

MILITARY SPECIFICATION

MICROCIRCUITS, LINEAR, CMOS/ANALOG
 MULTIPLEXERS/DEMULTIPLEXERS WITH OVERVOLTAGE PROTECTION,
 MONOLITHIC SILICON, POSITIVE LOGIC

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

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, CMOS/Analog logic microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided for each type and are reflected in the complete part number.

1.2 Part number. The part number shall be in accordance with MIL-M-38510.

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

| <u>Device type</u> | <u>Circuit</u> |
|--------------------|--|
| 01 | Single 16-channel MUX/DEMUX |
| 02 | Single 16-channel MUX/DEMUX with overvoltage protection |
| 03 | Differential 8-channel MUX/DEMUX |
| 04 | Differential 8-channel MUX/DEMUX with overvoltage protection |
| 05 | Single 8-channel MUX/DEMUX with overvoltage protection |
| 06 | Differential 4-channel MUX/DEMUX with overvoltage protection |
| 07 | Single 8-channel MUX/DEMUX |
| 08 | Differential 4-channel MUX/DEMUX |

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

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

| <u>Letter</u> | <u>Case outline (see MIL-M-38510, appendix C)</u> |
|---------------|---|
| E | D-2 (16-lead, 1/4" x 7/8"), dual-in-line package |
| X | See figure 4 (28-lead, 9/16" x 1-7/16"), dual-in-line package |

1.3 Absolute maximum ratings:

Supply voltage between V+ and V-:

Device types 02, 04, 05, and 06- - - - - +40 V
 Device types 01, 03, 07, and 08- - - - - +32 V

V+ to ground:

Device types 02, 04, 05, and 06- - - - - +20 V
 Device types 01, 03, 07, and 08- - - - - +16 V

Digital input voltage:

Device types 02, 04, 05, and 06- - - - - $((V-)-4 V) \leq V_D \leq ((V+)+4 V)$
 Device types 01, 03, 07, and 08- - - - - $-0.3 V \leq V_D \leq (V+)$

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: NASA Part Project Office, Code 311.A NASA/Goddard Space Flight Center, Greenbelt, MD 20771, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

Analog input:
 Device types 02, 04, 05, and 06- - - ((V-)-20 V < V_A ≤ ((V+)+20 V)
 Device types 01, 03, 07, and 08- - - (V-) ≤ V_A ≤ (V+)
 Storage temperature - - - - - -65°C to +150°C
 Lead temperature (soldering
 10 seconds)- - - - - 300°C
 Junction temperature (T_J)- - - - - 175°C

1.4 Recommended operating conditions:

V+ - - - - - +15 V
 V- - - - - -15 V
 V_{REF} - - - - - Open
 V_{IL} (max)- - - - - 0.8 V
 V_{IH} (min)- - - - -
 Device types 01, 03, 07, and 08- - - 2.4 V
 Device types 02, 04, 05, and 06- - - 4.0 V
 V_{EN}- - - - -
 Device types 02, 04, 05, and 06- - - 4.0 V
 Device types 01, 03, 07, and 08- - - 4.5 V
 Ambient operating temperature
 range (T_A) - - - - - -55°C to +125°C

1.5 Power and thermal characteristics.

| Package | Case outline | Maximum allowable power dissipation ^{1/} | Maximum θ _{JC} ^{2/} | Maximum θ _{JA} |
|-------------|--------------|---|---------------------------------------|-------------------------|
| 16-lead DIP | E | 400 mW @ T _A = 125°C | 50°C/W | 125°C/W |
| 28-lead DIP | X | 400 mW @ T _A = 125°C | 51°C/W | 125°C/W |

2. APPLICABLE DOCUMENTS

2.1 Government documents

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

SPECIFICATION

MILITARY

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

STANDARD

MILITARY

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

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

^{1/} All leads welded or soldered to PC board.

^{2/} Applies only when T_A ≥ 75°C.

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

3. REQUIREMENTS

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

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein. Although eutectic die bonding is preferred, epoxy die bonding may be performed. However, the resin used shall be Dupont 5504A conductive silver paste, or equivalent, which is cured at 200°C ±10°C for a minimum of 2 hours. The use of equivalent epoxies or cure cycles shall be approved by the qualifying activity. Equivalency shall be demonstrated in data submitted to the qualifying activity for verification.

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

3.2.2 Functional diagrams. The function diagrams shall be as specified on figure 2.

3.2.3 Truth tables. The truth tables shall be as specified on figure 3.

3.2.4 Case outlines. The case outline "X" shall be as specified on figure 4, and case outline "E" shall be as specified in 1.2.3.

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

3.2.6 Package and sealing material. Package and sealing material shall be in accordance with MIL-M-38510.

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

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

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

3.6 Marking. Marking shall be in accordance with MIL-M-38510 and 1.2 herein.

3.6.1 Serialization. All class S devices shall be serialized in accordance with MIL-M-38510.

3.6.2 Correctness of indexing and marking. All devices shall be subjected to the final electrical tests in table II after part number marking, to verify that they are correctly indexed and identified by part number. Optionally, an approved electrical test may be devised especially for this requirement.

3.7 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 82 (see MIL-M-38510, appendix E).

4. PRODUCT ASSURANCE PROVISIONS

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

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

- a. Burn-in tests (method 1015 of MIL-STD-883).
 - (1) For class S devices: dynamic test (test condition D) using the circuit shown on figure 7. Test duration shall be 240 hours minimum. Static test (test condition C) using the circuit shown on figure 6. Test duration shall be 48 hours minimum.
 - (2) For class B devices: Test condition A using the circuit shown on figure 6 or test condition D using the circuit shown on figure 7 or test condition F using an accelerated burn-in circuit approved by the qualifying activity.

NOTE: Burn-in circuit resistor tolerances for figures 6 and 7 shall be ± 10 percent.
- b. Interim and final electrical parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.
- c. The percent defective allowable (PDA) for class S and class B devices shall be as specified in MIL-M-38510, based on failures from group A, subgroup 1 test after cooldown as final electrical test in accordance with method 5004 of MIL-STD-883 and with no intervening electrical measurements. If interim electrical parameter tests are performed prior to burn-in, failures resulting from pre burn-in screening may be excluded from the PDA. If interim electrical parameter tests prior to burn-in are omitted, then all screening failures shall be included in the PDA. The verified failures of group A, subgroup 1 after burn-in divided by the total number of devices submitted for burn-in in that lot shall be used to determine the percent defective for that lot, and the lot shall be accepted or rejected based on the PDA for the applicable device class.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510 and as specified herein. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

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

- a. Tests shall be as specified in table II herein.
- b. Subgroups 5, 6, 7, and 8 of method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 4 (Cf measurements) shall be measured only for initial qualification and after process or design changes which may affect input capacitance. Capacitance shall be measured between the designated terminal and GND at a frequency of 1 MHz. Subgroup 4 shall be performed using a sample of 5 devices with no failures allowed.
- d. Subgroup 13 shall be added to group A inspection using an LTPD of 10 and shall consist of the tests, conditions, and limits as specified in table III.
- e. Subgroup 12 shall be performed for initial qualification only using a sample of 5 devices for each device type submitted to group A inspections with no failures allowed. If not more than 1 failure is found in the first sample of 5, a second sample of 5 is permitted with no further failures allowed.

TABLE I. Electrical performance characteristics.

| Characteristic | Symbol | Conditions 1/ 2/ V- = -15 V, V+ = +15 V, V _{EN} = 4.5 V, GND = 0 V -55°C < T _A < 125°C Unless otherwise specified | Device type | Limits | | Unit |
|---|----------------------|---|--------------------------|--------|------|------|
| | | | | Min | Max | |
| Positive input clamping voltage | V _{IC(POS)} | T _A = 25°C, V+ = V- = 0 V I _{IN} = 1 mA | 02,04,05, 06 | | 1.5 | V dc |
| Negative input clamping voltage | V _{IC(NEG)} | T _A = 25°C, V+ = V- = 0 V I _{IN} = -1 mA | 02,04,05, 06 | -1.5 | | |
| Input leakage current 3/ | I _{IH} | Measure address inputs sequen- tially, connect all unused address inputs to GND | All | -0.1 | +1.0 | μA |
| Input leakage current 3/ | I _{IL} | Measure address inputs sequen- tially connect all unused address inputs to 5 V | All | -1.0 | +0.1 | |
| Leakage current into the source terminal of an "OFF" switch | I _{S(OFF)} | V _S = 10 V, V _{EN} = 0.8 V All unused sources = -10 V T _A = 25°C -55°C ≤ T _A ≤ 125°C | All | -1 | 1 | nA |
| | | | All | -50 | 50 | |
| | | | All | -1 | 1 | |
| Leakage current into the drain terminal of an "OFF" switch | I _{D+(OFF)} | V _D = 10 V, V _{EN} = 0.8 V All unused sources to -10 V T _A = 25°C -55°C ≤ T _A ≤ 125°C | 01,02 | -20 | 20 | nA |
| | | | 03,04, 05,06 07,08 | -10 | 10 | |
| | | | 01,02, | -500 | 500 | |
| | | | 03,04 | -250 | 250 | |
| | | | 05,07 | | | |
| | | | 06,08 | -125 | 125 | |
| | I _{D-(OFF)} | V _D = 10 V, V _{EN} = 0.8 V All unused sources to -10 V T _A = 25°C -55°C ≤ T _A ≤ 125°C | 01,02 | -20 | 20 | |
| | | | 03,04, 05,06 07,08 | -10 | 10 | |
| | | | 01,02, | -500 | 500 | |
| | | | 03,04 | -250 | 250 | |
| | | 05,07 | | | | |
| | | 06,08 | -125 | 125 | | |

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

| Characteristic | Symbol | Conditions 1/ 2/ V ₋ = -15 V, V ₊ = +15 V, V _{EN} = 4.5 V, GND = 0 V -55°C < T _A < 125°C Unless otherwise specified | Device type | Limits | | Unit |
|--|------------------------------------|---|--------------------------|--------|-----|------|
| | | | | Min | Max | |
| Leakage current from an "ON" driver into the switch (drain) | I _{D(ON)} | V _S = 10 V, V _D = 10 V Connect all unused sources to -10 V T _A = 25°C -55°C ≤ T _A ≤ 125°C | 01,02 | -20 | 20 | nA |
| | | | 03,04, 05,06 07,08 | -10 | 10 | |
| | | | 01,02, 03,04 05,07 | -500 | 500 | |
| | | | 03,04 05,07 | -250 | 250 | |
| | | | 06,08 | -125 | 125 | |
| | | | 01,02 | -20 | 20 | |
| | | | 03,04, 05,06 07,08 | -10 | 10 | |
| | | | 01,02, 03,04 05,07 | -500 | 500 | |
| | | | 03,04 05,07 | -250 | 250 | |
| | | | 06,08 | -125 | 125 | |
| Overvoltage protected, leakage current into the drain terminal of an "OFF" switch | I _{D(OFF)} overvoltage | V _S = 33 V, V _D = 0 V, V _{EN} = 0.8 V | 02,04,05, 06 | -2.0 | 2.0 | μA |
| | | | 02,04,05, 06 | -2.0 | 2.0 | |
| Positive supply current | I(+) | V _A = 0 V, V _{EN} = 5 V | 01,03 | | 14 | mA |
| | | | 02,04,05, 06 | | 2.0 | |
| | | | 07,08 | | 12 | |
| Negative supply current | I(-) | V _A = 0 V, V _{EN} = 5 V | 01,03 | -14 | | |
| | | | 02,04,05, 06 | -1 | | |
| | | | 07,08 | -12 | | |
| Standby positive supply current | I+S _{BY} | V _A = 0 V, V _{EN} = 0 V | 01,03 | | 3.0 | mA |
| | | | 02,04,05, 06 | | 2.0 | |
| | | | 07,08 | | 3.5 | |
| Standby negative supply current | I-S _{BY} | V _A = 0 V, V _{EN} = 0 V | 01,03 | -4.0 | | |
| | | | 02,04,05, 06 | -1.0 | | |
| | | | 07,08 | -3.5 | | |

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

| Characteristic | Symbol | Conditions 1/ 2/ V ₋ = -15 V, V ₊ = +15 V, V _{EN} = 4.5 V, GND = 0 V -55°C < T _A < 125°C Unless otherwise specified | | | Device type | Limits | | Unit | |
|----------------------------|------------------|---|-----------------------|-------------------------|------------------------|--------|-----|------|-------|
| | | | | | | Min | Max | | |
| Capacitance: Address | C _A | V ₊ = V ₋ = 0 V, T _A = 25°C f = 1 MHz | | | A11 | | 10 | pF | |
| Capacitance: Enable | C _{EN} | V ₊ = V ₋ = 0 V, T _A = 25°C f = 1 MHz | | | A11 | | 10 | pF | |
| Capacitance: Output switch | C _{OS} | V ₊ = V ₋ = 0 V See table III | | | 01 | | 90 | pF | |
| | | | | | 02 | | 85 | | |
| | | | | | 03,04 | | 50 | | |
| | | | | | 05,07 | | 45 | | |
| | | | | | 06,08 | | 25 | | |
| Capacitance: Input switch | C _{IS} | V ₊ = V ₋ = 0 V See table III | | | A11 | | 10 | | |
| Switch "ON" resistance | R _{DS1} | V _S = 10 V | I _D = 1 mA | T _A = 25°C | 01,03 | | 600 | Ω | |
| | | | | T _A = -55°C | | | | | |
| | | | | T _A = 125°C | | | | | 700 |
| | | | | I _D = 100 μA | T _A = 25°C | 02,04 | | | 1,500 |
| | | | | | T _A = -55°C | | | | |
| | | | | | T _A = 125°C | 2,000 | | | |
| | | | | I _D = 100 μA | T _A = 25°C | 05,06 | | | 1,500 |
| | | | | | T _A = -55°C | | | | |
| | | | | T _A = 125°C | 1,800 | | | | |
| | | | | I _D = 1 mA | T _A = 25°C | 07,08 | | | 400 |
| T _A = -55°C | | | | | | | | | |
| T _A = 125°C | 500 | | | | | | | | |

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

| Characteristic | Symbol | Conditions 1/ 2/ V ₋ = -15 V, V ₊ = +15 V, V _{EN} = 4.5 V, GND = 0 V -55°C < T _A < 125°C Unless otherwise specified | | Device type | Limits | | Unit | | | |
|-------------------------------|------------------|---|--------------------------|------------------------|-----------------|-------|--------------------------|------------------------|-------------------------------------|-------|
| | | | | | Min | Max | | | | |
| Switch "ON" resistance | R _{DS1} | V _S = -10 V | I _D = -1 mA | T _A = 25°C | 01,03 | 600 | Ω | | | |
| | | | | T _A = -55°C | | | | | | |
| | | | I _D = -100 μA | T _A = 25°C | 02,04 | 1,500 | | | | |
| | | | | T _A = -55°C | | | | | | |
| | | | I _D = -1 mA | T _A = 25°C | 05,06 | 1,500 | | | | |
| | | | | T _A = -55°C | | | | | | |
| | R _{DS2} | V _S = 7.5 V | I _D = 1 mA | T _A = 25°C | 01,03,07, 08 | 1,000 | | | | |
| | | | | T _A = -55°C | | | | | | |
| | | | I _D = 100 μA | T _A = 25°C | 02,04 | 2,400 | | | | |
| | | | | T _A = -55°C | | | | | | |
| | | | I _D = -1 mA | T _A = 25°C | 05,06 | 2,200 | | | | |
| | | | | T _A = -55°C | | | | | | |
| Single channel isolation | V _{ISO} | f = 200 kHz, V _{GEN} = 1 V _{p-p} See figure 17 | A11 | 50 | 10 | dB | | | | |
| | | | | | | | I _D = -1 mA | T _A = 25°C | 01,03,07, 08 | 1,000 |
| | | | | | | | | T _A = -55°C | | |
| | | | | | | | I _D = -100 μA | T _A = 25°C | 02,04 | 2,400 |
| | | | | | | | | T _A = -55°C | | |
| | | | | | | | I _D = -1 mA | T _A = 25°C | 05,06 | 2,200 |
| T _A = -55°C | | | | | | | | | | |
| Crosstalk between channels | V _{CT} | f = 200 kHz, V _{GEN} = 1 V _{p-p} See figure 18 | A11 | 50 | 10 | dB | | | | |
| | | | | | | | Charge transfer error | V _{CTE} | V _S = GND, see figure 19 | A11 |

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

| Characteristic | Symbol | Conditions 1/ 2/ V ₋ = -15 V, V ₊ = +15 V, V _{EN} = 4.5 V, GND = 0 V -55°C < T _A < 125°C Unless otherwise specified | | Device type | Limits | | Unit |
|--|---|---|------------------------|----------------|--------|-------|------|
| | | | | | Min | Max | |
| Break-before-make time delay | t _g | See figure 16 | T _A = 25°C | All | 5 | | ns |
| Propagation delay times: Address inputs to I/O channels | t _{ON} (A) t _{OFF} (A) | R _L = 1 kΩ C _L = 100 pF See figures 8, 10, 12, and 14 | T _A = 25°C | All | | 1,000 | ns |
| | | | T _A = -55°C | | | | |
| | | | T _A = 125°C | | | 1,500 | |
| Enable to I/O | t _{ON} (EN) t _{OFF} (EN) | R _L = 1 kΩ C _L = 100 pF See figures 9, 11, 13, and 15 | T _A = 25°C | All | | 1,000 | |
| | | | T _A = -55°C | | | | |
| | | | T _A = 125°C | | | 1,500 | |

1/ Current flowing in either direction between any associated input and output terminals of the switch shall be 30 mA maximum.

2/ Input = source; Output = drain.

3/ Input current of one input node.

TABLE II. Electrical test requirements.

| MIL-STD-883 test requirements | Subgroups (see table III) <u>1/</u> , <u>2/</u> , <u>3/</u> | |
|--|--|-----------------------------------|
| | Class S <u>4/</u> | Class B |
| Interim electrical parameters (method 5004) | 1 | 1 |
| Final electrical parameters (method 5004) | 1,2,3,9 | 1,2,3,9, |
| Group A test requirements (method 5005) | 1,2,3,4,9, 10,11,12,13 | 1,2,3,4,9, 12,13 |
| Group B test requirements (method 5005) | 1, 2, 3 and table IV delta limits | N/A |
| Group C end-point electrical parameters (method 5005) | N/A | 1 and table IV delta limits |
| Additional electrical subgroups for group C periodic inspection | N/A | 10,11,12 |
| Group D end-point electrical parameters (method 5005) | 1, 2, 3 | 1 |
| Additional electrical subgroups for group D periodic inspection | 12** | None |

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

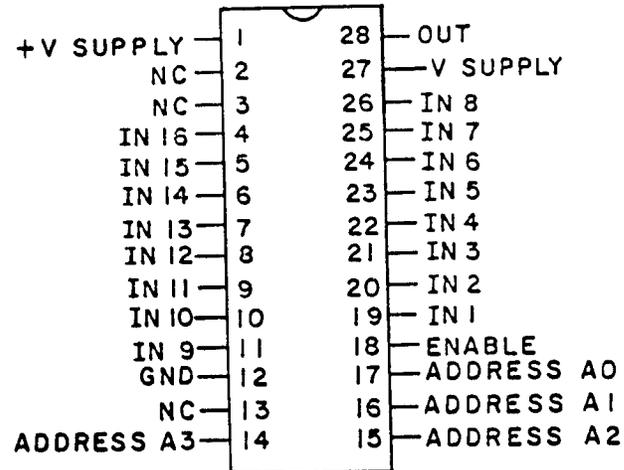
2/ See 4.4.1c.

3/ See 4.4.1e.

4/ See 4.4.4b.

