

INCH-POUND

MIL-M-38510/310D  
3 October 2002  
SUPERSEDING  
MIL-M-38510/310C  
28 April 1982

## DETAIL SPECIFICATION

### MICROCIRCUITS, DIGITAL, BIPOLAR LOW-POWER SCHOTTKY TTL, AND GATES, MONOLITHIC SILICON

Inactive for new design after 18 April 1997.

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, low-power Schottky TTL, positive AND logic gate 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. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).

1.2 Part number. The part number shall be in accordance with MIL-PRF-38535, and as specified herein.

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

| <u>Device type</u> | <u>Circuit</u>                                   |
|--------------------|--------------------------------------------------|
| 01                 | Triple, 3-input AND gate                         |
| 02                 | Triple, 3-input AND gate (open collector output) |
| 03                 | Dual, 4-input AND gate                           |
| 04                 | Quad, 2-input AND gate                           |
| 05                 | Quad, 2-input AND gate (open collector output)   |

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

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

| <u>Outline letter</u> | <u>Descriptive designator</u> | <u>Terminals</u> | <u>Package style</u>         |
|-----------------------|-------------------------------|------------------|------------------------------|
| A <u>1/</u>           | GDFP5-F14 or CDFP6-F14        | 14               | Flat pack                    |
| B <u>1/</u>           | GDFP4-14                      | 14               | Flat pack                    |
| C                     | GDIP1-T14 or CDIP2-T14        | 14               | Dual-in-line                 |
| D                     | GDFP1-F14 or CDFP2-F14        | 14               | Flat pack                    |
| X                     | CQCC2-N20                     | 20               | Square leadless chip carrier |
| 2                     | CQCC1-N20                     | 20               | Square leadless chip carrier |

1/ Inactive case outline package (see MIL-STD-1835).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, 3990 East Broad St., Columbus, OH 43216-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 5962

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# MIL-M-38510/310D

## 1.3 Absolute maximum ratings.

|                                                          |                            |
|----------------------------------------------------------|----------------------------|
| Supply voltage range .....                               | -0.5 V to +7.0 V           |
| Input voltage range .....                                | -1.5 V at -18 mA to +5.5 V |
| Storage temperature range .....                          | -65° to +150°C             |
| Maximum power dissipation, (P <sub>D</sub> ) <u>1</u> :  |                            |
| Device types 01 and 02 .....                             | 36 mW                      |
| Device type 03 .....                                     | 24.2 mW                    |
| Device types 04 and 05 .....                             | 48.4 mW                    |
| Lead temperature (soldering, 10 seconds) .....           | 300°C                      |
| Thermal resistance, junction to case (θ <sub>JC</sub> ): |                            |
| Cases A, B, C, D, X and 2.....                           | See MIL-STD-1835           |
| Junction temperature (T <sub>J</sub> ) .....             | 175°C <u>2</u>             |

## 1.4 Recommended operating conditions.

|                                                           |                                |
|-----------------------------------------------------------|--------------------------------|
| Supply voltage (V <sub>CC</sub> ) .....                   | 4.5 V minimum to 5.5 V maximum |
| Minimum high level input voltage (V <sub>IH</sub> ) ..... | 2.0 V                          |
| Maximum low level input voltage (V <sub>IL</sub> ) .....  | 0.7 V                          |
| Case operating temperature range (T <sub>C</sub> ) .....  | -55° to +125°C                 |

## 2. APPLICABLE DOCUMENTS

### 2.1 Government documents.

2.1.1 Specifications and Standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents 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

##### DEPARTMENT OF DEFENSE

- MIL-M-38510 - Microcircuits, General Specification for.
- MIL-PRF-38535 - Integrated Circuits (Microcircuits) Manufacturing, General Specification for.

#### STANDARD

##### DEPARTMENT OF DEFENSE

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

(Unless otherwise indicated, copies of the above specifications and standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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

1/ Must withstand the added P<sub>D</sub> due to short-circuit test (e.g., I<sub>OS</sub>).

2/ Maximum junction temperature (T<sub>J</sub>) may be increased during the burn-in screening and steady-state life test. However, such temperatures should not be used under normal operating conditions.

### 3. REQUIREMENTS

3.1 Qualification. Items furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.3 and 6.4).

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

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

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

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

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

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

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

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

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

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

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 8 (see MIL-PRF-38535, appendix A).

### 4. VERIFICATION (QUALITY ASSURANCE PROVISIONS)

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

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

- a. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.
- b. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.
- c. Additional screening for space level product shall be as specified in MIL-PRF-38535, appendix B.

TABLE I. Electrical performance characteristics.

| Test                                     | Symbol           | Conditions<br>-55°C ≤ T <sub>C</sub> ≤ +125°C                                | Device<br>types | Limits |      | Unit |
|------------------------------------------|------------------|------------------------------------------------------------------------------|-----------------|--------|------|------|
|                                          |                  |                                                                              |                 | Min    | Max  |      |
| High level output voltage                | V <sub>OH</sub>  | V <sub>CC</sub> = 4.5 V, V <sub>IH</sub> = 20 V<br>I <sub>OH</sub> = -400 μA | 01, 03,<br>04   | 2.5    |      | V    |
| Low level output voltage                 | V <sub>OL</sub>  | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 4 mA<br>V <sub>IL</sub> = 0.7 V   | All             |        | 0.4  | V    |
| Input clamp voltage                      | V <sub>IC</sub>  | V <sub>CC</sub> = 4.5 V, I <sub>IN</sub> = -18 mA<br>T <sub>C</sub> = 25°C   | All             |        | -1.5 | V    |
| Maximum collector cut-off current        | I <sub>CEX</sub> | V <sub>CC</sub> = 4.5 V, V <sub>IH</sub> = 2.0 V<br>V <sub>OH</sub> = 5.5 V  | 02, 05          |        | 100  | μA   |
| High level input current                 | I <sub>IH1</sub> | V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 2.7 V                             | All             |        | 20   | μA   |
| High level input current                 | I <sub>IH2</sub> | V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 5.5 V                             | All             |        | 100  | μA   |
| Low level input current                  | I <sub>IL</sub>  | V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0.4 V                             | 01, 05          | -30    | -380 | μA   |
|                                          |                  |                                                                              | 02, 03,<br>04   | -30    | -400 |      |
| Short circuit output current             | I <sub>OS</sub>  | V <sub>CC</sub> = 5.5 V <u>1/</u>                                            | 01              | -15    | -100 | mA   |
|                                          |                  |                                                                              | 03, 04          | -15    | -110 |      |
| High level supply current                | I <sub>CCH</sub> | V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 5.5 V                             | 01, 02          |        | 3.6  | mA   |
|                                          |                  |                                                                              | 03              |        | 2.4  |      |
|                                          |                  |                                                                              | 04, 05          |        | 4.8  |      |
| Low level supply current                 | I <sub>CCL</sub> | V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0 V                               | 01, 02          |        | 6.6  | mA   |
|                                          |                  |                                                                              | 03              |        | 4.4  |      |
|                                          |                  |                                                                              | 04, 05          |        | 8.8  |      |
| Propagation delay time high-to-low level | t <sub>PHL</sub> | C <sub>L</sub> = 50 pF<br>R <sub>L</sub> = 2 kΩ<br>V <sub>CC</sub> = 5.0 V   | 01, 03,<br>04   | 2      | 30   | ns   |
|                                          |                  |                                                                              | 02, 05          | 2      | 45   |      |
| Propagation delay time low-to-high level | t <sub>PLH</sub> | C <sub>L</sub> = 50 pF<br>R <sub>L</sub> = 2 kΩ<br>V <sub>CC</sub> = 5.0 V   | 01, 03,<br>04   | 2      | 25   | ns   |
|                                          |                  |                                                                              | 02, 05          | 2      | 50   |      |

1/ Not more than one output should be shorted at a time.

TABLE II. Electrical test requirements.

| MIL-PRF-38535<br>test requirements      | Subgroups (see table III) |                       |
|-----------------------------------------|---------------------------|-----------------------|
|                                         | Class S<br>devices        | Class B<br>devices    |
| Interim electrical parameters           | 1                         | 1                     |
| Final electrical test parameters        | 1*, 2, 3, 9,<br>10, 11    | 1*, 2, 3, 9           |
| Group A test requirements               | 1, 2, 3,<br>9, 10, 11     | 1, 2, 3, 9,<br>10, 11 |
| Group C end-point electrical parameters | 1, 2, 3, 5<br>9, 10, 11   | 1, 2, 3               |
| Group D end-point electrical parameters | 1, 2, 3                   | 1, 2, 3               |

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

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

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

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

- a. Tests shall be as specified in table II herein.
- b. Subgroups 4, 6, 7, and 8 shall be omitted.

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

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

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

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

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

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

| Pin number |                | Device type 01  |                 | Device type 02  |                 | Device type 03  |                 | Device type 04  |                 | Device type 05  |                 |
|------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Cases      |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 2, X       | A, B, C, and D | 2, X            | A, B, C, and D  | 2, X            | A, B, C, and D  | 2, X            | A, B, C, and D  | 2, X            | A, B, C, and D  | 2, X            | A, B, C, and D  |
| 1          | 1              | NC              | 1A              | NC              | 1A              | NC              | 1A              | NC              | 1A              | NC              | 1A              |
| 2          | 2              | 1A              | 1B              | 1A              | 1B              | 1A              | 1B              | 1A              | 1B              | 1A              | 1B              |
| 3          | 3              | 1B              | 2A              | 1B              | 2A              | 1B              | NC              | 1B              | 1Y              | 1B              | 1Y              |
| 4          | 4              | 2A              | 2B              | 2A              | 2B              | NC              | 1C              | 1Y              | 2A              | 1Y              | 2A              |
| 5          | 5              | NC              | 2C              | NC              | 2C              | NC              | 1D              | NC              | 2B              | NC              | 2B              |
| 6          | 6              | 2B              | 2Y              | 2B              | 2Y              | 1C              | 1Y              | 2A              | 2Y              | 2A              | 2Y              |
| 7          | 7              | NC              | GND             | NC              | GND             | NC              | GND             | NC              | GND             | NC              | GND             |
| 8          | 8              | 2C              | 3Y              | 2C              | 3Y              | 1D              | 2Y              | 2B              | 3Y              | 2B              | 3Y              |
| 9          | 9              | 2Y              | 3A              | 2Y              | 3A              | 1Y              | 2A              | 2Y              | 3A              | 2Y              | 3A              |
| 10         | 10             | GND             | 3B              | GND             | 3B              | GND             | 2B              | GND             | 3B              | GND             | 3B              |
| 11         | 11             | NC              | 3C              | NC              | 3C              | NC              | NC              | NC              | 4Y              | NC              | 4Y              |
| 12         | 12             | 3Y              | 1Y              | 3Y              | 1Y              | 2Y              | 2C              | 3Y              | 4A              | 3Y              | 4A              |
| 13         | 13             | 3A              | 1C              | 3A              | 1C              | 2A              | 2D              | 3A              | 4B              | 3A              | 4B              |
| 14         | 14             | 3B              | V <sub>CC</sub> | 3B              | V <sub>CC</sub> | 2B              | V <sub>CC</sub> | 3B              | V <sub>CC</sub> | 3B              | V <sub>CC</sub> |
| 15         |                | NC              |                 | NC              |                 | NC              |                 | NC              |                 | NC              |                 |
| 16         |                | 3C              |                 | 3C              |                 | NC              |                 | 4Y              |                 | 4Y              |                 |
| 17         |                | NC              |                 | NC              |                 | NC              |                 | NC              |                 | NC              |                 |
| 18         |                | 1Y              |                 | 1Y              |                 | 2C              |                 | 4A              |                 | 4A              |                 |
| 19         |                | 1C              |                 | 1C              |                 | 2D              |                 | 4B              |                 | 4B              |                 |
| 20         |                | V <sub>CC</sub> |                 | V <sub>CC</sub> |                 | V <sub>CC</sub> |                 | V <sub>CC</sub> |                 | V <sub>CC</sub> |                 |

FIGURE 1. Terminal connections.

