V | " | $\overline{Q}_1$ | " | | " |
| " | " | " | 4 | | | | | -.4 mA | | " | 2.0 V | A | | 0.8 V | | | | Q2 | " | | " |
| " | " | " | 5 | | | | | | -.4 mA | " | 0.8 V | A | | 2.0 V | | | " | $\overline{Q}_2$ | " | | " |
| " | " | " | 6 | | | | | | -.4 mA | " | | | 0.8 V | | | | | $\overline{Q}_2$ | " | | " |
| " | $V_{OL}$ | 3007 | 7 | 0.8 V | | 16 mA | 2.0 V | | | " | | | | | A | | " | Q1 | | 0.4 | " |
| " | " | " | 8 | 2.0 V | 16 mA | | 0.8 V | | | " | | | | | A | | | $\overline{Q}_1$ | | " | " |
| " | " | " | 9 | | | 16 mA | | | | " | | | | | | 0.8 V | " | Q1 | | " | " |
| " | " | " | 10 | | | | | 16 mA | | " | 0.8 V | A | | 2.0 V | | | | Q2 | | " | " |
| " | " | " | 11 | | | | | | 16 mA | " | 2.0 V | A | | 0.8 V | | | " | $\overline{Q}_2$ | | " | " |
| " | " | " | 12 | | | | | 16 mA | | " | | | 0.8 V | | | | | Q2 | | " | " |
| " | $V_{IC}$ | | 13 | -12 mA | | | | | | " | | | | | | | " | J1 | | -1.5 | " |
| " | " | | 14 | | | | -12 mA | | | " | | | | | | | | K1 | | " | " |
| " | " | | 15 | | | | | | | " | -12 mA | | | | | | " | J2 | | " | " |
| " | " | | 16 | | | | | | | " | | | | -12 mA | | | | K2 | | " | " |
| " | " | | 17 | | | | | | | " | | | | | | -12 mA | " | Clear 1 | | " | " |
| " | | | 18 | | | | | | | " | | | | | -12 mA | | | Clock 1 | | " | " |
| " | " | | 18 CKT B | 4.5 V | | | 0.8 V | | | " | | | | | A* | 4.5 V | " | Clock 1 | | -0.5 | " |
| " | " | | 19 | | | | | | | " | | | -12 mA | | | | | Clear 2 | | -1.5 | " |
| " | " | | 20 | | | | | | | " | | -12 mA | | | | | " | Clock 2 | | -1.5 | " |
| " | " | | 20 CKT B | | | | | | | " | 4.5 V | A* | 4.5 V | 0.8 V | | | " | Clock 2 | | -0.5 | " |
| " | $I_{IL1}$ | 3009 | 21 | 0.4 V | | | | | | " | | | | | 5/ | 4.5 V | 5.5 V | J1 | -0.7 | -1.6 | mA |
| " | " | " | 22 | | | | 0.4 V | | | " | | | | | 5/ | 4.5 V | " | K1 | " | " | " |
| " | " | " | 23 | | | | | | | " | 0.4 V | 5/ | 4.5 V | | | | " | J2 | " | " | " |
| " | " | " | 24 | | | | | | | " | | 5/ | 4.5 V | 0.4 V | | | " | K2 | " | " | " |
| " | $I_{IL2}$ | " | 25 | 4.5 V | | | 4.5 V | | | " | | | | | 0.4 V | B | " | Clock 1 | -1.25 | -3.2 | " |
| " | $I_{IL2}$ | " | 26 | | | | | | | " | 4.5 V | 0.4 V | B | 4.5 V | | | " | Clock 2 | -1.25 | -3.2 | " |
| " | $I_{IL3}$ | " | 27 CKT A, C | 4.5 V | | | | | | " | | | | | 4.5 V | 0.4 V | " | Clear 1 | -0.7 | -1.6 | " |
| " | " | " | 27 CKT B | 4.5 V | | | | | | " | | | | | 4.5 V | 0.4 V | " | Clear 1 | -1.4 | -3.2 | " |
| " | " | " | 28 CKT A, C | | | | | | | " | 4.5 V | 4.5 V | 0.4 V | | | | " | Clear 2 | -0.7 | -1.6 | " |
| " | " | " | 28 CKT B | | | | | | | " | 4.5 V | 4.5 V | 0.4 V | | | | " | Clear 2 | -1.4 | -3.2 | " |
| " | $I_{IH1}$ | 3010 | 29 | 2.4 V | | | | | | " | | | | | GND | GND | " | J1 | | 40 | µA |
| " | " | " | 30 | | | | 2.4 V | | | " | | | | | GND | B | " | K1 | | " | " |
| " | " | " | 31 | | | | | | | " | 2.4 V | GND | GND | | | | " | J2 | | " | " |
| " | " | " | 32 | | | | | | | " | | GND | B | 2.4 V | | | " | K2 | | " | " |
| " | $I_{IH2}$ | " | 33 | 5.5 V | | | | | | " | | | | | GND | GND | " | J1 | | 100 | " |
| " | " | " | 34 | | | | 5.5 V | | | " | | | | | GND | B | " | K1 | | " | " |
| " | " | " | 35 | | | | | | | " | 5.5 V | GND | GND | | | | " | J2 | | " | " |
| " | " | " | 36 | | | | | | | " | | GND | B | 5.5 V | | | " | K2 | | " | " |
| " | $I_{IH3}$ 7/ | " | 37 | GND | | | | | | " | | | | | GND | E | " | Clear 1 | | 80 | " |
| " | $I_{IH3}$ 7/ | " | 38 | | | | | | | " | GND | GND | E | | | | " | Clear 2 | | 80 | " |
| " | $I_{IH4}$ | " | 39 | GND | | | GND | | | " | | | | | 5.5 V | GND | " | Clock 1 | | 200 | " |
| " | " | " | 40 | GND | | | | | | " | | | | | GND | F | " | Clear 1 | | " | " |
| " | " | " | 41 | | | | | | | " | GND | 5.5 V | GND | GND | | | " | Clock 2 | | " | " |
| " | " | " | 42 | | | | | | | " | GND | GND | F | | | | " | Clear 2 | | " | " |
| " | $I_{IH5}$ | " | 43 CKT A, C | GND | | | GND | | | " | | | | | 2.4 V | GND | " | Clock 1 | -50 | -700 | " |
| " | " | " | 43 CKT B | GND | | | GND | | | " | | | | | 2.4 V | GND | " | Clock 1 | -200 | -850 | " |
| " | " | " | 44 CKT A, C | | | | | | | " | GND | 2.4 V | GND | GND | | | " | Clock 2 | -50 | -700 | " |
| " | " | " | 44 CKT B | | | | | | | " | GND | 2.4 V | GND | GND | | | " | Clock 2 | -80 | -850 | " |

See notes at end of device type 03.

TABLE III. Group A inspection for device type 03. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case C Test No. | 1 J1 | 2 $\overline{Q}_1$ | 3 Q1 | 4 K1 | 5 Q2 | 6 $\overline{Q}_2$ | 7 GND | 8 J2 | 9 Clock 2 | 10 Clear 2 | 11 K2 | 12 Clock 1 | 13 Clear 1 | 14 $V_{CC}$ | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $I_{OS}$ | 3011 | 45 | 2.4 V | GND | | 2.4 V | | | " | | | | | 2.4 V | GND | 5.5 V | $\overline{Q}_1$ | -20 | -57 | mA |
| $T_C$ = 25°C | " | 3011 * | 46 | 4.5 V | GND | GND | 0 V | | | " | | | | | A | 4.5 V | " | Q1 | " | | " |
| " | " | 3011 * | 47 | | | | | GND | GND | " | 4.5 V | A | 4.5 V | 2.4 V | | | " | Q2 | " | | " |
| " | " | 3011 | 48 | | | | | | GND | " | 2.4 V | 2.4 V | GND | 0 V | | | | $\overline{Q}_2$ | " | | " |
| " | $I_{CC}$ | 3005 | 49 | 4.5 V | | | GND | | | " | 4.5 V | D | 4.5 V | GND | D | 4.5 V | " | $V_{CC}$ | | 40 | " |
| 2 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = 125ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = -55ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 7 2/ 4/ | | | 50 | A | H 3/ | L 3/ | B | L 3/ | H 3/ | GND | A | B | B | B | B | B | 4.5 V | All output | H or L as shown 3/ | | |
| $T_C$ = 25°C | | | 51 | A | H | L | B | L | H | " | A | A | B | B | A | B | " | | | | |
| " | | | 52 | A | H | L | B | L | H | " | A | B | B | B | B | B | " | " | " | | |
| " | | | 53 | A | H | L | A | L | H | " | A | B | B | A | B | B | " | " | " | | |
| " | | | 54 | A | H | L | A | L | H | " | A | A | B | A | A | B | " | " | " | | |
| " | | | 55 | A | H | L | A | L | H | " | A | B | B | A | B | B | " | " | " | | |
| " | | | 56 | A | H | L | A | L | H | " | A | B | A | A | B | A | " | " | " | | |
| " | | | 57 | A | H | L | A | L | H | " | A | A | A | A | A | A | " | " | " | | |
| " | | | 58 | A | L | H | A | H | L | " | A | B | A | A | B | A | " | " | " | | |
| " | | | 59 | A | L | H | A | H | L | " | A | A | A | A | A | A | " | " | " | | |
| " | | | 60 | A | H | L | A | L | H | " | A | B | A | A | B | A | " | " | " | | |
| " | | | 61 | A | H | L | A | L | H | " | A | A | A | A | A | A | " | " | " | | |
| " | | | 62 | A | L | H | A | H | L | " | A | B | A | A | B | A | " | " | " | | |
| " | | | 63 | B | L | H | B | H | L | " | B | B | A | B | B | A | " | " | " | | |
| " | | | 64 | B | L | H | B | H | L | " | B | A | A | B | A | A | " | " | " | | |
| " | | | 65 | B | L | H | B | H | L | " | B | B | A | B | B | A | " | " | " | | |
| " | | | 66 | B | H | L | B | L | H | " | B | B | B | B | B | B | " | " | " | | |
| " | | | 67 | B | H | L | B | L | H | " | B | B | A | B | B | A | " | " | " | | |
| " | | | 68 | B | H | L | B | L | H | " | B | A | A | B | A | A | " | " | " | | |
| " | | | 69 | B | H | L | B | L | H | " | B | B | A | B | B | A | " | " | " | | |
| " | | | 70 | A | H | L | B | L | H | " | A | B | A | B | B | A | " | " | " | | |
| " | | | 71 | A | H | L | B | L | H | " | A | A | A | B | A | A | " | " | " | | |
| " | | | 72 | A | L | H | B | H | L | " | A | B | A | B | B | A | " | " | " | | |
| " | | | 73 | B | L | H | A | H | L | " | B | B | A | A | B | A | " | " | " | | |
| " | | | 74 | B | L | H | A | H | L | " | B | A | A | A | A | A | " | " | " | | |
| " | | | 75 | B | H | L | A | L | H | " | B | B | A | A | B | A | " | " | " | | |
| " | | | 76 | A | H | L | A | L | H | " | A | A | B | A | A | B | " | " | " | | |
| " | | | 77 | A | H | L | A | L | H | " | A | A | A | A | A | A | " | " | " | | |
| " | | | 78 | B | H | L | A | L | H | " | B | A | A | A | A | A | " | " | " | | |
| " | | | 79 | B | H | L | B | L | H | " | B | A | A | B | A | A | " | " | " | | |
| " | | | 80 | B | L | H | B | H | L | " | B | B | A | B | B | A | " | " | " | | |
| " | | | 81 | A | L | H | A | H | L | " | A | A | A | A | A | A | " | " | " | | |
| " | | | 82 | A | L | H | B | H | L | " | A | A | A | B | A | A | " | " | " | | |
| " | | | 83 | B | L | H | B | H | L | " | B | A | A | B | A | A | " | " | " | | |
| " | | | 84 | B | H | L | B | L | H | " | B | B | A | B | B | A | " | " | " | | |
| " | | | 85 | A | H | L | B | L | H | " | A | A | A | B | A | A | " | " | " | | |
| " | | | 86 | A | L | H | B | H | L | " | A | B | A | B | B | A | " | " | " | | |
| " | | | 87 | A | L | H | B | H | L | " | A | A | A | B | A | A | " | " | " | | |
| " | | | 88 | A | H | L | B | L | H | " | A | A | B | B | A | B | " | " | " | | |
| 8 2/ 4/ | Same tests, terminal conditions and limits as for subgroup 7, except $T_C$ = 125ºC and -55°C. | | | | | | | | | | | | | | | | | | | | |

See notes at end of device type 03.