Device type 01

Case X



Device type 02

Case X

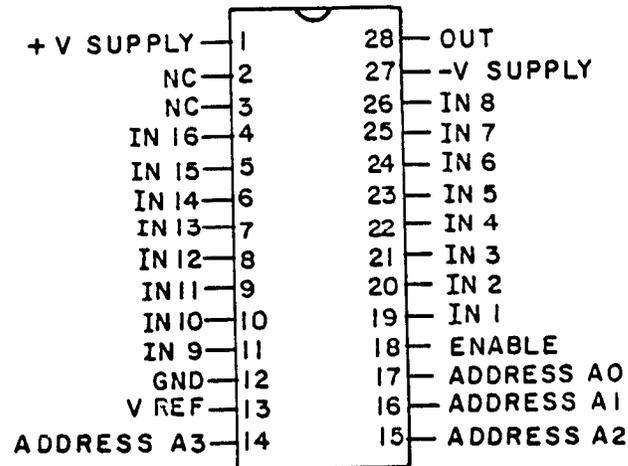
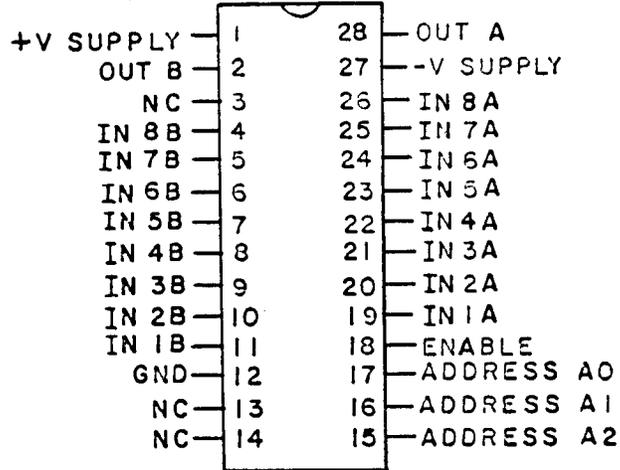


FIGURE 1. Terminal connections.

Device type 03

Case X



Device type 04

Case X

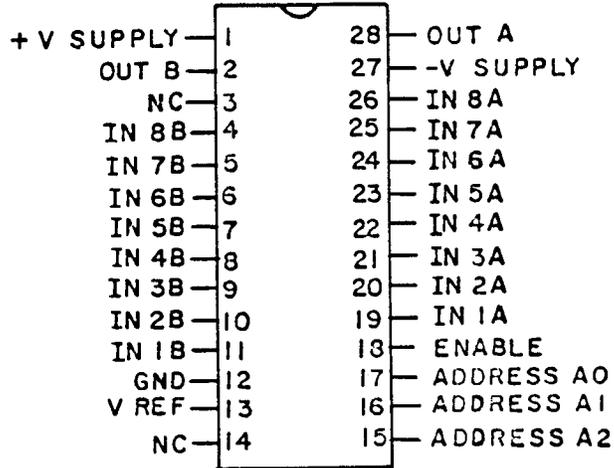
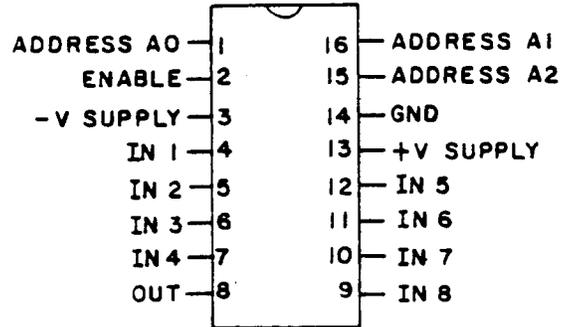


FIGURE 1. Terminal connections - Continued.

Device types 05 and 07

Case E



Device types 06 and 08

Case E

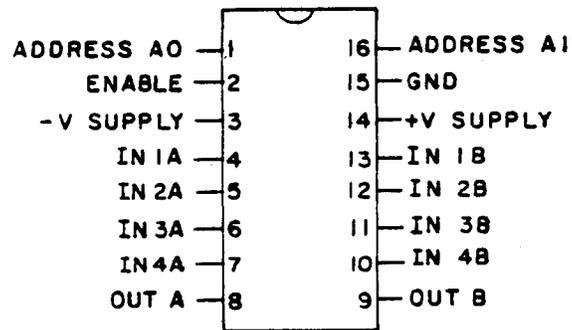


FIGURE 1. Terminal connections - Continued.

Device types 01 and 02

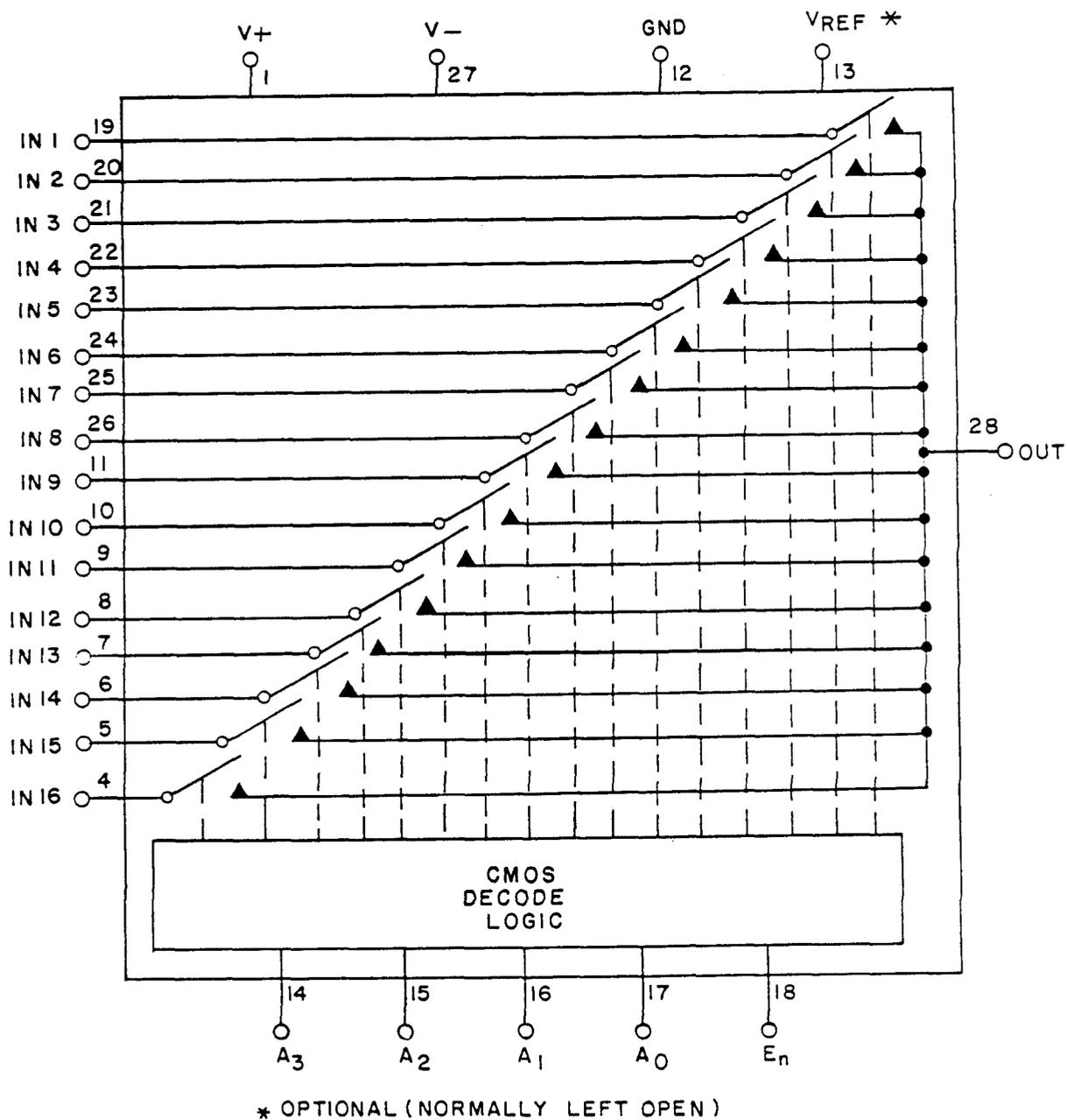


FIGURE 2. Functional diagrams.

Device types 03 and 04

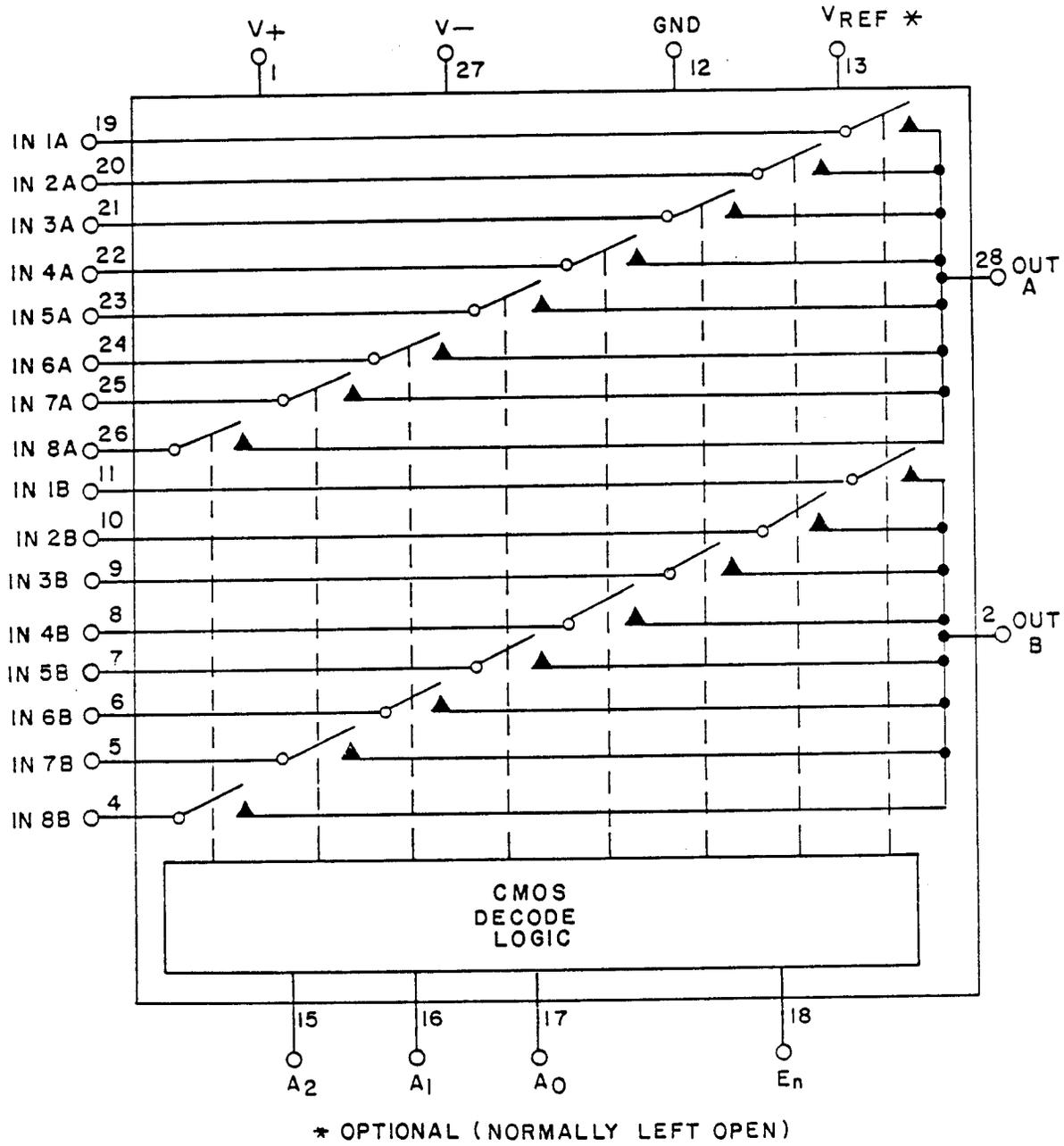
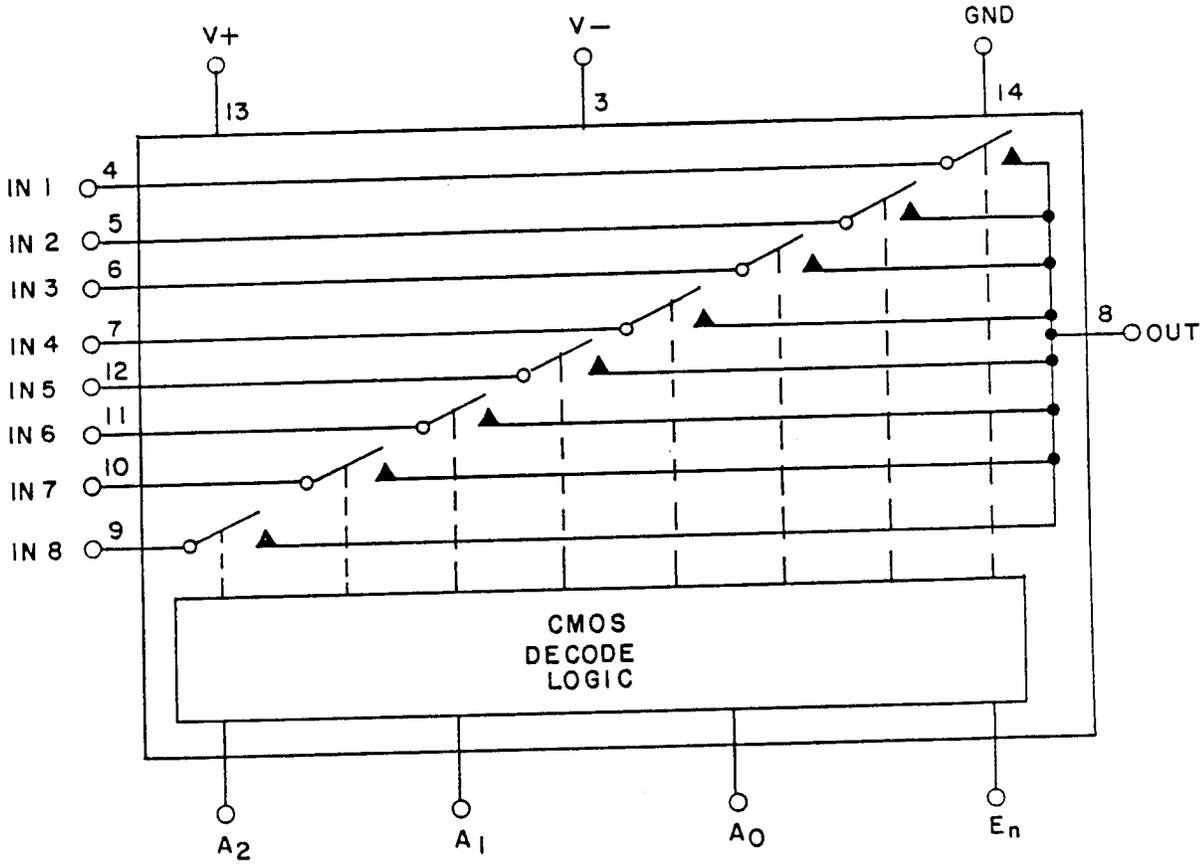


FIGURE 2. Functional diagrams - Continued.

Device types 05 and 07



Device types 06 and 08

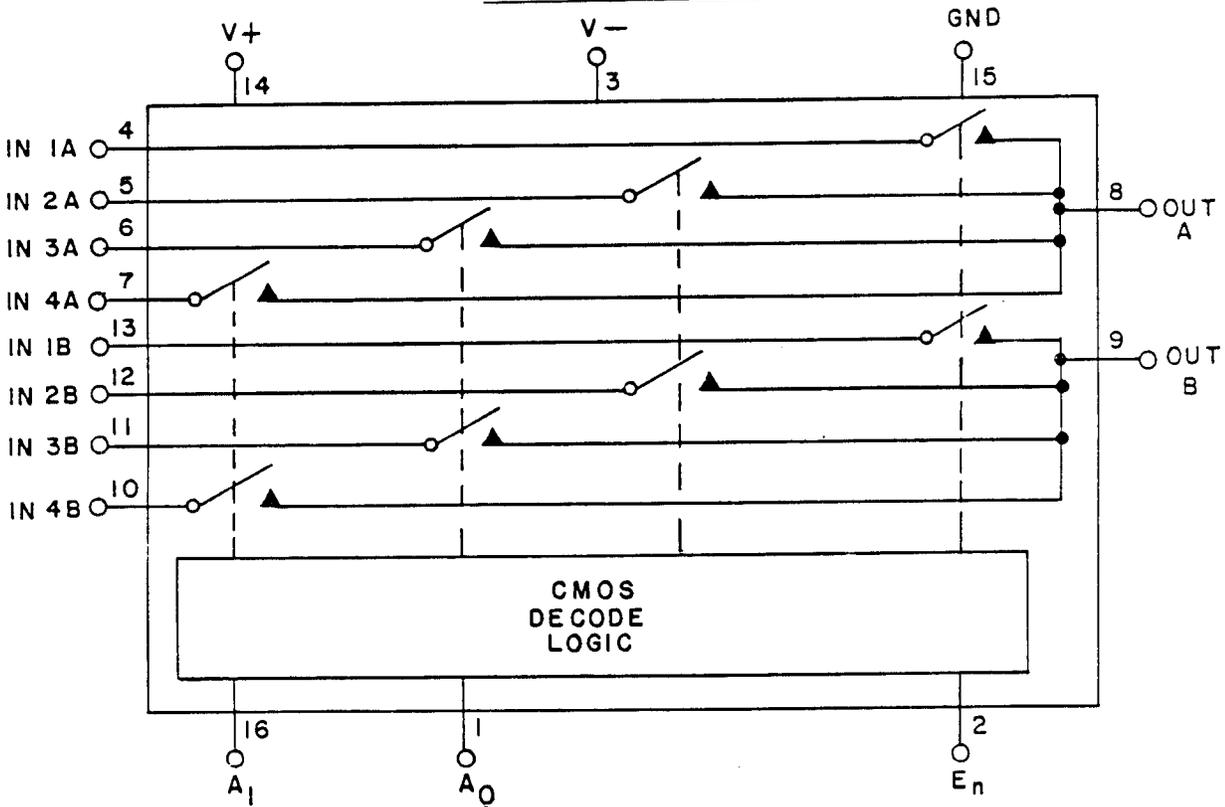


FIGURE 2. Functional diagrams - Continued.

Device types 01 and 02

| A3 | A2 | A1 | A0 | EN | CHANNEL SELECTED |
|----|----|----|----|----|------------------|
| X | X | X | X | L | NONE |
| L | L | L | L | H | 1 |
| L | L | L | H | H | 2 |
| L | L | H | L | H | 3 |
| L | L | H | H | H | 4 |
| L | H | L | L | H | 5 |
| L | H | L | H | H | 6 |
| L | H | H | L | H | 7 |
| L | H | H | H | H | 8 |
| H | L | L | L | H | 9 |
| H | L | L | H | H | 10 |
| H | L | H | L | H | 11 |
| H | L | H | H | H | 12 |
| H | H | L | L | H | 13 |
| H | H | L | H | H | 14 |
| H | H | H | L | H | 15 |
| H | H | H | H | H | 16 |

Device types 03 and 04

| A2 | A1 | A0 | EN | CHANNEL SELECTED |
|----|----|----|----|------------------|
| X | X | X | L | NONE |
| L | L | L | H | 1A,1B |
| L | L | H | H | 2A,2B |
| L | H | L | H | 3A,3B |
| L | H | H | H | 4A,4B |
| H | L | L | H | 5A,5B |
| H | L | H | H | 6A,6B |
| H | H | L | H | 7A,7B |
| H | H | H | H | 8A,8B |

Device types 05 and 07

| A2 | A1 | A0 | EN | CHANNEL SELECTED |
|----|----|----|----|------------------|
| X | X | X | L | NONE |
| L | L | L | H | 1 |
| L | L | H | H | 2 |
| L | H | L | H | 3 |
| L | H | H | H | 4 |
| H | L | L | H | 5 |
| H | L | H | H | 6 |
| H | H | L | H | 7 |
| H | H | H | H | 8 |

Device types 06 and 08

| A1 | A0 | EN | CHANNEL SELECTED |
|----|----|----|------------------|
| X | X | L | NONE |
| L | L | H | 1A,1B |
| L | H | H | 2A,2B |
| H | L | H | 3A,3B |
| H | H | H | 4A,4B |

FIGURE 3. Truth tables.