Device types 01 and 02

| Truth table (each gate) |   |   |        |
|-------------------------|---|---|--------|
| Inputs                  |   |   | Output |
| A                       | B | C | Y      |
| L                       | L | L | L      |
| H                       | L | L | L      |
| H                       | H | L | L      |
| H                       | L | H | L      |
| L                       | L | H | L      |
| H                       | H | H | H      |

Positive logic  $Y = ABC$

Device type 03

| Truth table (each gate) |   |   |   |        |
|-------------------------|---|---|---|--------|
| Inputs                  |   |   |   | Output |
| A                       | B | C | D | Y      |
| L                       | L | L | L | L      |
| H                       | L | L | L | L      |
| H                       | H | L | L | L      |
| H                       | H | H | L | L      |
| H                       | H | H | H | H      |

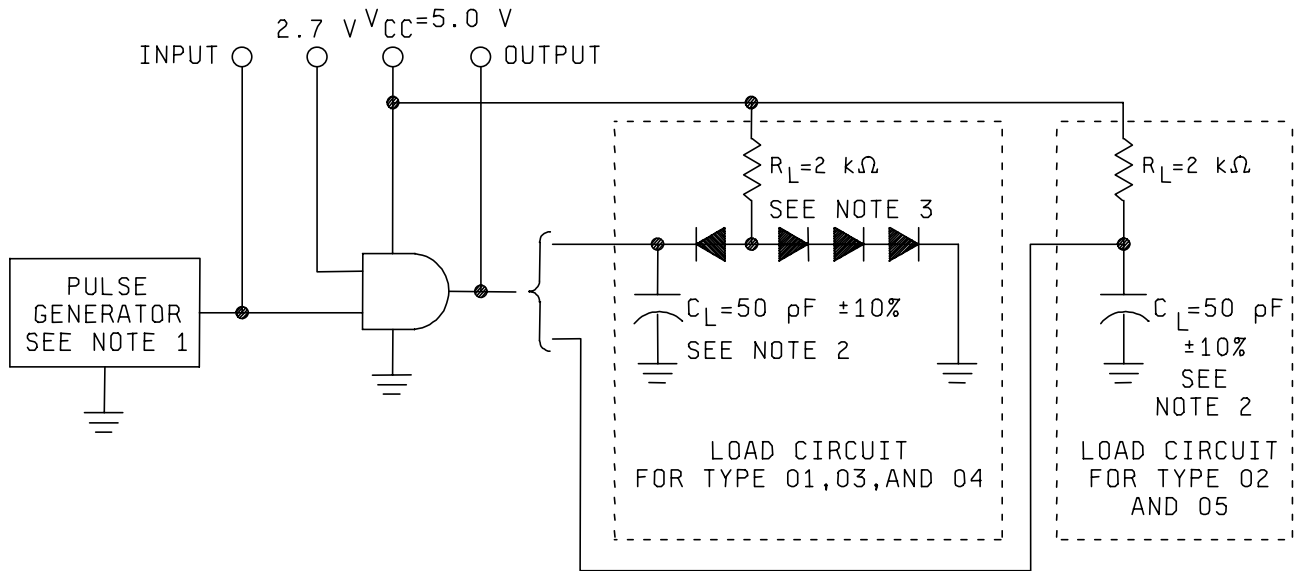
Positive logic  $Y = ABCD$

Device types 04 and 05

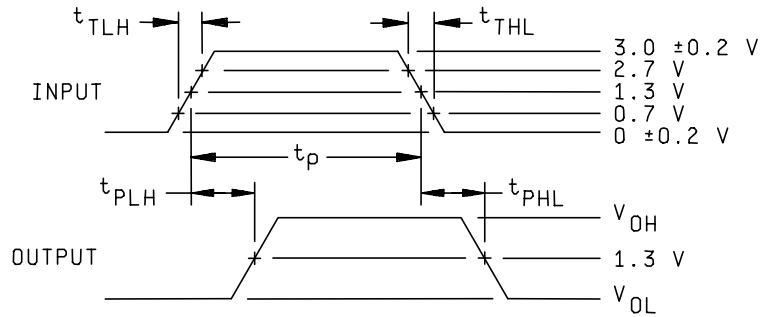
| Truth table (each gate) |   |        |
|-------------------------|---|--------|
| Inputs                  |   | Output |
| A                       | B | Y      |
| L                       | L | L      |
| H                       | L | L      |
| L                       | H | L      |
| H                       | H | H      |

Positive logic  $Y = AB$

FIGURE 2. Truth table and logic equations.



TEST CIRCUIT



VOLTAGE WAVEFORMS

## NOTES:

1. The generator has the following characteristics:  $t_{TLH} \leq 15$  ns,  $t_{THL} \leq 6$  ns,  $t_p = .5$   $\mu$ s,  $PRR \leq 1$  MHz,  $Z_{OUT} \cong 50\Omega$ .
2.  $C_L$  includes probe and jig capacitance.
3. All diodes are 1N3064 or equivalent.

FIGURE 3. Switching time test circuit.

TABLE III. Group A inspection for device type 01.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup       | Symbol          | MIL-STD-883 method | Cases A,B,C,D  | 1      | 2      | 3      | 4      | 5      | 6            | 7   | 8            | 9      | 10     | 11     | 12           | 13     | 14              | Measured terminal | Limits |      | Unit    |
|----------------|-----------------|--------------------|----------------|--------|--------|--------|--------|--------|--------------|-----|--------------|--------|--------|--------|--------------|--------|-----------------|-------------------|--------|------|---------|
|                |                 |                    | Cases 2, X, 1/ | 2      | 3      | 4      | 6      | 8      | 9            | 10  | 12           | 13     | 14     | 16     | 18           | 19     | 20              |                   |        |      |         |
|                |                 |                    | Test no.       | 1A     | 1B     | 2A     | 2B     | 2C     | 2Y           | GND | 3Y           | 3A     | 3B     | 3C     | 1Y           | 1C     | V <sub>CC</sub> |                   | Min    | Max  |         |
| 1<br>Tc = 25°C | V <sub>OH</sub> | 3006               | 1              | 2.0 V  | 2.0 V  | 5.5 V  | 5.5 V  | 5.5 V  |              | GND |              | 5.5 V  | 5.5 V  | 5.5 V  | -400 $\mu$ A | 2.0 V  | 4.5 V           | 1Y                | 2.5    |      | V dc    |
|                |                 |                    | 2              | 5.5 V  | 5.5 V  | 2.0 V  | 2.0 V  | 2.0 V  | -400 $\mu$ A |     |              | 5.5 V  | 5.5 V  | 5.5 V  |              | 5.5 V  |                 | 2Y                |        |      |         |
|                |                 |                    | 3              | 5.5 V  |        | 5.5 V  | 5.5 V  | 5.5 V  |              |     | -400 $\mu$ A | 2.0 V  | 2.0 V  | 2.0 V  |              |        |                 | 3Y                |        |      |         |
|                | V               | 3007               | 4              | 0.7 V  |        |        |        |        |              |     |              | 5.5 V  | 5.5 V  | 5.5 V  | 4 mA         |        |                 | 1Y                |        | 0.4  |         |
|                |                 |                    | 5              | 5.5 V  | 0.7 V  |        |        |        |              |     |              |        |        |        |              |        |                 | 1Y                |        |      |         |
|                |                 |                    | 6              |        | 5.5 V  |        |        |        |              |     |              |        |        |        |              | 0.7 V  |                 | 1Y                |        |      |         |
|                |                 |                    | 7              |        |        | 0.7 V  |        |        | 4 mA         |     |              |        |        |        |              | 5.5 V  |                 | 2Y                |        |      |         |
|                |                 |                    | 8              |        |        | 5.5 V  | 0.7 V  |        |              |     |              |        |        |        |              |        |                 | 2Y                |        |      |         |
|                |                 |                    | 9              |        |        |        | 5.5 V  | 0.7 V  |              |     |              |        |        |        |              |        |                 | 2Y                |        |      |         |
|                |                 |                    | 10             |        |        |        |        | 5.5 V  |              |     | 4 mA         | 0.7 V  |        |        |              |        |                 | 3Y                |        |      |         |
|                |                 |                    | 11             |        |        |        |        |        |              |     |              | 5.5 V  | 0.7 V  |        |              |        |                 | 3Y                |        |      |         |
|                |                 |                    | 12             |        |        |        |        |        |              |     |              |        | 5.5 V  | 0.7 V  |              |        |                 | 3Y                |        |      |         |
|                |                 |                    | 13             | -18 mA |        |        |        |        |              |     |              |        |        |        |              |        |                 | 1A                |        | -1.5 |         |
|                |                 |                    | 14             |        | -18 mA |        |        |        |              |     |              |        |        |        |              |        |                 | 1B                |        |      |         |
| V              | V               |                    | 15             |        |        |        |        |        |              |     |              |        |        |        |              | -18 mA |                 | 1C                |        |      |         |
|                |                 |                    | 16             |        |        | -18 mA |        |        |              |     |              |        |        |        |              |        |                 | 2A                |        |      |         |
|                |                 |                    | 17             |        |        |        | -18 mA |        |              |     |              |        |        |        |              |        |                 | 2B                |        |      |         |
|                |                 |                    | 18             |        |        |        |        | -18 mA |              |     |              |        |        |        |              |        |                 | 2C                |        |      |         |
|                |                 |                    | 19             |        |        |        |        |        |              |     |              | -18 mA |        |        |              |        |                 | 3A                |        |      |         |
|                |                 |                    | 20             |        |        |        |        |        |              |     |              |        | -18 mA |        |              |        |                 | 3B                |        |      |         |
|                |                 |                    | 21             |        |        |        |        |        |              |     |              |        |        | -18 mA |              |        |                 | 3C                |        |      |         |
|                |                 |                    | 22             | 2.7 V  | GND    | GND    | GND    | GND    |              |     |              |        | GND    | GND    |              | GND    | 5.5 V           | 1A                |        | 20   | $\mu$ A |
|                | I               | 3010               | 23             | GND    | 2.7 V  |        |        |        |              |     |              |        |        |        |              | GND    |                 | 1B                |        |      |         |
|                |                 |                    | 24             |        | GND    |        |        |        |              |     |              |        |        |        |              | 2.7 V  |                 | 1C                |        |      |         |
|                |                 |                    | 25             |        |        | 2.7 V  |        |        |              |     |              |        |        |        |              | GND    |                 | 2A                |        |      |         |
|                |                 |                    | 26             |        |        | GND    | 2.7 V  |        |              |     |              |        |        |        |              |        |                 | 2B                |        |      |         |
|                |                 |                    | 27             |        |        |        | GND    | 2.7 V  |              |     |              |        |        |        |              |        |                 | 2C                |        |      |         |
|                |                 |                    | 28             |        |        |        |        | GND    |              |     |              | 2.7 V  |        |        |              |        |                 | 3A                |        |      |         |
|                |                 |                    | 29             |        |        |        |        |        |              |     |              | GND    | 2.7 V  |        |              |        |                 | 3B                |        |      |         |
|                |                 |                    | 30             |        |        |        |        |        |              |     |              |        | GND    | 2.7 V  |              |        |                 | 3C                |        |      |         |
| I              | I               |                    | 31             | 5.5 V  |        |        |        |        |              |     |              |        |        | GND    |              |        |                 | 1A                |        | 100  |         |
|                |                 |                    | 32             | GND    | 5.5 V  |        |        |        |              |     |              |        |        |        |              |        |                 | 1B                |        |      |         |
|                |                 |                    | 33             |        | GND    |        |        |        |              |     |              |        |        |        |              | 5.5 V  |                 | 1C                |        |      |         |
|                |                 |                    | 34             |        |        | 5.5 V  |        |        |              |     |              |        |        |        |              | GND    |                 | 2A                |        |      |         |
|                |                 |                    | 35             |        |        | GND    | 5.5 V  |        |              |     |              |        |        |        |              |        |                 | 2B                |        |      |         |
|                |                 |                    | 36             |        |        |        | GND    | 5.5 V  |              |     |              |        |        |        |              |        |                 | 2C                |        |      |         |
|                |                 |                    | 37             |        |        |        |        | GND    |              |     |              | 5.5 V  |        |        |              |        |                 | 3A                |        |      |         |
|                |                 |                    | 38             |        |        |        |        | GND    |              |     |              | GND    | 5.5 V  |        |              |        |                 | 3B                |        |      |         |
|                |                 |                    | 39             |        |        |        |        | GND    |              |     |              | GND    | GND    | 5.5 V  |              |        |                 | 3C                |        |      |         |
|                | I               | 3009               | 40             | 0.4 V  | 5.5 V  | 5.5 V  | 5.5 V  | 5.5 V  |              |     |              | 5.5 V  | 5.5 V  |        |              | 5.5 V  |                 | 1A                | 1/     | 1/   |         |
|                |                 |                    | 41             | 5.5 V  | 0.4 V  |        |        |        |              |     |              |        |        |        |              | 5.5 V  |                 | 1B                |        |      |         |
|                |                 |                    | 42             |        | 5.5 V  |        |        |        |              |     |              |        |        |        |              | 0.4 V  |                 | 1C                |        |      |         |
|                |                 |                    | 43             |        |        | 0.4 V  |        |        |              |     |              |        |        |        |              | 5.5 V  |                 | 2A                |        |      |         |
|                |                 |                    | 44             |        |        | 5.5 V  | 0.4 V  |        |              |     |              |        |        |        |              |        |                 | 2B                |        |      |         |
|                |                 |                    | 45             |        |        |        | 5.5 V  | 0.4 V  |              |     |              |        |        |        |              |        |                 | 2C                |        |      |         |
|                |                 |                    | 46             |        |        |        |        | 5.5 V  |              |     |              | 0.4 V  |        |        |              |        |                 | 3A                |        |      |         |
|                |                 |                    | 47             |        |        |        |        | 5.5 V  |              |     |              |        | 5.5 V  | 0.4 V  |              |        |                 | 3B                |        |      |         |
|                |                 |                    | 48             |        |        |        |        | 5.5 V  |              |     |              |        | 5.5 V  | 5.5 V  | 0.4 V        |        |                 | 3C                |        |      |         |