TABLE III. Group A inspection for device type 03. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case C Test No. | 1 J1 | 2 $\overline{Q}_1$ | 3 Q1 | 4 K1 | 5 Q2 | 6 $\overline{Q}_2$ | 7 GND | 8 J2 | 9 Clock 2 | 10 Clear 2 | 11 K2 | 12 Clock 1 | 13 Clear 1 | 14 $V_{CC}$ | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 $T_C$ = 25°C | $F_{MAX}$ | (Fig. 7) 6/ | 89 | 2.4 V | | OUT | 2.4 V | | | GND | | | | | IN | 5.0 V | 5.0 V | Q1 | 10 | | MHz |
| " | " | " | 90 | 2.4 V | OUT | | 2.4 V | | | " | | | | | IN | 5.0 V | " | $\overline{Q}_1$ | " | | " |
| " | " | " | 91 | | | | | OUT | | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Q2 | " | | " |
| " | " | " | 92 | | | | | | OUT | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | $\overline{Q}_2$ | " | | " |
| " | $t_{PLH}$ | 3003 (Fig. 6) | 93 | 2.4 V | OUT | | GND | | | " | | | | | A | IN | " | Clr 1 to $\overline{Q}_1$ | 5 | 25 | ns |
| " | $t_{PLH}$ | " | 94 | | | | | | OUT | " | 2.4 V | A | IN | GND | | | " | Clr 2 to $\overline{Q}_2$ | " | 25 | " |
| " | $t_{PHL}$ | " | 95 | 2.4 V | | OUT | GND | | | " | | | | | A | IN | " | Clr 1 to Q1 | " | 40 | " |
| " | $t_{PHL}$ | " | 96 | | | | | OUT | | " | 2.4 V | A | IN | GND | | | " | Clr 2 to Q2 | " | 40 | " |
| " | $t_{PLH}$ | 3003 (Fig. 7) | 97 | 2.4 V | | OUT | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to Q1 | 5 | 30 | ns |
| " | " | | 98 | 2.4 V | OUT | | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 99 | | | | | OUT | | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to Q2 | " | " | " |
| " | " | " | 100 | | | | | | OUT | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to $\overline{Q}_2$ | " | " | " |
| " | $t_{PHL}$ | " | 101 | 2.4 V | | OUT | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to Q1 | " | 40 | " |
| " | " | " | 102 | 2.4 V | OUT | | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 103 | | | | | OUT | | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to Q2 | " | " | " |
| " | " | " | 104 | | | | | | OUT | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to $\overline{Q}_2$ | " | " | " |
| 10 $T_C$ = 125°C | $F_{MAX}$ | (Fig. 7) 6/ | 105 | 2.4 V | | OUT | 2.4 V | | | " | | | | | IN | 5.0 V | " | Q1 | 10 | | MHz |
| " | " | " | 106 | 2.4 V | OUT | | 2.4 V | | | " | | | | | IN | 5.0 V | " | $\overline{Q}_1$ | " | | " |
| " | " | " | 107 | | | | | OUT | | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Q2 | " | | " |
| " | " | " | 108 | | | | | | OUT | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | $\overline{Q}_2$ | " | | " |
| " | $t_{PLH}$ | 3003 (Fig 6) | 109 | 2.4 V | OUT | | GND | | | " | | | | | A | IN | " | Clr 1 to $\overline{Q}_1$ | 5 | 39 | ns |
| " | $t_{PLH}$ | " | 110 | | | | | | OUT | " | 2.4 V | A | IN | GND | | | " | Clr 2 to $\overline{Q}_2$ | " | 39 | " |
| " | $t_{PHL}$ | " | 111 | 2.4 V | | OUT | GND | | | " | | | | | A | IN | " | Clr 1 to Q1 | " | 50 | " |
| " | $t_{PHL}$ | " | 112 | | | | | OUT | | " | 2.4 V | A | IN | GND | | | " | Clr 2 to Q2 | " | 50 | " |
| " | $t_{PLH}$ | 3003 (Fig 7) | 113 | 2.4 V | | OUT | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to Q1 | 5 | 39 | ns |
| " | " | | 114 | 2.4 V | OUT | | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 115 | | | | | OUT | | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to Q2 | " | " | " |
| " | " | " | 116 | | | | | | OUT | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to $\overline{Q}_2$ | " | " | " |
| " | $t_{PHL}$ | " | 117 | 2.4 V | | OUT | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to Q1 | " | 50 | " |
| " | " | " | 118 | 2.4 V | OUT | | 2.4 V | | | " | | | | | IN | 5.0 V | " | Clk 1 to $\overline{Q}_1$ | " | " | " |
| " | " | " | 119 | | | | | OUT | | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to Q2 | " | " | " |
| " | " | " | 120 | | | | | | OUT | " | 2.4 V | IN | 5.0 V | 2.4 V | | | " | Clk 2 to $\overline{Q}_2$ | " | " | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | |

See notes at end of device type 03.

NOTES:

A = Normal clock pulse.
B = Momentary GND, then 4.5 V.
C = This note has been deleted.
D = Momentary 4.5 V, then GND.
E = Momentary ground, then 2.4 V.
F = Momentary ground, then 5.5 V.

* After clock pulse apply –12 mA to clock pin to insure $\overline{Q}$ is still in the low state (see figure 15).

** Test time limit ≤100 ms.

1/ Terminal conditions (pins not designated may be H ≥ 2.0 V, or L ≤ 0.8 V, or open).
2/ Input voltages shown are: A = 2.0 V minimum and B = 0.8 V maximum.
3/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.4 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.
4/ Tests shall be performed in sequence.
5/ One normal clock pulse, then 4.5 V.
6 $F_{MAX}$, minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.
7/ For CKT A, $I_{IH3}$ limits are 0 to 120 µA.

TABLE III. Group A inspection for device type 04. 1/

| Subgroup | Symbol | MIL-STD-883 method | Case E & F Test No. | 1 Clock 1 | 2 Preset 1 | 3 Clear 1 | 4 J1 | 5 $V_{CC}$ | 6 Clock 2 | 7 Preset 2 | 8 Clear 2 | 9 J2 | 10 $\overline{Q}$ 2 | 11 Q2 | 12 K2 | 13 GND | 14 $\overline{Q}$ 1 | 15 Q1 | 16 K1 | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $V_{OH}$ | 3006 | 1 | A | | | 2.0 V | 4.5 V | | | | | | | | GND | | -.4 mA | 0.8 V | Q1 | 2.4 | | V |
| $T_C$ = 25°C | " | " | 2 | A | | | 0.8 V | " | | | | | | | | " | -.4 mA | | 2.0 V | $\overline{Q}$ 1 | " | | " |
| " | " | " | 3 | | 2.0 V | 0.8 V | | " | | | | | | | | " | -.4 mA | | | $\overline{Q}$ 1 | " | | " |
| " | " | " | 4 | | 0.8 V | 2.0 V | | " | | | | | | | | " | | -.4 mA | | Q1 | " | | " |
| " | " | " | 5 | | | | | " | A | | | 2.0 V | | -.4 mA | 0.8 V | " | | | | Q2 | " | | " |
| " | " | " | 6 | | | | | " | A | | | 0.8 V | -.4 mA | | 2.0 V | " | | | | $\overline{Q}$ 2 | " | | " |
| " | " | " | 7 | | | | | " | | 2.0 V | 0.8 V | | -.4 mA | | | " | | | | $\overline{Q}$ 2 | " | | " |
| " | " | " | 8 | | | | | " | | 0.8 V | 2.0 V | | | -.4 mA | | " | | | | Q2 | " | | " |
| " | $V_{OL}$ | 3007 | 9 | A | | | 0.8 V | " | | | | | | | | " | | 16 mA | 2.0 V | Q1 | | 0.4 | " |
| " | " | " | 10 | A | | | 2.0 V | " | | | | | | | | " | 16 mA | | 0.8 V | $\overline{Q}$ 1 | | " | " |
| " | " | " | 11 | | 0.8 V | 2.0 V | | " | | | | | | | | " | 16 mA | | | $\overline{Q}$ 1 | | " | " |
| " | " | " | 12 | | 2.0 V | 0.8 V | | " | | | | | | | | " | | 16 mA | | Q1 | | " | " |
| " | " | " | 13 | | | | | " | A | | | 0.8 V | | 16 mA | 2.0 V | " | | | | Q2 | | " | " |
| " | " | " | 14 | | | | | " | A | | | 2.0 V | 16 mA | | 0.8 V | " | | | | $\overline{Q}$ 2 | | " | " |
| " | " | " | 15 | | | | | " | | 0.8 V | 2.0 V | | 16 mA | | | " | | | | $\overline{Q}$ 2 | | " | " |
| " | " | " | 16 | | | | | " | | 2.0 V | 0.8 V | | | 16 mA | | " | | | | Q2 | | " | " |
| " | $V_{IC}$ | | 17 | | | | -12 mA | " | | | | | | | | " | | | | J1 | | -1.5 | " |
| " | " | | 18 | | | | | " | | | | | | | | " | | | -12 mA | K1 | | " | " |
| " | " | | 19 | | | | | " | | | | -12 mA | | | | " | | | | J2 | | " | " |
| " | " | | 20 | | | | | " | | | | | | | -12 mA | " | | | | K2 | | " | " |
| " | " | | 21 | -12 mA | | | | " | | | | | | | | " | | | | Clock 1 | | " | " |
| " | " | | 22 | | -12 mA | | | " | | | | | | | | " | | | | Preset 1 | | " | " |
| " | " | | 23 | | | -12 mA | | " | | | | | | | | " | | | | Clear 1 | | " | " |
| " | " | | 24 | | | | | " | -12 mA | | | | | | | " | | | | Clock 2 | | " | " |
| " | " | | 25 | | | | | " | | -12 mA | | | | | | " | | | | Preset 2 | | " | " |
| " | " | | 26 | | | | | " | | | -12 mA | | | | | " | | | | Clear 2 | | " | " |
| " | $I_{IL1}$ | 3009 | 27 | 4.5 V | | B | 0.4 V | 5.5 V | | | | | | | | " | | | | J1 | -0.7 | -1.6 | mA |
| " | " | " | 28 | 4.5 V | B | 4.5 V | | " | | | | | | | | " | | | 0.4 V | K1 | " | " | " |
| " | " | " | 29 | | | | | " | 4.5 V | | B | 0.4 V | | | | " | | | | J2 | " | " | " |
| " | " | " | 30 | | | | | " | 4.5 V | B | 4.5 V | | | | 0.4 V | " | | | | K2 | " | " | " |
| " | $I_{IL2}$ | " | 31 | 0.4 V | B | | 4.5 V | " | | | | | | | | " | | | 4.5 V | Clock 1 | -1.25 | -3.2 | " |
| " | " | " | 32 | 0.4 V | | B | 4.5 V | " | | | | | | | | " | | | 4.5 V | Clock 1 | " | " | " |
| " | " | " | 33 | | | | | " | 0.4 V | B | | 4.5 V | | | 4.5 V | " | | | | Clock 2 | " | " | " |
| " | " | " | 34 | | | | | " | 0.4 V | | B | 4.5 V | | | 4.5 V | " | | | | Clock 2 | " | " | " |
| " | $I_{IL3}$ | " | 35 A, C | 4.5 V | | 0.4 V | 4.5 V | " | | | | | | | | " | | | 4.5 V | Clear 1 | -0.7 | -1.6 | " |
| " | " | " | 35 B | 4.5 V | | 0.4 V | 4.5 V | " | | | | | | | | " | | | 4.5 V | Clear 1 | -1.4 | -3.2 | " |
| " | " | " | 36 A, C | 4.5 V | 0.4 V | | 4.5 V | " | | | | | | | | " | | | 4.5 V | Preset 1 | -0.7 | -1.6 | " |
| " | " | " | 36 B | 4.5 V | 0.4 V | | 4.5 V | " | | | | | | | | " | | | 4.5 V | Preset 1 | -1.4 | -3.2 | " |
| " | " | " | 37 A, C | | | | | " | 4.5 V | | 0.4 V | 4.5 V | | | 4.5 V | " | | | | Clear 2 | -0.7 | -1.6 | " |
| " | " | " | 37 B | | | | | " | 4.5 V | | 0.4 V | 4.5 V | | | 4.5 V | " | | | | Clear 2 | -1.4 | -3.2 | " |
| " | " | " | 38 A, C | | | | | " | 4.5 V | 0.4 V | | 4.5 V | | | 4.5 V | " | | | | Preset 2 | -0.7 | -1.6 | " |
| " | " | " | 38 B | | | | | " | 4.5 V | 0.4 V | | 4.5 V | | | 4.5 V | " | | | | Preset 2 | -1.4 | -3.2 | " |
| " | $I_{IH1}$ | 3010 | 39 | GND | | GND | 2.4 V | " | | | | | | | | " | | | | J1 | | 40 | µA |
| " | " | " | 40 | GND | GND | | | " | | | | | | | | " | | | 2.4 V | K1 | | " | " |
| " | " | " | 41 | | | | | " | GND | | GND | 2.4 V | | | | " | | | | J2 | | " | " |
| " | " | " | 42 | | | | | " | GND | GND | | | | | 2.4 V | " | | | | K2 | | " | " |
| " | $I_{IH2}$ | " | 43 | GND | | GND | 5.5 V | " | | | | | | | | " | | | | J1 | | 100 | " |
| " | " | " | 44 | GND | GND | | | " | | | | | | | | " | | | 5.5 V | K1 | | " | " |
| " | " | " | 45 | | | | | " | GND | | GND | 5.5 V | | | | " | | | | J2 | | " | " |
| " | " | " | 46 | | | | | " | GND | GND | | | | | 5.5 V | " | | | | K2 | | " | " |

See notes at end of device type 04.