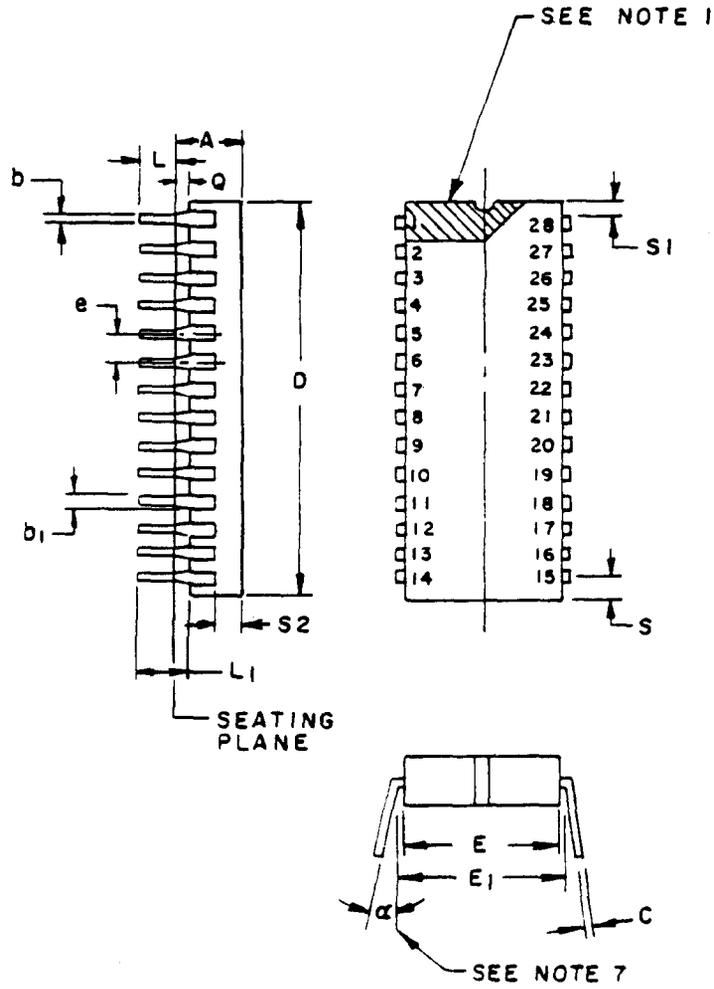


FIGURE 4. Case outline X (28-lead, 9/16" x 1-7/16").

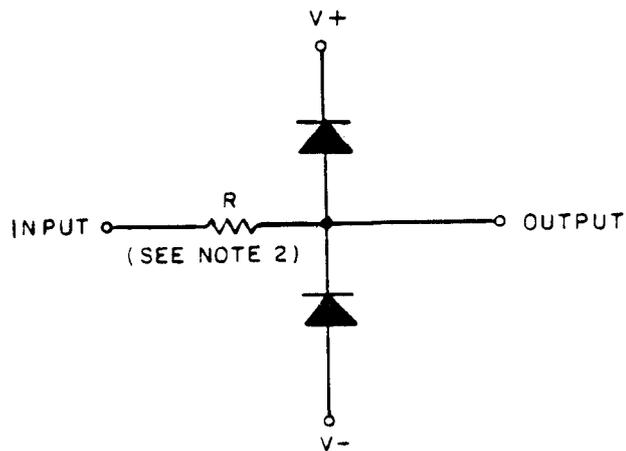
| Symbol | Inches | | Millimeters | | Notes |
|----------------|----------|------|-------------|-------|-------|
| | Min | Max | Min | Max | |
| A | --- | .200 | --- | 5.08 | |
| b | .014 | .023 | 0.36 | 0.58 | 8 |
| b ₁ | .040 | .070 | 1.02 | 1.78 | 2,8 |
| C | .008 | .014 | .20 | 0.36 | 8 |
| D | --- | 1.48 | --- | 37.6 | 4 |
| E | .520 | .610 | 13.21 | 13.97 | 4 |
| E ₁ | .585 | .620 | 14.86 | 15.75 | 7 |
| E ₂ | N/A | N/A | N/A | N/A | |
| E ₃ | N/A | N/A | N/A | N/A | |
| e | .100 BSC | | 2.54 BSC | | 5,9 |
| L | .125 | .200 | 3.18 | 5.08 | |
| L ₁ | .150 | | 3.81 | 5.08 | |
| Q | .015 | .060 | 0.51 | 1.52 | 3 |
| Q ₁ | N/A | N/A | N/A | N/A | |
| S | --- | .098 | --- | 2.49 | 6 |
| S ₁ | .005 | --- | 0.13 | --- | 6 |
| S ₂ | .005 | --- | 0.13 | N/A | |
| α | 0° | 15° | 0° | 15° | |

NOTES:

1. Index area; a notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The minimum limit for dimension b₁ may be .023 (.58 mm) for leads number 1, 14, 15, and 28 only.
3. Dimension Q shall be measured from the seating plane to the base plane.
4. This dimension allows for off-center lid, meniscus and glass overrun.
5. The basic pin spacing is .100 (2.54 mm) between centerlines. Each pin centerline shall be located within ±.010 (.25 mm) of its exact longitudinal position relative to pins 1 and 28.
6. Applies to all four corners (leads number 1, 14, 15, and 28), and 40.5 appendix C of MIL-M-38510 shall apply.
7. Lead center when α=0°. E₁ shall be measured at the centerline of the leads (see 40.4 appendix C of MIL-M-38510).
8. All leads - Increase maximum limit by .003 (.08 mm) measured at the center of the flat, when lead finish A or B is applied.
9. Twenty six spaces.
10. If this configuration is used, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.

FIGURE 4. Case outline x (28-lead, 9/16" x 1-7/16") - Continued.

Network A

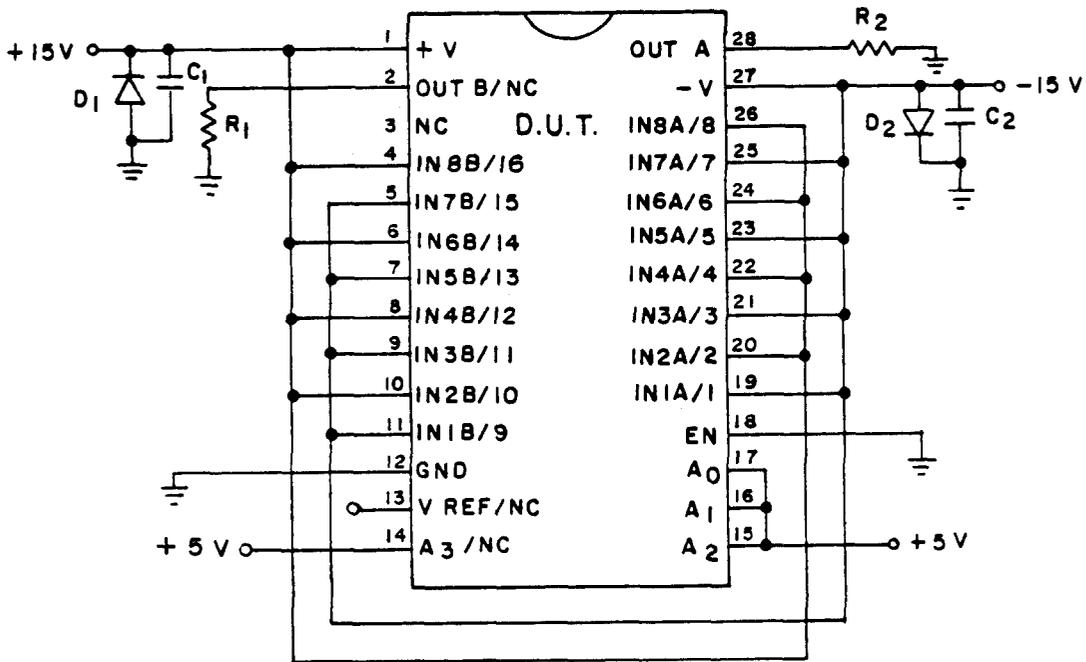


NOTES:

1. All device inputs shall be protected from transients such as electrostatic discharge. This circuit is intrinsic to the device.
2. This resistance is 200 to 2,000 ohms depending on device type.

FIGURE 5. Address and Enable input protection circuit for device types 02, 04, 05 and 06.

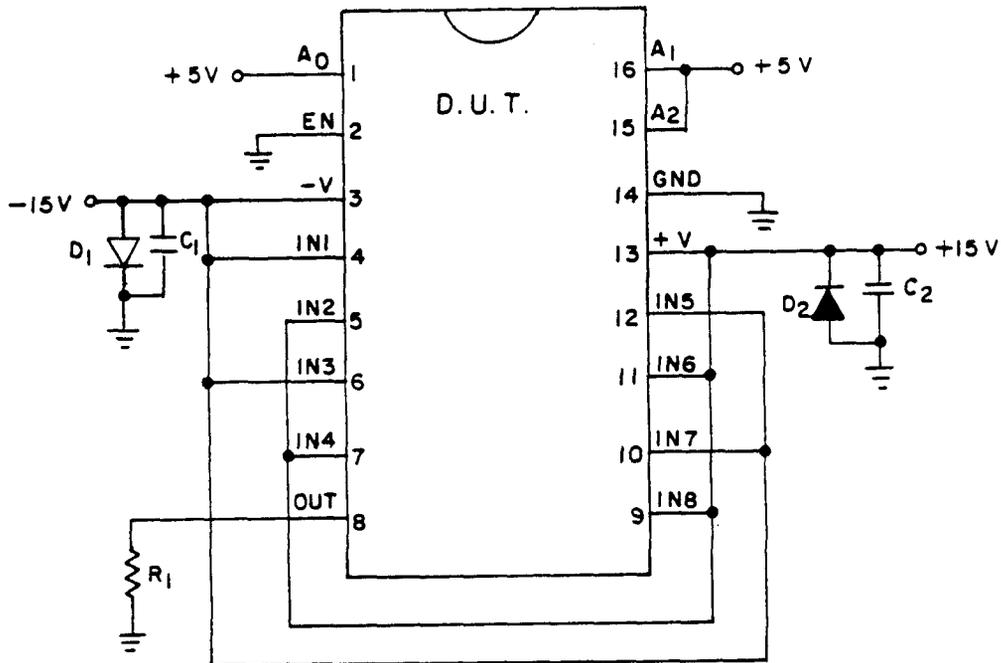
Device types 01, 02, 03, and 04



NOTE: $R_1, R_2 = 10 \text{ k}\Omega \pm 10\%, 1/2 \text{ or } 1/4 \text{ W.}$
 $C_1, C_2 = .01 \mu\text{f.}$
 $D_1, D_2 = 1\text{N}4002 \text{ (or equivalent).}$

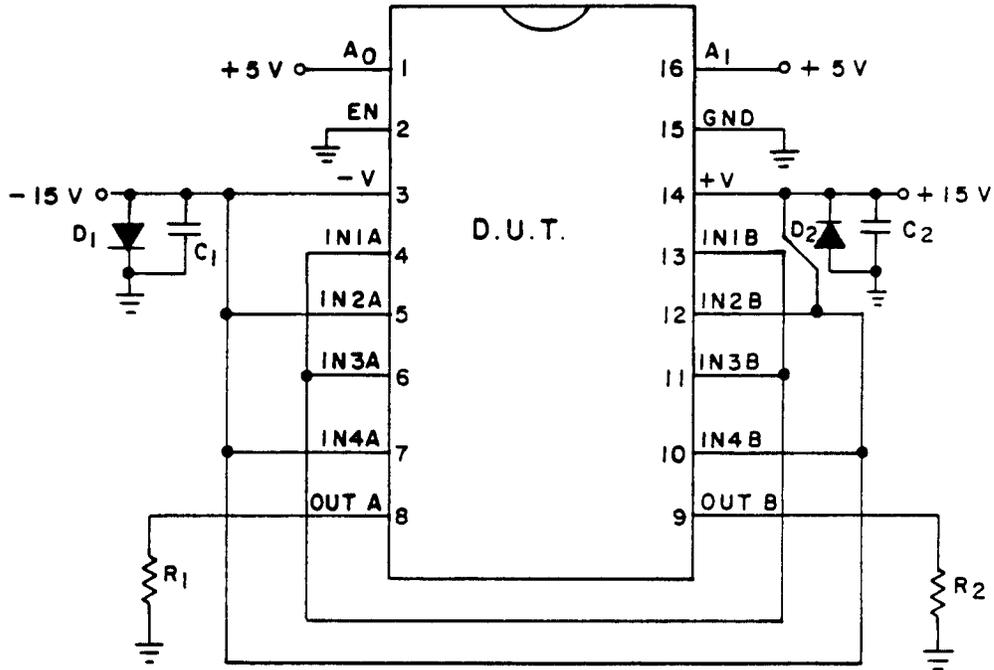
FIGURE 6. Static burn-in test circuits.

Device types 05 and 07



NOTE: $R_1 = 10 \text{ k}\Omega \pm 10\%$, 1/4 or 1/2 W.
 $C_1, C_2 = .01 \text{ }\mu\text{f}$.
 $D_1, D_2 = 1\text{N}4002$ (or equivalent).

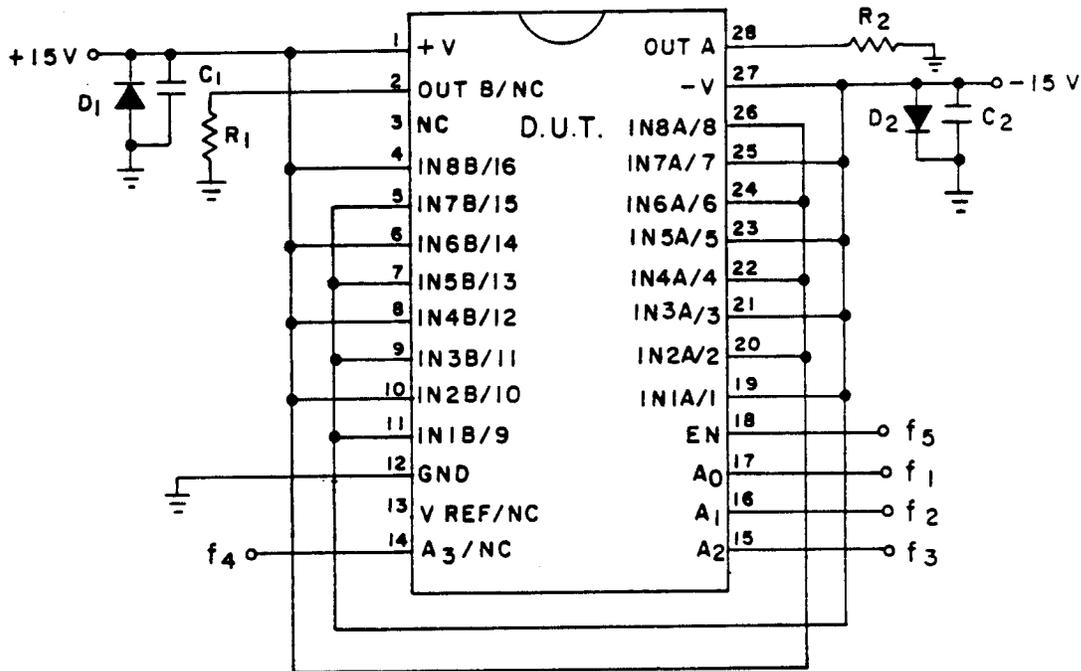
FIGURE 6. Static burn-in test circuits - Continued.

Device types 06 and 08

NOTE: $R_1, R_2 = 10 \text{ k}\Omega \pm 10\%$, 1/2 or 1/4 W.
 $C_1, C_2 = .01 \mu\text{f}$.
 $D_1, D_2 = 1\text{N}4002$ (or equivalent).

FIGURE 6. Static burn-in test circuits - Continued.

Device types 01, 02, 03, and 04

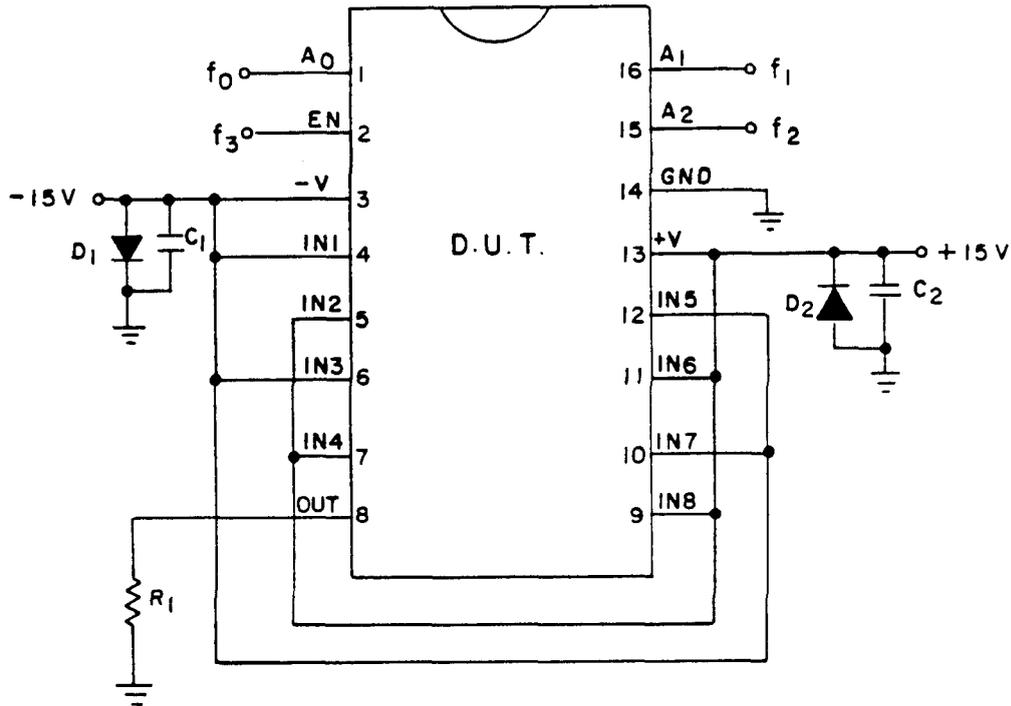


NOTES:

1. $R_1, R_2 = 10 \text{ k}\Omega \pm 10\%$, 1/2 or 1/4 W.
 $C_1, C_2 = .01 \mu\text{f}$.
 $D_1, D_2 = 1\text{N}4002$ (or equivalent).
2. Input signal requirements:
 - a. Square wave, 50% duty cycle.
 - b. $f_1 = 100 \text{ kHz}$.
 $f_2 = 50 \text{ kHz}$.
 $f_3 = 25 \text{ kHz}$.
 $f_4 = 12.5 \text{ kHz}$.
 $f_5 = 6.25 \text{ kHz}$.
 - c. t_{TLH} and $t_{\text{THL}} < 1 \mu\text{s}$.
 - d. Voltage = 0 to 15 V peak minimum.

FIGURE 7. Dynamic and steady state life test circuits.

Device types 05 and 07

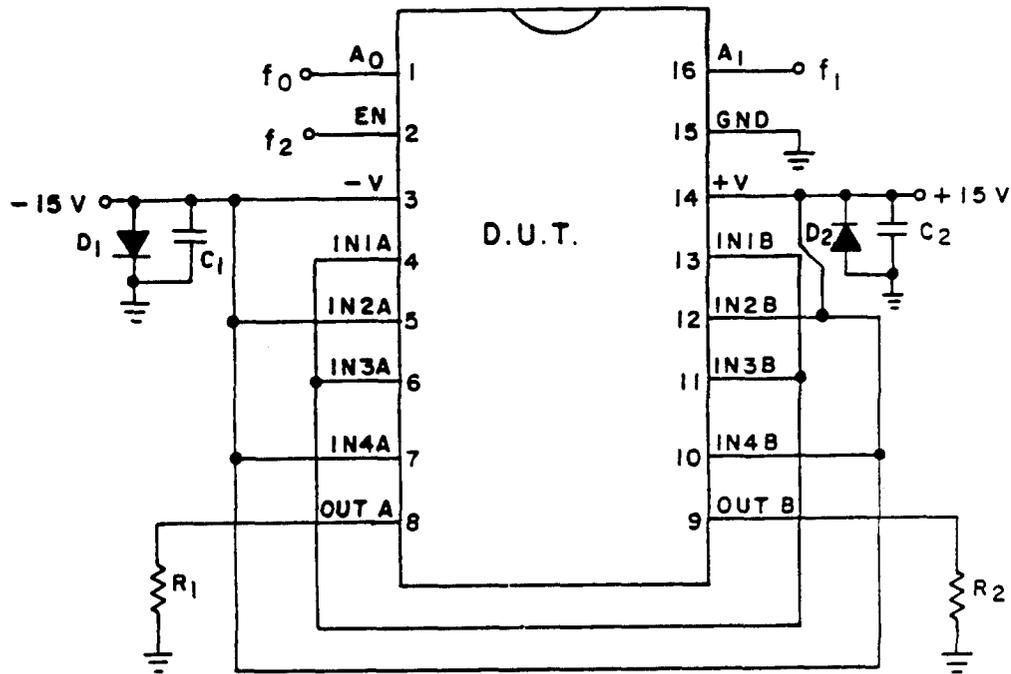


NOTES:

1. $R_1 = 10 \text{ k}\Omega \pm 10\%$, 1/2 or 1/4 W.
 $C_1, C_2 = .01 \text{ }\mu\text{f}$.
 $D_1, D_2 = 1\text{N}4002$ (or equivalent).
2. Input signal requirements:
 - a. Square wave, 50% duty cycle.
 - b. $f_0 = 100 \text{ kHz}$.
 $f_1 = 50 \text{ kHz}$.
 $f_2 = 25 \text{ kHz}$.
 $f_3 = 12.5 \text{ kHz}$.
 - c. t_{TLH} and $t_{\text{THL}} < 1 \text{ }\mu\text{s}$.
 - d. Voltage = 0 to 15 V peak minimum.