See footnotes at end of device type 01

TABLE III. Group A inspection for device type 01 – Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup                   | Symbol                                                                                                                                                | MIL-STD-883 method | Cases A,B,C,D  | 1     | 2     | 3     | 4     | 5     | 6   | 7   | 8   | 9     | 10    | 11    | 12  | 13    | 14              | Measured terminal | Limits |      | Unit |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-------|-------|-------|-------|-------|-----|-----|-----|-------|-------|-------|-----|-------|-----------------|-------------------|--------|------|------|
|                            |                                                                                                                                                       |                    | Cases 2, X, 1/ | 2     | 3     | 4     | 6     | 8     | 9   | 10  | 12  | 13    | 14    | 16    | 18  | 19    | 20              |                   |        |      |      |
|                            |                                                                                                                                                       |                    | Test no.       | 1A    | 1B    | 2A    | 2B    | 2C    | 2Y  | GND | 3Y  | 3A    | 3B    | 3C    | 1Y  | 1C    | V <sub>CC</sub> |                   | Min    | Max  |      |
| 1<br>T <sub>C</sub> = 25°C | I <sub>OS</sub>                                                                                                                                       | 3011               | 49             | 5.5 V | 5.5 V |       |       |       |     | GND |     |       |       |       | GND | 5.5 V | 5.5 V           | 1Y                | -15    | -100 | mA   |
|                            |                                                                                                                                                       |                    | 50             |       |       | 5.5 V | 5.5 V | 5.5 V | GND | "   |     |       |       |       |     | "     | 2Y              | -15               | -100   | "    |      |
|                            |                                                                                                                                                       |                    | 51             |       |       |       |       |       |     | "   | GND | 5.5 V | 5.5 V | 5.5 V |     |       | "               | 3Y                | -15    | -100 | "    |
|                            | C <sub>CH</sub>                                                                                                                                       | 3005               | 52             | 5.5 V | 5.5 V | 5.5 V | 5.5 V | 5.5 V |     | "   |     | 5.5 V | 5.5 V | 5.5 V |     | 5.5 V | "               | V <sub>CC</sub>   |        | 3.6  | "    |
|                            | C <sub>CL</sub>                                                                                                                                       | 3005               | 53             | GND   | GND   | GND   | GND   | GND   |     |     |     | GND   | GND   | GND   |     | GND   | "               | V <sub>CC</sub>   |        | 6.6  | "    |
| 2                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = 125° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |       |       |       |     |     |     |       |       |       |     |       |                 |                   |        |      |      |
| 3                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = -55° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |       |       |       |     |     |     |       |       |       |     |       |                 |                   |        |      |      |
| 9<br>T <sub>C</sub> = 25°C | t <sub>PHL</sub>                                                                                                                                      | 3003<br>Fig. 3     | 54             | IN    | 2.7 V |       |       |       | "   | GND |     |       |       |       | OUT | 2.7 V | 5.0 V           | 1A to 1Y          | 2      | 20   | ns   |
|                            |                                                                                                                                                       |                    | 55             | 2.7 V | IN    |       |       |       |     | "   |     |       |       |       | OUT | 2.7 V | "               | 1B to 1Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 56             | 2.7 V | 2.7 V |       |       |       |     | "   |     |       |       |       | OUT | IN    | "               | 1C to 1Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 57             |       |       | IN    | 2.7 V | 2.7 V | OUT | "   |     |       |       |       |     |       | "               | 2A to 2Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 58             |       |       | 2.7 V | IN    | 2.7 V | OUT | "   |     |       |       |       |     | "     | 2B to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 59             |       |       | 2.7 V | 2.7 V | IN    | OUT | "   |     |       |       |       |     | "     | 2C to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 60             |       |       |       |       |       |     | "   | OUT | IN    | 2.7 V | 2.7 V |     |       | "               | 3A to 3Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 61             |       |       |       |       |       |     | "   | OUT | 2.7 V | IN    | 2.7 V |     |       | "               | 3B to 3Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 62             |       |       |       |       |       |     | "   | OUT | 2.7 V | 2.7 V | IN    |     |       | "               | 3C to 3Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 63             | IN    | 2.7 V |       |       |       |     | "   |     |       |       |       | OUT | 2.7 V | "               | 1A to 1Y          | "      | 15   | "    |
|                            |                                                                                                                                                       |                    | 64             | 2.7 V | IN    |       |       |       |     | "   |     |       |       |       | OUT | 2.7 V | "               | 1B to 1Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 65             | 2.7 V | 2.7 V |       |       |       |     | "   |     |       |       |       | OUT | IN    | "               | 1C to 1Y          | "      | "    | "    |
|                            | t                                                                                                                                                     | PLH                | 66             |       |       | IN    | 2.7 V | 2.7 V | OUT | "   |     |       |       |       |     | "     | 2A to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 67             |       |       | 2.7 V | IN    | 2.7 V | OUT | "   |     |       |       |       |     | "     | 2B to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 68             |       |       | 2.7 V | 2.7 V | IN    | OUT | "   |     |       |       |       |     | "     | 2C to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 69             |       |       |       |       |       |     | "   | OUT | IN    | 2.7 V | 2.7 V |     |       | "               | 3A to 3Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 70             |       |       |       |       |       |     | "   | OUT | 2.7 V | IN    | 2.7 V |     |       | "               | 3B to 3Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 71             |       |       |       |       |       |     | "   | OUT | 2.7 V | 2.7 V | IN    |     |       | "               | 3C to 3Y          | "      | "    | "    |
| 10                         | Same tests, terminal conditions and limits as for subgroup 9, except T <sub>C</sub> = 125° C, t <sub>PLH</sub> = 25 ns, and t <sub>PHL</sub> = 30 ns. |                    |                |       |       |       |       |       |     |     |     |       |       |       |     |       |                 |                   |        |      |      |
| 11                         | Same tests, terminal conditions and limits as for subgroup 10, except T <sub>C</sub> = -55° C.                                                        |                    |                |       |       |       |       |       |     |     |     |       |       |       |     |       |                 |                   |        |      |      |

1/ For cases X and 2, pins not referenced are NC.

2/ I<sub>IL</sub> limits in  $\mu$ A are as follows:

| Circuit         | A         | B        | C         | D         | E         | F         |
|-----------------|-----------|----------|-----------|-----------|-----------|-----------|
| I <sub>IL</sub> | -120/-360 | -30/-300 | -160/-400 | -120/-360 | -150/-380 | -105/-345 |