TABLE III. Group A inspection for device type 04. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case E & F Test No. | 1 Clock 1 | 2 Preset 1 | 3 Clear 1 | 4 J1 | 5 $V_{CC}$ | 6 Clock 2 | 7 Preset 2 | 8 Clear 2 | 9 J2 | 10 $\overline{Q}$ 2 | 11 Q2 | 12 K2 | 13 GND | 14 $\overline{Q}$ 1 | 15 Q1 | 16 K1 | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $I_{IH3}$ | 3010 | 47 | GND | | E | GND | 5.5 V | | | | | | | | GND | | | 4.5 V | Clear 1 | | 160 | µA |
| $T_C$ = 25°C | " | " | 48 | GND | E | | 4.5 V | " | | | | | | | | " | | | GND | Preset 1 | | " | " |
| " | " | " | 49 | | | | | " | GND | | E | GND | | | 4.5 V | " | | | | Clear 2 | | " | " |
| " | " | " | 50 | | | | | " | GND | E | | 4.5 V | | | GND | " | | | | Preset 2 | | " | " |
| " | $I_{IH4}$ | " | 51 | GND | | F | GND | " | | | | | | | | " | | | 4.5 V | Clear 1 | | 200 | " |
| " | " | " | 52 | GND | F | | 4.5 V | " | | | | | | | | " | | | GND | Preset 1 | | " | " |
| " | " | " | 53 | | | | | " | GND | | F | GND | | | 4.5 V | " | | | | Clear 2 | | " | " |
| " | " | " | 54 | | | | | " | GND | F | | 4.5 V | | | GND | " | | | | Preset 2 | | " | " |
| " | " | " | 55 | 5.5 V | | GND | GND | " | | | | | | | | " | | | GND | Clock 1 | | " | " |
| " | " | " | 56 | | | | | " | 5.5 V | | GND | GND | | | GND | " | | | | Clock 2 | | " | " |
| " | $I_{IH5}$ | " | 57 CKT A, C | 2.4 V | | GND | GND | " | | | | | | | | " | | | GND | Clock 1 | -50 | -700 | " |
| " | " | " | 57 CKT B | 2.4 V | | GND | GND | " | | | | | | | | " | | | GND | Clock 1 | -200 | -850 | " |
| " | " | " | 58 CKT A, C | | | | | " | 2.4 V | | GND | GND | | | GND | " | | | | Clock 2 | -50 | -700 | " |
| " | " | " | 58 CKT B | | | | | " | 2.4 V | | GND | GND | | | GND | " | | | | Clock 2 | -200 | -850 | " |
| " | $I_{OS}$ | 3011 | 59 ** | 2.4 V | GND | 4.5 V | 2.4 V | " | | | | | | | | " | | GND | 2.4 V | Q1 | -20 | -57 | mA |
| " | " | " | 60 | 2.4 V | 4.5 V | GND | 2.4 V | " | | | | | | | | " | GND | | 2.4 V | $\overline{Q}$ 1 | " | " | " |
| " | " | " | 61** | | | | | " | 2.4 V | GND | 4.5 V | 2.4 V | | GND | 2.4 V | " | | | | Q2 | " | " | " |
| " | " | " | 62 | | | | | " | 2.4 V | 4.5 V | GND | 2.4 V | GND | | 2.4 V | " | | | | $\overline{Q}$ 2 | " | " | " |
| " | $I_{CC}$ | 3005 | 63 | GND | 4.5 V | GND | GND | " | GND | 4.5 V | GND | GND | | | GND | " | | | GND | $V_{CC}$ | | 40 | " |
| " | $I_{CC}$ | 3005 | 64 | GND | GND | 4.5 V | GND | " | GND | GND | 4.5 V | GND | | | GND | " | | | GND | $V_{CC}$ | | 40 | " |
| 2 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = 125ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = -55ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | | | |
| 7 2/ 4/ | | | 65 | B | A | B | A | 4.5 V | B | A | B | A | H 3/ | L 3/ | B | GND | H 3/ | L 3/ | B | All | H or L | | |
| $T_C$ = 25°C | | | 66 | A | A | B | A | " | A | A | B | A | H | L | B | " | H | L | B | output | as shown 3/ | | |
| " | | | 67 | B | A | B | A | " | B | A | B | A | H | L | B | " | H | L | B | " | " | | |
| " | | | 68 | B | A | B | A | " | B | A | B | A | H | L | A | " | H | L | A | " | " | | |
| " | | | 69 | A | A | B | A | " | A | A | B | A | H | L | A | " | H | L | A | " | " | | |
| " | | | 70 | B | A | B | A | " | B | A | B | A | H | L | A | " | H | L | A | " | " | | |
| " | | | 71 | B | B | A | A | " | B | B | A | A | L | H | A | " | L | H | A | " | " | | |
| " | | | 72 | A | B | A | A | " | A | B | A | A | L | H | A | " | L | H | A | " | " | | |
| " | | | 73 | B | B | A | A | " | B | B | A | A | L | H | A | " | L | H | A | " | " | | |
| " | | | 74 | B | B | A | B | " | B | B | A | B | L | H | A | " | L | H | A | " | " | | |
| " | | | 75 | A | B | A | B | " | A | B | A | B | L | H | A | " | L | H | A | " | " | | |
| " | | | 76 | B | B | A | B | " | B | B | A | B | L | H | A | " | L | H | A | " | " | | |
| " | | | 77 | B | A | A | B | " | B | A | A | B | L | H | B | " | L | H | B | " | " | | |
| " | | | 78 | A | A | A | B | " | A | A | A | B | L | H | B | " | L | H | B | " | " | | |
| " | | | 79 | B | A | A | B | " | B | A | A | B | L | H | B | " | L | H | B | " | " | | |
| " | | | 80 | B | A | B | B | " | B | A | B | B | H | L | B | " | H | L | B | " | " | | |
| " | | | 81 | B | A | A | B | " | B | A | A | B | H | L | B | " | H | L | B | " | " | | |
| " | | | 82 | A | A | A | B | " | A | A | A | B | H | L | B | " | H | L | B | " | " | | |
| " | | | 83 | B | A | A | B | " | B | A | A | B | H | L | B | " | H | L | B | " | " | | |
| " | | | 84 | B | A | A | A | " | B | A | A | A | H | L | B | " | H | L | B | " | " | | |
| " | | | 85 | A | A | A | A | " | A | A | A | A | H | L | B | " | H | L | B | " | " | | |
| " | | | 86 | B | A | A | A | " | B | A | A | A | L | H | B | " | L | H | B | " | " | | |

See notes at end of device type 04.

TABLE III. Group A inspection for device type 04. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case E & F Test No. | 1 Clock 1 | 2 Preset 1 | 3 Clear 1 | 4 J1 | 5 $V_{CC}$ | 6 Clock 2 | 7 Preset 2 | 8 Clear 2 | 9 J2 | 10 $\overline{Q}$ 2 | 11 Q2 | 12 K2 | 13 GND | 14 $\overline{Q}$ 1 | 15 Q1 | 16 K1 | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 2/ 4/ $T_C$ = 25°C | | | 87 | B | A | A | B | 4.5 V | B | A | A | B | L 3/ | H 3/ | A | GND | L 3/ | H 3/ | A | All Output | H or L as shown 3/ | | |
| " | | | 88 | A | A | A | B | " | A | A | A | B | L | H | A | " | L | H | A | | | | |
| " | | | 89 | B | A | A | B | " | B | A | A | B | H | L | A | " | H | L | A | " | " | | |
| " | | | 90 | B | A | A | A | " | B | A | A | A | H | L | A | " | H | L | A | " | " | | |
| " | | | 91 | A | A | A | A | " | A | A | A | A | H | L | A | " | H | L | A | " | " | | |
| " | | | 92 | B | A | A | A | " | B | A | A | A | L | H | A | " | L | H | A | " | " | | |
| " | | | 93 | A | A | A | A | " | A | A | A | A | L | H | A | " | L | H | A | " | " | | |
| " | | | 94 | B | A | A | A | " | B | A | A | A | H | L | A | " | H | L | A | " | " | | |
| " | | | 95 | A | B | B | B | " | A | B | B | B | H | H | B | " | H | H | B | " | " | | |
| " | | | 96 | A | B | A | A | " | A | B | A | A | L | H | A | " | L | H | A | " | " | | |
| " | | | 97 | A | A | A | A | " | A | A | A | A | L | H | A | " | L | H | A | " | " | | |
| " | | | 98 | A | A | A | A | " | A | A | A | A | L | H | B | " | L | H | B | " | " | | |
| " | | | 99 | A | A | A | B | " | A | A | A | B | L | H | B | " | L | H | B | " | " | | |
| " | | | 100 | B | A | A | B | " | B | A | A | B | H | L | B | " | H | L | B | " | " | | |
| " | | | 101 | A | A | A | A | " | A | A | A | A | H | L | A | " | H | L | A | " | " | | |
| " | | | 102 | A | A | A | B | " | A | A | A | B | H | L | A | " | H | L | A | " | " | | |
| " | | | 103 | A | A | A | B | " | A | A | A | B | H | L | B | " | H | L | B | " | " | | |
| " | | | 104 | B | A | A | B | " | B | A | A | B | L | H | B | " | L | H | B | " | " | | |
| 8 2/ 4/ | Same tests, terminal conditions and limits as for subgroup 7, except $T_C$ = 125ºC and -55ºC. | | | | | | | | | | | | | | | | | | | | | | |
| 9 $T_C$ = 25°C | $F_{MAX}$ | (Fig. 9) 5/ | 105 | IN | 5.0 V | | 2.4 V | 5.0 V | | | | | | | | GND | | OUT | 2.4 V | Q1 | 10 | | MHz |
| " | " | | 106 | IN | 5.0 V | | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | $\overline{Q}$ 1 | " | | " |
| " | " | " | 107 | | | | | " | IN | 5.0 V | | 2.4 V | | OUT | 2.4 V | " | | | | Q2 | " | | " |
| " | " | " | 108 | | | | | " | IN | 5.0 V | | 2.4 V | OUT | | 2.4 V | " | | | | $\overline{Q}$ 2 | " | | " |
| " | $t_{PLH1}$ | 3003 (Fig 8) | 109 | 2.4 V | 5.0 V | IN | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | Clear 1 to $\overline{Q}$ 1 | 5 | 25 | ns |
| " | " | " | 110 | 2.4 V | IN | 5.0 V | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Preset 1 to Q1 | " | " | " |
| " | " | " | 111 | | | | | " | 2.4 V | 5.0 V | IN | 2.4 V | OUT | | 2.4 V | " | | | | Clear 2 to $\overline{Q}$ 2 | " | " | " |
| " | " | " | 112 | | | | | " | 2.4 V | IN | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Preset 2 to Q2 | " | " | " |
| " | $t_{PHL1}$ | " | 113 | 2.4 V | 5.0 V | IN | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Clear 1 to Q1 | " | 40 | " |
| " | " | " | 114 | 2.4 V | IN | 5.0 V | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | Preset 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | " | 115 | | | | | " | 2.4 V | 5.0 V | IN | 2.4 V | | OUT | 2.4 V | " | | | | Clear 2 to Q2 | " | " | " |
| " | " | " | 116 | | | | | " | 2.4 V | IN | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Preset 2 to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PLH2}$ | 3003 (Fig 9) | 117 | IN | 5.0 V | 5.0 V | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Clock 1 to Q1 | 5 | 30 | ns |
| " | " | " | 118 | IN | 5.0 V | 5.0 V | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | " | 119 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 120 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PHL2}$ | " | 121 | IN | 5.0 V | 5.0 V | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Clock 1 to Q1 | " | 40 | " |

See notes at end of device type 04.