FIGURE 7. Dynamic and steady state life test circuits - Continued.

Device types 06 and 08

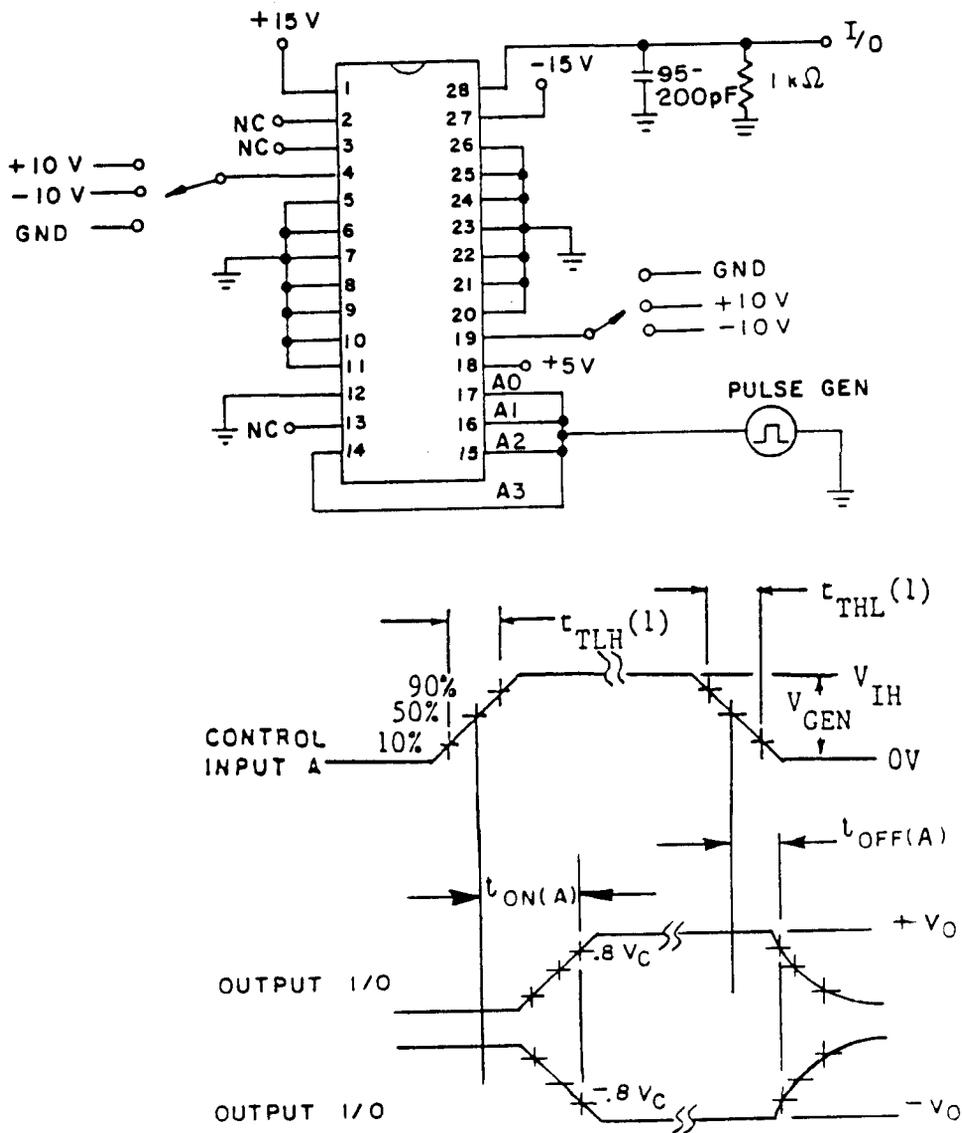


NOTES:

1. $R_1, R_2 = 10 \text{ k}\Omega \pm 10\%$, 1/2 or 1/4 W.
 $C_1, C_2 = .01 \text{ }\mu\text{f}$.
 $D_1, D_2 = 1\text{N}4002$ (or equivalent).
2. Input signal requirements:
 - a. Square wave, 50% duty cycle.
 - b. $f_0 = 100 \text{ kHz}$.
 $f_1 = 50 \text{ kHz}$.
 $f_2 = 25 \text{ kHz}$.
 - c. t_{TLH} and $t_{\text{THL}} = 1 \text{ }\mu\text{s}$.
 - d. Voltage = 0 to 15 V peak minimum.

FIGURE 7. Dynamic and steady state life test circuits - Continued.

Device types 01 and 02

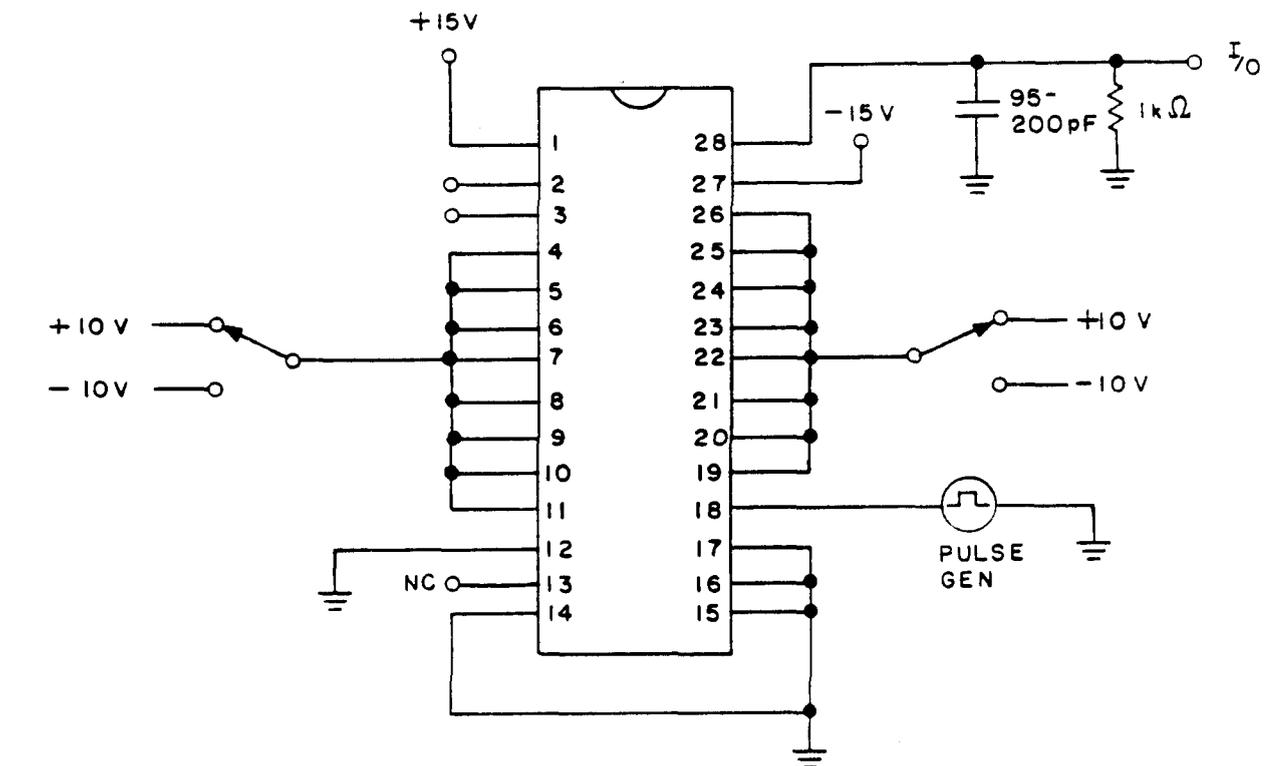


Input pulse requirements:
 $V_{GEN} = 4V$
 $t_{THL(1)} = t_{TLH(1)} \leq 20 \text{ ns.}$

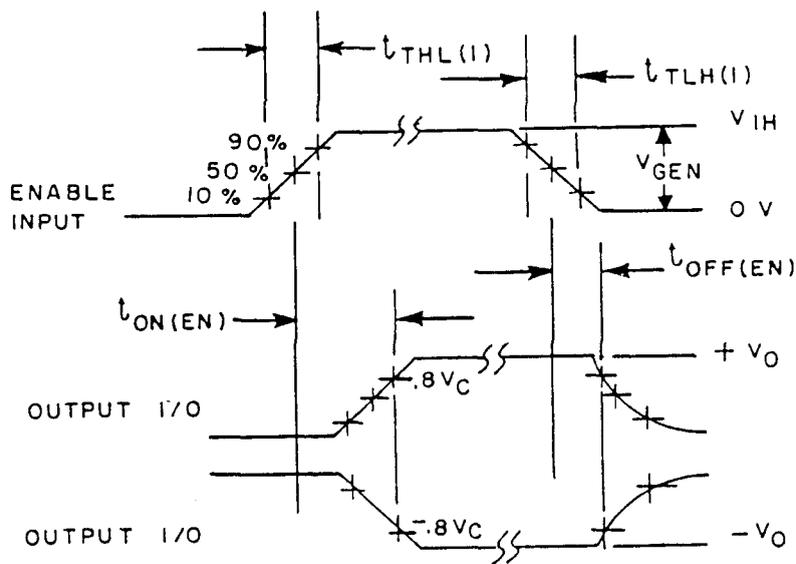
DYNAMIC TEST WAVEFORMS

FIGURE 8. Switching times test circuit and waveforms.
 (Address inputs to I/O)

Device types 01 and 02



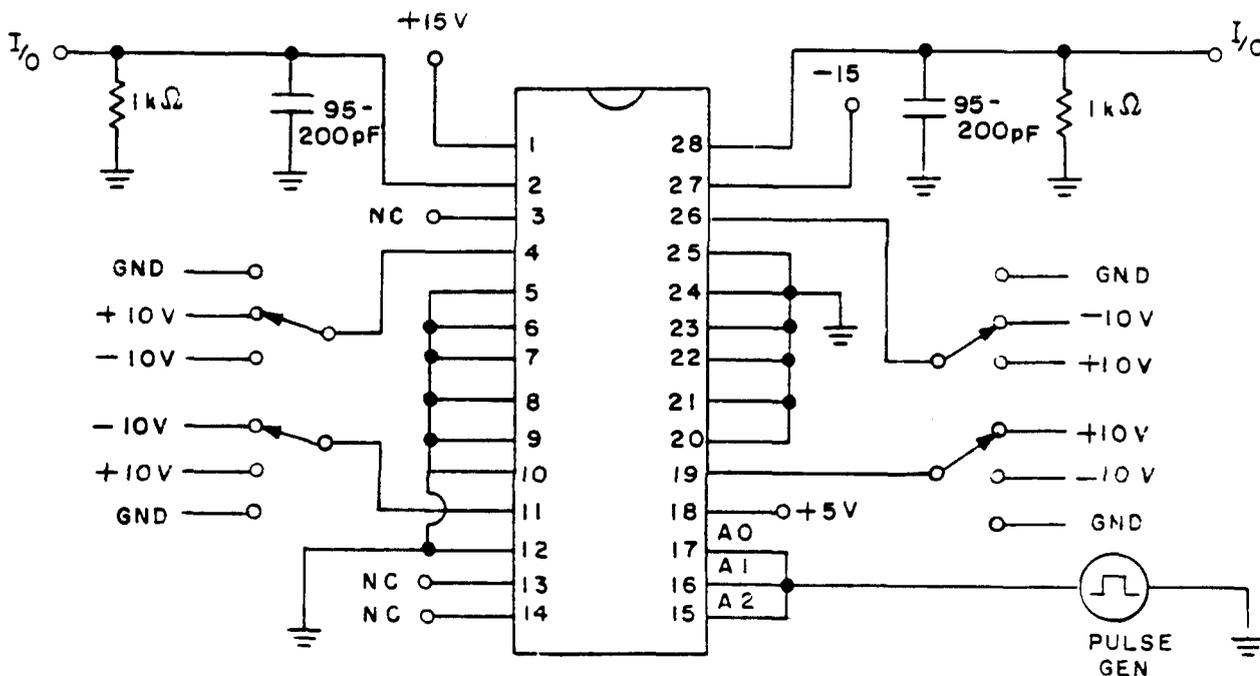
Input pulse requirements:
 $V_{GEN} = 4V.$
 $t_{THL(1)} = t_{TLH(1)} \leq 20 ns.$



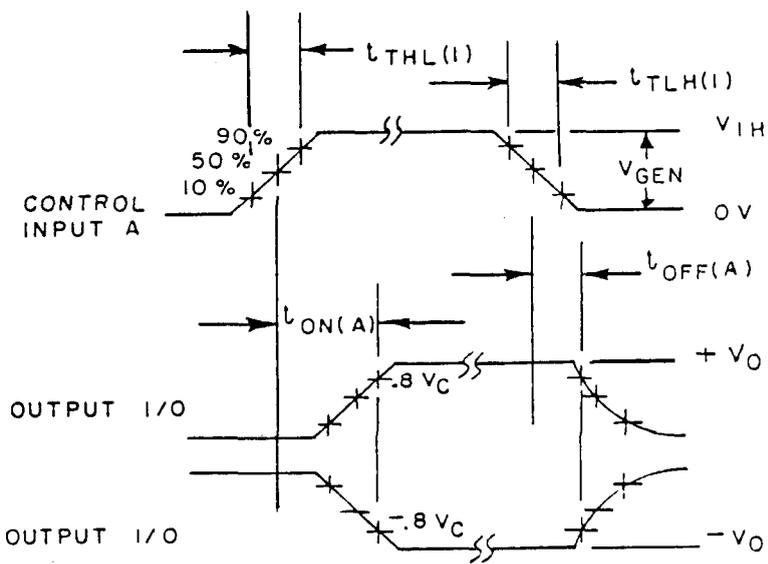
DYNAMIC TEST WAVEFORMS

FIGURE 9. Switching times test circuit and waveforms.
 (Enable to I/O)

Device types 03 and 04



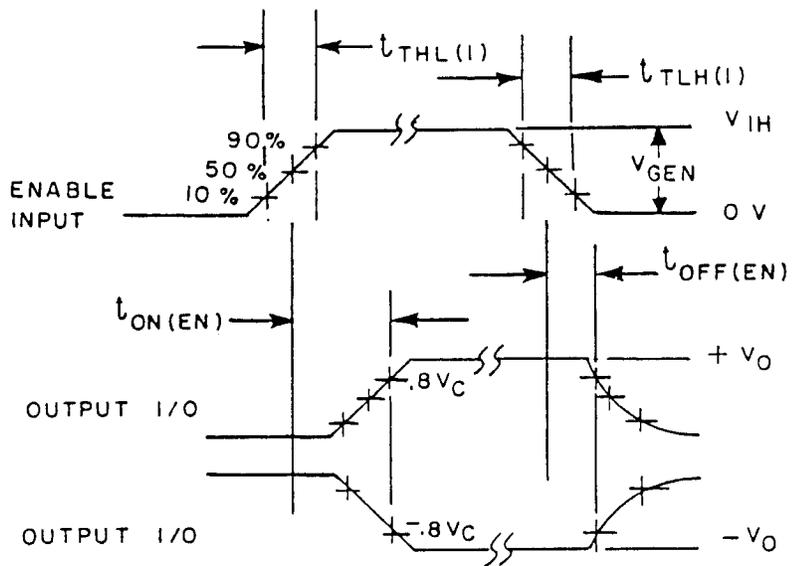
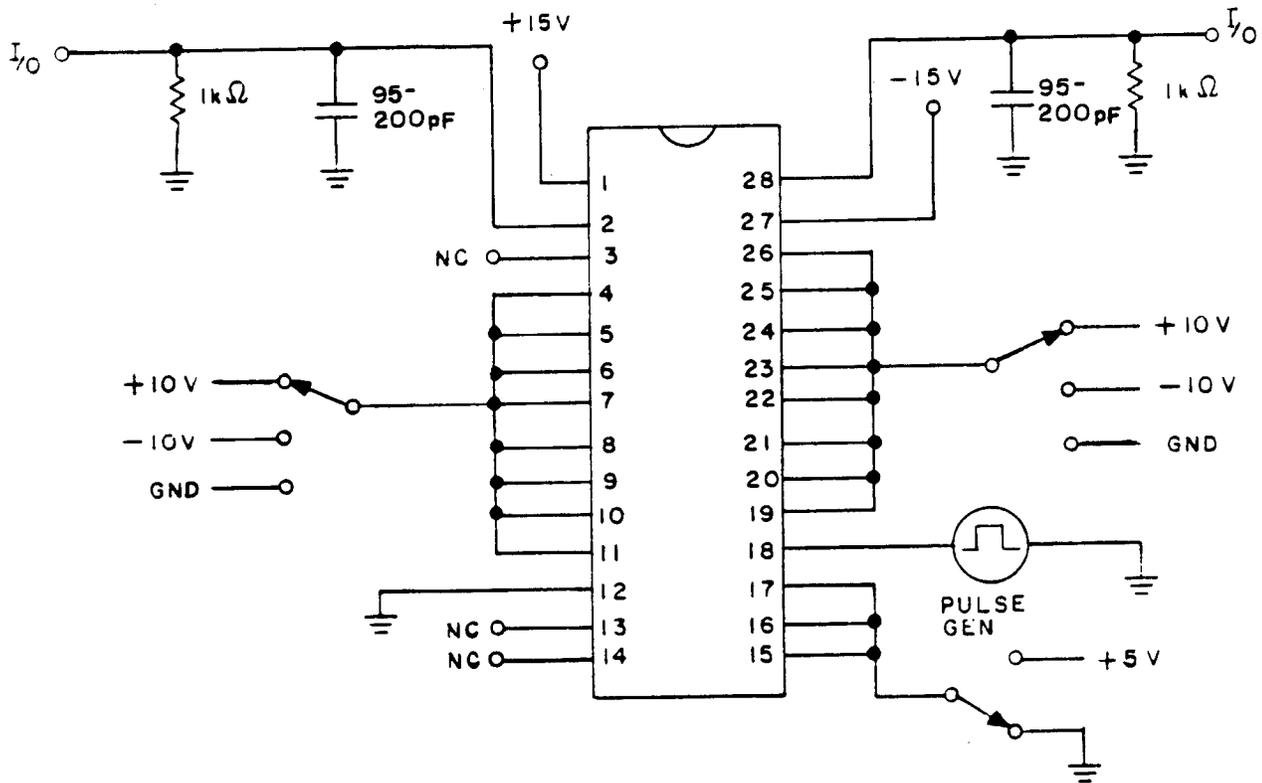
Input pulse requirements:
 $V_{GEN} = 4 \text{ V.}$
 $t_{THL(1)} = t_{TLH(1)} \leq 20 \text{ ns.}$



DYNAMIC TEST WAVEFORMS

FIGURE 10. Switching times test circuit and waveforms.
 (Address inputs to I/O)