TABLE III. Group A inspection for device type 02.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup                   | Symbol          | MIL-STD-883 method | Cases A,B,C,D  | 1      | 2      | 3      | 4      | 5     | 6     | 7      | 8      | 9      | 10    | 11     | 12    | 13    | 14              | Measured terminal | Limits |      | Unit |  |
|----------------------------|-----------------|--------------------|----------------|--------|--------|--------|--------|-------|-------|--------|--------|--------|-------|--------|-------|-------|-----------------|-------------------|--------|------|------|--|
|                            |                 |                    | Cases 2, X, 1/ | 2      | 3      | 4      | 6      | 8     | 9     | 10     | 12     | 13     | 14    | 16     | 18    | 19    | 20              |                   |        |      |      |  |
|                            |                 |                    | Test no.       | 1A     | 1B     | 2A     | 2B     | 2C    | 2Y    | GND    | 3Y     | 3A     | 3B    | 3C     | 1Y    | 1C    | V <sub>CC</sub> |                   | Min    | Max  |      |  |
| 1<br>T <sub>C</sub> = 25°C | V <sub>OL</sub> | 3007               | 1              | 0.7 V  | 5.5 V  | 5.5 V  | 5.5 V  | 5.5 V |       |        |        | 5.5 V  | 5.5 V | 5.5 V  | 4 mA  | 5.5 V | 4.5 V           | 1Y                |        | 0.4  | V dc |  |
|                            |                 |                    | 2              | 5.5 V  | 0.7 V  |        |        |       |       |        |        |        |       |        |       | 5.5 V |                 | 1Y                |        |      |      |  |
|                            |                 |                    | 3              |        | 5.5 V  |        |        |       |       |        |        |        |       |        |       | 0.7 V |                 | 1Y                |        |      |      |  |
|                            |                 |                    | 4              |        |        | 0.7 V  |        |       | 4 mA  |        |        |        |       |        |       | 5.5 V |                 | 2Y                |        |      |      |  |
|                            |                 |                    | 5              |        |        | 5.5 V  | 0.7 V  |       |       |        |        |        |       |        |       |       |                 | 2Y                |        |      |      |  |
|                            |                 |                    | 6              |        |        |        | 5.5 V  | 0.7 V |       |        |        |        |       |        |       |       |                 | 2Y                |        |      |      |  |
|                            |                 |                    | 7              |        |        |        |        | 5.5 V |       |        | 4 mA   | 0.7 V  |       |        |       |       |                 | 3Y                |        |      |      |  |
|                            |                 |                    | 8              |        |        |        |        |       |       |        |        | 5.5 V  | 0.7 V |        |       |       |                 | 3Y                |        |      |      |  |
|                            |                 |                    | 9              |        |        |        |        |       |       |        |        | 5.5 V  | 5.5 V | 0.7 V  |       |       |                 | 3Y                |        |      |      |  |
|                            | I               | CEX                | 10             | 2.0 V  |        |        |        |       |       |        |        |        |       |        | 5.5 V | 5.5 V |                 | 1Y                |        | 100  | μA   |  |
|                            |                 |                    | 11             | 5.5 V  | 2.0 V  |        |        |       |       |        |        |        |       |        |       |       |                 | 1Y                |        |      |      |  |
|                            |                 |                    | 12             |        | 5.5 V  |        |        |       |       |        |        |        |       |        |       | 2.0 V |                 | 1Y                |        |      |      |  |
|                            |                 |                    | 13             |        |        | 2.0 V  |        |       | 5.5 V |        |        |        |       |        |       | 5.5 V |                 | 2Y                |        |      |      |  |
|                            |                 |                    | 14             |        |        | 5.5 V  | 2.0 V  |       |       |        |        |        |       |        |       |       |                 | 2Y                |        |      |      |  |
|                            |                 |                    | 15             |        |        |        | 5.5 V  | 2.0 V |       |        |        |        |       |        |       |       |                 | 2Y                |        |      |      |  |
|                            |                 |                    | 16             |        |        |        |        | 5.5 V |       |        | 5.5 V  | 2.0 V  |       |        |       |       |                 | 3Y                |        |      |      |  |
|                            |                 |                    | 17             |        |        |        |        |       |       |        |        | 5.5 V  | 2.0 V |        |       |       |                 | 3Y                |        |      |      |  |
|                            |                 |                    | 18             |        |        |        |        |       |       |        |        | 5.5 V  | 5.5 V | 2.0 V  |       |       |                 | 3Y                |        |      |      |  |
| V                          | I <sub>C</sub>  | 19                 | -18 mA         |        |        |        |        |       |       |        |        |        |       |        |       |       | 1A              |                   | -1.5   | V dc |      |  |
|                            |                 | 20                 |                | -18 mA |        |        |        |       |       |        |        |        |       |        |       |       | 1B              |                   |        |      |      |  |
|                            |                 | 21                 |                |        |        |        |        |       |       |        |        |        |       | -18 mA |       |       | 1C              |                   |        |      |      |  |
|                            |                 | 22                 |                |        | -18 mA |        |        |       |       |        |        |        |       |        |       |       | 2A              |                   |        |      |      |  |
|                            |                 | 23                 |                |        |        | -18 mA |        |       |       |        |        |        |       |        |       |       | 2B              |                   |        |      |      |  |
|                            |                 | 24                 |                |        |        |        | -18 mA |       |       |        |        |        |       |        |       |       | 2C              |                   |        |      |      |  |
|                            |                 | 25                 |                |        |        |        |        |       |       | -18 mA |        |        |       |        |       |       | 3A              |                   |        |      |      |  |
|                            |                 | 26                 |                |        |        |        |        |       |       |        | -18 mA |        |       |        |       |       | 3B              |                   |        |      |      |  |
|                            |                 | 27                 |                |        |        |        |        |       |       |        |        | -18 mA |       |        |       |       | 3C              |                   |        |      |      |  |
| I                          | I <sub>H1</sub> | 3010               | 28             | 2.7 V  | GND    | GND    | GND    | GND   |       |        |        |        | GND   | GND    |       | GND   | 5.5 V           | 1A                |        | 20   | μA   |  |
|                            |                 |                    | 29             | GND    | 2.7 V  |        |        |       |       |        |        |        |       |        |       | GND   |                 | 1B                |        |      |      |  |
|                            |                 |                    | 30             |        | GND    |        |        |       |       |        |        |        |       |        |       |       |                 | 1C                |        |      |      |  |
|                            |                 |                    | 31             |        |        | 2.7 V  |        |       |       |        |        |        |       |        |       |       | 2.7 V           |                   | 2A     |      |      |  |
|                            |                 |                    | 32             |        |        | GND    | 2.7 V  |       |       |        |        |        |       |        |       |       |                 |                   | 2B     |      |      |  |
|                            |                 |                    | 33             |        |        |        | GND    | 2.7 V |       |        |        |        |       |        |       |       |                 |                   | 2C     |      |      |  |
|                            |                 |                    | 34             |        |        |        |        | GND   |       |        | 2.7 V  |        |       |        |       |       |                 |                   | 3A     |      |      |  |
|                            |                 |                    | 35             |        |        |        |        |       |       |        |        | GND    | 2.7 V |        |       |       |                 |                   | 3B     |      |      |  |
|                            |                 |                    | 36             |        |        |        |        |       |       |        |        |        | GND   | 2.7 V  |       |       |                 |                   | 3C     |      |      |  |
| I                          | I <sub>H2</sub> |                    | 37             | 5.5 V  |        |        |        |       |       |        |        |        |       |        | GND   |       |                 | 1A                |        | 100  |      |  |
|                            |                 |                    | 38             | GND    | 5.5 V  |        |        |       |       |        |        |        |       |        |       |       |                 | 1B                |        |      |      |  |
|                            |                 |                    | 39             |        | GND    |        |        |       |       |        |        |        |       |        |       | 5.5 V |                 | 1C                |        |      |      |  |
|                            |                 |                    | 40             |        |        | 5.5 V  |        |       |       |        |        |        |       |        |       | GND   |                 | 2A                |        |      |      |  |
|                            |                 |                    | 41             |        |        | GND    | 5.5 V  |       |       |        |        |        |       |        |       |       |                 | 2B                |        |      |      |  |
|                            |                 |                    | 42             |        |        |        | GND    | 5.5 V |       |        |        |        |       |        |       |       |                 | 2C                |        |      |      |  |
|                            |                 |                    | 43             |        |        |        |        | GND   |       |        |        |        |       | 5.5 V  |       |       |                 | 3A                |        |      |      |  |
|                            |                 |                    | 44             |        |        |        |        | GND   |       |        |        | GND    | 5.5 V |        |       |       |                 | 3B                |        |      |      |  |
|                            |                 |                    | 45             |        |        |        |        | GND   |       |        |        | GND    | GND   | 5.5 V  |       |       |                 | 3C                |        |      |      |  |

See footnotes at end of device type 02

TABLE III. Group A inspection for device type 02 – Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup                   | Symbol                                                                                                                                                                | MIL-STD-883 method | Cases A,B,C,D  | 1     | 2     | 3     | 4     | 5     | 6     | 7   | 8     | 9     | 10    | 11    | 12    | 13    | 14              | Measured terminal | Limits   |     | Unit |  |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|-----------------|-------------------|----------|-----|------|--|
|                            |                                                                                                                                                                       |                    | Cases 2, X, 1/ | 2     | 3     | 4     | 6     | 8     | 9     | 10  | 12    | 13    | 14    | 16    | 18    | 19    | 20              |                   | Min      | Max |      |  |
|                            |                                                                                                                                                                       |                    | Test no.       | 1A    | 1B    | 2A    | 2B    | 2C    | 2Y    | GND | 3Y    | 3A    | 3B    | 3C    | 1Y    | 1C    | V <sub>CC</sub> |                   |          |     |      |  |
| 1<br>T <sub>C</sub> = 25°C | I <sub>IL</sub>                                                                                                                                                       | 3009               | 46             | 0.4 V | 5.5 V | 5.5 V | 5.5 V | 5.5 V |       | GND |       | 5.5 V | 5.5 V | 5.5 V |       | 5.5 V | 5.5 V           | 1A                | 2/       | 2/  | μA   |  |
|                            |                                                                                                                                                                       |                    | 47             | 5.5 V | 0.4 V |       |       |       |       |     |       |       |       |       |       | 5.5 V |                 | 1B                |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 48             |       | 5.5 V |       |       |       |       |     |       |       |       |       |       | 0.4 V |                 | 1C                |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 49             |       |       | 0.4 V |       |       |       |     |       |       |       |       |       | 5.5 V |                 | 2A                |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 50             |       |       | 5.5 V | 0.4 V |       |       |     |       |       |       |       |       |       |                 | 2B                |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 51             |       |       |       | 5.5 V | 0.4 V |       |     |       |       |       |       |       |       |                 | 2C                |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 52             |       |       |       |       | 5.5 V |       |     |       |       | 0.4 V |       |       |       |                 | 3A                |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 53             |       |       |       |       | 5.5 V |       |     |       | 5.5 V | 0.4 V |       |       |       |                 | 3B                |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 54             |       |       |       |       | 5.5 V |       |     |       | 5.5 V | 5.5 V | 0.4 V |       |       |                 | 3C                |          |     |      |  |
|                            | CCL                                                                                                                                                                   | 3005               | 55             | GND   | GND   | GND   | GND   | GND   |       |     | GND   | GND   | GND   |       | GND   |       | V <sub>CC</sub> |                   | 6.6      | mA  |      |  |
|                            | CCH                                                                                                                                                                   | 3005               | 56             | 5.5 V | 5.5 V | 5.5 V | 5.5 V | 5.5 V |       |     | 5.5 V | 5.5 V | 5.5 V |       | 5.5 V |       | V <sub>CC</sub> |                   | 3.6      | mA  |      |  |
| 2                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = 125° C, and V <sub>IC</sub> tests are omitted.                                  |                    |                |       |       |       |       |       |       |     |       |       |       |       |       |       |                 |                   |          |     |      |  |
| 3                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = -55° C, and V <sub>IC</sub> tests are omitted.                                  |                    |                |       |       |       |       |       |       |     |       |       |       |       |       |       |                 |                   |          |     |      |  |
| 9<br>T <sub>C</sub> = 25°C | t <sub>PHL</sub>                                                                                                                                                      | 3003<br>Fig. 3     | 57             | IN    | 2.7 V |       |       |       |       | GND |       |       |       |       | OUT   | 2.7 V | 5.0 V           | 1A to 1Y          | 2        | 30  | ns   |  |
|                            |                                                                                                                                                                       |                    | 58             | 2.7 V | IN    |       |       |       |       |     |       |       |       |       | OUT   | 2.7 V |                 | 1B to 1Y          |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 59             | 2.7 V | 2.7 V |       |       |       |       |     |       |       |       |       | OUT   | IN    |                 | 1C to 1Y          |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 60             |       |       | IN    | 2.7 V | 2.7 V | OUT   |     |       |       |       |       |       |       |                 | 2A to 2Y          |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 61             |       |       | 2.7 V | IN    | 2.7 V | OUT   |     |       |       |       |       |       |       |                 | 2B to 2Y          |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 62             |       |       | 2.7 V | 2.7 V | IN    | OUT   |     |       |       |       |       |       |       |                 | 2C to 2Y          |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 63             |       |       |       |       |       |       |     | OUT   | IN    | 2.7 V | 2.7 V |       |       |                 | 3A to 3Y          |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 64             |       |       |       |       |       |       |     | OUT   | 2.7 V | IN    | 2.7 V |       |       |                 | 3B to 3Y          |          |     |      |  |
|                            |                                                                                                                                                                       |                    | 65             |       |       |       |       |       |       |     |       | OUT   | 2.7 V | 2.7 V | IN    |       |                 | 3C to 3Y          |          |     |      |  |
|                            | t                                                                                                                                                                     |                    | PLH            | 66    | IN    | 2.7 V |       |       |       |     |       |       |       |       |       | OUT   | 2.7 V           |                   | 1A to 1Y |     | 35   |  |
|                            |                                                                                                                                                                       |                    |                | 67    | 2.7 V | IN    |       |       |       |     |       |       |       |       |       | OUT   | 2.7 V           |                   | 1B to 1Y |     |      |  |
|                            |                                                                                                                                                                       |                    |                | 68    | 2.7 V | 2.7 V |       |       |       |     |       |       |       |       |       | OUT   | IN              |                   | 1C to 1Y |     |      |  |
|                            |                                                                                                                                                                       |                    |                | 69    |       |       | IN    | 2.7 V | 2.7 V | OUT |       |       |       |       |       |       |                 |                   | 2A to 2Y |     |      |  |
|                            |                                                                                                                                                                       |                    |                | 70    |       |       | 2.7 V | IN    | 2.7 V | OUT |       |       |       |       |       |       |                 |                   | 2B to 2Y |     |      |  |
|                            |                                                                                                                                                                       |                    |                | 71    |       |       | 2.7 V | 2.7 V | IN    | OUT |       |       |       |       |       |       |                 |                   | 2C to 2Y |     |      |  |
|                            |                                                                                                                                                                       |                    |                | 72    |       |       |       |       |       |     |       | OUT   | IN    | 2.7 V | 2.7 V |       |                 |                   | 3A to 3Y |     |      |  |
|                            |                                                                                                                                                                       |                    |                | 73    |       |       |       |       |       |     |       |       | OUT   | 2.7 V | IN    | 2.7 V |                 |                   | 3B to 3Y |     |      |  |
|                            |                                                                                                                                                                       |                    |                | 74    |       |       |       |       |       |     |       | OUT   | 2.7 V | 2.7 V | IN    |       |                 |                   | 3C to 3Y |     |      |  |
| 10                         | Same tests, terminal conditions and limits as for subgroup 9, except T <sub>C</sub> = 125° C, t <sub>PHL</sub> = 45 ns, maximum and t <sub>PLH</sub> = 50 ns maximum. |                    |                |       |       |       |       |       |       |     |       |       |       |       |       |       |                 |                   |          |     |      |  |
| 11                         | Same tests, terminal conditions and limits as for subgroup 10, except T <sub>C</sub> = -55° C.                                                                        |                    |                |       |       |       |       |       |       |     |       |       |       |       |       |       |                 |                   |          |     |      |  |

1/ For cases X and 2, pins not referenced are NC.