TABLE III. Group A inspection for device type 04. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case E & F Test No. | 1 Clock 1 | 2 Preset 1 | 3 Clear 1 | 4 J1 | 5 $V_{CC}$ | 6 Clock 2 | 7 Preset 2 | 8 Clear 2 | 9 J2 | 10 $\overline{Q}$ 2 | 11 Q2 | 12 K2 | 13 GND | 14 $\overline{Q}$ 1 | 15 Q1 | 16 K1 | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 $T_C$ = 25°C | $t_{PHL2}$ | 3003 (Fig 8) | 122 | IN | 5.0 V | | 2.4 V | 5.0 V | | | | | | | | GND | OUT | OUT | 2.4 V | Clock 1 to $\overline{Q}$ 1 | 5 | 40 | ns |
| " | " | " | 123 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 124 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| 10 | $F_{MAX}$ 5/ | (Fig 9) | 125 | IN | 5.0 V | | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Q1 | 10 | | MHz |
| $T_C$ = 125°C | " | " | 126 | IN | 5.0 V | | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | $\overline{Q}$ 1 | " | | " |
| " | " | " | 127 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Q2 | " | | " |
| " | " | " | 128 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | $\overline{Q}$ 2 | " | | " |
| " | $t_{PLH1}$ | 3003 (Fig 8) | 129 | 2.4 V | 5.0 V | IN | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | Clear 1 to $\overline{Q}$ 1 | 5 | 39 | ns |
| " | " | " | 130 | 2.4 V | IN | 5.0 V | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Preset 1 to Q1 | " | " | " |
| " | " | " | 131 | | | | | " | 2.4 V | 5.0 V | IN | 2.4 V | OUT | | 2.4 V | " | | | | Clear 2 to $\overline{Q}$ 2 | " | " | " |
| " | " | " | 132 | | | | | " | 2.4 V | IN | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Preset 2 to Q2 | " | " | " |
| " | $t_{PHL1}$ | " | 133 | 2.4 V | 5.0 V | IN | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Clear 1 to Q1 | " | 50 | " |
| " | " | " | 134 | 2.4 V | IN | 5.0 V | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | Preset 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | " | 135 | | | | | " | 2.4 V | 5.0 V | IN | 2.4 V | | OUT | 2.4 V | " | | | | Clear 2 to Q2 | " | " | " |
| " | " | " | 136 | | | | | " | 2.4 V | IN | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Preset 2 to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PLH2}$ | 3003 (Fig 9) | 137 | IN | 5.0 V | 5.0 V | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Clock 1 to Q1 | 5 | 39 | ns |
| " | " | " | 138 | IN | 5.0 V | 5.0 V | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | " | 139 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 140 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PHL2}$ | " | 141 | IN | 5.0 V | 5.0 V | 2.4 V | " | | | | | | | | " | | OUT | 2.4 V | Clock 1 to Q1 | " | 50 | " |
| " | " | " | 142 | IN | 5.0 V | 5.0 V | 2.4 V | " | | | | | | | | " | OUT | | 2.4 V | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | " | 143 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | | OUT | 2.4 V | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | " | 144 | | | | | " | IN | 5.0 V | 5.0 V | 2.4 V | OUT | | 2.4 V | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | | | |

See notes at end of device type 04.

NOTES:
A = Normal clock pulse.
B = Momentary GND, then 4.5 V.
C = This note has been deleted.
E = Momentary ground, then 2.4 V.
F = Momentary ground, then 5.5 V.
** = Test time limit ≤ 100 ms.
J = This note has been deleted.

1/ Terminal conditions (pins not designated may be H ≥ 2.0 V, or L ≤ 0.8 V, or open.)
2/ Input voltages shown are: A = 2.0 V minimum and B = 0.8 V maximum.
3/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.4 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.
4/ Tests shall be performed in sequence.
5/ $F_{MAX}$, 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 05. 1/

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 3 | 2 | 1 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | | | | |
| | | | Test No. | Clock 1 | D1 | Clear 1 | $V_{CC}$ | Clear 2 | D2 | Clock 2 | Preset 2 | Q2 | $\overline{Q}$ 2 | GND | $\overline{Q}$ 1 | Q1 | Preset 1 | | Min | Max | Unit |
| 1 | $V_{OH}$ | 3006 | 1 | A | 2.0 V | | 4.5 V | | | | | | | GND | | -.4 mA | | Q1 | 2.4 | | V |
| $T_C$ = 25°C | " | " | 2 | A | 0.8 V | | " | | | | | | | " | -.4 mA | | | $\overline{Q}$ 1 | " | | " |
| " | " | " | 3 | GND | | 0.8 V | " | | | | | | | " | -.4 mA | | GND | $\overline{Q}$ 1 | " | | " |
| " | " | " | 4 | | | GND | " | | | | | | | " | | -.4 mA | 0.8 V | Q1 | " | | " |
| " | " | " | 5 | | | | " | | 2.0 V | A | | -.4 mA | | " | | | | Q2 | " | | " |
| " | " | " | 6 | | | | " | | 0.8 V | A | | | -.4 mA | " | | | | $\overline{Q}$ 2 | " | | " |
| " | " | " | 7 | | | | " | 0.8 V | | GND | GND | | -.4 mA | " | | | | $\overline{Q}$ 2 | " | | " |
| " | " | " | 8 | | | | " | GND | | | 0.8 V | -.4 mA | | " | | | | Q2 | " | | " |
| " | $V_{OL}$ | 3007 | 9 | A | 2.0 V | | " | | | | | | | " | 16 mA | | | $\overline{Q}$ 1 | | 0.4 | " |
| " | " | " | 10 | A | 0.8 V | | " | | | | | | | " | | 16 mA | | Q1 | | " | " |
| " | " | " | 11 | | | 0.8 V | " | | | | | | | " | | 16 mA | 2.0 V | Q1 | | " | " |
| " | " | " | 12 | | | 2.0 V | " | | | | | | | " | 16 mA | | 0.8 V | $\overline{Q}$ 1 | | " | " |
| " | " | " | 13 | | | | " | | 2.0 V | A | | | 16 mA | " | | | | $\overline{Q}$ 2 | | " | " |
| " | " | " | 14 | | | | " | | 0.8 V | A | | 16 mA | | " | | | | Q2 | | " | " |
| " | " | " | 15 | | | | " | 0.8 V | | | 2.0 V | 16 mA | | " | | | | Q2 | | " | " |
| " | " | " | 16 | | | | " | 2.0 V | | | 0.8 V | | 16 mA | " | | | | $\overline{Q}$ 2 | | " | " |
| " | $V_{IC}$ | | 17 | | -12 mA | | " | | | | | | | " | | | | D1 | | -1.5 | " |
| " | " | | 18 | -12 mA | | | " | | | | | | | " | | | | Clock 1 | | " | " |
| " | " | | 19 | | | -12 mA | " | | | | | | | " | | | | Clear 1 | | " | " |
| " | " | | 20 | | | | " | | | | | | | " | | | -12 mA | Preset 1 | | " | " |
| " | " | | 21 | | | | " | | -12 mA | | | | | " | | | | D2 | | " | " |
| " | " | | 22 | | | | " | | | -12 mA | | | | " | | | | Clock 2 | | " | " |
| " | " | | 23 | | | | " | -12 mA | | | | | | " | | | | Clear 2 | | " | " |
| " | " | | 24 | | | | " | | | | -12 mA | | | " | | | | Preset 2 | | " | " |
| " | $I_{IL1}$ | 3009 | 25 | 4.5 V | 0.4 V | 4.5 V | 5.5 V | | | | | | | " | | | GND | D1 | -0.7 | -1.6 | mA |
| " | " | " | 26 | | | | " | 4.5 V | 0.4 V | 4.5 V | GND | | | " | | | | D2 | -0.7 | -1.6 | " |
| " | " | " | 27 | GND | GND | GND | " | | | | | | | " | | | 0.4 V | Preset 1 | -1.4 | -3.2 | " |
| " | " | " | 28 | | | | " | GND | GND | GND | 0.4 V | | | " | | | | Preset 2 | -1.4 | -3.2 | " |
| " | $I_{IL2}$ | " | 29 | 0.4 V | GND | 4.5 V | " | | | | | | | " | | | GND | Clock 1 | -1.4 | -3.2 | " |
| " | " | " | 30 7/ | 4.5 V | 4.5 V | 0.4 V | " | | | | | | | " | | | GND | Clear 1 | -2.1 | -4.8 | " |
| " | " | " | 31 | | | | " | 4.5 V | GND | 0.4 V | GND | | | " | | | | Clock 2 | -1.4 | -3.2 | " |
| " | " | " | 32 7/ | | | | " | 0.4 V | 4.5 V | 4.5 V | GND | | | " | | | | Clear 2 | -2.1 | -4.8 | " |
| " | $I_{IH1}$ | 3010 | 33 | 4.5 V | 2.4 V | GND | " | | | | | | | " | | | 4.5 V | D1 | | 40 | µA |
| " | $I_{IH1}$ | " | 34 | | | | " | GND | 2.4 V | 4.5 V | 4.5 V | | | " | | | | D2 | | 40 | " |
| " | $I_{IH2}$ | " | 35 | 4.5 V | 5.5 V | GND | " | | | | | | | " | | | 4.5 V | D1 | | 100 | " |
| " | $I_{IH2}$ | " | 36 | | | | " | GND | 5.5 V | 4.5 V | 4.5 V | | | " | | | | D2 | | 100 | " |
| " | $I_{IH3}$ | " | 37 | 2.4 V | 4.5 V | GND | " | | | | | | | " | | | 4.5 V | Clock 1 | | 80 | " |
| " | " | " | 38 | B | 4.5 V | 4.5 V | " | | | | | | | " | | | 2.4 V | Preset 1 | | " | " |
| " | " | " | 39 | | | | " | GND | 4.5 V | 2.4 V | 4.5 V | | | " | | | | Clock 2 | | " | " |
| " | " | " | 40 | | | | " | 4.5 V | 4.5 V | B | 2.4 V | | | " | | | | Preset 2 | | " | " |
| " | $I_{IH4}$ | " | 41 | 5.5 V | 4.5 V | GND | " | | | | | | | " | | | 4.5 V | Clock 1 | | 200 | " |
| " | " | " | 42 | B | 4.5 V | 4.5 V | " | | | | | | | " | | | 5.5 V | Preset 1 | | " | " |
| " | " | " | 43 | | | | " | GND | 4.5 V | 5.5 V | 4.5 V | | | " | | | | Clock 2 | | " | " |
| " | " | " | 44 | | | | " | 4.5 V | 4.5 V | B | 5.5 V | | | " | | | | Preset 2 | | " | " |
| " | $I_{IH5}$ | " | 45 | B | GND | 2.4 V | " | | | | | | | " | | | 4.5 V | Clear 1 | | 120 | " |
| " | $I_{IH5}$ | " | 46 | | | | " | 2.4 V | GND | B | 4.5 V | | | " | | | | Clear 2 | | 120 | " |
| " | $I_{IH6}$ | " | 47 | B | GND | 5.5 V | " | | | | | | | " | | | 4.5 V | Clear 1 | | 300 | " |
| " | $I_{IH6}$ | " | 48 | | | | " | 5.5 V | GND | B | 4.5 V | | | " | | | | Clear 2 | | 300 | " |

See notes at end of device type 05.

