

REVISIONS

| LTR | DESCRIPTION   | DATE        | APPROVED       |
|-----|---|-------------|----------------|
| A   | Removed vendor CAGE 61772 as source of supply for case outline letter Z, the F-11A package. Added case outline letters U and T, F-11 and D-15 to the drawing. Editorial changes throughout. | 1990 OCT 04 | M. A. Frye     |
| B   | Changes in accordance with NOR 5962-R042-95.  | 94-12-15    | M. A. Frye     |
| C   | Updated boilerplate to reflect current requirements. Corrections to pages 4, 5, 8 and timing waveforms. - glg   | 01-01-17    | Raymond Monnin |

**THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED.**

|                      |       |    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |   |   |  |
|----------------------|-------|----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|---|---|--|
| REV                  |       |    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |   |   |  |
| SHEET                |       |    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |   |   |  |
| REV                  | C     | C  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |   |   |  |
| SHEET                | 15    | 16 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |   |   |  |
| REV STATUS OF SHEETS | REV   |    | C | C | C | C | C | C | C | C | C | C  | C  | C  | C  | C  | C | C |  |
|                      | SHEET |    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |   |   |  |

|   |                                      |   |                           |                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--------------------------------------|---|---------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| PMIC N/A  | PREPARED BY<br>Kenneth Rice          | <b>DEFENSE SUPPLY CENTER COLUMBUS</b>   |                           |                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>STANDARD<br/>MICROCIRCUIT<br/>DRAWING</b><br><br>THIS DRAWING IS AVAILABLE<br>FOR USE BY ALL DEPARTMENTS<br><br>AND AGENCIES OF THE<br>DEPARTMENT OF DEFENSE<br><br>AMSC N/A | CHECKED BY<br>Ray Monnin             | <b>COLUMBUS, OHIO 43216</b>   |                           |                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | APPROVED BY<br>Michael. A. Frye      | MICROCIRCUITS, MEMORY, DIGITAL,<br>CMOS, PARALLEL 512 X 9 FIFO,<br>MONOLITHIC SILICON |                           |                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | DRAWING APPROVAL DATE<br>23 May 1988 | SIZE<br><b>A</b>  | CAGE CODE<br><b>67268</b> | <b>5962-87531</b> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | REVISION LEVEL<br><b>C</b>           | SHEET   |                           | 1 OF 16           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue 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-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Method Standard Microcircuits.

MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-103 - List of Standard Microcircuit Drawings (SMD's).

MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbooks 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 drawing and the references cited herein, the text of this drawing shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements The individual item requirements shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein. Product built to this drawing that is produced by a Qualified Manufacturer Listing (QML) certified and qualified manufacturer or a manufacturer who has been granted transitional certification to MIL-PRF-38535 may be processed as QML product in accordance with the manufacturer's approved program plan and qualifying activity approval in accordance with MIL-PRF-38535. This QML flow as documented in the Quality Management (QM) plan may make modifications to the requirements herein. These modifications shall not affect the PIN as described herein. A "Q" or "QML" certification mark in accordance with MIL-PRF-38535 is required to identify when the QML flow option is used.

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

3.2.1 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

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

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

3.2.4 Die overcoat. Polyimide and silicone coatings are allowable as an overcoat on the die for alpha particle protection provided that each coated microcircuit inspection lot (see MIL-PRF-38535, appendix A) shall be subjected to and pass the Internal Water-Vapor Content test (test method 1018 of MIL-STD-883). The frequency of the internal water vapor testing may not be decreased unless approved by the preparing activity.

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

|   |                   |                             |                    |
|---|-------------------|-----------------------------|--------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | <b>SIZE<br/>A</b> |                             | <b>5962-87531</b>  |
|   |                   | <b>REVISION LEVEL<br/>C</b> | <b>SHEET<br/>3</b> |

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

3.5 Marking. Marking shall be in accordance with MIL-PRF-38535, appendix A. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-HDBK-103 (see 6.6 herein). For packages where the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device.

3.5.1 Certification/compliance mark. The compliance mark for device class M shall be a "C" as required in MIL-PRF-38535, Appendix A.

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-PRF-38535, appendix A and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DSCC-VA shall be required in accordance with MIL-PRF-38535, appendix A.