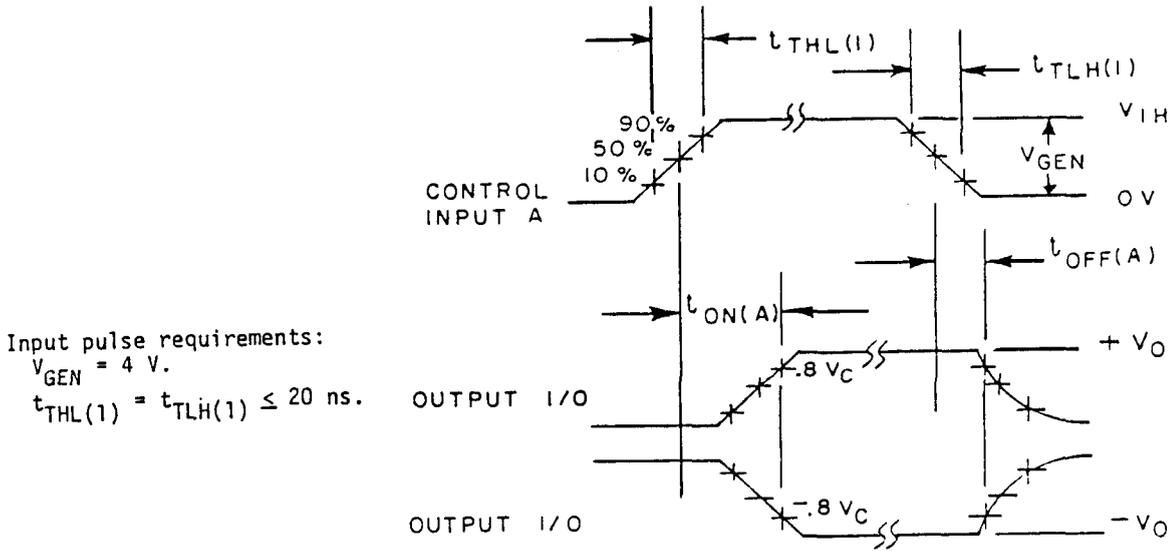
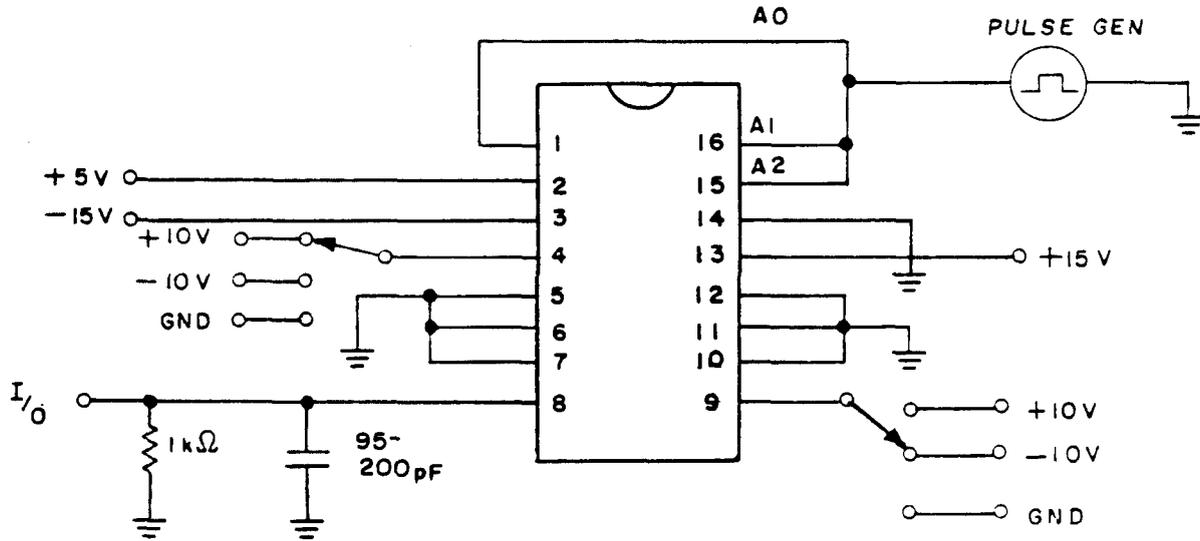
Device types 03 and 04



DYNAMIC TEST WAVEFORMS

FIGURE 11. Switching times test circuit and waveforms.
(Enable to I/O)

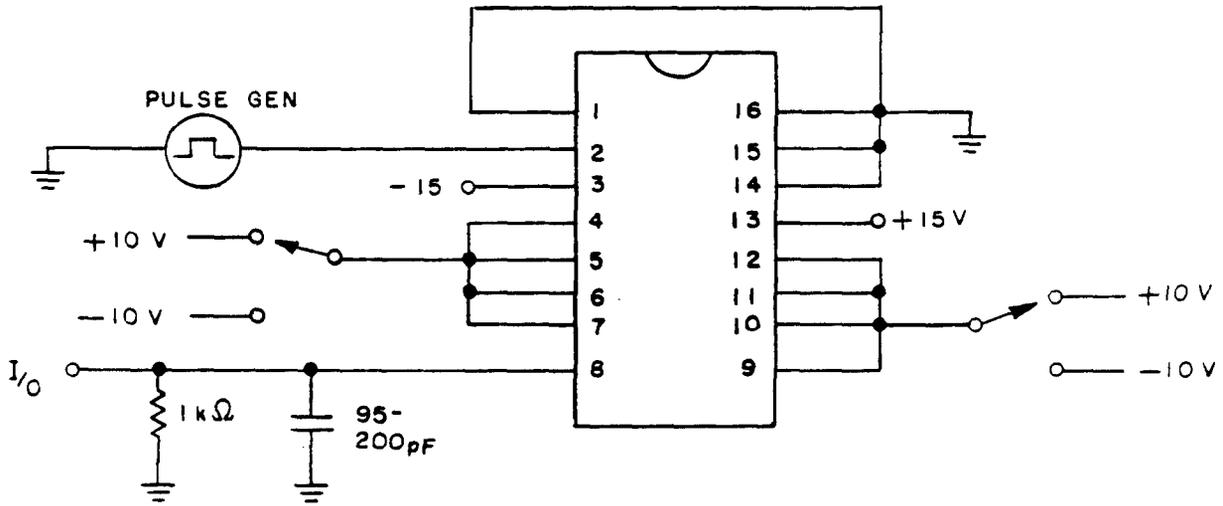
Device types 05 and 07



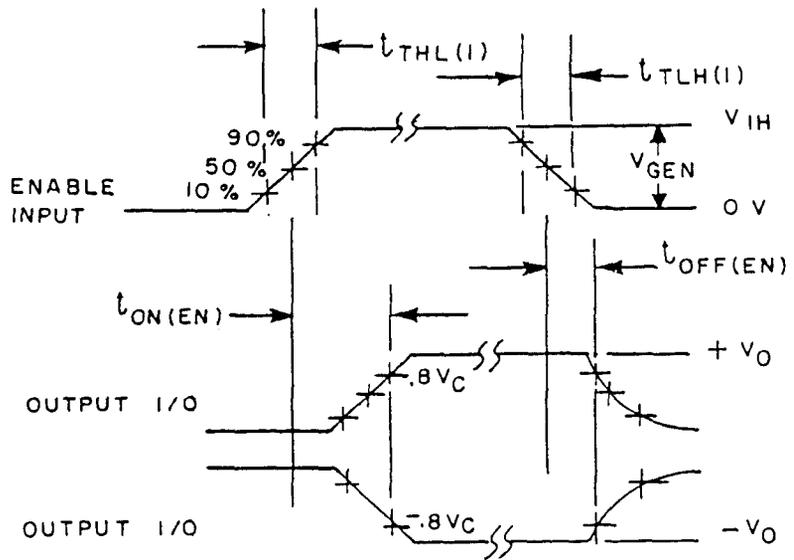
DYNAMIC TEST WAVEFORMS

FIGURE 12. Switching times test circuit and waveforms.
 (Address inputs to I/O)

Device types 05 and 07



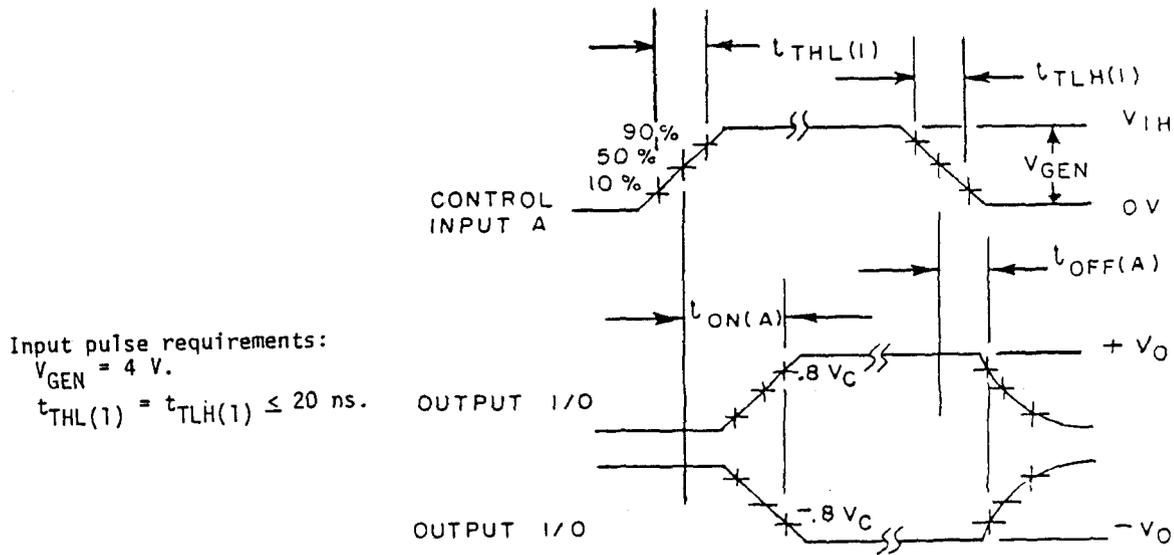
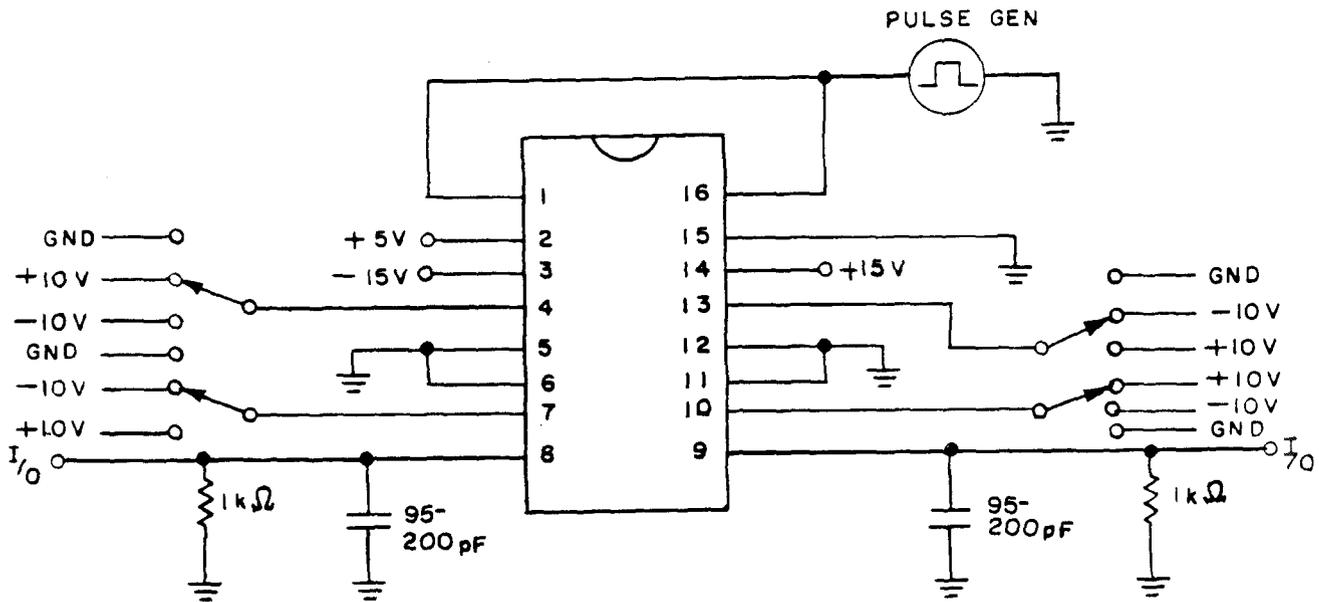
Input pulse requirements:
 $V_{GEN} = 4\text{ V.}$
 $t_{THL(1)} = t_{TLH(1)} \leq 20\text{ ns.}$



DYNAMIC TEST WAVEFORMS

FIGURE 13. Switching times test circuit and waveforms.
 (Enable to I/O)

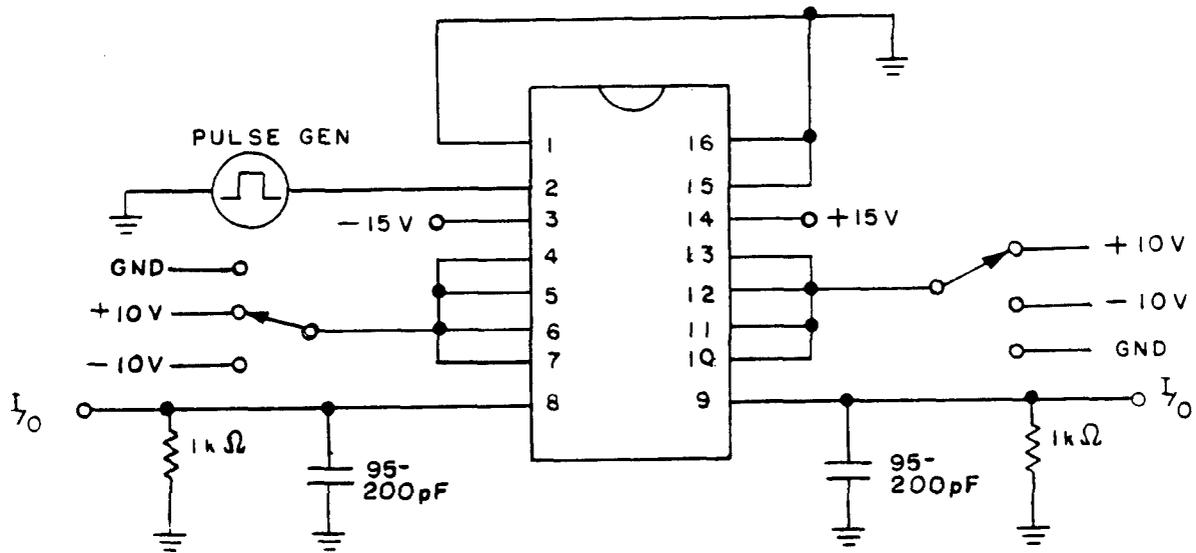
Device types 06 and 08



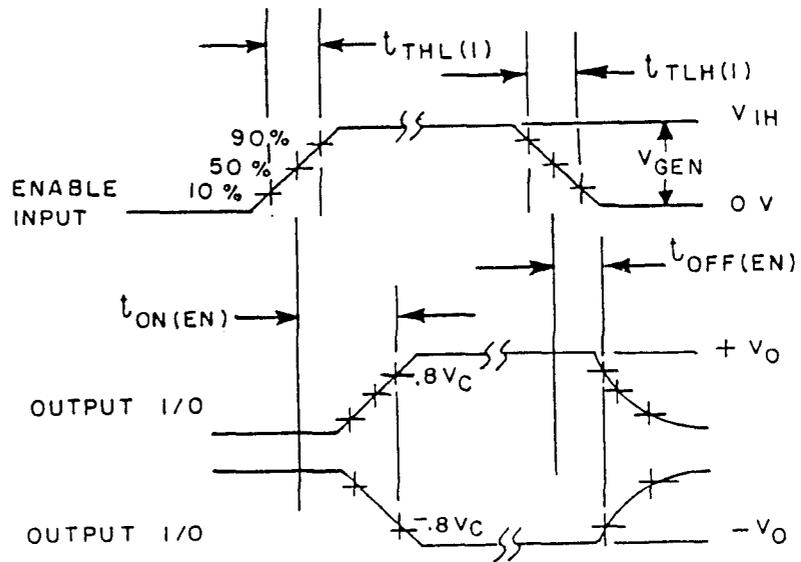
DYNAMIC TEST WAVEFORMS

FIGURE 14. Switching times test circuit and waveforms.
 (Address inputs to I/O)

Device types 06 and 08



Input pulse requirements:
 $V_{GEN} = 4V$.
 $t_{THL(1)} = t_{TLH(1)} \leq 20 \text{ ns}$.



DYNAMIC TEST WAVEFORMS

FIGURE 15. Switching times test circuit and waveforms.
 (Enable to I/O)

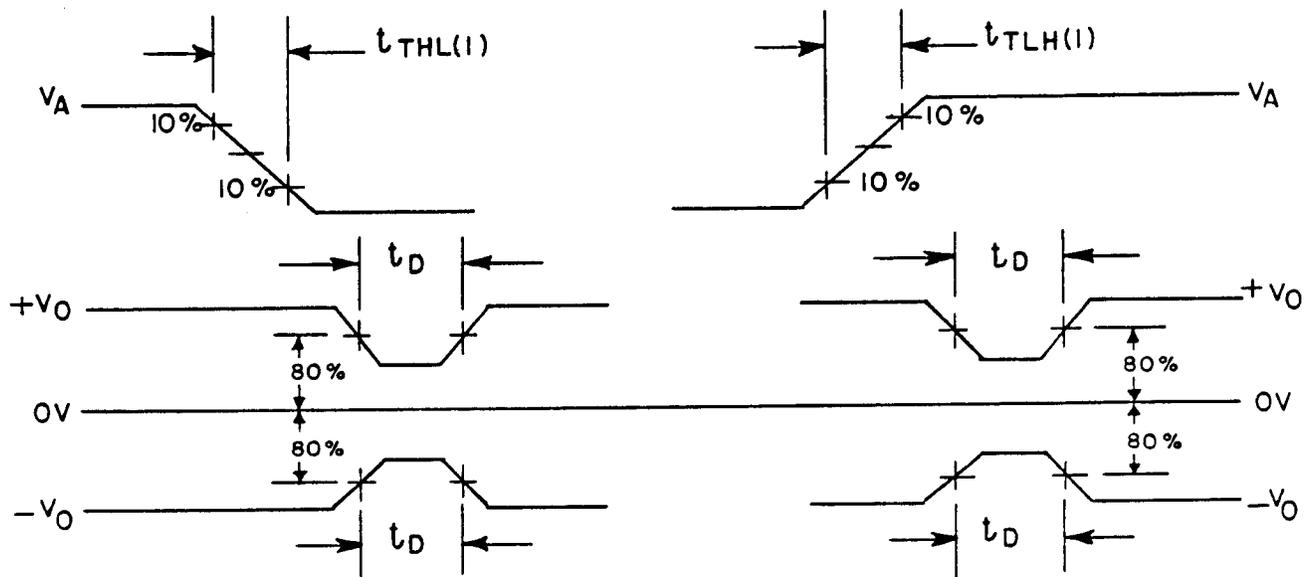
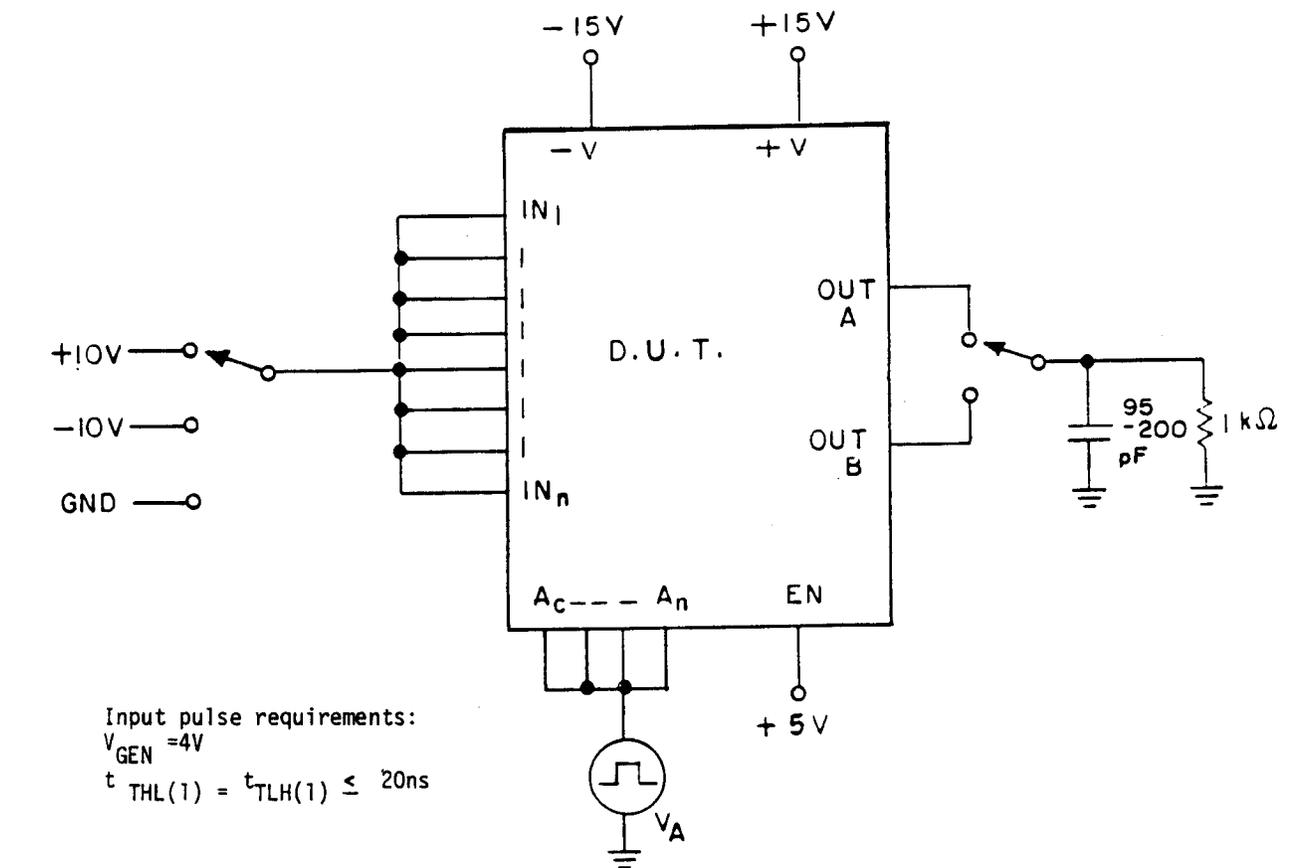


FIGURE 16. Break before make test circuit and waveforms.