TABLE III. Group A inspection for device type 05. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 3 | 2 | 1 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | | | | |
| | | | Test No. | Clock 1 | D1 | Clear 1 | $V_{CC}$ | Clear 2 | D2 | Clock | Preset 2 | Q2 | $\overline{Q}$ 2 | GND | $\overline{Q}$ 1 | Q1 | Preset 1 | | Min | Max | Unit |
| 1 | $I_{OS}$ | 3011 | 49 | | | | 5.5 V | | | | | | | GND | | GND | GND | Q1 | -20 | -57 | mA |
| $T_C$ = 25°C | " | " | 50 | | | GND | " | | | | | | | " | GND | | | $\overline{Q}$ 1 | " | " | " |
| " | " | " | 51 | | | | " | | | | GND | GND | | " | | | | Q2 | " | " | " |
| " | " | " | 52 | | | | " | GND | | | | | GND | " | | | | $\overline{Q}$ 2 | " | " | " |
| " | $I_{CC}$ | 3005 | 53 | GND | GND | | " | | GND | GND | GND | | | " | | | GND | $V_{CC}$ | | 30 | " |
| " | $I_{CC}$ | 3005 | 54 | GND | GND | GND | " | GND | GND | GND | | | | " | | | | $V_{CC}$ | | 30 | " |
| 2 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = 125ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = -55ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 7 2/ 4/ | | | 55 | B | B | B | 4.5 V | B | B | B | B | H 3/ | H 3/ | GND | H 3/ | H | B | All outputs | H or L as shown 3/ | | |
| $T_C$ = 25°C | | | 56 | B | B | B | " | B | B | B | A | L | H | " | H | L | A | | | | |
| " | | | 57 | B | B | A | " | A | B | B | A | L | H | " | H | L | A | " | " | | |
| " | | | 58 | B | B | A | " | A | B | B | B | H | L | " | L | H | B | " | " | | |
| " | | | 59 | A | B | A | " | A | B | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 60 | A | B | B | " | B | B | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 61 | A | A | B | " | B | A | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 62 | A | A | B | " | B | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 63 | A | A | A | " | A | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 64 | A | A | A | " | A | A | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 65 | A | A | A | " | A | A | A | A | H | L | " | L | H | A | " | " | | |
| " | | | 66 | B | A | A | " | A | A | B | A | H | L | " | L | H | A | " | " | | |
| " | | | 67 | B | B | A | " | A | B | B | A | H | L | " | L | H | A | " | " | | |
| " | | | 68 | A | B | A | " | A | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 69 | A | B | A | " | A | B | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 70 | A | A | B | " | B | A | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 71 | A | B | B | " | B | B | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 72 | A | B | B | " | B | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 73 | A | B | A | " | A | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 74 | B | A | A | " | A | A | B | A | L | H | " | H | L | A | " | " | | |
| " | | | 75 | A | A | A | " | A | A | A | A | H | L | " | L | H | A | " | " | | |
| " | | | 76 | A | A | A | " | A | A | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 77 | A | A | A | " | A | A | A | A | H | L | " | L | H | A | " | " | | |
| " | | | 78 | A | A | B | " | B | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 79 | A | A | A | " | A | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 80 | A | B | A | " | A | B | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 81 | A | B | A | " | A | B | A | A | H | L | " | L | H | A | " | " | | |
| " | | | 82 | A | B | B | " | B | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 83 | A | B | A | " | A | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 84 | A | A | A | " | A | A | A | A | L | H | " | H | L | A | " | " | | |
| 8 2/ 4/ | Same tests, terminal conditions and limits as for subgroup 7, except $T_C$ = 125ºC and -55ºC. | | | | | | | | | | | | | | | | | | | | |
| 9 | $F_{MAX}$ 6/ | (Fig. 11) | 85 | IN | E | | 5.0 V | | | | | | | GND | | OUT | 5.0 V | Q1 | 10 | | MHz |
| $T_C$ = 25°C | " | " | 86 | IN | E | | " | | | | | | | " | OUT | | 5.0 V | $\overline{Q}$ 1 | " | | " |
| " | " | " | 87 | | | | " | | E | IN | 5.0 V | OUT | | " | | | | Q2 | " | | " |
| " | " | " | 88 | | | | " | | E | IN | 5.0 V | | OUT | " | | | | $\overline{Q}$ 2 | " | | " |

See notes at end of device type 05.

TABLE III. Group A inspection for device type 05. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 3 | 2 | 1 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | | | | |
| | | | Test No. | Clock 1 | D1 | Clear 1 | $V_{CC}$ | Clear 2 | D2 | Clock 2 | Preset 2 | Q2 | $\overline{Q}$ 2 | GND | $\overline{Q}$ 1 | Q1 | Preset 1 | | Min | Max | Unit |
| 9<br>$T_C$ = 25°C | $t_{PLH1}$ | 3003<br>(Fig 10) | 89 | | | IN | 5.0 V | | | | | | | GND | OUT | | J | Clear 1<br>to $\overline{Q}$ 1 | 5 | 25 | ns |
| " | " | " | 90 | | | J | " | | | | | | | " | | OUT | IN | Preset 1<br>to Q1 | " | " | " |
| " | " | " | 91 | | | | " | IN | | | J | | OUT | " | | | | Clear 2<br>to $\overline{Q}$ 2 | " | " | " |
| " | " | " | 92 | | | | " | J | | | IN | OUT | | " | | | | Preset 2<br>to Q2 | " | 40 | " |
| " | $t_{PHL1}$ | " | 93 | | | IN | " | | | | | | | " | | OUT | J | Clear 1<br>to Q1 | " | " | " |
| " | " | " | 94 | | | J | " | | | | | | | " | OUT | | IN | Preset 1<br>to $\overline{Q}$ 1 | " | " | " |
| " | " | " | 95 | | | | " | IN | | | J | OUT | | " | | | | Clear 2<br>to Q2 | " | " | " |
| " | " | " | 96 | | | | " | J | | | IN | | OUT | " | | | | Preset 2<br>to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PLH2}$ | 3003 5/<br>(Fig 11) | 97 | IN | IN (A) | B | " | | | | | | | " | | OUT | 5.0 V | Clock 1<br>to Q1 | 5 | 30 | ns |
| " | " | (Fig 12) | 98 | IN | IN (A) | 5.0 V | " | | | | | | | " | OUT | | B | Clock 1<br>to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig 11) | 99 | | | | " | B | IN (A) | IN | 5.0 V | OUT | | " | | | | Clock 2<br>to Q2 | " | " | " |
| " | " | (Fig 12) | 100 | | | | " | 5.0 V | IN (A) | IN | B | | OUT | " | | | | Clock 2<br>to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PHL2}$ | (Fig 12) | 101 | IN | IN (B) | 5.0 V | " | | | | | | | " | | OUT | B | Clock 1<br>to Q1 | " | 40 | " |
| " | " | (Fig 11) | 102 | IN | IN (B) | B | " | | | | | | | " | OUT | | 5.0 V | Clock 1<br>to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig 12) | 103 | | | | " | 5.0 V | IN (B) | IN | B | OUT | | " | | | | Clock 2<br>to Q2 | " | " | " |
| " | " | (Fig 11) | 104 | | | | " | B | IN (B) | IN | 5.0 V | | OUT | " | | | | Clock 2<br>to $\overline{Q}$ 2 | " | " | " |
| 10<br>$T_C$ = 125°C | $F_{MAX}$ 6/ | (Fig 11) | 105 | IN | E | | " | | | | | | | " | | OUT | 5.0 V | Q1 | 10 | " | MHz |
| | " | " | 106 | IN | E | | " | | | | | | | " | OUT | | 5.0 V | $\overline{Q}$ 1 | " | " | " |
| " | " | " | 107 | | | | " | | E | IN | 5.0 V | OUT | | " | | | | Q2 | " | " | " |
| " | " | " | 108 | | | | " | | E | IN | 5.0 V | | OUT | " | | | | $\overline{Q}$ 2 | " | | " |
| " | $t_{PLH1}$ | 3003<br>(Fig 10) | 109 | | | IN | " | | | | | | | " | OUT | | J | Clear 1<br>to $\overline{Q}$ 1 | 5 | 39 | ns |
| " | " | " | 110 | | | J | " | | | | | | | " | | OUT | IN | Preset 1<br>to Q1 | " | " | " |
| " | " | " | 111 | | | | " | IN | | | J | | OUT | " | | | | Clear 2<br>to $\overline{Q}$ 2 | " | " | " |
| " | " | " | 112 | | | | " | J | | | IN | OUT | | " | | | | Preset 2<br>to Q2 | " | " | " |
| " | $t_{PHL1}$ | " | 113 | | | IN | " | | | | | | | " | | OUT | J | Clear 1<br>to Q1 | " | 50 | " |
| " | " | " | 114 | | | J | " | | | | | | | " | OUT | | IN | Preset 1<br>to $\overline{Q}$ 1 | " | " | " |
| " | " | " | 115 | | | | " | IN | | | J | OUT | | " | | | | Clear 2<br>to Q2 | " | " | " |
| " | " | " | 116 | | | | " | J | | | IN | | OUT | " | | | | Preset 2<br>to $\overline{Q}$ 2 | " | " | " |

See notes at end of device type 05.

TABLE III. Group A inspection for device type 05. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B, D Case C Test No. | 1 Clock 1 | 2 D1 | 3 Clear 1 | 4 $V_{CC}$ | 5 Clear 2 | 6 D2 | 7 Clock 2 | 8 Preset 2 | 9 Q2 | 10 $\overline{Q}$ 2 | 11 GND | 12 $\overline{Q}$ 1 | 13 Q1 | 14 Preset 1 | Meas. terminal | Test limits Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 $T_C$ = 125°C | $t_{PLH2}$ | 3003 5/ (Fig 11) | 117 | IN | IN (A) | B | " | | | | | | | " | | OUT | 5.0 V | Clock 1 to Q1 | 5 | 39 | ns |
| | " | (Fig 12) | 118 | IN | IN (A) | 5.0 V | " | | | | | | | " | OUT | | B | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig 11) | 119 | | | | " | B | IN (A) | IN | 5.0 V | OUT | | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | (Fig 12) | 120 | | | | " | 5.0 V | IN (A) | IN | B | | OUT | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PHL2}$ | (Fig 12) | 121 | IN | IN (B) | 5.0 V | " | | | | | | | " | | OUT | B | Clock 1 to Q1 | " | 40 | " |
| " | " | (Fig 11) | 122 | IN | IN (B) | B | " | | | | | | | " | OUT | | 5.0 V | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig 12) | 123 | | | | " | 5.0 V | IN (B) | IN | B | OUT | | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | (Fig 11) | 124 | | | | " | B | IN (B) | IN | 5.0 V | | OUT | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | |

NOTES:
A = Normal clock pulse.
B = Momentary GND, then 4.5 V.
E = Input D connected to $\overline{Q}$ .
J = Input pulse, $t_p \geq 100$ ns, PRR = 1 MHz, $V_{OL}$ = 0 V, $V_{OH}$ = 4.5 V.

1/ Terminal conditions (pins not designated may be H ≥ 2.0 V, or L ≤ 0.8 V, or open).
2/ Input voltages shown are: A = 2.0 V minimum and B = 0.8 V maximum.
3/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.4 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.
4/ Tests shall be performed in sequence.
5/ Tests shall be performed for both D input pulses (A and B).
6 $F_{MAX}$, minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.
7/ CKT C limits are –0.7 to -4.8 mA for these tests.