3.9 Verification and review. DSCC, DSCC's agent and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

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

- a. Burn-in test (method 1015 of MIL-STD-883).
  - (1) Test condition C or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or procuring 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.
  - (2)  $T_A = +125^\circ\text{C}$ , minimum.
- b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

##### 4.3.1 Group A inspection.

- a. Tests shall be as specified in table II herein.
- b. Subgroups 5 and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 4 ( $C_{IN}$  and  $C_{OUT}$  measurement) shall be measured only for the initial test and after any design or process changes which may affect capacitance. Sample size is 15 devices with no failures, and all input and output terminals tested.
- d. Subgroups 7 and 8 tests shall include verification of the truth table.

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TABLE I. Electrical performance characteristics.

| Test                         | Symbol           | Conditions<br>-55°C ≤ T <sub>C</sub> ≤ +125°C<br>V <sub>SS</sub> = 0 V<br>4.5 V ≤ V <sub>CC</sub> ≤ 5.5 V<br>unless otherwise specified | Group A<br>subgroups | Device<br>types | Limits |     | Unit |
|------------------------------|------------------|---|----------------------|-----------------|--------|-----|------|
|                              |                  |   |                      |                 | Min    | Max |      |
| Input leakage current        | I <sub>LI</sub>  | 0.4 V ≤ V <sub>IN</sub> ≤ V <sub>CC</sub>   | 1, 2, 3              | All             | -10    | 10  | μA   |
| Output leakage current       | I <sub>LO</sub>  | 0.4 V ≤ V <sub>OUT</sub> ≤ V <sub>CC</sub> , $\bar{R} \geq V_{IH}$  | 1, 2, 3              | All             | -10    | 10  | μA   |
| Output low voltage           | V <sub>OL</sub>  | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 8.0 mA<br>V <sub>IL</sub> = 0.8 V, V <sub>IH</sub> = 2.2 V                                   | 1, 2, 3              | All             |        | 0.4 | V    |
| Output high voltage          | V <sub>OH</sub>  | V <sub>CC</sub> = 4.5 V, I <sub>OH</sub> = -2.0 mA<br>V <sub>IL</sub> = 0.8 V, V <sub>IH</sub> = 2.2 V                                  | 1, 2, 3              | All             | 2.4    |     | V    |
| Operating supply current     | I <sub>CC1</sub> | f = maximum, outputs open,<br>V <sub>CC</sub> = maximum   | 1, 2, 3              | All             |        | 100 | mA   |
| Standby power supply current | I <sub>CC2</sub> | $\bar{R} = \bar{W} = \bar{RS} = \bar{FL}/\bar{RT} = V_{IH}$ ,<br>outputs open   | 1, 2, 3              | All             |        | 15  | mA   |
| Power down current           | I <sub>CC3</sub> | All inputs = V <sub>CC</sub> - 0.2 V,<br>outputs open   | 1, 2, 3              | All             |        | 900 | μA   |
| Input capacitance <u>1/</u>  | C <sub>I</sub>   | V <sub>I</sub> = 5.0 V or GND, f = 1 MHz<br>T <sub>C</sub> = +25°C, See 4.3.1c  | 4                    | All             |        | 5   | pF   |
| Output capacitance <u>1/</u> | C <sub>O</sub>   | V <sub>O</sub> = 5.0 V or GND, f = 1 MHz<br>T <sub>C</sub> = +25°C, See 4.3.1c  | 4                    | All             |        | 7   | pF   |
| Functional tests             |                  | See 4.3.1d.   | 7, 8A, 8B            | All             |        |     |      |

See footnotes at end of table.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
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TABLE I. Electrical performance characteristics.