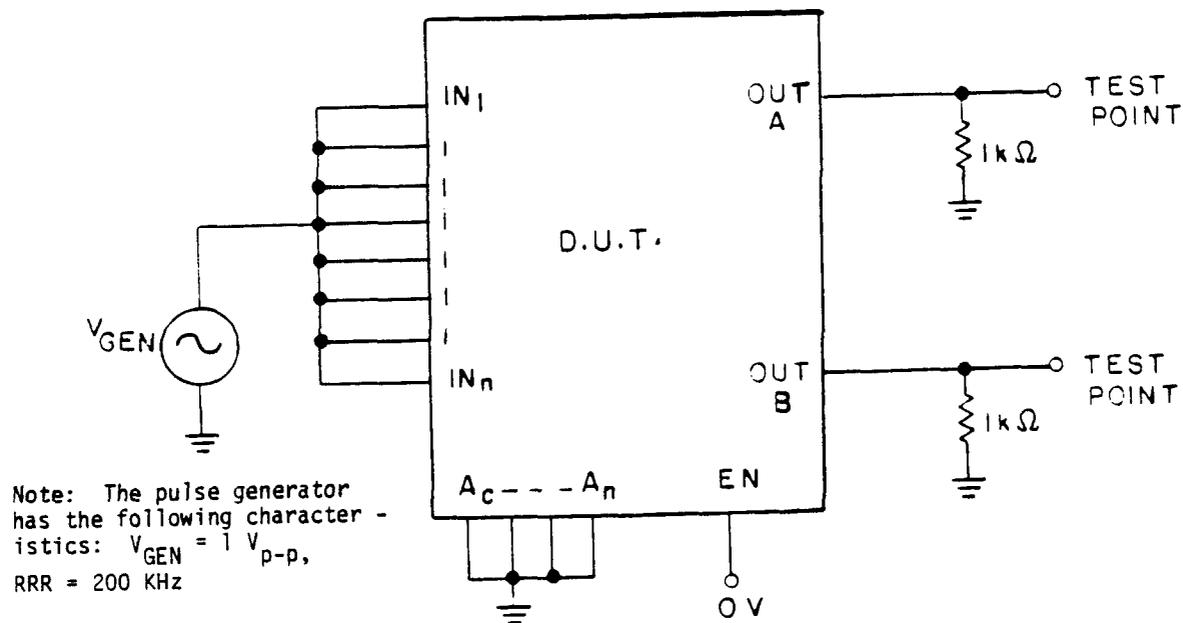
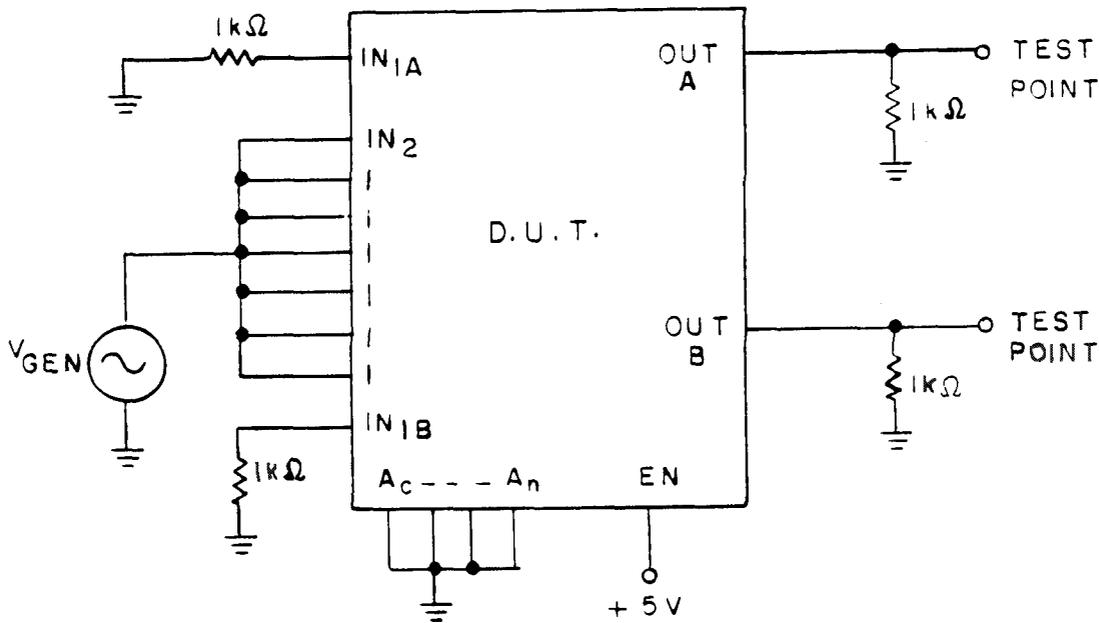
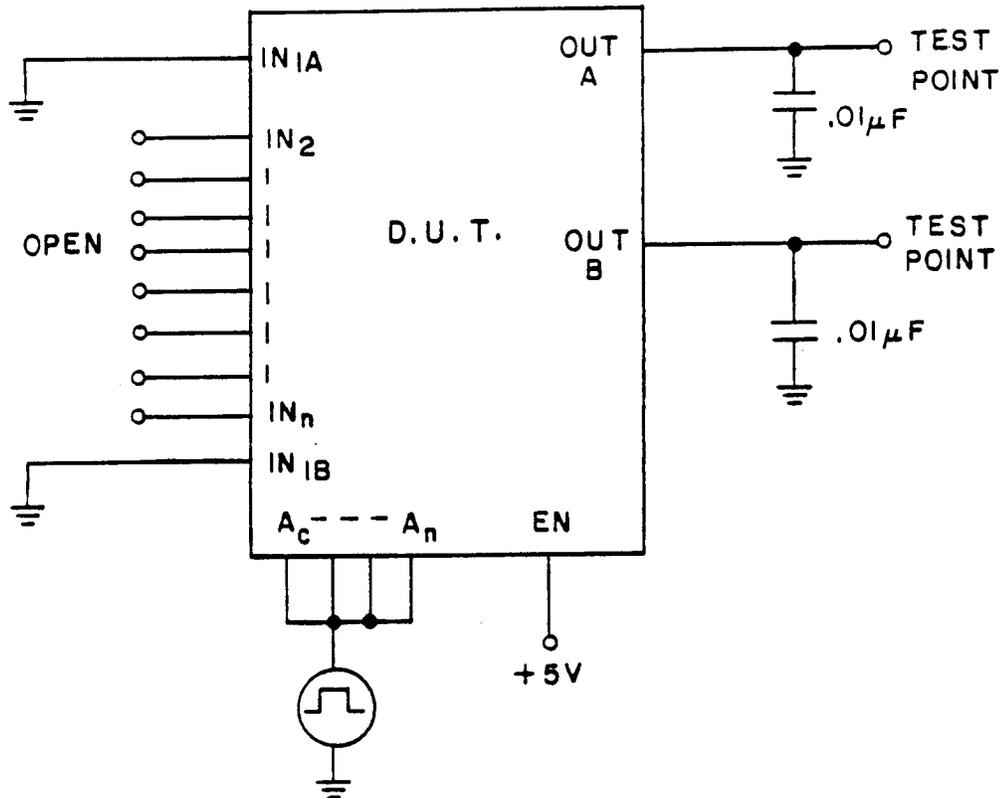


FIGURE 17. Single channel isolation test circuit.



Note: The pulse generator has the following characteristics: $V_{GEN} = 1V_{p-p}$; PRR= 200KHz.

FIGURE 18. Crosstalk test circuit.



NOTE: The pulse generator has
the following characteristics:
 $V_{GEN} = 0 - 5V$

FIGURE 19. Charge transfer error test circuit.

TABLE III. Group A inspection for device type 01.

| Symbol | MIL-STD-883 method | Case X | Terminal conditions 1/ | | | | | | | | | | | | | | Measured terminal | Test limits | | | | | | Unit | | | | |
|----------------------|--------------------|-----------------------|------------------------|----|----|------|------|------|------|------|------|------|-----|----|----|----|-------------------|--------------------------------------|------|---------------------------------------|------|---------------------------------------|-----|------|---|---|---|---|
| | | | Terminal conditions 1/ | | | | | | | | | | | | | | | Subgroup 1 T _A = 25 °C | | Subgroup 2 T _A = 125 °C | | Subgroup 3 T _A = -55 °C | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | Min | Max | Min | Max | Min | Max | | | | | |
| I _{IH} Z/ | 3010 | TEST no. 1 | V* | NC | NC | IN16 | IN15 | IN14 | IN13 | IN12 | IN11 | IN10 | IN9 | NC | A3 | A3 | -0.1 | 1.0 | -0.1 | 1.0 | -0.1 | 1.0 | μA | | | | | |
| | | 2 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | | | |
| | | 3 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | | |
| | | 4 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | | |
| | | 5 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| I _{IL} Z/ | 3009 | 6 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | | | |
| | | 7 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | | |
| | | 8 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | | 9 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | | 10 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | | 11 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | | 12 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | | 13 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 14 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 15 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| I _I (OFF) | | 16 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 17 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 18 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | |
| | | 19 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | |
| | | 20 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | |
| | | 21 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | |
| | | 22 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | |
| | | 23 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 24 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 25 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 26 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 27 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 28 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 29 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 30 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 31 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 32 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 33 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 34 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 35 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 36 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 37 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 38 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 39 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 40 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 41 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | 42 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| | | I _O -(OFF) | | 43 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " |
| 44 | " | | | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| I _O -(ON) | | 45 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 46 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 47 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 48 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 49 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 50 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | | 51 | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |

See footnotes at end of table.

TABLE III. Group A inspection for device type 01.

| Symbol | Case X Test no. | Terminal conditions | | | | | | | | | | | | | | | | Measured terminal | Test limits | | | | | | Unit |
|--------------------------|--------------------|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|--------------------------------------|-------|---------------------------------------|-------|---------------------------------------|--|------|
| | | I/ | | | | | | | | | | | | | | | | | Subgroup 1 I _A = 25 °C | | Subgroup 2 I _A = 125 °C | | Subgroup 3 I _A = -55 °C | | |
| | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | Min | Max | | Min | Max | Min | Max | | | |
| I _{IH} 2/ | 1 | GND | GND | GND | EN | IN1 | IN2 | IN3 | IN4 | IN5 | IN6 | IN7 | IN8 | V- | OUT | -0.1 | 1.0 | -0.1 | 1.0 | -0.1 | 1.0 | μA | | | |
| | 2 | 2.4 V | GND | GND | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 3 | GND | 2.4 V | GND | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 4 | GND | GND | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 5 | GND | GND | GND | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| I _{IL} 2/ | 6 | 5 V | 5 V | 5 V | 5 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 7 | 0.8 V | 5 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 8 | 5 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 9 | 5 V | 5 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| | 10 | 5 V | 5 V | 5 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | |
| I _{IS} (OFF) 3/ | 11 | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 12 | " | 0.8 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 13 | " | 2.4 V | 0.8 V | " | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| | 14 | " | 2.4 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 15 | 2.4 V | 0.8 V | 0.8 V | " | " | " | " | " | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| | 16 | " | 0.8 V | 2.4 V | " | " | " | " | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 17 | " | 2.4 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 18 | " | 2.4 V | 2.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 19 | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| | 20 | " | 0.8 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 21 | " | 2.4 V | 0.8 V | " | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| | 22 | " | 2.4 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 23 | 2.4 V | 0.8 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 24 | " | 0.8 V | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 25 | " | 2.4 V | 0.8 V | " | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| | 26 | " | 2.4 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 27 | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| | 28 | " | 0.8 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 29 | " | 2.4 V | 0.8 V | " | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| | 30 | " | 2.4 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 31 | 2.4 V | 0.8 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 32 | " | 0.8 V | 2.4 V | " | 10 V | 10 V | 10 V | 10 V | 10 V | | | |
| 33 | " | 2.4 V | 0.8 V | " | -10 V | -10 V | -10 V | -10 V | | | | |
| 34 | " | 2.4 V | 2.4 V | " | 10 V | 10 V | 10 V | 10 V | | | | |
| 35 | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | | | | |
| 36 | " | 0.8 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | | | | |
| 37 | " | 2.4 V | 0.8 V | " | 10 V | 10 V | 10 V | 10 V | | | | |
| 38 | " | 2.4 V | 2.4 V | " | -10 V | -10 V | -10 V | -10 V | | | | |
| 39 | 2.4 V | 0.8 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | | |
| 40 | " | 0.8 V | 2.4 V | " | 10 V | 10 V | 10 V | 10 V | | | | |
| 41 | " | 2.4 V | 0.8 V | " | -10 V | -10 V | -10 V | -10 V | | | | |
| 42 | " | 2.4 V | 2.4 V | " | 10 V | 10 V | 10 V | 10 V | | | | |
| I _D -(OFF) | 43 | 0.8 V | 0.8 V | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | | | |
| | 44 | " | " | 0.8 V | " | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| I _D +(ON) | 45 | " | " | 0.8 V | 4.5 V | 10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | -10 V | | | |
| | 46 | " | " | 2.4 V | " | 10 V | 10 V | 10 V | 10 V | | | | |
| | 47 | " | " | 0.8 V | " | -10 V | -10 V | -10 V | -10 V | | | | |
| | 48 | " | 2.4 V | 2.4 V | " | " | " | " | " | 10 V | 10 V | 10 V | 10 V | | | | |
| | 49 | 2.4 V | 0.8 V | 0.8 V | " | " | " | " | " | -10 V | -10 V | -10 V | -10 V | | | | |
| 50 | 2.4 V | 0.8 V | 2.4 V | " | " | " | " | " | 10 V | 10 V | 10 V | | | | | |
| 51 | 2.4 V | 2.4 V | 0.8 V | " | " | " | " | " | -10 V | -10 V | -10 V | | | | | |

See footnotes at end of table.

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

| Symbol | MIL-STD-883 method | Case X | Terminal conditions 17 | | | | | | | | | | | | | | Measured terminal | Test limits | | | | | | Unit | | | | | |
|----------------------|--------------------|----------------------|------------------------|----|----|------|------|------|------|------|------|------|-----|-----|----|----|-------------------|--------------------------|-----|---------------------------|------|---------------------------|------|------|-----|----|--|--|--|
| | | | | | | | | | | | | | | | | | | Subgroup 1 TA = 25 °C | | Subgroup 2 TA = 125 °C | | Subgroup 3 TA = -55 °C | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | Min | Max | Min | Max | Min | Max | | | | | | |
| I _{D+} (ON) | Test no. | 52 | V+ | NC | NC | IM16 | IM15 | IM14 | IM13 | IM12 | IM11 | IM10 | IM9 | GND | NC | A3 | 0.8 V 2.4 V | INB & OUT INS & OUT | -20 | 20 | -500 | 500 | -500 | 500 | 900 | mA | | | |
| | | 53 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 54 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 55 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 56 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 57 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 58 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 59 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 60 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | I _{D-} (ON) | Test no. | 61 | V+ | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 62 | V+ | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I+SBY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I-SBY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I _{PS1} | Test no. | 81 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 82 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 83 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 84 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 85 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 86 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 87 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 88 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 89 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 90 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 91 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | V+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of table.

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

| Symbol | Case X Test no. | Terminal conditions | | | | | | | | | | | | | | | | Measured terminal | Test limits | | | | | | Unit |
|----------------------------------|----------------------------------|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|-------------------------------------|-----------|--------------------------------------|------|--------------------------------------|-----|------|
| | | | | | | | | | | | | | | | | | | | Subgroup 1 T _A = 25°C | | Subgroup 2 T _A = 125°C | | Subgroup 3 T _A = -55°C | | |
| | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | Min | Max | | Min | Max | Min | Max | | | |
| I _D ⁺ (ON) | 52 | 2.4 V | 2.4 V | 2.4 V | 4.5 V | -10 V | IN8 & OUT | -20 | 20 | -500 | 500 | 500 | nA |
| | 53 | 0.8 V | 0.8 V | 0.8 V | 0.8 V | -10 V | IN9 & OUT | | | | | | |
| | 54 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN10 & OUT | | | | | | |
| | 55 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN11 & OUT | | | | | | |
| | 56 | 2.4 V | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN12 & OUT | | | | | | |
| | 57 | 2.4 V | 0.8 V | 0.8 V | | | | | | | | | | | | | | | IN13 & OUT | | | | | | |
| | 58 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN14 & OUT | | | | | | |
| | 59 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN15 & OUT | | | | | | |
| | 60 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN16 & OUT | | | | | | |
| | I _D ⁻ (ON) | 61 | 0.8 V | 0.8 V | 0.8 V | | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN1 & OUT | | | | | |
| 62 | | | 0.8 V | 2.4 V | | 10 V | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN2 & OUT | | | | | | |
| 63 | | | 2.4 V | 0.8 V | | 10 V | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN3 & OUT | | | | | | |
| 64 | | | 2.4 V | 2.4 V | | | 10 V | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN4 & OUT | | | | | | |
| 65 | | 2.4 V | 0.8 V | 0.8 V | | | 10 V | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN5 & OUT | | | | | | |
| 66 | | | 0.8 V | 0.8 V | | | | | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN6 & OUT | | | | | | |
| 67 | | | 2.4 V | 2.4 V | | | | | 10 V | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN7 & OUT | | | | | | |
| 68 | | | 2.4 V | 0.8 V | | | | | | | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN8 & OUT | | | | | | |
| 69 | | 0.8 V | 0.8 V | 0.8 V | | | | | | | 10 V | -10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN9 & OUT | | | | | | |
| 70 | | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN10 & OUT | | | | | | |
| 71 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN11 & OUT | | | | | | | |
| 72 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN12 & OUT | | | | | | | |
| 73 | 2.4 V | 0.8 V | 0.8 V | | | | | | | | | | | | | | | IN13 & OUT | | | | | | | |
| 74 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN14 & OUT | | | | | | | |
| 75 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN15 & OUT | | | | | | | |
| 76 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN16 & OUT | | | | | | | |
| I _I ⁺ | 77 | 0 V | 0 V | 0 V | 5 V | | | | | | | | | | | | | V ⁺ | 14 | 14 | -4.0 | 14 | 14 | mA | |
| I _I ⁻ | 78 | | | | 5 V | | | | | | | | | | | | | V ⁻ | -14 | -14 | -4.0 | -14 | -14 | | |
| I _I ⁺ SBY | 79 | | | | 0 V | | | | | | | | | | | | | V ⁺ | 3.0 | 3.0 | -4.0 | 3.0 | 3.0 | | |
| I _I ⁻ SBY | 80 | | | | 0 V | | | | | | | | | | | | | V ⁻ | -4.0 | -4.0 | -4.0 | -4.0 | -4.0 | | |
| I _D S1 | 81 | 0.8 V | 0.8 V | 0.8 V | 4.5 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | IN1 & OUT | | | | | | Ω |
| | 82 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN2 & OUT | | | | | | |
| | 83 | | 2.4 V | | | | | | | | | | | | | | | IN3 & OUT | | | | | | | |
| | 84 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN4 & OUT | | | | | | |
| | 85 | 2.4 V | 0.8 V | 0.8 V | | | | | | | | | | | | | | | IN5 & OUT | | | | | | |
| | 86 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN6 & OUT | | | | | | |
| | 87 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN7 & OUT | | | | | | |
| | 88 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN8 & OUT | | | | | | |
| | 89 | 0.8 V | 0.8 V | 0.8 V | | | | | | | | | | | | | | | IN9 & OUT | | | | | | |
| | 90 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN10 & OUT | | | | | | |
| 91 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN11 & OUT | | | | | | | |
| 92 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN12 & OUT | | | | | | | |
| 93 | 2.4 V | 0.8 V | 0.8 V | | | | | | | | | | | | | | | IN13 & OUT | | | | | | | |
| 94 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN14 & OUT | | | | | | | |
| 95 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN15 & OUT | | | | | | | |
| 96 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN16 & OUT | | | | | | | |
| 97 | 0.8 V | 0.8 V | 0.8 V | | -10 V | IN1 & OUT | | | | | | |
| 98 | | 0.8 V | 2.4 V | | | | | | | | | | | | | | | IN2 & OUT | | | | | | | |
| 99 | | 2.4 V | 0.8 V | | | | | | | | | | | | | | | IN3 & OUT | | | | | | | |
| 100 | | 2.4 V | 2.4 V | | | | | | | | | | | | | | | IN4 & OUT | | | | | | | |
| 101 | 2.4 V | 0.8 V | 0.8 V | | | | | | | | | | | | | | | IN5 & OUT | | | | | | | |

See footnotes at end of table.