TABLE III. Group A inspection for device type 06. 1/

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 10 | 12 | 13 | 14 | 2 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 11 | | | | |
| | | | Test No. | K1 | Clock | Preset | $V_{CC}$ | Clear | NC | J1 | J2 | J* | $\overline{Q}$ | GND | Q | K* | K2 | | Min | Max | Unit |
| 1 $T_C$ = 25°C | $V_{OH}$ | 3006 | 1 | 0.8 V | A | | 4.5 V | | | 2.0 V | 2.0 V | 0.8 V | | GND | -.4 mA | 2.0 V | 0.8 V | Q | 2.4 | | V |
| " | " | " | 2 | 2.0 V | A | | " | | | 0.8 V | 0.8 V | 2.0 V | -.4 mA | " | | 0.8 V | 2.0 V | $\overline{Q}$ | " | | " |
| " | " | " | 3 | | GND | 2.0 V | " | 0.8 V | | | | GND | -.4 mA | " | | GND | | $\overline{Q}$ | " | | " |
| " | " | " | 4 | | GND | 0.8 V | " | 2.0 V | | | | GND | | " | -.4 mA | GND | | Q | " | | " |
| " | $V_{OL}$ | 3007 | 5 | 2.0 V | A | | " | | | 0.8 V | 0.8 V | 2.0 V | | " | 16 mA | 0.8 V | 2.0 V | Q | | 0.4 | " |
| " | " | " | 6 | 0.8 V | A | | " | | | 2.0 V | 2.0 V | 0.8 V | 16 mA | " | | 2.0 V | 0.8 V | $\overline{Q}$ | | " | " |
| " | " | " | 7 | | GND | 0.8 V | " | 2.0 V | | | | GND | 16 mA | " | | | | $\overline{Q}$ | | " | " |
| " | " | " | 8 | | GND | 2.0 V | " | 0.8 V | | | | GND | | " | 16 mA | | | Q | | " | " |
| " | $V_{IC}$ | | 9 | | | | " | | | -12 mA | | | | " | | | | J1 | | -1.5 | " |
| " | " | | 10 | | | | " | | | | -12 mA | | | " | | | | J2 | | " | " |
| " | " | | 11 | | | | " | | | | | -12 mA | | " | | | | J* | | " | " |
| " | " | | 12 | -12 mA | | | " | | | | | | | " | | | | K1 | | " | " |
| " | " | | 13 | | | | " | | | | | | | " | | | -12 mA | K2 | | " | " |
| " | " | | 14 | | | | " | | | | | | | " | | -12 mA | | K* | | " | " |
| " | " | | 15 | | -12 mA | | " | | | | | | | " | | | | Clock | | " | " |
| " | " | | 16 | | | -12 mA | " | | | | | | | " | | | | Preset | | " | " |
| " | " | | 17 | | | | " | -12 mA | | | | | | " | | | | Clear | | " | " |
| " | $I_{IL1}$ | 3009 | 18 | | GND | | 5.5 V | B | | 0.4 V | 4.5 V | 0.4 V | | " | | | | J1 | -0.7 | -1.6 | mA |
| " | " | " | 19 | | GND | | " | B | | 4.5 V | 0.4 V | 0.4 V | | " | | | | J2 | " | " | " |
| " | " | " | 20 | | | | " | | | | | 0.4 V | | " | | | | J* | " | " | " |
| " | " | " | 21 | 0.4 V | GND | B | " | | | | | | | " | | 0.4 V | 4.5 V | K1 | " | " | " |
| " | " | " | 22 | 4.5 V | GND | B | " | | | | | | | " | | 0.4 V | 0.4 V | K2 | " | " | " |
| " | " | " | 23 | | | | " | | | | | | | " | | 0.4 V | | K* | " | " | " |
| " | " | " | 24 | | 0.4 V | | " | | | | | | | " | | | | Clock | " | " | " |
| " | " | " | 25 | 4.5 V | GND | 0.4 V | " | | | | | | | " | | 0.4 V | 4.5 V | Preset | " | " | " |
| " | " | " | 26 | | GND | | " | 0.4 V | | 4.5 V | 4.5 V | 0.4 V | | " | | | | Clear | " | " | " |
| " | $I_{IH1}$ | 3010 | 27 | | | | " | GND | | 2.4 V | GND | 4.5 V | | " | | | | J1 | | 40 | µA |
| " | " | " | 28 | | | | " | GND | | GND | 2.4 V | 4.5 V | | " | | | | J2 | | " | " |
| " | " | " | 29 | | | | " | | | | | 2.4 V | | " | | | | J* | | " | " |
| " | " | " | 30 | 2.4 V | | GND | " | | | | | | | " | | 4.5 V | GND | K1 | | " | " |
| " | " | " | 31 | GND | | GND | " | | | | | | | " | | 4.5 V | 2.4 V | K2 | | " | " |
| " | " | " | 32 | | | | " | | | | | | | " | | 2.4 V | | K* | | " | " |
| " | " | " | 33 | | 2.4 V | | " | | | | | | | " | | | | Clock | | " | " |
| " | $I_{IH2}$ | " | 34 | | | | " | GND | | 5.5 V | GND | 4.5 V | | " | | | | J1 | | 100 | " |
| " | " | " | 35 | | | | " | GND | | GND | 5.5 V | 4.5 V | | " | | | | J2 | | " | " |
| " | | " | 36 | | | | " | | | | | 5.5 V | | " | | | | J* | | " | " |
| " | " | " | 37 | 5.5 V | | GND | " | | | | | | | " | | 4.5 V | GND | K1 | | " | " |
| " | " | " | 38 | GND | | GND | " | | | | | | | " | | 4.5 V | 5.5 V | K2 | | " | " |
| " | " | " | 39 | | | | " | | | | | | | " | | 5.5 V | | K* | | " | " |
| " | " | " | 40 | | 5.5 V | | " | | | | | | | " | | | | Clock | | " | " |
| " | $I_{IH3}$ | " | 41 | GND | A | 2.4 V | " | | | 4.5 V | 4.5 V | GND | | " | | 4.5 V | GND | Preset | | 80 | " |
| " | " | " | 42 | 4.5 V | A | | " | 2.4 V | | GND | GND | 4.5 V | | " | | GND | 4.5 V | Clear | | 80 | " |
| " | $I_{IH4}$ | " | 43 | GND | A | 5.5 V | " | | | 4.5 V | 4.5 V | GND | | " | | 4.5 V | GND | Preset | | 200 | " |
| " | " | " | 44 | 4.5 V | A | | " | 5.5 V | | GND | GND | 4.5 V | | " | | GND | 4.5 V | Clear | | 200 | " |
| " | $I_{OS}$ | 3011 | 45 | | GND | GND | " | | | | | GND | | " | GND | GND | | Q | -20 | -57 | mA |
| " | " | " | 46 | | GND | | " | GND | | | | GND | GND | " | | GND | | $\overline{Q}$ | -20 | -57 | " |
| " | $I_{CC}$ | 3005 | 47 | | | | " | GND | | | | | | " | | | | $V_{CC}$ | | 30 | " |
| " | " | " | 48 | | | GND | " | | | | | | | " | | | | $V_{CC}$ | | 30 | " |
| 2 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = 125ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions and limits as for subgroup 1, except $T_C$ = -55ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |

See notes at end of device type 06.

TABLE III. Group A inspection for device type 06. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 10 | 12 | 13 | 14 | 2 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 11 | | | | |
| | | | Test No. | K1 | Clock | Preset | $V_{CC}$ | Clear | NC | J1 | J2 | J* | $\overline{Q}$ | GND | Q | K* | K2 | | Min | Max | Unit |
| 7 2/ 4/ $T_C$ = 25°C | | | 49 | B | B | A | 4.5 V | B | B | B | B | A | H 3/ | GND | L 3/ | A | B | All output | H or L as shown 3/ | | |
| " | | | 50 | B | B | B | " | A | B | B | B | A | L | " | H | A | B | " | " | | |
| " | | | 51 | B | B | A | " | A | B | B | B | A | L | " | H | B | A | " | " | | |
| " | | | 52 | B | A | A | " | A | B | B | B | A | L | " | H | B | A | " | " | | |
| " | | | 53 | B | B | A | " | A | B | B | B | A | L | " | H | B | A | " | " | | |
| " | | | 54 | A | B | A | " | A | B | B | B | A | L | " | H | B | B | " | " | | |
| " | | | 55 | A | A | A | " | A | B | B | B | A | L | " | H | B | B | " | " | | |
| " | | | 56 | A | B | A | " | A | B | B | B | A | L | " | H | B | B | " | " | | |
| " | | | 57 | A | B | A | " | A | B | B | B | A | L | " | H | A | A | " | " | | |
| " | | | 58 | A | A | A | " | A | B | B | B | A | L | " | H | A | A | " | " | | |
| " | | | 59 | A | B | A | " | A | B | B | B | A | L | " | H | A | A | " | " | | |
| " | | | 60 | A | B | A | " | B | B | B | B | A | H | " | L | A | A | " | " | | |
| " | | | 61 | B | B | A | " | A | B | A | B | B | H | " | L | A | B | " | " | | |
| " | | | 62 | B | A | A | " | A | B | A | B | B | H | " | L | A | B | " | " | | |
| " | | | 63 | B | B | A | " | A | B | A | B | B | H | " | L | A | B | " | " | | |
| " | | | 64 | B | B | A | " | A | B | B | A | B | H | " | L | A | B | " | " | | |
| " | | | 65 | B | A | A | " | A | B | B | A | B | H | " | L | A | B | " | " | | |
| " | | | 66 | B | B | A | " | A | B | B | A | B | H | " | L | A | B | " | " | | |
| " | | | 67 | B | B | A | " | A | B | A | A | A | H | " | L | A | B | " | " | | |
| " | | | 68 | B | A | A | " | A | B | A | A | A | H | " | L | A | B | " | " | | |
| " | | | 69 | B | B | A | " | A | B | A | A | A | H | " | L | A | B | " | " | | |
| " | | | 70 | A | B | A | " | A | B | A | A | B | H | " | L | B | A | " | " | | |
| " | | | 71 | A | A | A | " | A | B | A | A | B | L | " | H | B | A | " | " | | |
| " | | | 72 | A | B | A | " | A | B | A | A | B | L | " | H | B | A | " | " | | |
| " | | | 73 | A | A | A | " | A | B | A | A | B | H | " | L | B | A | " | " | | |
| " | | | 74 | A | B | A | " | A | B | A | A | B | H | " | L | B | A | " | " | | |
| " | | | 75 | A | B | A | " | B | B | A | A | B | H | " | L | B | A | " | " | | |
| " | | | 76 | A | A | A | " | B | B | A | A | B | H | " | L | B | A | " | " | | |
| " | | | 77 | A | B | A | " | B | B | A | A | B | H | " | L | B | A | " | " | | |
| " | | | 78 | A | B | B | " | B | B | A | A | B | L | " | L | B | A | " | " | | |
| " | | | 79 | A | A | B | " | B | B | A | A | B | L | " | L | B | A | " | " | | |
| " | | | 80 | A | B | B | " | B | B | A | A | B | L | " | L | B | A | " | " | | |
| " | | | 81 | B | B | A | " | B | B | B | B | A | H | " | L | A | B | " | " | | |
| " | | | 82 | B | B | A | " | A | B | B | B | A | H | " | L | A | B | " | " | | |
| " | | | 83 | B | A | A | " | A | B | B | B | A | H | " | L | A | B | " | " | | |
| " | | | 84 | B | A | B | " | A | B | B | B | A | L | " | L | A | B | " | " | | |
| " | | | 85 | B | B | B | " | A | B | B | B | A | L | " | H | A | B | " | " | | |
| " | | | 86 | B | B | A | " | A | B | B | B | A | L | " | H | A | B | " | " | | |
| " | | | 87 | B | A | A | " | A | B | B | B | A | L | " | H | A | B | " | " | | |
| " | | | 88 | B | A | A | " | B | B | B | B | A | L | " | L | A | B | " | " | | |
| " | | | 89 | B | A | A | " | A | B | B | B | A | L | " | H | A | B | " | " | | |
| " | | | 90 | A | B | A | " | A | B | A | A | B | L | " | H | B | A | " | " | | |
| " | | | 91 | A | B | B | " | A | B | A | A | B | L | " | H | B | A | " | " | | |
| " | | | 92 | A | A | B | " | A | B | A | A | B | L | " | H | B | A | " | " | | |
| 8 2/ 4/ | Same tests, terminal conditions and limits as for subgroup 7, except $T_C$ = 125ºC and -55°C. | | | | | | | | | | | | | | | | | | | | |

See notes at end of device type 06.