| Test                                  | Symbol                     | Conditions <u>2/ 3/</u><br>-55°C ≤ T <sub>C</sub> ≤ +125°C<br>V <sub>SS</sub> = 0 V<br>4.5 V ≤ V <sub>CC</sub> ≤ 5.5 V<br>unless otherwise specified | Group A<br>subgroups | Device<br>types | Limits |     | Unit |
|---------------------------------------|----------------------------|--|----------------------|-----------------|--------|-----|------|
|                                       |                            |  |                      |                 | Min    | Max |      |
| Read cycle time                       | t <sub>RC</sub>            |  | 9, 10, 11            | 01              | 40     |     | ns   |
|                                       |                            |  |                      | 02              | 65     |     |      |
|                                       |                            |  |                      | 03              | 100    |     |      |
| Access time                           | t <sub>A</sub>             |  | 9, 10, 11            | 01              |        | 30  | ns   |
|                                       |                            |  |                      | 02              |        | 50  |      |
|                                       |                            |  |                      | 03              |        | 80  |      |
| Read recovery time                    | t <sub>RR</sub>            |  | 9, 10, 11            | 01              | 10     |     | ns   |
|                                       |                            |  |                      | 02              | 15     |     |      |
|                                       |                            |  |                      | 03              | 20     |     |      |
| Read pulse width                      | t <sub>RPW</sub>           |  | 9, 10, 11            | 01              | 30     |     | ns   |
|                                       |                            |  |                      | 02              | 50     |     |      |
|                                       |                            |  |                      | 03              | 80     |     |      |
| Read pulse low to data bus at low-Z   | t <sub>RLZ</sub> <u>4/</u> |  | 9, 10, 11            | All             | 5      |     | ns   |
| Write pulse low to data bus at low-Z  | t <sub>WLZ</sub> <u>4/</u> |  | 9, 10, 11            | All             | 5      |     | ns   |
| Data valid from read pulse high       | t <sub>DV</sub>            |  | 9, 10, 11            | All             | 5      |     | ns   |
| Read pulse high to data bus at high-Z | t <sub>RHZ</sub> <u>4/</u> |  | 9, 10, 11            | 01              |        | 20  | ns   |
|                                       |                            |  |                      | 02,03           |        | 30  |      |
| Write cycle time                      | t <sub>WC</sub>            |  | 9, 10, 11            | 01              | 40     |     | ns   |
|                                       |                            |  |                      | 02              | 65     |     |      |
|                                       |                            |  |                      | 03              | 100    |     |      |
| Write pulse width                     | t <sub>WPW</sub>           |  | 9, 10, 11            | 01              | 30     |     | ns   |
|                                       |                            |  |                      | 02              | 50     |     |      |
|                                       |                            |  |                      | 03              | 80     |     |      |
| Write recovery time                   | t <sub>WR</sub>            |  | 9, 10, 11            | 01              | 10     |     | ns   |
|                                       |                            |  |                      | 02              | 15     |     |      |
|                                       |                            |  |                      | 03              | 20     |     |      |
| Data setup time                       | t <sub>DS</sub>            |  | 9, 10, 11            | 01              | 18     |     | ns   |
|                                       |                            |  |                      | 02              | 30     |     |      |
|                                       |                            |  |                      | 03              | 40     |     |      |
| Data hold time                        | t <sub>DH</sub>            |  | 9, 10, 11            | 01              | 0      |     | ns   |
|                                       |                            |  |                      | 02              | 5      |     |      |
|                                       |                            |  |                      | 03              | 10     |     |      |
| Reset cycle time                      | t <sub>RSC</sub>           |  | 9, 10, 11            | 01              | 40     |     | ns   |
|                                       |                            |  |                      | 02              | 65     |     |      |
|                                       |                            |  |                      | 03              | 100    |     |      |
| Reset pulse width                     | t <sub>RS</sub>            |  | 9, 10, 11            | 01              | 30     |     | ns   |
|                                       |                            |  |                      | 02              | 50     |     |      |
|                                       |                            |  |                      | 03              | 80     |     |      |
| Reset recovery time                   | t <sub>RSR</sub>           |  | 9, 10, 11            | 01              | 10     |     | ns   |
|                                       |                            |  |                      | 02              | 15     |     |      |
|                                       |                            |  |                      | 03              | 20     |     |      |

See footnotes at end of table.

|   |                   |                     |                   |
|---|-------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | <b>SIZE<br/>A</b> |                     | <b>5962-87531</b> |
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TABLE I. Electrical performance characteristics.