2/ I<sub>IL</sub> limits in μA are as follows:

| Circuit         | A         | B        | C         | D         | E         | F         |
|-----------------|-----------|----------|-----------|-----------|-----------|-----------|
| I <sub>IL</sub> | -120/-360 | -30/-300 | -160/-400 | -120/-360 | -150/-380 | -105/-345 |

TABLE III. Group A inspection for device type 03.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup       | Symbol          | MIL-STD-883 method | Cases A,B,C,D  | 1      | 2      | 3  | 4      | 5      | 6            | 7   | 8            | 9     | 10     | 11 | 12     | 13     | 14              | Measured terminal | Limits |         | Unit |
|----------------|-----------------|--------------------|----------------|--------|--------|----|--------|--------|--------------|-----|--------------|-------|--------|----|--------|--------|-----------------|-------------------|--------|---------|------|
|                |                 |                    | Cases 2, X, 1/ | 2      | 3      | 4  | 6      | 8      | 9            | 10  | 12           | 13    | 14     | 16 | 18     | 19     | 20              |                   |        |         |      |
|                |                 |                    | Test no.       | 1A     | 1B     | NC | 1C     | 1D     | 1Y           | GND | 2Y           | 2A    | 2B     | NC | 2C     | 2D     | V <sub>CC</sub> |                   | Min    | Max     |      |
| 1<br>Tc = 25°C | V <sub>OH</sub> | 3006               |                | 2.0 V  | 2.0 V  |    | 2.0 V  | 2.0 V  | -400 $\mu$ A | GND |              | 5.5 V | 5.5 V  |    | 5.5 V  | 5.5 V  | 4.5 V           | 1Y                | 2.5    |         | V dc |
|                |                 |                    | 1              | 5.5 V  | 5.5 V  |    | 5.5 V  | 5.5 V  |              |     | -400 $\mu$ A | 2.0 V | 2.0 V  |    | 2.0 V  | 2.0 V  |                 | 2Y                | 2.5    |         |      |
|                | V               | 3007               | 3              | 0.7 V  | 5.5 V  |    |        |        | 4 mA         |     |              | 5.5 V | 5.5 V  |    | 5.5 V  | 5.5 V  |                 | 1Y                |        | 0.4     |      |
|                |                 |                    | 4              | 5.5 V  | 0.7 V  |    |        |        |              |     |              |       |        |    |        |        |                 | 1Y                |        |         |      |
|                |                 |                    | 5              |        | 5.5 V  |    |        |        |              |     |              |       |        |    |        |        |                 | 1Y                |        |         |      |
|                |                 |                    | 6              |        |        |    | 5.5 V  | 0.7 V  |              |     |              |       |        |    |        |        |                 | 1Y                |        |         |      |
|                |                 |                    | 7              |        |        |    |        | 5.5 V  |              |     | 4 mA         | 0.7 V |        |    |        |        |                 | 2Y                |        |         |      |
|                |                 |                    | 8              |        |        |    |        |        |              |     |              | 5.5 V | 0.7 V  |    |        |        |                 | 2Y                |        |         |      |
|                |                 |                    | 9              |        |        |    |        |        |              |     |              |       | 5.5 V  |    | 0.7 V  |        |                 | 2Y                |        |         |      |
|                |                 |                    | 10             |        |        |    |        |        |              |     |              |       | 5.5 V  |    | 5.5 V  | 0.7 V  |                 | 2Y                |        |         |      |
|                | V               |                    | 11             | -18 mA |        |    |        |        |              |     |              |       |        |    |        |        |                 | 1A                | -1.5   |         |      |
|                |                 |                    | 12             |        | -18 mA |    |        |        |              |     |              |       |        |    |        |        |                 | 1B                |        |         |      |
|                |                 |                    | 13             |        |        |    | -18 mA |        |              |     |              |       |        |    |        |        |                 | 1C                |        |         |      |
|                |                 |                    | 14             |        |        |    |        | -18 mA |              |     |              |       |        |    |        |        |                 | 1D                |        |         |      |
|                |                 |                    | 15             |        |        |    |        |        |              |     | -18 mA       |       |        |    |        |        |                 | 2A                |        |         |      |
|                |                 |                    | 16             |        |        |    |        |        |              |     |              |       | -18 mA |    |        |        |                 | 2B                |        |         |      |
|                |                 |                    | 17             |        |        |    |        |        |              |     |              |       |        |    | -18 mA |        |                 | 2C                |        |         |      |
|                |                 |                    | 18             |        |        |    |        |        |              |     |              |       |        |    |        | -18 mA |                 | 2D                |        |         |      |
| I              | IH1             | 3010               | 19             | 2.7 V  | GND    |    | GND    | GND    |              |     |              | GND   | GND    |    | GND    | GND    | 5.5 V           | 1A                | 20     | $\mu$ A |      |
|                |                 |                    | 20             | GND    | 2.7 V  |    | GND    | GND    |              |     |              |       |        |    |        |        |                 | 1B                |        |         |      |
|                |                 |                    | 21             |        | GND    |    | 2.7 V  | GND    |              |     |              |       |        |    |        |        |                 | 1C                |        |         |      |
|                |                 |                    | 22             |        |        |    | GND    | 2.7 V  |              |     |              |       |        |    |        |        |                 | 1D                |        |         |      |
|                |                 |                    | 23             |        |        |    |        | GND    |              |     |              | 2.7 V |        |    |        |        |                 | 2A                |        |         |      |
|                |                 |                    | 24             |        |        |    |        |        |              |     |              | GND   | 2.7 V  |    |        |        |                 | 2B                |        |         |      |
|                | IH2             |                    | 25             |        |        |    |        |        |              |     |              |       | GND    |    | 2.7 V  |        |                 | 2C                |        |         |      |
|                |                 |                    | 26             |        |        |    |        |        |              |     |              |       |        |    | GND    | 2.7 V  |                 | 2D                |        |         |      |
|                |                 |                    | 27             | 5.5 V  |        |    |        |        |              |     |              |       |        |    |        | GND    |                 | 1A                | 100    |         |      |
|                |                 |                    | 28             | GND    | 5.5 V  |    |        |        |              |     |              |       |        |    |        |        |                 | 1B                |        |         |      |
|                |                 |                    | 29             |        | GND    |    | 5.5 V  |        |              |     |              |       |        |    |        |        |                 | 1C                |        |         |      |
|                |                 |                    | 30             |        |        |    | GND    | 5.5 V  |              |     |              |       |        |    |        |        |                 | 1D                |        |         |      |
|                |                 |                    | 31             |        |        |    |        | GND    |              |     |              |       | 5.5 V  |    |        |        |                 | 2A                |        |         |      |
|                |                 |                    | 32             |        |        |    |        |        |              |     |              | GND   | 5.5 V  |    |        |        |                 | 2B                |        |         |      |
| I              | IL              | 3009               | 33             |        |        |    |        |        |              |     |              | GND   | GND    |    | 5.5 V  |        |                 | 2C                |        |         |      |
|                |                 |                    | 34             |        |        |    |        |        |              |     |              | GND   | GND    |    | GND    | 5.5 V  |                 | 2D                |        |         |      |
|                |                 |                    | 35             | 0.4 V  | 5.5 V  |    | 5.5 V  | 5.5 V  |              |     |              | 5.5 V | 5.5 V  |    | 5.5 V  |        |                 | 1A                | 2/     | 2/      |      |
|                |                 |                    | 36             | 5.5 V  | 0.4 V  |    | 5.5 V  |        |              |     |              |       |        |    |        |        |                 | 1B                |        |         |      |
|                |                 |                    | 37             |        | 5.5 V  |    | 0.4 V  |        |              |     |              |       |        |    |        |        |                 | 1C                |        |         |      |
|                |                 |                    | 38             |        |        |    | 5.5 V  | 0.4 V  |              |     |              |       |        |    |        |        |                 | 1D                |        |         |      |
|                |                 |                    | 39             |        |        |    |        | 5.5 V  |              |     |              | 0.4 V |        |    |        |        |                 | 2A                |        |         |      |
|                |                 |                    | 40             |        |        |    |        |        |              |     |              | 5.5 V | 0.4 V  |    |        |        |                 | 2B                |        |         |      |
|                |                 |                    | 41             |        |        |    |        |        |              |     |              | 5.5 V | 5.5 V  |    | 0.4 V  |        |                 | 2C                |        |         |      |
|                |                 |                    | 42             |        |        |    |        |        |              |     |              | 5.5 V | 5.5 V  |    | 5.5 V  | 0.4 V  |                 | 2D                |        |         |      |

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 – Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup                   | Symbol                                                                                                                                                | MIL-STD-883 method | Cases A,B,C,D  | 1     | 2     | 3     | 4     | 5     | 6     | 7   | 8   | 9     | 10    | 11    | 12    | 13    | 14              | Measured terminal | Limits   |      | Unit |   |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-------|-------|-------|-------|-------|-------|-----|-----|-------|-------|-------|-------|-------|-----------------|-------------------|----------|------|------|---|
|                            |                                                                                                                                                       |                    | Cases 2, X, 1/ | 2     | 3     | 4     | 6     | 8     | 9     | 10  | 12  | 13    | 14    | 16    | 18    | 19    | 20              |                   |          |      |      |   |
|                            |                                                                                                                                                       |                    | Test no.       | 1A    | 1B    | NC    | 1C    | 1D    | 1Y    | GND | 2Y  | 2A    | 2B    | NC    | 2C    | 2D    | V <sub>CC</sub> |                   | Min      | Max  |      |   |
| 1<br>T <sub>C</sub> = 25°C | I <sub>OS</sub>                                                                                                                                       | 3011               | 43             | 5.5 V | 5.5 V |       | 5.5 V | 5.5 V | GND   | GND |     |       |       |       |       |       | 5.5 V           | 1Y                | -15      | -110 | mA   |   |
|                            |                                                                                                                                                       |                    | 44             |       |       |       |       |       |       | "   | GND | 5.5 V | 5.5 V |       |       |       | 5.5 V           | 2Y                | -15      | -110 | "    |   |
|                            | C <sub>CH</sub>                                                                                                                                       | 3005               | 45             | 5.5 V | 5.5 V |       | 5.5 V | 5.5 V |       | "   |     | 5.5 V | 5.5 V |       | 5.5 V | 5.5 V | "               | V <sub>CC</sub>   |          | 2.4  | "    |   |
|                            | C <sub>CL</sub>                                                                                                                                       | 3005               | 46             | GND   | GND   |       |       | GND   |       | "   |     | GND   | GND   |       | GND   | GND   | "               | V <sub>CC</sub>   |          | 4.4  | "    |   |
| 2                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = 125° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |       |       |       |       |     |     |       |       |       |       |       |                 |                   |          |      |      |   |
| 3                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = -55° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |       |       |       |       |     |     |       |       |       |       |       |                 |                   |          |      |      |   |
| 9<br>T <sub>C</sub> = 25°C | t <sub>PHL</sub>                                                                                                                                      | 3003<br>Fig. 3     | 47             | IN    | 2.7 V |       | 2.7 V | 2.7 V | OUT   | GND |     |       |       |       |       |       | 5.0 V           | 1A to 1Y          | 2        | 20   | ns   |   |
|                            |                                                                                                                                                       |                    | 48             | 2.7 V | IN    |       | 2.7 V | 2.7 V | OUT   | "   |     |       |       |       |       | "     | 1B to 1Y        | "                 | "        | "    |      |   |
|                            |                                                                                                                                                       |                    | 49             | 2.7 V | 2.7 V |       | IN    | 2.7 V | OUT   | "   |     |       |       |       |       | "     | 1C to 1Y        | "                 | "        | "    |      |   |
|                            |                                                                                                                                                       |                    | 50             | 2.7 V | 2.7 V |       | 2.7 V | IN    | OUT   | "   |     |       |       |       |       | "     | 1D to 1Y        | "                 | "        | "    |      |   |
|                            |                                                                                                                                                       |                    | 51             |       |       |       |       |       |       | "   | OUT | IN    | 2.7 V |       | 2.7 V | 2.7 V | "               | 2A to 2Y          | "        | "    | "    |   |
|                            |                                                                                                                                                       |                    | 52             |       |       |       |       |       |       | "   | OUT | 2.7 V | IN    |       | 2.7 V | 2.7 V | "               | 2B to 2Y          | "        | "    | "    |   |
|                            |                                                                                                                                                       |                    | 53             |       |       |       |       |       |       | "   | OUT | 2.7 V | 2.7 V |       | IN    | 2.7 V | "               | 2C to 2Y          | "        | "    | "    |   |
|                            |                                                                                                                                                       |                    | 54             |       |       |       |       |       |       | "   | OUT | 2.7 V | 2.7 V |       | 2.7 V | IN    | "               | 2D to 2Y          | "        | "    | "    |   |
|                            | t                                                                                                                                                     |                    | PLH            | 55    | IN    | 2.7 V |       | 2.7 V | 2.7 V | OUT | "   |       |       |       |       |       |                 | "                 | 1A to 1Y | "    | 15   | " |
|                            |                                                                                                                                                       |                    |                | 56    | 2.7 V | IN    |       | 2.7 V | 2.7 V | OUT | "   |       |       |       |       |       | "               | 1B to 1Y          | "        | "    | "    |   |
|                            |                                                                                                                                                       |                    |                | 57    | 2.7 V | 2.7 V |       | IN    | 2.7 V | OUT | "   |       |       |       |       |       | "               | 1C to 1Y          | "        | "    | "    |   |
|                            |                                                                                                                                                       |                    |                | 58    | 2.7 V | 2.7 V |       | 2.7 V | IN    | OUT | "   |       |       |       |       |       | "               | 1D to 1Y          | "        | "    | "    |   |
|                            |                                                                                                                                                       |                    |                | 59    |       |       |       |       |       |     | "   | OUT   | IN    | 2.7 V |       | 2.7 V | 2.7 V           | "                 | 2A to 2Y | "    | "    | " |
|                            |                                                                                                                                                       |                    |                | 60    |       |       |       |       |       |     | "   | OUT   | 2.7 V | IN    |       | 2.7 V | 2.7 V           | "                 | 2B to 2Y | "    | "    | " |
|                            |                                                                                                                                                       |                    |                | 61    |       |       |       |       |       |     | "   | OUT   | 2.7 V | 2.7 V |       | IN    | 2.7 V           | "                 | 2C to 2Y | "    | "    | " |
|                            |                                                                                                                                                       |                    |                | 62    |       |       |       |       |       |     | "   | OUT   | 2.7 V | 2.7 V |       | 2.7 V | IN              | "                 | 2D to 2Y | "    | "    | " |
| 10                         | Same tests, terminal conditions and limits as for subgroup 9, except T <sub>C</sub> = 125° C, t <sub>PHL</sub> = 30 ns, and t <sub>PLH</sub> = 25 ns. |                    |                |       |       |       |       |       |       |     |     |       |       |       |       |       |                 |                   |          |      |      |   |
| 11                         | Same tests, terminal conditions and limits as for subgroup 10, except T <sub>C</sub> = -55° C.                                                        |                    |                |       |       |       |       |       |       |     |     |       |       |       |       |       |                 |                   |          |      |      |   |