TABLE III. Group A inspection for device type 06. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 10 | 12 | 13 | 14 | 2 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 11 | | | | |
| | | | Test No. | K1 | Clock | Preset | $V_{CC}$ | Clear | NC | J1 | J2 | J* | $\overline{Q}$ | GND | Q | K* | K2 | | Min | Max | Unit |
| 9 | $F_{MAX}$ 5/ | (Fig. 14) | 93 | 2.4 V | IN | 5.0 V | 5.0 V | 5.0 V | | 2.4 V | 2.4 V | GND | | GND | OUT | GND | 2.4 V | Q | 20 | | MHz |
| $T_C$ = 25°C | $F_{MAX}$ 5/ | (Fig. 14) | 94 | 2.4 V | IN | 5.0 V | " | 5.0 V | | 2.4 V | 2.4 V | GND | OUT | " | | GND | 2.4 V | $\overline{Q}$ | 20 | | MHz |
| " | $t_{PLH}$ | 3003 (Fig. 13) | 95 | 5.0 V | 0.8 V | IN | " | IN | | 5.0 V | 5.0 V | GND | OUT | " | | GND | 5.0 V | Clear to $\overline{Q}$ | 5 | 50 | ns |
| " | $t_{PLH}$ | " | 96 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Preset to Q | " | " | " |
| " | $t_{PHL}$ | " | 97 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Clear to Q | " | " | " |
| " | $t_{PHL}$ | " | 98 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Preset to $\overline{Q}$ | " | " | " |
| " | (Fig. 15) | 3003 | 99 | 2.4 V | IN | 5.0 V | " | 5.0 V | | 2.4 V | 2.4 V | GND | | " | OUT | GND | 2.4 V | Clock to Q | 5 | 50 | ns |
| " | $t_{PLH}$ | (Fig. 14) | 100 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | " | " |
| " | $t_{PHL}$ | " | 101 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Clock to Q | " | " | " |
| " | $t_{PHL}$ | " | 102 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | " | " |
| 10 | $F_{MAX}$ 5/ | (Fig. 14) | 103 | 2.4 V | IN | 5.0 V | " | 5.0 V | | 2.4 V | 2.4 V | GND | | " | OUT | GND | 2.4 V | Q | 15 | | MHz |
| $T_C$ = 125°C | $F_{MAX}$ 5/ | (Fig. 14) | 104 | 2.4 V | IN | 5.0 V | " | 5.0 V | | 2.4 V | 2.4 V | GND | OUT | " | | GND | 2.4 V | $\overline{Q}$ | 15 | | MHz |
| " | $t_{PLH}$ | 3003 (Fig. 13) | 105 | 5.0 V | 0.8 V | IN | " | IN | | 5.0 V | 5.0 V | GND | OUT | " | | GND | 5.0 V | Clear to $\overline{Q}$ | 5 | 62 | ns |
| " | $t_{PLH}$ | " | 106 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Preset to Q | " | " | " |
| " | $t_{PHL}$ | " | 107 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Clear to Q | " | " | " |
| " | $t_{PHL}$ | " | 108 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Preset to $\overline{Q}$ | " | " | " |
| " | $t_{PLH}$ | 3003 (Fig. 14) | 109 | 2.4 V | IN | 5.0 V | " | 5.0 V | | 5.0 V | 5.0 V | GND | | " | OUT | GND | 2.4 V | Clock to Q | 5 | 62 | ns |
| " | $t_{PLH}$ | | 110 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | " | " |
| " | $t_{PHL}$ | " | 111 | " | " | " | " | " | | " | " | " | | " | OUT | " | " | Clock to Q | " | " | " |
| " | $t_{PHL}$ | " | 112 | " | " | " | " | " | | " | " | " | OUT | " | | " | " | Clock to $\overline{Q}$ | " | " | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | |

NOTES:
A = Normal clock pulse.
B = Momentary GND, then 4.5 V.

1/ Terminal conditions (pins not designated may be H ≥ 2.0 V, or L ≤ 0.8 V, or open).
2/ Input voltages shown are: A = 2.0 V minimum and B = 0.8 V maximum.
3/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.4 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.
4/ Tests shall be performed in sequence.
5 $F_{MAX}$, 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 07. 1/

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 3 | 2 | 1 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | | | | |
| | | | Test No. | Clock 1 | D1 | Clear 1 | $V_{CC}$ | Clear 2 | D2 | Clock 2 | Preset 2 | Q2 | $\overline{Q}$ 2 | GND | $\overline{Q}$ 1 | Q1 | Preset 1 | | Min | Max | Unit |
| 1 $T_C$ = 25°C | $V_{OH}$ | 3006 | 1 | A | 2.0 V | | 4.5 V | | | | | | | GND | | -.4 mA | | Q1 | 2.4 | | V |
| " | " | " | 2 | A | 0.8 V | | " | | | | | | | " | -.4 mA | | | $\overline{Q}$ 1 | " | | " |
| " | " | " | 3 | | | 0.8 V | " | | | | | | | " | -.4 mA | | 2.0 V | $\overline{Q}$ 1 | " | | " |
| " | " | " | 4 | | | 2.0 V | " | | | | | | | " | | -.4 mA | 0.8 V | Q1 | " | | " |
| " | " | " | 5 | | | | " | | 2.0 V | A | | -.4 mA | | " | | | | Q2 | " | | " |
| " | " | " | 6 | | | | " | | 0.8 V | A | | | -.4 mA | " | | | | $\overline{Q}$ 2 | " | | " |
| " | " | " | 7 | | | | " | 0.8 V | | | 2.0 V | | -.4 mA | " | | | | $\overline{Q}$ 2 | " | | " |
| " | " | " | 8 | | | | " | 2.0 V | | | 0.8 V | -.4 mA | | " | | | | Q2 | " | | " |
| " | $V_{OL}$ | 3007 | 9 | A | 2.0 V | | " | | | | | | | " | 16 mA | | | $\overline{Q}$ 1 | | 0.4 V | " |
| " | " | " | 10 | A | 0.8 V | | " | | | | | | | " | | 16 mA | | Q1 | | " | " |
| " | " | " | 11 | | | 0.8 V | " | | | | | | | " | | 16 mA | 2.0 V | $\overline{Q}$ 1 | | " | " |
| " | " | " | 12 | | | 2.0 V | " | | | | | | | " | 16 mA | | 0.8 V | Q1 | | " | " |
| " | " | " | 13 | | | | " | | 2.0 V | A | | | 16 mA | " | | | | $\overline{Q}$ 2 | | " | " |
| " | " | " | 14 | | | | " | | 0.8 V | A | | 16 mA | | " | | | | Q2 | | " | " |
| " | " | " | 15 | | | | " | 0.8 V | | | 2.0 V | 16 mA | | " | | | | Q2 | | " | " |
| " | " | " | 16 | | | | " | 2.0 V | | | 0.8 V | | 16 mA | " | | | | $\overline{Q}$ 2 | | " | " |
| " | $V_{IC}$ | | 17 | | -12 mA | | " | | | | | | | " | | | | D1 | | -1.5 | " |
| " | " | | 18 | -12 mA | | | " | | | | | | | " | | | | Clock 1 | | " | " |
| " | " | | 19 | | | -12 mA | " | | | | | | | " | | | | Clear 1 | | " | " |
| " | " | | 20 | | | | " | | | | | | | " | | | -12 mA | Preset 1 | | " | " |
| " | " | | 21 | | | | " | | -12 mA | | | | | " | | | | D2 | | " | " |
| " | " | | 22 | | | | " | | | -12 mA | | | | " | | | | Clock 2 | | " | " |
| " | " | | 23 | | | | " | -12 mA | | | | | | " | | | | Clear 2 | | " | " |
| " | " | | 24 | | | | " | | | | -12 mA | | | " | | | | Preset 2 | | " | " |
| " | $I_{IL1}$ | 3009 | 25 | 4.5 V | 0.4 V | 4.5 V | 5.5 V | | | | | | | " | | | 0.4 V | D 1 | -0.5 | -1.6 | mA |
| " | " | " | 26 | 0.4 V | 0.4 V | 4.5 V | " | | | | | | | " | | | 0.4 V | Preset 1 | " | " | " |
| " | " | " | 27 | | | | " | 4.5 V | 0.4 V | 4.5 V | 0.4 V | | | " | | | | D 2 | " | " | " |
| " | " | " | 28 | | | | " | 4.5 V | 0.4 V | 0.4 V | 0.4 V | | | " | | | | Preset 2 | " | " | " |
| " | $I_{IL2}$ | " | 29 | 0.4 V | 0.4 V | 4.5 V | " | | | | | | | " | | | GND | Clock 1 | -1.0 | -3.2 | " |
| " | " | " | 30 | 0.8 V | 4.5 V | 0.4 V | " | | | | | | | " | | | 4.5 V | Clear 1 | " | " | " |
| " | " | " | 31 | | | | " | 4.5 V | 0.4 V | 0.4 V | GND | | | " | | | | Clock 2 | " | " | " |
| " | " | " | 32 | | | | " | 0.4 V | 4.5 V | 0.8 V | 4.5 V | | | " | | | | Clear 2 | " | " | " |
| " | $I_{IH1}$ | 3010 | 33 | 4.5 V | 2.4 V | GND | " | | | | | | | " | | | GND | D1 | | 40 | µA |
| " | " | " | 34 | | | | " | GND | 2.4 V | 4.5 V | GND | | | " | | | | D2 | | 40 | " |
| " | $I_{IH2}$ | " | 35 | 4.5 V | 5.5 V | GND | " | | | | | | | " | | | GND | D1 | | 100 | " |
| " | " | " | 36 | | | | " | GND | 5.5 V | 4.5 V | GND | | | " | | | | D2 | | 100 | " |
| " | $I_{IH3}$ | " | 37 | 2.4 V | | B | " | | | | | | | " | | | GND | Clock 1 | | 80 | " |
| " | " | " | 38 | B | 4.5 V | 4.5 V | " | | | | | | | " | | | 2.4 V | Preset 1 | | " | " |
| " | " | " | 39 | | | | " | B | | 2.4 V | GND | | | " | | | | Clock 2 | | " | " |
| " | " | " | 40 | | | | " | 4.5 V | 4.5 V | B | 2.4 V | | | " | | | | Preset 2 | | " | " |
| " | $I_{IH4}$ | " | 41 | 5.5 V | | B | " | | | | | | | " | | | GND | Clock 1 | | 200 | " |
| " | " | " | 42 | B | 4.5 V | 4.5 V | " | | | | | | | " | | | 5.5 V | Preset 1 | | " | " |
| " | " | " | 43 | | | | " | B | | 5.5 V | GND | | | " | | | | Clock 2 | | " | " |
| " | " | " | 44 | | | | " | 4.5 V | 4.5 V | B | 5.5 V | | | " | | | | Preset 2 | | " | " |
| " | $I_{IH5}$ | " | 45 | GND | GND | 2.4 V | " | | | | | | | " | | | | Clear 1 | | 120 | " |
| " | " | " | 46 | | | | " | 2.4 v | GND | GND | | | | " | | | | Clear 2 | | 120 | " |
| " | $I_{IH6}$ | " | 47 | GND | GND | 5.5 V | " | | | | | | | " | | | | Clear 1 | | 300 | " |
| " | " | " | 48 | | | | " | 5.5 V | GND | GND | | | | " | | | | Clear 2 | | 300 | " |

See notes at end of device type 07.