| Test                                  | Symbol                               | Conditions <sup>2/ 3/</sup><br>-55°C ≤ T <sub>C</sub> ≤ +125°C<br>V <sub>SS</sub> = 0 V<br>4.5 V ≤ V <sub>CC</sub> ≤ 5.5 V<br>unless otherwise specified | Group A<br>subgroups | Device<br>types | Limits |     | Unit |    |
|---------------------------------------|--------------------------------------|--|----------------------|-----------------|--------|-----|------|----|
|                                       |                                      |  |                      |                 | Min    | Max |      |    |
| Reset setup time                      | t <sub>RSS</sub>                     |  | 9, 10, 11            | 01              | 30     |     | ns   |    |
|                                       |                                      |  |                      | 02              | 50     |     |      |    |
|                                       |                                      |  |                      | 03              | 80     |     |      |    |
| Retransmit cycle time                 | t <sub>RTC</sub>                     |  | 9, 10, 11            | 01              | 40     |     | ns   |    |
|                                       |                                      |  |                      | 02              | 65     |     |      |    |
|                                       |                                      |  |                      | 03              | 80     |     |      |    |
| Retransmit pulse width                | t <sub>RT</sub>                      |  | 9, 10, 11            | 01              | 30     |     | ns   |    |
|                                       |                                      |  |                      | 02              | 50     |     |      |    |
|                                       |                                      |  |                      | 03              | 80     |     |      |    |
| Retransmit recovery time              | t <sub>RTR</sub>                     |  | 9, 10, 11            | 01              | 10     |     | ns   |    |
|                                       |                                      |  |                      | 02              | 15     |     |      |    |
|                                       |                                      |  |                      | 03              | 20     |     |      |    |
| Reset to empty flag low               | t <sub>EFL</sub>                     |  | 9, 10, 11            | 01              |        | 40  | ns   |    |
|                                       |                                      |  |                      | 02              |        | 65  |      |    |
|                                       |                                      |  |                      | 03              |        | 100 |      |    |
| Read low to empty flag low            | t <sub>REF</sub>                     |  | 9, 10, 11            | 01              |        | 30  | ns   |    |
|                                       |                                      |  |                      | 02              |        | 45  |      |    |
|                                       |                                      |  |                      | 03              |        | 60  |      |    |
| Read high to full flag high           | t <sub>RFF</sub>                     |  | 9, 10, 11            | 01              |        | 30  | ns   |    |
|                                       |                                      |  |                      | 02              |        | 45  |      |    |
|                                       |                                      |  |                      | 03              |        | 60  |      |    |
| Write high to empty flag high         | t <sub>WEF</sub>                     |  | 9, 10, 11            | 01              |        | 30  | ns   |    |
|                                       |                                      |  |                      | 02              |        | 45  |      |    |
|                                       |                                      |  |                      | 03              |        | 60  |      |    |
| Write low to full flag low            | t <sub>WFF</sub>                     |  | 9, 10, 11            | 01              |        | 30  | ns   |    |
|                                       |                                      |  |                      | 02              |        | 45  |      |    |
|                                       |                                      |  |                      | 03              |        | 60  |      |    |
| Reset to half-full and full flag high | t <sub>HFH</sub><br>t <sub>FFH</sub> |  | 9, 10, 11            | 01              |        | 40  | ns   |    |
|                                       |                                      |  |                      | 02              |        | 65  |      |    |
|                                       |                                      |  |                      | 03              |        | 100 |      |    |
| Read/write to $\overline{XO}$ low     | t <sub>XOL</sub>                     |  | 9, 10, 11            | 01              |        | 30  | ns   |    |
|                                       |                                      |  |                      |                 | 02     |     |      | 50 |
|                                       |                                      |  |                      |                 | 03     |     |      | 80 |
| Read/write to $\overline{XO}$ high    | t <sub>XOH</sub>                     |  | 9, 10, 11            | 01              |        | 30  | ns   |    |
|                                       |                                      |  |                      |                 | 02     |     |      | 50 |
|                                       |                                      |  |                      |                 | 03     |     |      | 80 |
| $\overline{XI}$ pulse width           | t <sub>XI</sub>                      |  | 9, 10, 11            | 01              | 30     |     | ns   |    |
|                                       |                                      |  |                      |                 | 02     | 50  |      |    |
|                                       |                                      |  |                      |                 | 03     | 80  |      |    |
| $\overline{XI}$ recovery time         | t <sub>XIR</sub>                     |  | 9, 10, 11            | All             | 10     |     | ns   |    |
| $\overline{XI}$ setup time            | t <sub>XIS</sub>                     |  | 9, 10, 11            | All             | 15     |     | ns   |    |

1/ This parameter tested initially and after any design or process change which could affect this parameter, and is therefore guaranteed to the limits specified in table I.