1/ For cases X and 2, pins not referenced are NC.

2/ I<sub>IL</sub> limits in  $\mu$ A are as follows:

| Circuit         | A         | B        | C         | D         | E         | F         |
|-----------------|-----------|----------|-----------|-----------|-----------|-----------|
| I <sub>IL</sub> | -120/-360 | -30/-300 | -160/-400 | -120/-360 | -150/-380 | -105/-345 |

TABLE III. Group A inspection for device type 04.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup       | Symbol          | MIL-STD-883 method | Cases A,B,C,D  | 1      | 2      | 3            | 4      | 5      | 6            | 7   | 8            | 9      | 10     | 11           | 12     | 13     | 14              | Measured terminal | Limits |      | Unit    |
|----------------|-----------------|--------------------|----------------|--------|--------|--------------|--------|--------|--------------|-----|--------------|--------|--------|--------------|--------|--------|-----------------|-------------------|--------|------|---------|
|                |                 |                    | Cases 2, X, 1/ | 2      | 3      | 4            | 6      | 8      | 9            | 10  | 12           | 13     | 14     | 16           | 18     | 19     | 20              |                   |        |      |         |
|                |                 |                    | Test no.       | 1A     | 1B     | 1Y           | 2A     | 2B     | 2Y           | GND | 3Y           | 3A     | 3B     | 4Y           | 4A     | 4B     | V <sub>CC</sub> |                   | Min    | Max  |         |
| 1<br>Tc = 25°C | V <sub>OH</sub> | 3006               |                | 2.0 V  | 2.0 V  | -400 $\mu$ A | 5.5 V  | 5.5 V  |              | GND |              | 5.5 V  | 5.5 V  |              | 5.5 V  | 5.5 V  | 4.5 V           | 1Y                | 2.5    |      | V dc    |
|                |                 |                    | 1              | 5.5 V  | 5.5 V  |              | 2.0 V  | 2.0 V  | -400 $\mu$ A |     |              | 5.5 V  | 5.5 V  |              |        |        |                 | 2Y                |        |      |         |
|                |                 |                    | 3              |        |        |              | 5.5 V  | 5.5 V  |              |     | -400 $\mu$ A | 2.0 V  | 2.0 V  |              |        |        |                 | 3Y                |        |      |         |
|                |                 |                    | 4              |        |        |              |        |        |              |     |              | 5.5 V  | 5.5 V  | -400 $\mu$ A | 2.0 V  | 2.0 V  |                 | 4Y                |        |      |         |
|                | V               | 3007               | 5              | 0.7 V  | 5.5 V  | 4 mA         |        |        |              |     |              | 5.5 V  | 5.5 V  |              | 5.5 V  | 5.5 V  |                 | 1Y                |        | 0.4  |         |
|                |                 |                    | 6              | 5.5 V  | 0.7 V  | 4 mA         |        |        |              |     |              |        |        |              |        |        |                 | 1Y                |        |      |         |
|                |                 |                    | 7              |        | 5.5 V  |              | 0.7 V  |        | 4 mA         |     |              |        |        |              |        |        |                 | 2Y                |        |      |         |
|                |                 |                    | 8              |        |        |              | 5.5 V  | 0.7 V  | 4 mA         |     |              |        |        |              |        |        |                 | 2Y                |        |      |         |
|                |                 |                    | 9              |        |        |              |        | 5.5 V  |              |     | 4 mA         | 0.7 V  |        |              |        |        |                 | 3Y                |        |      |         |
|                |                 |                    | 10             |        |        |              |        |        |              |     | 4 mA         | 5.5 V  | 0.7 V  |              |        |        |                 | 3Y                |        |      |         |
|                |                 |                    | 11             |        |        |              |        |        |              |     |              |        | 5.5 V  | 4 mA         | 0.7 V  |        |                 | 4Y                |        |      |         |
|                |                 |                    | 12             |        |        |              |        |        |              |     |              |        |        | 5.5 V        | 4 mA   | 5.5 V  | 0.7 V           | 4Y                |        |      |         |
|                | V               |                    | 13             | -18 mA |        |              |        |        |              |     |              |        |        |              |        |        |                 | 1A                |        | -1.5 |         |
|                |                 |                    | 14             |        | -18 mA |              |        |        |              |     |              |        |        |              |        |        |                 | 1B                |        |      |         |
|                |                 |                    | 15             |        |        |              | -18 mA |        |              |     |              |        |        |              |        |        |                 | 2A                |        |      |         |
|                |                 |                    | 16             |        |        |              |        | -18 mA |              |     |              |        |        |              |        |        |                 | 2B                |        |      |         |
|                |                 |                    | 17             |        |        |              |        |        |              |     |              | -18 mA |        |              |        |        |                 | 3A                |        |      |         |
|                |                 |                    | 18             |        |        |              |        |        |              |     |              |        | -18 mA |              |        |        |                 | 3B                |        |      |         |
|                |                 |                    | 19             |        |        |              |        |        |              |     |              |        |        |              | -18 mA |        |                 | 4A                |        |      |         |
|                |                 |                    | 20             |        |        |              |        |        |              |     |              |        |        |              |        | -18 mA |                 | 4B                |        |      |         |
|                | I               | 3010               | 21             | 2.7 V  | GND    |              | GND    | GND    |              |     |              | GND    | GND    |              | GND    | GND    | 5.5 V           | 1A                |        | 20   | $\mu$ A |
|                |                 |                    | 22             | GND    | 2.7 V  |              | GND    | GND    |              |     |              |        |        |              |        |        |                 | 1B                |        |      |         |
|                |                 |                    | 23             |        | GND    |              | 2.7 V  | GND    |              |     |              |        |        |              |        |        |                 | 2A                |        |      |         |
|                |                 |                    | 24             |        |        |              | GND    | 2.7 V  |              |     |              |        |        |              |        |        |                 | 2B                |        |      |         |
|                |                 |                    | 25             |        |        |              |        | GND    |              |     |              |        |        |              |        |        |                 | 3A                |        |      |         |
|                |                 |                    | 26             |        |        |              |        |        |              |     |              | 2.7 V  |        |              |        |        |                 | 3B                |        |      |         |
|                |                 |                    | 27             |        |        |              |        |        |              |     |              | GND    | 2.7 V  |              | 2.7 V  |        |                 | 4A                |        |      |         |
|                |                 |                    | 28             |        |        |              |        |        |              |     |              |        |        |              | GND    | 2.7 V  |                 | 4B                |        |      |         |
|                | I               |                    | 29             | 5.5 V  |        |              |        |        |              |     |              |        |        |              |        | GND    |                 | 1A                |        | 100  |         |
|                |                 |                    | 30             | GND    | 5.5 V  |              |        |        |              |     |              |        |        |              |        |        |                 | 1B                |        |      |         |
|                |                 |                    | 31             |        | GND    |              | 5.5 V  |        |              |     |              |        |        |              |        |        |                 | 2A                |        |      |         |
|                |                 |                    | 32             |        |        |              | GND    | 5.5 V  |              |     |              |        |        |              |        |        |                 | 2B                |        |      |         |
|                |                 |                    | 33             |        |        |              |        | GND    |              |     |              | 5.5 V  |        |              |        |        |                 | 3A                |        |      |         |
|                |                 |                    | 34             |        |        |              |        |        |              |     |              | GND    | 5.5 V  |              |        |        |                 | 3B                |        |      |         |
|                |                 |                    | 35             |        |        |              |        |        |              |     |              | GND    | GND    |              | 5.5 V  |        |                 | 4A                |        |      |         |
|                |                 |                    | 36             |        |        |              |        |        |              |     |              | GND    | GND    |              | GND    | 5.5 V  |                 | 4B                |        |      |         |
|                | I               | 3009               | 37             | 0.4 V  | 5.5 V  |              | 5.5 V  | 5.5 V  |              |     |              | 5.5 V  | 5.5 V  |              | 5.5 V  |        |                 | 1A                | 2/     | 2/   |         |
|                |                 |                    | 38             | 5.5 V  | 0.4 V  |              | 5.5 V  |        |              |     |              |        |        |              |        |        |                 | 1B                |        |      |         |
|                |                 |                    | 39             |        | 5.5 V  |              | 0.4 V  |        |              |     |              |        |        |              |        |        |                 | 2A                |        |      |         |
|                |                 |                    | 40             |        |        |              | 5.5 V  | 0.4 V  |              |     |              |        |        |              |        |        |                 | 2B                |        |      |         |
|                |                 |                    | 41             |        |        |              |        | 5.5 V  |              |     |              | 0.4 V  |        |              |        |        |                 | 3A                |        |      |         |
|                |                 |                    | 42             |        |        |              |        |        |              |     |              | 5.5 V  | 0.4 V  |              |        |        |                 | 3B                |        |      |         |
|                |                 |                    | 43             |        |        |              |        |        |              |     |              | 5.5 V  | 5.5 V  |              | 0.4 V  |        |                 | 4A                |        |      |         |
|                |                 |                    | 44             |        |        |              |        |        |              |     |              | 5.5 V  | 5.5 V  |              | 5.5 V  | 0.4 V  |                 | 4B                |        |      |         |