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

| Symbol | Case X Test no. | Terminal conditions 1/ | | | | | | | | | | | | | | | | | Measured terminal | Test limits | | | | | |
|--|--------------------|------------------------|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|-------------------------------------|-------|---------------------------------------|-------------------|---------------------------------------|-----|-----|--|--|--|
| | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | Subgroup 9 I _A = 25 C | | Subgroup 10 I _A = 125 C | | Subgroup 11 I _A = -55 C | | | | | |
| | | A2 | A1 | A0 | EN | IN1 | IN2 | IN3 | IN4 | IN5 | IN6 | IN7 | IN8 | V- | OUT | Min | Max | Min | | Max | Min | Max | | | |
| t _{ON} (A) and t _{OFF} (A) | 167 | | | | 5 V | GND | -15 V | OUT | 1,000 | 1,500 | 1,000 | 1,000 | ns | | | | | |
| | 168 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 169 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 170 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 171 | | | | | | | | | | | | | | | | | | | | | | | | |
| t _{ON} (EN) and t _{OFF} (EN) | 175 | GND | GND | GND | | -10 V | ENABLE TO OUT | | | | | | | | | | |
| | 176 | | | | | 10 V | | | | | | | | | | | |
| | 177 | | | | | -10 V | | | | | | | | | | | |
| | 178 | | | | | 10 V | | | | | | | | | | | |
| V _{ISO} | 179 | GND | GND | GND | 0 V | IN | -15 V | OUT | 50 | | | | dB | | | | | |
| | V _{CT} | GND | GND | GND | 5 V | 5/ | IN | -15 V | OUT | 50 | | | | | dB | | | | |
| | | IN | IN | IN | 5 V | GND | | | | | | | | -15 V | OUT | 10 | | | | | mV | | | | |
| t _D | 182 | | | | 5 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | OUT | 5 | | | | ns | | | | | |
| | 183 | | | | | -10 V | | | | | | | | | | | |
| | 184 | | | | | 10 V | | | | | | | | | | | |
| | 185 | | | | | -10 V | | | | | | | | | | | |

See footnotes at end of table.

TABLE 111. Group A inspection for device type 02 - Continued.

| Symbol | MIL-STD-883 method | Case X test no. | Terminal conditions V | | | | | | | | | | | | | | TEST LIMITS | | | Unit | | | | | | |
|---------------------|--------------------|-----------------|-----------------------|----|----|------|------|------|------|------|-----|-----|------|-----|----|----|-------------------------|-----|---------------------------|------|---------------------------|-----|-----|--|----|--|
| | | | Terminal conditions V | | | | | | | | | | | | | | Subgroup 4 TA = 25°C | | Subgroup 10 TA = 125°C | | Subgroup 11 TA = -55°C | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Min | Max | Min | | Max | Min | Max | | | |
| | | | V+ | NC | NC | IM15 | IM16 | IM15 | IM11 | IM10 | IM9 | GND | VREF | A3 | | | | | | | | | | | | |
| C _A | 3012 | 187 | GND | | | | | | | | | GND | | 4/ | | | | | | 10 | | | | | pf | |
| | | 188 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 189 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 190 | | | | | | | | | | | | | | | | | | | | | | | | |
| C ₀₅ | | 191 | | | | | | | | | | | | 0 V | | | | | | 85 | | | | | | |
| C ₁₅ | | 192 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 193 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 194 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 195 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 196 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 197 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 198 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 199 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 200 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 201 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 202 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 203 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 204 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 205 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 206 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 207 | | | | | | | | | | | | | | | | | | | | | | | | |
| C _{EN} | | 208 | | | | | | | | | | | | | | | | | | | | | | | | |
| t _{ON(A)} | 3003 | 209 | 15 V | | | | | | | | | | | | | | | | | | | | | | | |
| t _{OFF(A)} | fig. 8 | 210 | -10 V | | | | | | | | | | | | | | | | | | | | | | | |
| | | 211 | -10 V | | | | | | | | | | | | | | | | | | | | | | | |
| | | 212 | -10 V | | | | | | | | | | | | | | | | | | | | | | | |
| | | 213 | GND | | | | | | | | | | | | | | | | | | | | | | | |
| | | 214 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 215 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 216 | | | | | | | | | | | | | | | | | | | | | | | | |
| t _{ON(EN)} | fig. 9 | 217 | -10 V | | | | | | | | | | | | | | | | | | | | | | | |
| and | | 218 | 10 V | | | | | | | | | | | | | | | | | | | | | | | |
| t _{ON(EN)} | | 219 | -10 V | | | | | | | | | | | | | | | | | | | | | | | |
| | | 220 | 10 V | | | | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of table.

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

| Symbol | Case X Test no. | Terminal conditions | | | | | | | | | | | | | | | | | Measured terminal | Test limits | | Unit | | | | | |
|------------------|-----------------------|---------------------|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|--------------------------|-------|-------|-------|---|----|----|---|
| | | V | | | | | | | | | | | | | | | | | | Subgroup 12 TA = 25 C | Min | | Max | | | | |
| | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | | | | | | | | | | | | |
| V _{ISO} | 221 | GND | X1 | A0 | EM | IN1 | IN | IN | IN | OUT | 50 | | dB | | |
| V _{CT} | 222 | GND | GND | GND | 0 V | IN | IN | IN | OUT | 50 | | dB | | |
| V _{CTE} | 223 | IN | IN | IN | 5 V | GND | | | | | | | | | | | | | | | | OUT | 10 | | mV | | |
| t _p | 224 | | | | 5 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V | OUT | 5 | | ns | |
| | 225 | | | | * | -10 V | -10 V | -10 V | -10 V | * | * | * | * | |
| | 226 | | | | * | 10 V | 10 V | 10 V | 10 V | * | * | * | * | |
| | 227 | | | | * | -10 V | -10 V | -10 V | -10 V | -10 V | * | * | * | * |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of table.

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

| Symbol | MIL-STD-883 Method | Case X | Terminal conditions | | | | | | | | | | | | | | Measured Terminal | Test Limits | | | | | | Unit |
|------------------------------|--------------------|--------|---------------------|----|------|------|------|------|------|------|------|-----|------|----|------|------|-------------------|-------------------------------------|-----|--------------------------------------|-----|--------------------------------------|-----|------|
| | | | Terminal conditions | | | | | | | | | | | | | | | Subgroup 1 T _A = 25 C | | Subgroup 2 T _A = 125 C | | Subgroup 3 T _A = -55 C | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | Min | Max | Min | Max | Min | Max | |
| I _Q (OFF) Voltage | Test no. | V+ | OUTB | NC | 1W7B | 1W6B | 1W5B | 1W4B | 1W3B | 1W2B | 1W1B | GND | VREF | NC | OUTA | -2.0 | 2.0 | -2.0 | 2.0 | -2.0 | 2.0 | μA | | |
| | 101 | 15 V | | | | | | | | | | | | | | | | | | | | | | |
| | 102 | " | 0 V | | | | | | | | | | | | | | | | | | | | | |
| | 103 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 104 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 105 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 106 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 107 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 108 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 109 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 110 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 111 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 112 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 113 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 114 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 115 | " | " | | | | | | | | | | | | | | | | | | | | | |
| | 116 | " | " | | | | | | | | | | | | | | | | | | | | | |
| I* | 117 | " | | | | | | | | | | | | | | | | | | | | mA | | |
| I- | 118 | " | | | | | | | | | | | | | | | | | | | | | | |
| I*SBY | 119 | " | | | | | | | | | | | | | | | | | | | | | | |
| I-SBY | 120 | " | | | | | | | | | | | | | | | | | | | | | | |
| R _{DS1} | 121 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 122 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 123 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 124 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 125 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 126 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 127 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 128 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 129 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 130 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 131 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 132 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 133 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 134 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 135 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 136 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 137 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 138 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 139 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 140 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 141 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 142 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 143 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 144 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 145 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 146 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 147 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 148 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 149 | " | | | | | | | | | | | | | | | | | | | | | | |
| | 150 | " | | | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of table.

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

| Symbol | Case X Test no. | Terminal conditions 1/ | | | | | | | | | | | | | | Measured terminal | Test limits | | | | | | Unit | |
|---|--------------------|--|-----|-----|-----|------|------|------|------|------|------|------|------|----|------|-------------------|-------------------------------------|-------|--------------------------------------|-----|--------------------------------------|-----|------|----------------|
| | | | | | | | | | | | | | | | | | Subgroup 1 T _A = 25 C | | Subgroup 2 T _A = 125 C | | Subgroup 3 T _A = -55 C | | | |
| | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | | Min | Max | Min | Max | Min | Max | | |
| R _D S1 | 151 | A2 | A1 | A0 | EN | IN1A | IN2A | IN3A | IN4A | IN5A | IN6A | IN7A | IN8A | V- | OUTA | IN7B | IN8B | 1.5 | 1.5 | 2.0 | 2.0 | 1.5 | 1.5 | K _Ω |
| | 152 | | | | | | | | | | | | | | | | | 1.5 | 1.5 | 2.0 | 2.0 | 1.5 | 1.5 | " |
| R _Q S2 | 153 thru 168 | Same terminal conditions as for tests 121 thru 136, except V _A = +10 V, V _S = +7.5 V, and limits as shown. | | | | | | | | | | | | | | | | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | " | |
| R _Q S2 | 169 thru 184 | Same terminal conditions as for tests 137 thru 152, except V _A = +10 V, V _S = -7.5 V, and limits as shown. | | | | | | | | | | | | | | | | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | " | |
| C _A | 185 | 4/ | | | | | | | | | | | | | | | | 10 | | | | | | PF |
| | 186 | | 4/ | | | | | | | | | | | | | | | 10 | | | | | | " |
| C _Q S | 187 | | | 4/ | | | | | | | | | | | | | | 10 | | | | | | " |
| | 188 | 0 V | 0 V | 0 V | 0 V | | | | | | | | | | | | | 50 | | | | | | " |
| C _I S | 189 | | | | | | | | | | | | | | | | | 50 | | | | | | " |
| | 190 | | | | | 4/ | | | | | | | | | | | | 10 | | | | | | " |
| | 191 | | | | | | 4/ | | | | | | | | | | | " | | | | | | " |
| | 192 | | | | | | | 4/ | | | | | | | | | | " | | | | | | " |
| | 193 | | | | | | | | 4/ | | | | | | | | | " | | | | | | " |
| | 194 | | | | | | | | | 4/ | | | | | | | | " | | | | | | " |
| | 195 | | | | | | | | | | 4/ | | | | | | | " | | | | | | " |
| | 196 | | | | | | | | | | | 4/ | | | | | | " | | | | | | " |
| | 197 | | | | | | | | | | | | 4/ | | | | | " | | | | | | " |
| | 198 | | | | | | | | | | | | | 4/ | | | | " | | | | | | " |
| | 199 | | | | | | | | | | | | | | 4/ | | | " | | | | | | " |
| | 200 | | | | | | | | | | | | | | | | | " | | | | | | " |
| | 201 | | | | | | | | | | | | | | | | | " | | | | | | " |
| | 202 | | | | | | | | | | | | | | | | | " | | | | | | " |
| | 203 | | | | | | | | | | | | | | | | | " | | | | | | " |
| 204 | | | | | | | | | | | | | | | | | " | | | | | | " | |
| 205 | | | | | | | | | | | | | | | | | " | | | | | | " | |
| C _{EN} | 206 | | | | 4/ | | | | | | | | | | | | | " | | | | | | " |
| | | | | | | | | | | | | | | | | | | | | | | | | " |
| t _{LOW(A)} and t _{OFF(A)} | 207 | | | | | | | | | | | | | | | | | 1,000 | | | | | | ns |
| | 208 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 209 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 210 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 211 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 212 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 213 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 214 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 215 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 216 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 217 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 218 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 219 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 220 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| | 221 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " |
| 222 | | | | | | | | | | | | | | | | | 1,000 | | | | | | " | |

See footnotes at end of table.

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

| Symbol | MIL-STD-883 Method | Case X | Terminal conditions 1/ | | | | | | | | | | | | | | Test Limits | | | | | | Unit |
|--|--------------------|--------|------------------------|------|----|------|------|------|------|------|------|------|------|-----|------|----------------|--------------------------------------|--------|--|--------|--|-----|------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Subgroup 9 T _A = 25 °C | | Subgroup 10 T _A = 125 °C | | Subgroup 11 T _A = -55 °C | | |
| | | | Test no. | V+ | NC | IN88 | IN78 | IN68 | IN58 | IN48 | IN38 | IN28 | IN18 | GND | VREF | NC | Min | Max | Min | Max | Min | Max | |
| t _{ON} (EN) and t _{OFF} (EN) | 3003 | 223 | 15 V | OUTB | NC | GND | GND | GND | ENABLE TO OUTA | 11,000 | 11,500 | 11,000 | 11,500 | ns | | |
| | | | 224 | | | | | | | | | | | | | | | | | | | | |
| | | | 225 | | | | | | | | | | | | | | | | | | | | |
| | | | 226 | | | | | | | | | | | | | | | | | | | | |
| | | | 227 | | | | | | | | | | | | | | | | | | | | |
| V _{CT} | f19-18 | 233 | | OUT | | IN | IN | OUTA | | | | | | | | |
| | | | 234 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| V _{CTE} | f19-19 | 235 | | OUT | | | | | | | | | | | OUTA | | | | | | | | |
| | | | 236 | | | | | | | | | | | | | | | | | | | | |
| t _D | f19-16 | 237 | 15 V | | | GND | GND | GND | OUTA | 5 | | | | ns | | |
| | | | 238 | | | | | | | | | | | | | | | | | | | | |
| | | | 239 | | | | | | | | | | | | | | | | | | | | |
| | | | 240 | | | | | | | | | | | | | | | | | | | | |
| | | | 241 | | | | | | | | | | | | | | | | | | | | |
| V _{CTE} | f19-19 | 243 | | | | IN | IN | OUTB | | | | | | | | |
| | | | 244 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of table.

TABLE III. Group A Inspection for device Type 04 - Continued.

| Symbol | Case X Test no. | Terminal conditions | | | | | | | | | | | | | | | | | Measured terminal | Test Limits | | | | | | Unit |
|--|-----------------------|---------------------|-----|-----|------|------|------|------|------|------|------|------|-------|-------|-------------------|-------------------|-------|-------|----------------------|--------------------------------------|-----|--|--|--|--|------|
| | | | | | | | | | | | | | | | | | | | | Subgroup 9 T _A = 25 °C | | Subgroup 10 T _A = 125 °C | | Subgroup 11 T _A = -55 °C | | |
| | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | Min | Max | Min | | Max | Min | Max | | | | |
| t _{ON} (EN) and t _{OFF} (EM) | 223 | A2 | A1 | A0 | EN | IN1A | IN2A | IN3A | IN4A | IN5A | IN6A | IN7A | IN8A | V- | OUT | ENABLE TO OUTA | 1,000 | 1,500 | 1,000 | 1,000 | ns | | | | | |
| | 224 | GND | GND | GND | | 10 V | -15 V | OUT | ENABLE TO OUTA | . | . | . | . | . | | | | | |
| | 225 | GND | GND | GND | | 10 V | -10 V | OUT | ENABLE TO OUTB | . | . | . | . | . | | | | | |
| | 226 | GND | GND | GND | | 10 V | -10 V | OUT | ENABLE TO OUTB | . | . | . | . | . | | | | | |
| | 227 | GND | GND | GND | | 10 V | -10 V | OUT | ENABLE TO OUTB | . | . | . | . | . | | | | | |
| | 228 | GND | GND | GND | | 10 V | -10 V | OUT | ENABLE TO OUTB | . | . | . | . | . | | | | | |
| 230 | GND | GND | GND | | 10 V | -10 V | OUT | ENABLE TO OUTB | . | . | . | . | . | | | | | | |
| V _{ISO} | 231 | GND | GND | GND | 0 V | IN | -15 V | OUT | OUTA OUTB | 50 | | | | dB | | | | | |
| | 232 | GND | GND | GND | 0 V | IN | -15 V | OUT | OUTA OUTB | . | . | . | . | . | | | | | |
| V _{CT} | 233 | GND | GND | GND | 5 V | 6/ | | | | | | | | | OUT | OUTA OUTB | . | . | . | . | . | | | | | |
| | 234 | GND | GND | GND | 5 V | 6/ | | | | | | | | | OUT | OUTA OUTB | . | . | . | . | . | | | | | |
| V _{CTE} | 235 | IN | IN | IN | | GND | | | | | | | | | OUT | OUTA OUTB | 10 | 10 | | | mV | | | | | |
| | 236 | IN | IN | IN | | GND | | | | | | | | | OUT | OUTA OUTB | 10 | 10 | | | mV | | | | | |
| t _D | 237 | GND | GND | GND | 5 V | IN | -15 V | OUT | OUTA | 5 | | | | ns | | | | | |
| | 238 | GND | GND | GND | 5 V | IN | -10 V | OUT | OUTA | . | . | . | . | . | | | | | |
| | 239 | GND | GND | GND | 5 V | IN | -10 V | OUT | OUTA | . | . | . | . | . | | | | | |
| | 240 | GND | GND | GND | 5 V | IN | -10 V | OUT | OUTA | . | . | . | . | . | | | | | |
| | 241 | GND | GND | GND | 5 V | IN | -10 V | OUT | OUTA | . | . | . | . | . | | | | | |
| | 242 | GND | GND | GND | 5 V | IN | -10 V | OUT | OUTA | . | . | . | . | . | | | | | |
| 243 | GND | GND | GND | 5 V | IN | -10 V | OUT | OUTA | . | . | . | . | . | | | | | | |
| 244 | GND | GND | GND | 5 V | IN | -10 V | OUT | OUTA | . | . | . | . | . | | | | | | |

See footnotes at end of table.