2/ For output load circuit and ac test conditions, see figure 3.

3/ For timing waveforms, see figure 4.

4/ May not be tested, but shall be guaranteed to the limits specified in table I.

|   |                   |                     |                   |
|---|-------------------|---------------------|-------------------|
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| Device types    | All             |                 |
|-----------------|-----------------|-----------------|
| Case outlines   | X, Z, U, T      | Y               |
| Terminal number | Terminal symbol |                 |
| 1               | W               | NC              |
| 2               | D <sub>8</sub>  | W               |
| 3               | D <sub>3</sub>  | D <sub>8</sub>  |
| 4               | D <sub>2</sub>  | D <sub>3</sub>  |
| 5               | D <sub>1</sub>  | D <sub>2</sub>  |
| 6               | D <sub>0</sub>  | D <sub>1</sub>  |
| 7               | XI              | D <sub>0</sub>  |
| 8               | FF              | XI              |
| 9               | Q <sub>0</sub>  | FF              |
| 10              | Q <sub>1</sub>  | Q <sub>0</sub>  |
| 11              | Q <sub>2</sub>  | Q <sub>1</sub>  |
| 12              | Q <sub>3</sub>  | NC              |
| 13              | Q <sub>8</sub>  | Q <sub>2</sub>  |
| 14              | GND             | Q <sub>3</sub>  |
| 15              | R               | Q <sub>8</sub>  |
| 16              | Q <sub>4</sub>  | GND             |
| 17              | Q <sub>5</sub>  | NC              |
| 18              | Q <sub>6</sub>  | R               |
| 19              | Q <sub>7</sub>  | Q <sub>4</sub>  |
| 20              | XO / HF         | Q <sub>5</sub>  |
| 21              | EF              | Q <sub>6</sub>  |
| 22              | RS              | Q <sub>7</sub>  |
| 23              | FL / RT         | XO / HF         |
| 24              | D <sub>7</sub>  | EF              |
| 25              | D <sub>6</sub>  | RS              |
| 26              | D <sub>5</sub>  | FL / RT         |
| 27              | D <sub>4</sub>  | NC              |
| 28              | V <sub>CC</sub> | D <sub>7</sub>  |
| 29              | ---             | D <sub>6</sub>  |
| 30              | ---             | D <sub>5</sub>  |
| 31              | ---             | D <sub>4</sub>  |
| 32              | ---             | V <sub>CC</sub> |

NC = no connection

FIGURE 1. Terminal connections.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
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Reset and retransmit  
Single device configuration/width expansion mode

| Mode       | Inputs          |                 |                 | Internal status     |                     | Outputs         |                 |                 |
|------------|-----------------|-----------------|-----------------|---------------------|---------------------|-----------------|-----------------|-----------------|
|            | $\overline{RS}$ | $\overline{RT}$ | $\overline{XI}$ | Read pointer        | Write pointer       | $\overline{EF}$ | $\overline{FF}$ | $\overline{HF}$ |
| Reset      | 0               | X               | 0               | Location zero       | Location zero       | 0               | 1               | 1               |
| Retransmit | 1               | 0               | 0               | Location zero       | Unchanged           | X               | X               | X               |
| Read/write | 1               | 1               | 0               | Increment <u>1/</u> | Increment <u>1/</u> | X               | X               | X               |

1/ Pointer will increment if flag is high.

Reset and first load  
Depth expansion/compound expansion mode

| Mode                    | Inputs          |                 |                 | Internal status |               | Outputs         |                 |
|-------------------------|-----------------|-----------------|-----------------|-----------------|---------------|-----------------|-----------------|
|                         | $\overline{RS}$ | $\overline{FL}$ | $\overline{XI}$ | Read pointer    | Write pointer | $\overline{EF}$ | $\overline{FF}$ |
| Reset first device      | 0               | 0               | <u>1/</u>       | Location zero   | Location zero | 0               | 1               |
| Reset all other devices | 0               | 1               | <u>1/</u>       | Location zero   | Location zero | 0               | 1               |
| Read/write              | 1               | X               | <u>1/</u>       | X               | X             | X               | X               |