See footnotes at end of device type 04

TABLE III. Group A inspection for device type 04 – Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup                   | Symbol                                                                                                                                                | MIL-STD-883 method | Cases A,B,C,D  | 1     | 2     | 3   | 4     | 5     | 6   | 7   | 8   | 9     | 10    | 11  | 12    | 13    | 14              | Measured terminal | Limits |      | Unit |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-------|-------|-----|-------|-------|-----|-----|-----|-------|-------|-----|-------|-------|-----------------|-------------------|--------|------|------|
|                            |                                                                                                                                                       |                    | Cases 2, X, 1/ | 2     | 3     | 4   | 6     | 8     | 9   | 10  | 12  | 13    | 14    | 16  | 18    | 19    | 20              |                   |        |      |      |
|                            |                                                                                                                                                       |                    | Test no.       | 1A    | 1B    | 1Y  | 2A    | 2B    | 2Y  | GND | 3Y  | 3A    | 3B    | 4Y  | 4A    | 4B    | V <sub>CC</sub> |                   | 1Y     | Min  |      |
| 1<br>T <sub>C</sub> = 25°C | I <sub>OS</sub>                                                                                                                                       | 3011               | 45             | 5.5 V | 5.5 V | GND |       |       |     | GND |     |       |       |     |       |       | 5.5 V           | 1Y                | -15    | -100 | mA   |
|                            |                                                                                                                                                       |                    | 46             |       |       |     | 5.5 V | 5.5 V | GND | "   |     |       |       |     |       | "     | 2Y              | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 47             |       |       |     |       |       |     | "   | GND | 5.5 V | 5.5 V |     |       |       | "               | 3Y                | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 48             |       |       |     |       |       |     | "   |     |       |       | GND | 5.5 V | 5.5 V | "               | 4Y                | "      | "    | "    |
|                            | C <sub>CH</sub>                                                                                                                                       | 3005               | 49             | 5.5 V | 5.5 V |     | 5.5 V | 5.5 V |     | "   |     | 5.5 V | 5.5 V |     | 5.5 V | 5.5 V | "               | V <sub>CC</sub>   |        | 4.8  | "    |
| C <sub>CL</sub>            | 3005                                                                                                                                                  | 50                 | GND            | GND   |       |     | GND   |       | "   |     | GND | GND   |       | GND | GND   | "     | V <sub>CC</sub> |                   | 8.8    | "    |      |
| 2                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = 125° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |      |      |
| 3                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = -55° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |      |      |
| 9<br>T <sub>C</sub> = 25°C | t <sub>PHL</sub>                                                                                                                                      | 3003<br>Fig. 3     | 51             | IN    | 2.7 V | OUT |       |       |     | GND |     |       |       |     |       |       | 5.0 V           | 1A to 1Y          | 2      | 20   | ns   |
|                            |                                                                                                                                                       |                    | 52             | 2.7 V | IN    | OUT |       |       |     | "   |     |       |       |     |       | "     | 1B to 1Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 53             |       |       |     | IN    | 2.7 V | OUT | "   |     |       |       |     |       | "     | 2A to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 54             |       |       |     | 2.7 V | IN    | OUT | "   |     |       |       |     |       | "     | 2B to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 55             |       |       |     |       |       |     | "   | OUT | IN    | 2.7 V |     |       | "     | 3A to 3Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 56             |       |       |     |       |       |     | "   | OUT | 2.7 V | IN    |     |       | "     | 3B to 3Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 57             |       |       |     |       |       |     | "   |     |       |       | OUT | IN    | 2.7 V | "               | 4A to 4Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 58             |       |       |     |       |       |     | "   |     |       |       | OUT | 2.7 V | IN    | "               | 4B to 4Y          | "      | "    | "    |
|                            | t                                                                                                                                                     | PLH                | 59             | IN    | 2.7 V | OUT |       |       |     | "   |     |       |       |     |       | "     | 1A to 1Y        | "                 | 15     | "    |      |
|                            |                                                                                                                                                       |                    | 60             | 2.7 V | IN    | OUT |       |       |     | "   |     |       |       |     |       | "     | 1B to 1Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 61             |       |       |     | IN    | 2.7 V | OUT | "   |     |       |       |     |       | "     | 2A to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 62             |       |       |     | 2.7 V | IN    | OUT | "   |     |       |       |     |       | "     | 2B to 2Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 63             |       |       |     |       |       |     | "   | OUT | IN    | 2.7 V |     |       | "     | 3A to 3Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 64             |       |       |     |       |       |     | "   | OUT | 2.7 V | IN    |     |       | "     | 3B to 3Y        | "                 | "      | "    |      |
|                            |                                                                                                                                                       |                    | 65             |       |       |     |       |       |     | "   |     |       |       | OUT | IN    | 2.7 V | "               | 4A to 4Y          | "      | "    | "    |
|                            |                                                                                                                                                       |                    | 66             |       |       |     |       |       |     | "   |     |       |       | OUT | 2.7 V | IN    | "               | 4B to 4Y          | "      | "    | "    |
| 10                         | Same tests, terminal conditions and limits as for subgroup 9, except T <sub>C</sub> = 125° C, t <sub>PHL</sub> = 30 ns, and t <sub>PLH</sub> = 25 ns. |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |      |      |
| 11                         | Same tests, terminal conditions and limits as for subgroup 10, except T <sub>C</sub> = -55° C.                                                        |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |      |      |

1/ For cases X and 2, pins not referenced are NC.

2/ I<sub>IL</sub> limits in  $\mu$ A are as follows:

| Circuit         | A         | B        | C         | D         | E         | F         |
|-----------------|-----------|----------|-----------|-----------|-----------|-----------|
| I <sub>IL</sub> | -120/-360 | -30/-300 | -150/-380 | -160/-400 | -150/-380 | -105/-345 |

TABLE III. Group A inspection for device type 05.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup                   | Symbol          | MIL-STD-883 method | Cases A,B,C,D  | 1      | 2      | 3     | 4      | 5      | 6     | 7   | 8     | 9      | 10     | 11    | 12     | 13     | 14              | Measured terminal | Limits |      | Unit |
|----------------------------|-----------------|--------------------|----------------|--------|--------|-------|--------|--------|-------|-----|-------|--------|--------|-------|--------|--------|-----------------|-------------------|--------|------|------|
|                            |                 |                    | Cases 2, X, 1/ | 2      | 3      | 4     | 6      | 8      | 9     | 10  | 12    | 13     | 14     | 16    | 18     | 19     | 20              |                   |        |      |      |
|                            |                 |                    | Test no.       | 1A     | 1B     | 1Y    | 2A     | 2B     | 2Y    | GND | 3Y    | 3A     | 3B     | 4Y    | 4A     | 4B     | V <sub>CC</sub> |                   | Min    | Max  |      |
| 1<br>T <sub>c</sub> = 25°C | V <sub>OL</sub> | 3007               | 1              | 0.7 V  | 5.5 V  | 4 mA  | 5.5 V  | 5.5 V  |       | "   |       | 5.5 V  | 5.5 V  |       | 5.5 V  | 5.5 V  | 4.5 V           | 1Y                |        | 0.4  | V dc |
|                            |                 |                    | 2              | 5.5 V  | 0.7 V  | 4 mA  | 5.5 V  | 5.5 V  |       | "   |       | "      | "      |       | "      | "      | "               | 1Y                |        | "    | "    |
|                            |                 |                    | 3              | "      | 5.5 V  |       | 0.7 V  | 5.5 V  | 4 mA  | "   |       | "      | "      |       | "      | "      | "               | 2Y                |        | "    | "    |
|                            |                 |                    | 4              | "      | "      |       | 5.5 V  | 0.7 V  | 4 mA  | "   |       | "      | "      |       | "      | "      | "               | 2Y                |        | "    | "    |
|                            |                 |                    | 5              | "      | "      |       | "      | 5.5 V  |       | "   | 4 mA  | 0.7 V  | "      |       | "      | "      | "               | 3Y                |        | "    | "    |
|                            |                 |                    | 6              | "      | "      |       | "      | "      |       | "   | 4 mA  | 5.5 V  | 0.7 V  |       | "      | "      | "               | 3Y                |        | "    | "    |
|                            |                 |                    | 7              | "      | "      |       | "      | "      |       | "   |       | "      | 5.5 V  | 4 mA  | 0.7 V  | "      | "               | 4Y                |        | "    | "    |
|                            |                 |                    | 8              | "      | "      |       | "      | "      |       | "   |       | "      |        | 4 mA  | 5.5 V  | 0.7 V  | "               | 4Y                |        | "    | "    |
|                            | CEX             |                    | 9              | 2.0 V  | "      | 5.5 V | "      | "      |       |     |       |        | "      |       | "      | 5.5 V  | "               | 1Y                |        | 100  | μA   |
|                            |                 |                    | 10             | 5.5 V  | 2.0 V  | 5.5 V | "      | "      |       | "   |       | "      | "      |       | "      | "      | "               | 1Y                |        | "    | "    |
|                            |                 |                    | 11             | "      | 5.5 V  |       | 2.0 V  | "      | 5.5 V | "   |       | "      | "      |       | "      | "      | "               | 2Y                |        | "    | "    |
|                            |                 |                    | 12             | "      | "      |       | 5.5 V  | 2.0 V  | 5.5 V | "   | "     | "      | "      |       | "      | "      | "               | 2Y                |        | "    | "    |
|                            |                 |                    | 13             | "      | "      |       | "      | 5.5 V  |       | "   | 5.5 V | 2.0 V  | "      |       | "      | "      | "               | 3Y                |        | "    | "    |
|                            |                 |                    | 14             | "      | "      |       | "      | "      |       | "   | 5.5 V | 5.5 V  | 2.0 V  |       | "      | "      | "               | 3Y                |        | "    | "    |
|                            |                 |                    | 15             | "      | "      |       | "      | "      |       | "   |       | 5.5 V  | 5.5 V  | 5.5 V | 2.0 V  | "      | "               | 4Y                |        | "    | "    |
|                            |                 |                    | 16             | "      | "      |       | "      | "      |       | "   |       | 5.5 V  | 5.5 V  | 5.5 V | 5.5 V  | 2.0 V  | "               | 4Y                |        | "    | "    |
|                            | I <sub>C</sub>  |                    | 17             | -18 mA |        |       |        |        |       | "   |       |        |        |       |        |        | "               | 1A                |        | -1.5 | V dc |
|                            |                 |                    | 18             |        | -18 mA |       |        |        |       | "   |       |        |        |       |        |        | "               | 1B                |        | "    | "    |
|                            |                 |                    | 19             |        |        |       | -18 mA |        |       | "   |       |        |        |       |        |        | "               | 2A                |        | "    | "    |
|                            |                 |                    | 20             |        |        |       |        | -18 mA |       | "   |       |        |        |       |        |        | "               | 2B                |        | "    | "    |
|                            |                 |                    | 21             |        |        |       |        |        |       | "   |       | -18 mA |        |       |        |        | "               | 3A                |        | "    | "    |
|                            |                 |                    | 22             |        |        |       |        |        |       | "   |       |        | -18 mA |       |        |        | "               | 3B                |        | "    | "    |
|                            |                 |                    | 23             |        |        |       |        |        |       | "   |       |        |        |       | -18 mA |        | "               | 4A                |        | "    | "    |
|                            |                 |                    | 24             |        |        |       |        |        |       | "   |       |        |        |       |        | -18 mA | "               | 4B                |        | "    | "    |
|                            | I <sub>H1</sub> | 3010               | 25             | 2.7 V  | GND    |       | GND    | GND    |       | "   |       | GND    | GND    |       | GND    | GND    | 5.5 V           | 1A                |        | 20   | μA   |
|                            |                 |                    | 26             | GND    | 2.7 V  |       | GND    | GND    |       | "   |       |        |        |       | "      | "      | "               | 1B                |        | "    | "    |
|                            |                 |                    | 27             | "      | GND    |       | 2.7 V  | GND    |       | "   |       |        | "      |       | "      | "      | "               | 2A                |        | "    | "    |
|                            |                 |                    | 28             | "      | "      |       | GND    | 2.7 V  |       | "   |       |        | "      |       | "      | "      | "               | 2B                |        | "    | "    |
|                            |                 |                    | 29             | "      | "      |       |        | GND    |       | "   | "     | 2.7 V  | "      |       | "      | "      | "               | 3A                |        | "    | "    |
|                            |                 |                    | 30             | "      | "      |       | "      | "      |       | "   | "     | GND    | 2.7 V  |       | "      | "      | "               | 3B                |        | "    | "    |
|                            |                 |                    | 31             | "      | "      |       |        | "      |       | "   |       |        | GND    |       | 2.7 V  | "      | "               | 4A                |        | "    | "    |
|                            |                 |                    | 32             | "      | "      | "     |        | "      |       | "   |       |        | "      |       | GND    | 2.7 V  | "               | 4B                |        | "    | "    |
|                            | I <sub>H2</sub> |                    | 33             | 5.5 V  | "      |       |        | "      |       |     |       |        | "      |       | "      | "      | "               | 1A                |        | 100  | "    |
|                            |                 |                    | 34             | GND    | 5.5 V  | "     | "      | "      |       |     |       |        | "      |       | "      | "      | "               | 1B                |        | "    | "    |
|                            |                 |                    | 35             | "      | GND    | "     | 5.5 V  | "      |       |     |       |        | "      |       | "      | "      | "               | 2A                |        | "    | "    |
|                            |                 |                    | 36             | "      | "      | "     | GND    | 5.5 V  |       | "   | "     |        | "      |       | "      | "      | "               | 2B                |        | "    | "    |
|                            |                 |                    | 37             | "      | "      |       |        | GND    |       | "   | "     | 5.5 V  | "      |       | "      | "      | "               | 3A                |        | "    | "    |
|                            |                 |                    | 38             | "      | "      |       | "      | "      |       | "   | "     | GND    | 5.5 V  |       | "      | "      | "               | 3B                |        | "    | "    |
|                            |                 |                    | 39             | "      | "      |       |        | "      |       | "   | "     | GND    | GND    |       | 5.5 V  | "      | "               | 4A                |        | "    | "    |
|                            |                 |                    | 40             | "      | "      | "     |        | "      |       | "   |       | GND    | GND    |       | GND    | 5.5 V  | "               | 4B                |        | "    | "    |