TABLE III. Group A inspection for device type 07. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 3 | 2 | 1 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | | | | |
| | | | Test No. | Clock 1 | D1 | Clear 1 | $V_{CC}$ | Clear 2 | D2 | Clock 2 | Preset 2 | Q2 | $\overline{Q}$ 2 | GND | $\overline{Q}$ 1 | Q1 | Preset 1 | | Min | Max | Unit |
| 1 | $I_{OS}$ | 3011 | 49 | | | | 5.5 V | | | | | | | GND | | GND | GND | Q1 | -20 | -57 | mA |
| $T_C$ = 25°C | " | " | 50 | | | GND | " | | | | | | | " | GND | | | $\overline{Q}$ 1 | " | " | " |
| " | " | " | 51 | | | | " | | | | GND | GND | | " | | | | Q2 | " | " | " |
| " | " | " | 52 | | | | " | GND | | | | | GND | " | | | | $\overline{Q}$ 2 | " | " | " |
| " | $I_{CC}$ | 3005 | 53 | GND | GND | | " | | GND | GND | GND | GND | | " | | | GND | $V_{CC}$ | | 30 | " |
| " | $I_{CC}$ | 3005 | 54 | GND | GND | GND | " | GND | GND | GND | GND | | | " | | | | $V_{CC}$ | | 30 | " |
| 2 | Same tests, terminal conditions and limits as subgroup 1, except $T_C$ = 125ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions and limits as subgroup 1, except $T_C$ = -55ºC and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 7 2/ 4/ | | | 55 | B | B | B | 4.5 V | B | B | B | B | H 3/ | H 3/ | GND | H 3/ | H 3/ | B | All outputs | H or L as shown 3/ | | |
| $T_C$ = 25°C | | | 56 | B | B | B | " | B | B | B | A | L | H | " | H | L | A | | | | |
| " | | | 57 | B | B | A | " | A | B | B | A | L | H | " | H | L | A | " | " | | |
| " | | | 58 | B | B | A | " | A | B | B | B | H | L | " | L | H | B | " | " | | |
| " | | | 59 | A | B | A | " | A | B | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 60 | A | B | B | " | B | B | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 61 | A | A | B | " | B | A | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 62 | A | A | B | " | B | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 63 | A | A | A | " | A | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 64 | A | A | A | " | A | A | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 65 | A | A | A | " | A | A | A | A | H | L | " | L | H | A | " | " | | |
| " | | | 66 | B | A | A | " | A | A | B | A | H | L | " | L | H | A | " | " | | |
| " | | | 67 | B | B | A | " | A | B | B | A | H | L | " | L | H | A | " | " | | |
| " | | | 68 | A | B | A | " | A | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 69 | A | B | A | " | A | B | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 70 | A | A | B | " | B | A | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 71 | A | B | B | " | B | B | A | B | H | H | " | H | H | B | " | " | | |
| " | | | 72 | A | B | B | " | B | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 73 | A | B | A | " | A | B | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 74 | B | A | A | " | A | A | B | A | L | H | " | H | L | A | " | " | | |
| " | | | 75 | A | A | A | " | A | A | A | A | H | L | " | L | H | A | " | " | | |
| " | | | 76 | A | A | A | " | A | A | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 77 | A | A | A | " | A | A | A | A | H | L | " | L | H | A | " | " | | |
| " | | | 78 | A | A | B | " | B | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 79 | A | A | A | " | A | A | A | A | L | H | " | H | L | A | " | " | | |
| " | | | 80 | A | B | A | " | A | B | A | B | H | L | " | L | H | B | " | " | | |
| " | | | 81 | A | B | A | " | A | B | A | A | H | L | " | L | H | A | " | " | | |
| 8 2/ 4/ | Same tests, terminal conditions and limits as for subgroup 7, except $T_C$ = 125ºC and -55°C. | | | | | | | | | | | | | | | | | | | | |

See notes at end of device type 07.

TABLE III. Group A inspection for device type 07. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 3 | 2 | 1 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | | | | |
| | | | Test No. | Clock 1 | D1 | Clear 1 | $V_{CC}$ | Clear 2 | D2 | Clock 2 | Preset 2 | Q2 | $\overline{Q}$ 2 | GND | $\overline{Q}$ 1 | Q1 | Preset 1 | | Min | Max | Unit |
| 9 | $F_{MAX}$ | (Fig. 11) | 82 | IN | E | 5.0 V | 5.0 V | | | | | | | GND | | OUT | 5.0 V | Q1 | 10 | | MHz |
| $T_C$ = 25°C | " | " | 83 | IN | E | 5.0 V | " | | | | | | | " | OUT | | 5.0 V | $\overline{Q}$ 1 | " | | " |
| " | " | " | 84 | | | | " | 5.0 V | E | IN | 5.0 V | OUT | | " | | | | Q2 | " | | " |
| " | " | " | 85 | | | | " | 5.0 V | E | IN | 5.0 V | | OUT | " | | | | $\overline{Q}$ 2 | " | | " |
| " | $t_{PLH}$ | 3003 ((Fig. 10) | 86 | | | IN | " | | | | | | | " | OUT | | IN | Clear 1 to $\overline{Q}$ 1 | 5 | 25 | ns |
| " | " | " | 87 | | | IN | " | | | | | | | " | | OUT | IN | Preset 1 to Q1 | " | " | " |
| " | " | " | 88 | | | | " | IN | | | IN | | OUT | " | | | | Clear 2 to $\overline{Q}$ 2 | " | " | " |
| " | " | " | 89 | | | | " | IN | | | IN | OUT | | " | | | | Preset 2 to Q2 | " | " | " |
| " | $t_{PHL}$ | " | 90 | | | IN | " | | | | | | | " | | OUT | IN | Clear 1 to Q1 | " | 33 | " |
| " | " | " | 91 | | | IN | " | | | | | | | " | OUT | | IN | Preset 1 to $\overline{Q}$ 1 | " | 36 | " |
| " | " | " | 92 | | | | " | IN | | | IN | | OUT | " | | | | Clear 2 to $\overline{Q}$ 2 | " | 36 | " |
| " | " | " | 93 | | | | " | IN | | | IN | OUT | | " | | | | Preset 2 to Q2 | " | 33 | " |
| " | $t_{PLH}$ | 3003 5/ (Fig. 11) | 94 | IN | IN (A) | B | " | | | | | | | " | | OUT | 5.0 V | Clock 1 to Q1 | 5 | 25 | ns |
| " | " | (Fig. 12) | 95 | IN | IN (A) | 5.0 V | " | | | | | | | " | OUT | | B | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig. 11) | 96 | | | | " | B | IN (A) | IN | 5.0 V | OUT | | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | (Fig. 12) | 97 | | | | " | 5.0 V | IN (A) | IN | B | | OUT | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PHL}$ | (Fig. 12) | 98 | IN | IN (B) | 5.0 V | " | | | | | | | " | | OUT | B | Clock 1 to Q1 | " | 33 | " |
| " | " | (Fig. 11) | 99 | IN | IN (B) | B | " | | | | | | | " | OUT | | 5.0 V | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig. 12) | 100 | | | | " | 5.0 V | IN (B) | IN | B | OUT | | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | (Fig. 11) | 101 | | | | " | B | IN (B) | IN | 5.0 V | | OUT | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |

See notes at end of device type 07.

TABLE III. Group A inspection for device type 07. 1/ - Continued.

| Subgroup | Symbol | MIL-STD-883 method | Case A, B D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Meas. terminal | Test limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case C | 3 | 2 | 1 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | | | | |
| | | | Test No. | Clock 1 | D1 | Clear 1 | $V_{CC}$ | Clear 2 | D2 | Clock 2 | Preset 2 | Q2 | $\overline{Q}$ 2 | GND | $\overline{Q}$ 1 | Q1 | Preset 1 | | Min | Max | Unit |
| 10 | $F_{MAX}$ 6/ | (Fig. 11) | 102 | IN | E | 5.0 V | 5.0 V | | | | | | | GND | | OUT | 5.0 V | Q1 | 10 | | MHz |
| $T_C$ = 125°C | " | " | 103 | IN | E | 5.0 V | " | | | | | | | " | OUT | | 5.0 V | $\overline{Q}$ 1 | " | | " |
| " | " | " | 104 | | | | " | 5.0 V | E | IN | 5.0 V | OUT | | " | | | | Q2 | " | | " |
| " | " | " | 105 | | | | " | 5.0 V | E | IN | 5.0 V | | OUT | " | | | | $\overline{Q}$ 2 | " | | " |
| " | $t_{PLH}$ | 3003 ((Fig. 10) | 106 | | | IN | " | | | | | | | " | OUT | | IN | Clear 1 to $\overline{Q}$ 1 | 5 | 31 | ns |
| | " | " | 107 | | | IN | " | | | | | | | " | | OUT | IN | Preset 1 to Q1 | " | | " |
| " | " | " | 108 | | | | " | IN | | | IN | | OUT | " | | | | Clear 2 to $\overline{Q}$ 2 | " | " | " |
| " | " | " | 109 | | | | " | IN | | | IN | OUT | | " | | | | Preset 2 to Q2 | " | " | " |
| " | $t_{PHL}$ | " | 110 | | | IN | " | | | | | | | " | | OUT | IN | Clear 1 to Q1 | " | 39 | " |
| " | | " | 111 | | | IN | " | | | | | | | " | OUT | | IN | Preset 1 to $\overline{Q}$ 1 | " | 42 | " |
| " | " | " | 112 | | | | " | IN | | | IN | | OUT | " | | | | Preset 2 to $\overline{Q}$ 2 | " | 42 | " |
| " | " | " | 113 | | | | " | IN | | | IN | OUT | | " | | | | Clear 2 to Q2 | " | 39 | " |
| " | $t_{PLH}$ | 3003 5/ (Fig. 11) | 114 | IN | IN (A) | B | " | | | | | | | " | | OUT | 5.0 V | Clock 1 to Q1 | 5 | 31 | ns |
| " | " | (Fig. 12) | 115 | IN | IN (A) | 5.0 V | " | | | | | | | " | OUT | | B | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig. 11) | 116 | | | | " | B | IN (A) | IN | 5.0 V | OUT | | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | (Fig. 12) | 117 | | | | " | 5.0 V | IN (A) | IN | B | | OUT | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| " | $t_{PHL}$ | (Fig. 12) | 118 | IN | IN (B) | 5.0 V | " | | | | | | | " | | OUT | B | Clock 1 to Q1 | " | 39 | " |
| " | " | (Fig. 11) | 119 | IN | IN (B) | B | " | | | | | | | " | OUT | | 5.0 V | Clock 1 to $\overline{Q}$ 1 | " | " | " |
| " | " | (Fig. 12) | 120 | | | | " | 5.0 V | IN (B) | IN | B | OUT | | " | | | | Clock 2 to Q2 | " | " | " |
| " | " | (Fig. 11) | 121 | | | | " | B | IN (B) | IN | 5.0 V | | OUT | " | | | | Clock 2 to $\overline{Q}$ 2 | " | " | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | |

NOTES:
A = Normal clock pulse.
B = Momentary GND, then 4.5 V.
E = Input D connected to $\overline{Q}$ .

1/ Terminal conditions (pins not designated may be H ≥ 2.0 V, or L ≤ 0.8 V, or open).
2/ Input voltages shown are: A = 2.0 V minimum and B = 0.8 V maximum.
3/ Output voltages shall be either: (a) H = 2.4 V, minimum and L = 0.4 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.
4/ Tests shall be performed in sequence.
5/ Tests shall be performed for both D input pulses (A and B).
6/ $F_{MAX}$, minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

5. PACKAGING

5.1 Packaging requirements. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service or Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of the specification.

b. PIN and compliance identifier, if applicable (see 1.2).

c. Requirements for delivery of one copy of the conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.

d. Requirements for certificate of compliance, if applicable.

e. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.

f. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.

g. Requirements for product assurance options.

h. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.

I Requirements for "JAN" marking.

j. Packaging Requirements (see 5.1)

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, 3990 E. Broad Street, Columbus, Ohio 43218-3990.

6.4 Superseding information. The requirements of MIL-M-38510 have been superseded to take advantage of the available Qualified Manufacturer Listing (QML) system provided by MIL-PRF-38535. Previous references to MIL-M-38510 in this document have been replaced by appropriate references to MIL-PRF-38535. All technical requirements now consist of this specification and MIL-PRF-38535. The MIL-M-38510 specification sheet number and PIN have been retained to avoid adversely impacting existing government logistics systems and contractor's parts lists.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535, MIL-HDBK-1331, and as follows:

GND ..... Electrical ground (common terminal)
$V_{IN}$ ..... Voltage level at an input terminal

6.6 Logistic support. Lead materials and finishes (see 3.4) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.

6.7 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 should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

| Military device type | Generic-industry type |
|---|---|
| 01 | SN5472 (Circuit A) |
| 01 | DM5472 (Circuit B) |
| 01 | MC5472 (Circuit C) |
| 02 | SN5473 (Circuit A) |
| 02 | DM5473 (Circuit B) |
| 02 | S5473 (Circuit C) |
| 03 | SN54107 (Circuit A) |
| 03 | DM54107 (Circuit B) |
| 03 | S54107 (Circuit C) |
| 04 | SN5476 (Circuit A) |
| 04 | DM5476 (Circuit B) |
| 04 | S5476 (Circuit C) |
| 05 | 5474 (Circuit A) |
| 05 | DM5474 (Circuit B) |
| 06 | 5470 |
| 07 | SN5479 (Circuit A) |
| 07 | MC5479 (Circuit B) |

6.8 Change from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

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

Preparing activity:
DLA - CC

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

(Project 5962-2096)

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