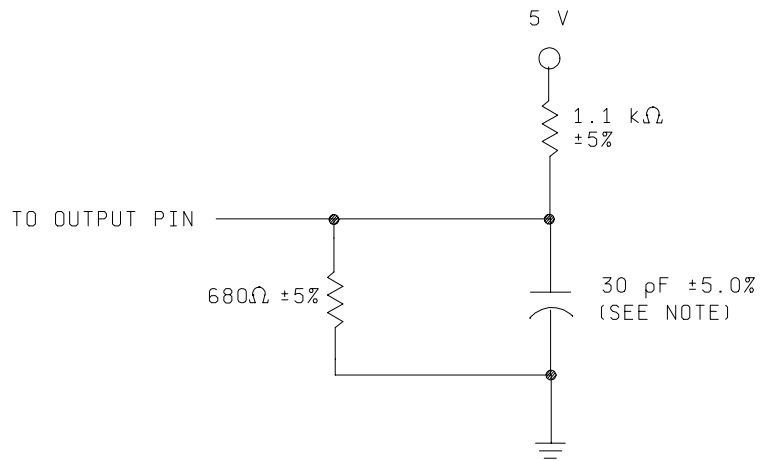
1/  $\overline{XI}$  is connected to  $\overline{XO}$  of previous device.

NOTES:  $\overline{RS}$  = Reset input,  $\overline{FL}/\overline{RT}$  = First load/retransmit,  $\overline{EF}$  = Empty flag output,  
 $\overline{FF}$  = Full flag output,  $\overline{XI}$  = Expansion input, and  $\overline{HF}$  = Half-full flag output  
 0 = Low level voltage  
 1 = High level voltage  
 X = Don't care

FIGURE 2. Truth tables.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
|   |                  | REVISION LEVEL<br>C | SHEET<br>9        |

OUTPUT LOAD CIRCUIT (OR EQUIVALENT)



NOTE:  $C_L$  includes scope and jig capacitance.

AC test conditions

|                               |              |
|-------------------------------|--------------|
| Input pulse levels            | GND to 3.0 V |
| Input rise and fall times     | 5 ns         |
| Input timing reference levels | 1.5 V        |
| Output reference levels       | 1.5 V        |

FIGURE 3. Output load circuit and ac test conditions.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
|   |                  | REVISION LEVEL<br>C | SHEET<br>10       |