See footnotes at end of device type 05.

" "

" "

TABLE III. Group A inspection for device type 05 – Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq 0.7$  V or open)

| Subgroup                   | Symbol                                                                                                                                                | MIL-STD-883 method | Cases A,B,C,D  | 1     | 2     | 3   | 4     | 5     | 6   | 7   | 8   | 9     | 10    | 11  | 12    | 13    | 14              | Measured terminal | Limits |     | Unit |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-------|-------|-----|-------|-------|-----|-----|-----|-------|-------|-----|-------|-------|-----------------|-------------------|--------|-----|------|
|                            |                                                                                                                                                       |                    | Cases 2, X, 1/ | 2     | 3     | 4   | 6     | 8     | 9   | 10  | 12  | 13    | 14    | 16  | 18    | 19    | 20              |                   | Min    | Max |      |
|                            |                                                                                                                                                       |                    | Test no.       | 1A    | 1B    | 1Y  | 2A    | 2B    | 2Y  | GND | 3Y  | 3A    | 3B    | 4Y  | 4A    | 4B    | V <sub>CC</sub> |                   | 1A     | 2/  | 2/   |
| 1<br>T <sub>C</sub> = 25°C | I <sub>IL</sub>                                                                                                                                       | 3009               | 41             | 0.4 V | 5.5 V |     | 5.5 V | 5.5 V |     | GND |     | 5.5 V | 5.5 V |     | 5.5 V | 5.5 V | 4.5 V           | 1A                | 2/     | 2/  | "    |
|                            |                                                                                                                                                       |                    | 42             | 5.5 V | 0.4 V |     | 5.5 V | 5.5 V |     | "   |     | "     |       | "   | "     | "     | 1B              | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 43             | "     | 5.5 V |     | 0.4 V | 5.5 V |     | "   |     | "     |       | "   | "     | "     | 2A              | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 44             | "     | "     |     | 5.5 V | 0.4 V |     | "   |     | "     |       | "   | "     | "     | 2B              | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 45             | "     | "     |     |       | 5.5 V |     | "   |     | 0.4 V |       | "   | "     | "     | 3A              | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 46             | "     | "     |     | "     | "     |     | "   | "   | 5.5 V | 0.4 V |     | "     | "     | "               | 3B                | "      | "   | "    |
|                            |                                                                                                                                                       |                    | 47             | "     | "     |     |       | "     |     |     | "   |       | 5.5 V |     | 0.4 V | "     | "               | 4A                | "      | "   | "    |
|                            |                                                                                                                                                       |                    | 48             | "     | "     |     | "     |       |     |     |     |       | "     |     | 5.5 V | 0.4 V | "               | 4B                | "      | "   | "    |
|                            | C <sub>CH</sub>                                                                                                                                       | 3005               | 49             | 5.5 V | 5.5 V |     | 5.5 V | 5.5 V |     | "   |     | 5.5 V | 5.5 V |     | 5.5 V | 5.5 V | "               | V <sub>CC</sub>   |        | 4.8 | mA   |
| C <sub>CL</sub>            | 3005                                                                                                                                                  | 50                 | GND            | GND   | "     |     | GND   | "     | "   | "   | GND | GND   |       | GND | GND   | "     | V <sub>CC</sub> |                   | 8.8    | mA  |      |
| 2                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = 125° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |     |      |
| 3                          | Same tests, terminal conditions and limits as for subgroup 1, except T <sub>C</sub> = -55° C, and V <sub>IC</sub> tests are omitted.                  |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |     |      |
| 9<br>T <sub>C</sub> = 25°C | t <sub>PHL</sub>                                                                                                                                      | 3003<br>Fig. 3     | 51             | IN    | 2.7 V | OUT |       |       |     | GND |     |       |       |     |       |       | 5.0 V           | 1A to 1Y          | 2      | 30  | ns   |
|                            |                                                                                                                                                       |                    | 52             | 2.7 V | IN    | OUT |       |       |     | "   |     |       |       |     |       | "     | 1B to 1Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 53             |       |       |     | IN    | 2.7 V | OUT | "   |     |       |       |     |       | "     | 2A to 2Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 54             |       |       |     | 2.7 V | IN    | OUT | "   |     |       |       |     |       | "     | 2B to 2Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 55             |       |       |     |       |       |     | "   | OUT | IN    | 2.7 V |     |       | "     | 3A to 3Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 56             |       |       |     |       |       |     | "   | OUT | 2.7 V | IN    |     |       | "     | 3B to 3Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 57             |       |       |     |       |       |     | "   |     |       |       | OUT | IN    | 2.7 V | "               | 4A to 4Y          | "      | "   | "    |
|                            |                                                                                                                                                       |                    | 58             |       |       |     |       |       |     | "   |     |       |       | OUT | 2.7 V | IN    | "               | 4B to 4Y          | "      | "   | "    |
|                            | t                                                                                                                                                     | PLH                | 59             | IN    | 2.7 V | OUT |       |       |     | "   |     |       |       |     |       | "     | 1A to 1Y        | "                 | 35     | "   |      |
|                            |                                                                                                                                                       |                    | 60             | 2.7 V | IN    | OUT |       |       |     | "   |     |       |       |     |       | "     | 1B to 1Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 61             |       |       |     | IN    | 2.7 V | OUT | "   |     |       |       |     |       | "     | 2A to 2Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 62             |       |       |     | 2.7 V | IN    | OUT | "   |     |       |       |     |       | "     | 2B to 2Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 63             |       |       |     |       |       |     | "   | OUT | IN    | 2.7 V |     |       | "     | 3A to 3Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 64             |       |       |     |       |       |     | "   | OUT | 2.7 V | IN    |     |       | "     | 3B to 3Y        | "                 | "      | "   |      |
|                            |                                                                                                                                                       |                    | 65             |       |       |     |       |       |     | "   |     |       |       | OUT | IN    | 2.7 V | "               | 4A to 4Y          | "      | "   | "    |
|                            |                                                                                                                                                       |                    | 66             |       |       |     |       |       |     | "   |     |       |       | OUT | 2.7 V | IN    | "               | 4B to 4Y          | "      | "   | "    |
| 10                         | Same tests, terminal conditions and limits as for subgroup 9, except T <sub>C</sub> = 125° C, t <sub>PHL</sub> = 45 ns, and t <sub>PLH</sub> = 50 ns. |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |     |      |
| 11                         | Same tests, terminal conditions and limits as for subgroup 10, except T <sub>C</sub> = -55° C.                                                        |                    |                |       |       |     |       |       |     |     |     |       |       |     |       |       |                 |                   |        |     |      |

1/ For cases X and 2, pins not referenced are NC.

2/ I<sub>IL</sub> limits in  $\mu$ A are as follows:

| Circuit         | A | B        | C | D | E         | F         |
|-----------------|---|----------|---|---|-----------|-----------|
| I <sub>IL</sub> |   | -30/-300 |   |   | -150/-380 | -105/-345 |

## 5. PACKAGING

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

## 6. NOTES

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

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (2.1).
- c. Packaging requirements (see 5.1).
- d. Complete part number (see 1.2).
- e. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- f. Requirements for certificate of compliance, if applicable.
- g. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.
- h. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.
- i. Requirements for product assurance options.
- j. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
- k. Requirements for "JAN" marking.

6.3 Superseding information. The requirements of MIL-M-38510 have been superseded to take advantage of the available Qualified Manufacturer Listing (QML) system provided by MIL-PRF-38535. Previous references to MIL-M-38510 in this document have been replaced by appropriate references to MIL-PRF-38535.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, 3990 E. Broad Street, Columbus, Ohio 43216-5000.

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

|                       |                                        |
|-----------------------|----------------------------------------|
| GND .....             | Ground zero voltage potential          |
| I <sub>IN</sub> ..... | Current flowing into an input terminal |
| V <sub>IC</sub> ..... | Input clamp voltage                    |
| V <sub>IN</sub> ..... | Voltage level at an input terminal     |

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

6.7 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-35810 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 or MIL-PRF-38535.

| Military device type | Generic-industry type |
|----------------------|-----------------------|
| 01                   | 54LS11                |
| 02                   | 54LS15                |
| 03                   | 54LS21                |
| 04                   | 54LS08                |
| 05                   | 54LS09                |

6.8 Manufacturers' designation. Manufacturers' included in this specification are designated as shown in table IV herein.

TABLE IV. Substitutability and manufacturers' designation.

| Device type | Manufacturer                        |                                    |                                          |                               |                           |                                      |
|-------------|-------------------------------------|------------------------------------|------------------------------------------|-------------------------------|---------------------------|--------------------------------------|
|             | Circuit A<br>Texas Instruments Inc. | Circuit B<br>Signetics Corporation | Circuit C<br>National Semiconductor Corp | Circuit D<br>Raytheon Company | Circuit E<br>Motorola Inc | Circuit F<br>Fairchild Semiconductor |
| 01          | X                                   | X                                  | X                                        | X                             | X                         | X                                    |
| 02          | X                                   | X                                  | X                                        | X                             | X                         | X                                    |
| 03          | X                                   | X                                  | X                                        | X                             | X                         | X                                    |
| 04          | X                                   | X                                  | X                                        | X                             | X                         | X                                    |
| 05          |                                     | X                                  |                                          |                               | X                         | X                                    |

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

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

Preparing activity:  
 DLA - CC  
 (Project 5962-1931)

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

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2002-10-03

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4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

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b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*  
(1) Commercial  
(2) DSN  
*(If applicable)*

7. DATE SUBMITTED  
(YYYYMMDD)

8. PREPARING ACTIVITY

a. NAME  
Defense Supply Center, Columbus

b. TELEPHONE *(Include Area Code)*  
(1) Commercial 614-692-0535 (2) DSN 850-0535

c. ADDRESS *(Include Zip Code)*  
DSCC-VA  
P. O. Box 3990  
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