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

| Symbol | MIL-STD-883 test method | Case E | terminal conditions 1/ | | | | | | | | | | | | | | | | Test limits | | | | | | | |
|-----------------------------------|-------------------------|-------------|---|-------|-------|-------|-------|-------|---------|------|------|------|------|------|----|-----|----|-----|-------------------|-------------------------------------|------|--------------------------------------|------|--------------------------------------|-----|------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Measured terminal | Subgroup 1 T _A = 25°C | | Subgroup 2 T _A = 125°C | | Subgroup 3 T _A = -55°C | | Unit |
| | | | AO | EW | V- | IN1A | IN2A | IN3A | IN4A | OUTA | OUTB | IN3B | IN2B | IN1B | V+ | GND | AI | Min | | Max | Min | Max | Min | Max | | |
| I+ | | 49 | 0 V | 5.0 V | -15 V | | | | | | | | | | | | | | | V+ | 2.0 | 2.0 | 2.0 | 2.0 | mA | |
| I- | | 50 | " | 5.0 V | " | | | | | | | | | | | | | | | V- | -1 | -1 | -1 | -1 | " | |
| I+SBY | | 51 | " | 0 V | " | | | | | | | | | | | | | | | V+ | 2.0 | 2.0 | 2.0 | 2.0 | " | |
| I-SBY | | 52 | " | " | " | | | | | | | | | | | | | | | V- | -1.0 | -1.0 | -1.0 | -1.0 | " | |
| I _D (OFF) over-voltage | | 53 | 0.8 V | 0.8 V | " | 33 V | 33 V | 33 V | 0 V | | | | | | | | | | | OUTA | -2.0 | 2.0 | -2.0 | 2.0 | 2.0 | μA |
| | | 54 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 55 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 56 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 57 | 0.8 V | " | " | " | " | " | 0 V | | | | | | | | | | | OUTB | " | " | " | " | " | " |
| | | 58 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 59 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 60 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| I _D (OFF) over-voltage | | 61 | 0.8 V | " | " | -33 V | -33 V | -33 V | 0 V | | | | | | | | | | | OUTA | " | " | " | " | " | " |
| | | 62 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 63 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 64 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 65 | 0.8 V | " | " | " | " | " | 0 V | | | | | | | | | | | OUTB | " | " | " | " | " | " |
| | | 66 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 67 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| | | 68 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | " | " | " | " | " | " | " |
| P _{DS1} | | 69 | 0.8 V | 4.0 V | " | 10 V | 10 V | 10 V | 100 μA | | | | | | | | | | | IN1A & OUTA | 1.5 | 1.8 | 1.5 | 1.5 | kJ | |
| | | 70 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN2A & OUTA | " | " | " | " | " | |
| | | 71 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | IN3A & OUTA | " | " | " | " | " | |
| | | 72 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN4A & OUTA | " | " | " | " | " | |
| | | 73 | 0.8 V | " | " | " | " | " | 100 μA | | | | | | | | | | | IN1B & OUTB | " | " | " | " | " | |
| | | 74 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN2B & OUTB | " | " | " | " | " | |
| | | 75 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | IN3B & OUTB | " | " | " | " | " | |
| | | 76 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN4B & OUTB | " | " | " | " | " | |
| | | 77 | 0.8 V | " | " | -10 V | -10 V | -10 V | -100 μA | | | | | | | | | | | IN1A & OUTA | " | " | " | " | " | |
| | | 78 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN2A & OUTA | " | " | " | " | " | |
| | | 79 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | IN3A & OUTA | " | " | " | " | " | |
| | | 80 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN4A & OUTA | " | " | " | " | " | |
| | | 81 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | IN1B & OUTB | " | " | " | " | " | |
| | | 82 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN2B & OUTB | " | " | " | " | " | |
| | | 83 | 0.8 V | " | " | " | " | " | " | | | | | | | | | | | IN3B & OUTB | " | " | " | " | " | |
| | | 84 | 4.0 V | " | " | " | " | " | " | | | | | | | | | | | IN4B & OUTB | " | " | " | " | " | |
| P _{DS2} | | 85 thru 100 | Same terminal conditions as for tests 69 thru 84, except V _A = ±10 V, V _S = ±7.5 V and limits as shown. | | | | | | | | | | | | | | | | 2.2 | 2.2 | 2.2 | 2.2 | " | | | |

See footnotes at end of table.

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

| Symbol | MIL-STD-883 E test method | [Case no.] | Terminal conditions \bar{V} | | | | | | | | | | | | | | | | Test limits | | | |
|----------------|---------------------------|------------|-------------------------------|---------------------------------------|-------|-------|-------|-------|------|------|------|------|------|------|------|-----|-----|------|-------------------|------|--|--|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Measured terminal | Unit | | |
| | | | AD | EN | V- | IN1A | IN2A | IN3A | IN4A | OUTA | OUTB | IN4B | IN3B | IN2B | IN1B | V+ | GND | AI | | | | |
| VISO | fig. 171 138 | | GND | 0 V | -15 V | IN | IN | IN | OUT | OUT | OUT | IN | IN | IN | 15 V | GND | GND | OUTA | dB | | | |
| | fig. 171 139 | | | 0 V | | | | | | | | | | | | | | OUTB | | | | |
| VCT | fig. 181 140 | | | 5 V | | | | | OUT | | | | | | | | | OUTA | dB | | | |
| | fig. 181 141 | | | | | | | | | | | | | | | | | OUTB | | | | |
| VCTE | fig. 191 142 | | IN | | | | | | OUT | | | | | | | | | OUTA | mV | | | |
| | fig. 191 143 | | IN | | | | | | | | | | | | | | | OUTB | | | | |
| I _D | fig. 161 144 | | | 5 V | -15 V | 10 V | 10 V | 10 V | OUT | | GND | GND | GND | GND | 15 V | GND | | OUTA | ns | | | |
| | fig. 161 145 | | | | 10 V | -10 V | -10 V | -10 V | | | | | | | | | | | | | | |
| | fig. 161 146 | | | | 10 V | 10 V | 10 V | 10 V | | | | | | | | | | | | | | |
| | fig. 161 147 | | | | 10 V | -10 V | -10 V | -10 V | | | | | | | | | | | | | | |
| | fig. 161 148 | | | | GND | GND | GND | GND | OUT | | | | | | | | | OUTB | | | | |
| | fig. 161 149 | | | | | | | | | | | | | | | | | | | | | |
| | fig. 161 150 | | | | | | | | | | | | | | | | | | | | | |
| | fig. 161 151 | | | | | | | | | | | | | | | | | | | | | |
| | | | | Subgroup 13 T _A = 25 °C | | | | | | | | | | | | | | | | | | |
| | | | | Min | | | | | | | | | | | | | | | | Max | | |
| | | | | Min | | | | | | | | | | | | | | | | Max | | |

See footnotes at end of table.

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

| Symbol | MIL-STD-883 test method | Case E | Terminal conditions 1/ | | | | | | | | | | | | | | | | Test limits | | | | | | |
|------------------|---|---|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|--------------------------------------|--------|--|----------------|---------------------------------------|-----|------|
| | | | | | | | | | | | | | | | | | | | Subgroup 1 T _A = 25 °C | | Subgroup 2 T _A = 125 °C | | Subgroup 3 T _A = -55 °C | | Unit |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Min | Max | Min | Max | Min | Max | |
| I+ | 43 | 0 V | 5.0 V | -15 V | | | | | | | | | 15 V | GND | 0 V | 0 V | V* | 12 | 12 | 12 | 12 | 12 | 12 | mA | |
| I- | 44 | " | 5.0 V | " | | | | | | | | | " | " | " | " | V- | -12 | -12 | -12 | -12 | -12 | -12 | " | |
| I+SBY | 45 | " | 0 V | " | | | | | | | | | " | " | " | " | V* | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | " | |
| I-SBY | 46 | " | 0 V | " | | | | | | | | | " | " | " | " | V- | -3.5 | -3.5 | -3.5 | -3.5 | -3.5 | -3.5 | " | |
| R _{DS1} | 47 | 0.8 V | 4.5 V | " | 10 V | 1 mA | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | Ω | |
| | 48 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| | 49 | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | " | |
| | 50 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| | 51 | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | " | |
| | 52 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| | 53 | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | " | |
| | 54 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| | 55 | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | " | |
| | 56 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| | 57 | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | " | |
| | 58 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| | 59 | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | " | |
| | 60 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| | 61 | 0.8 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | 0.8 V | " | |
| | 62 | 2.4 V | " | " | " | " | " | " | " | " | " | " | " | " | " | " | " | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | 2.4 V | " | |
| R _{DS2} | 63 thru 78 | Same terminal conditions as tests 47 thru 62, except V _A = ±10 V, V _S = ±7.5 V and limits as shown. | | | | | | | | | | | | | | | | 11,000 | 11,000 | 11,000 | 11,000 | 11,000 | 11,000 | " | |
| R _{DS2} | 79 thru 94 | Same terminal conditions as tests 47 thru 62, except V _A = ±10 V, V _S = -7.5 V and limits as shown. | | | | | | | | | | | | | | | | 11,000 | 11,000 | 11,000 | 11,000 | 11,000 | 11,000 | " | |
| C _A | 3012 95 96 97 | | | GND | | | | | | | | | | | | | | GND | 4/ | 4/ | A2 A1 A0 | 10 10 10 | | | PF |
| C _{OS} | 98 | 0 V | | | | | | | | | | | | | | | 5/ | | 0 V | 0 V | OUT | 45 | | | " |
| C ₁₅ | 99 100 101 102 103 104 105 106 | | 0 V | | 4/ | 4/ | 4/ | 4/ | 4/ | 4/ | 4/ | 4/ | 4/ | 4/ | 4/ | 4/ | | | | | IM1 IM2 IM3 IM4 IM5 IM6 IM7 IM8 | 10 | | | " |
| C _{EN} | 107 | | 4/ | | | | | | | | | | | | | | | | | | EN | | | | " |

See footnotes at end of table.

TABLE III. Group A Inspection for device type 08 - Continued.

| Symbol | MIL-STD-883 E test method | Terminal conditions I/ | | | | | | | | | | | | | | | | Test limits | | | | | | | | |
|--|---------------------------|------------------------|-----|-------|--|--|--|--|------|------|------|------|------|------|------|-----|--------------------|-------------------------------------|-------|-------|---------------------------------------|-----|-----|---------------------------------------|--|--|
| | | Terminal conditions I/ | | | | | | | | | | | | | | | | Subgroup 9 I _A = 25 C | | | Subgroup 10 I _A = 125 C | | | Subgroup 11 I _A = -55 C | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Min | Max | Min | Max | Min | Max | | | |
| I _{ON} (A) and I _{OFF} (A) | 3003 | AD | EN | V- | TR1A | TR2A | TR3A | TR4A | OUTA | OUTB | TR5B | TR6B | TR7B | V+ | GND | AI | ADDRESS IN TO OUTA | 1,000 | 1,500 | 1,000 | 1,000 | ns | | | | |
| | 82 | | 5 V | -15 V | GND | GND | 10 V -10 V -10 V GND | 10 V -10 V -10 V GND | OUT | | GND | GND | GND | 15 V | GND | | | | | | | | | | | |
| | 83 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 84 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 85 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 86 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 87 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 89 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I _{ON} (EN) and I _{OFF} (EN) | Fig. 15 | GND | | | 10 V -10 V -10 V -10 V GND | OUT | | | | | | | | | | | | | | | | | |
| | 108 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 109 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 110 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 111 | | | | | | | | | | | | | | | | | | | | | | | | | |
| V _{CT} | Fig. 17 | GND | 0 V | -15 V | 1M | 1M | 1M | 1M | OUT | | 1M | 1M | 1M | 15 V | GND | GND | OUTA OUTB | 50 | | | | | | | | |
| | 116 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 117 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 118 | | | | | | | | | | | | | | | | | | | | | | | | | |
| V _{CTE} | Fig. 18 | | 5 V | | 6/5 | | | | OUT | | | | | | | | OUTA OUTB | | | | | | | | | |
| | 119 | | | | | | | | | | | | | | | | | | | | | | | | | |
| t ₀ | Fig. 19 | IN | | | GND | GND | | | OUT | | | | | | | IN | OUTA OUTB | 10 | 10 | | | | | | | |
| | 120 | | | | | | | | | | | | | | | | | | | | | | | | | |
| t ₀ | Fig. 16 | | 5 V | -15 V | 10 V -10 V -10 V -10 V GND | OUT | | GND | GND | GND | GND | 15 V | GND | IN | OUTA OUTB | 5 | | | | | | | |
| | 122 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 123 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 124 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 125 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 126 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 127 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 128 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 129 | | | | | | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of table.

- 1/ Pins not designated may be high-level logic or open. Exceptions are as follows: $V_{IC(POS)}$ tests, the V-, GND terminal shall be open; $V_{IC(NEG)}$ tests, the V+ terminal shall be open.
- 2/ The device manufacturer may, at his option, measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.
- 3/ The I_S and I_D measurements shall be performed in sequence.
- 4/ C_A , C_{EN} , and C_{IS} - Connect capacitance bridge between measured terminal and V_{SS} , frequency = 1 MHz, see 4.4.1c.
- 5/ C_{OS} - Connect capacitance bridge between measured output and V_{SS} , frequency = 1 MHz, see 4.4.1c.
- 6/ Connect input to ground through a 1 k Ω \pm 5% resistor.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II of method 5005 of MIL-STD-883 and as follows:

- a. Electrical parameters shall be as specified in table II herein. For class S devices, delta limits shall apply only to subgroup 5 of group B inspection.
- b. Steady state life test for class S devices shall be in accordance with table IIa of method 5005 of MIL-STD-883, using an accelerated burn-in circuit approved by the qualifying activity. If the alternate burn-in conditions are used, the circuit shown on figure 7 shall be used.

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

- a. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 1 of group C inspection.
- b. Steady state life test (method 1005 of MIL-STD-883) conditions:
 1. Test condition C using the circuit shown on figure 6 or test condition D using the circuit shown on figure 7.
 2. $T_A = 125^\circ\text{C}$, minimum for 1,000 hours.
- c. A special subgroup shall be added to the group C inspection requirements for class B devices, and shall consist of the tests, conditions, and limits as specified for subgroups 10 and 11 of group A.
- d. A special subgroup shall be added to group C inspection for class B devices only and it shall consist of group A, subgroup 12 as specified in table III herein. This special subgroup shall be performed on each device type that is qualified from those listed in 1.2.1 herein. After initial qualification, the special subgroup shall be performed periodically on a single device type selected from those device types previously qualified. A sample of 5 devices (of the device type to be inspected) shall be chosen and submitted to test with no failures allowed. If not more than 1 failure is found in the first sample of 5, a second sample of 5 is permitted with no further failures allowed. When more than one device type is qualified, the single device type selected shall be a different device for each subsequent periodic inspection until all qualified device types have been inspected. The sequence of single device types shall be repeated to fulfill the periodic inspection requirement.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883 and as follows:

- a. End-point electrical parameters shall be as specified in table III herein.
- b. A special subgroup shall be added to group D inspection for class S devices only and it shall consist of the group A subgroups 4 and 7 as specified in table III herein. This special subgroup shall be performed on each device type that is qualified from those listed in 1.2.1 herein. After initial qualification, the special subgroup shall be performed periodically on a single device type selected from those device types previously qualified. When more than one device type is qualified, the single device type selected shall be a different device type for each subsequent periodic inspection until all qualified device types have been inspected. The sequence of single device types shall be repeated to fulfill the periodic inspection requirement.

4.5 Methods of inspection. Methods of inspection shall be as specified in the appropriate tables. Electrical test circuits as prescribed herein or in the referenced test methods of MIL-STD-883 shall be acceptable. Other test circuits shall require the approval of the qualifying activity.

4.5.1 Voltages and currents. All voltages values given are referenced to the ground terminal of the device under test (DUT). Current values given are for conventional current and are positive when flowing into the referenced terminal.

4.5.2 Life test and burn-in cooldown procedure. When the devices are measured at 25°C following application of the steady state life or burn-in test condition, they shall be cooled to within 10°C of their power stable condition prior to removal of the bias.

4.6 Data reporting. When specified in the contract or purchase order, a copy of the following data, as applicable, shall be supplied:

- a. Attributes data for all screening tests (see 4.2) and variables data for all static burn-in, dynamic burn-in, and operating life tests.
- b. The quality conformance inspection data (see 4.4).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510. The devices covered by this specification require electrostatic protection.

6. NOTES

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

6.2 Ordering data. The contract or purchase order should specify the following:

- a. Complete part number (see 1.2).
- b. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment supplied by the device manufacturer, if applicable.
- c. Requirement for certificate of compliance, if applicable.
- d. Requirements for notification of change of product or process to procuring activity in addition to notification to the qualifying activity, if applicable.
- e. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.
- f. Requirements for product assurance options.
- g. Requirements special lead lengths or lead forming, if applicable. These requirements shall not affect the part number.
- h. Requirements for "JAN" marking.

6.3 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-M-38510, MIL-STD-1313, and as follows:

| | |
|-------------------------------|--|
| V _{IC} - - - - - | Input clamp voltage. |
| I _{IL} - - - - - | Low level (address) input current. |
| I _{IH} - - - - - | High level (address) input current. |
| I _{S(OFF)} - - - - - | Leakage current into the source terminal of an "OFF" switch. |
| I _{D(OFF)} - - - - - | Leakage current into the drain terminal of an "OFF" switch. |

| | | |
|-----------|-----------|--|
| $I_D(ON)$ | - - - - - | Leakage current from an "ON" driver into the switch. |
| $I(+)$ | - - - - - | Positive supply current. |
| $I(-)$ | - - - - - | Negative supply current. |
| $I(SBY)$ | - - - - - | Standby supply current. |
| R_{ON} | - - - - - | Resistance of an "ON" switch. |
| C_A | - - - - - | Address capacitance. |
| C_{OS} | - - - - - | Output switch capacitance. |
| C_{IS} | - - - - - | Input switch capacitance. |
| C_{IOS} | - - - - - | Input to output (feedthrough) capacitance. |
| t_{PLH} | - - - - - | Propagation delay time: low to high level. |
| t_{PHL} | - - - - - | Propagation delay time: high to low level. |
| GND | - - - - - | Electrical ground. |
| VREF | - - - - - | Reference voltage. |
| A | - - - - - | Address input to switch. |
| EN | - - - - - | Enable. |
| O/I | - - - - - | Output/Input. |
| I/O | - - - - - | Input/Output. |

TABLE IV. Group C end-point electrical parameters ($T_A = 25^\circ\text{C}$).

| Parameter | Device types | | | | | |
|------------|-------------------------------------|---------------------|--------------------|---------------------|--------------------------------------|--------------------------------------|
| | 01, 07 | 02 | 03, 08 | 04 | 05 | 06 |
| R_{ON} | 50 Ω or 10% ^{1/} | 150 Ω or 10% | 50 Ω or 10% | 150 Ω or 10% | 150 Ω or 10% ^{1/} | 150 Ω or 10% ^{1/} |
| $I_D(OFF)$ | 15 nA | 15 nA | 15 nA | 15 nA | 15 nA | 15 nA |
| $I_S(OFF)$ | 15 nA | 15 nA | 15 nA | 15 nA | 15 nA | 15 nA |

^{1/} Whichever is greater.

^{2/} Each of the above parameters shall be recorded before and after the required burn-in or life tests to determine deltas (Δ).

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

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

| <u>Military device type</u> | <u>Generic-industry type</u> |
|---------------------------------|----------------------------------|
| 01 | 506, 6116 |
| 02 | 506A |
| 03 | 507, 6216 |
| 04 | 507A |
| 05 | 508A |
| 06 | 509A |
| 07 | 508, 6108 |
| 08 | 509, 6208 |

6.6 Handling. MOS devices must be handled with certain precautions to avoid damage due to accumulation of static charge. Input protective devices have been designed in the chip to minimize the effect of this static buildup. However, the following handling practices are recommended:

- a. Devices should be handled on benches with conductive and grounded surface.
- b. Ground test equipment, tools and operator.
- c. Do not handle devices by the leads.
- d. Store devices in conductive foam or carriers.
- e. Avoid use of plastic, rubber, or silk in MOS areas.
- f. Maintain relative humidity above 50 percent.

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

Custodians:

Army - ER
Navy - EC
Air Force - 17

Preparing activity:

NASA - WA

Agent:

DLA - ES

Review activities:

Army - MI
Air Force - 11, 19, 80, 85, 99
DLA - ES

(Project 5962-0909)

User activities:

Army - AR, SM
Navy - AS, CG, OS, MC, SH

Civil Agency Coordinating Activity:

NASA - WA

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

| | |
|--|--|
| 1. DOCUMENT NUMBER MIL-M-38510/190C | 2. DOCUMENT TITLE Microcircuits, Linear, CMOS/Analog Multiplexers/ Demultiplexers with Overvoltage Protection, Monolithic, Silicon |
|--|--|

| | |
|---|--|
| 3a. NAME OF SUBMITTING ORGANIZATION Positive Logic | 4. TYPE OF ORGANIZATION <i>(Mark one)</i> <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER <i>(Specify):</i> _____ |
|---|--|

b. ADDRESS *(Street, City, State, ZIP Code)*

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

| | |
|---|--|
| 7a. NAME OF SUBMITTER <i>(Last, First, MI)</i> - Optional | b. WORK TELEPHONE NUMBER <i>(Include Area Code)</i> - Optional |
|---|--|

| | |
|--|--------------------------------|
| c. MAILING ADDRESS <i>(Street, City, State, ZIP Code)</i> - Optional | 8. DATE OF SUBMISSION (YYMMDD) |
|--|--------------------------------|

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