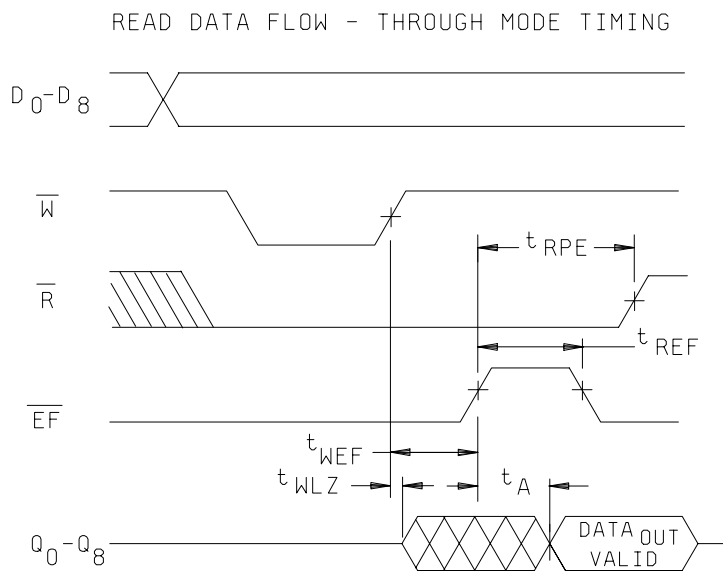
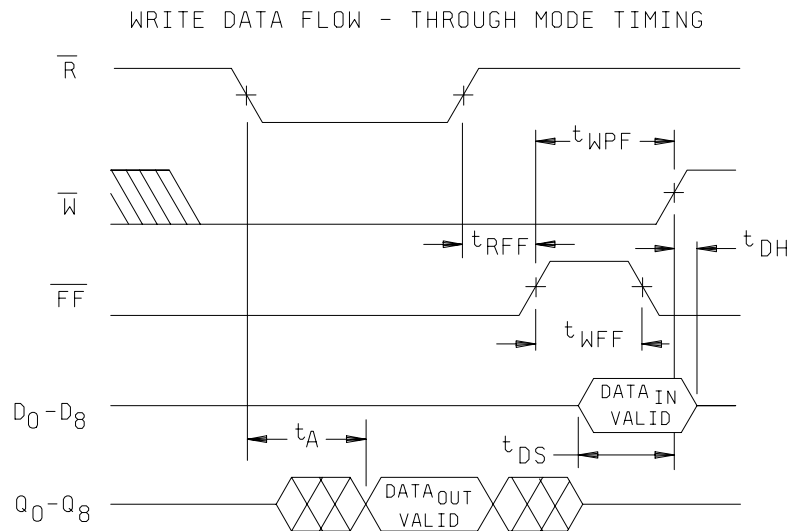
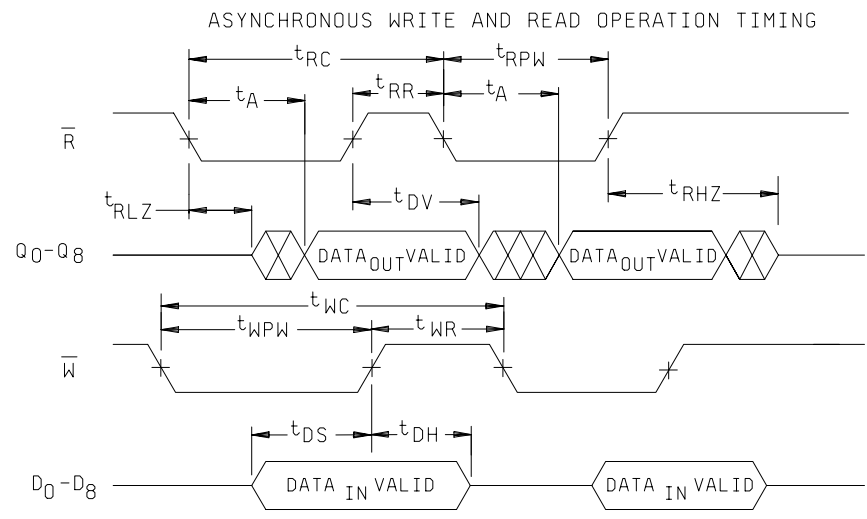
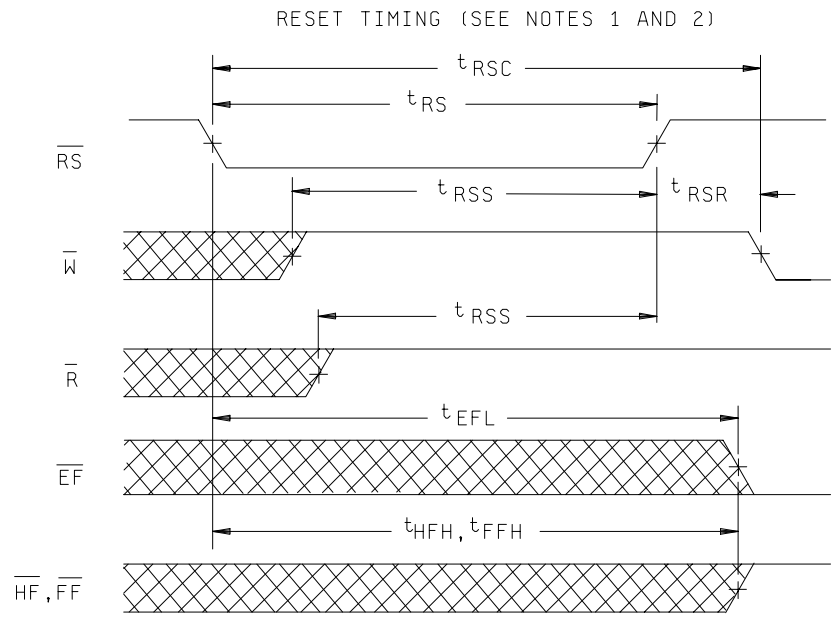


FIGURE 4. Timing waveforms.

|   |                  |                            |                   |
|---|------------------|----------------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                            | <b>5962-87531</b> |
|   |                  | REVISION LEVEL<br><b>C</b> | SHEET<br>11       |

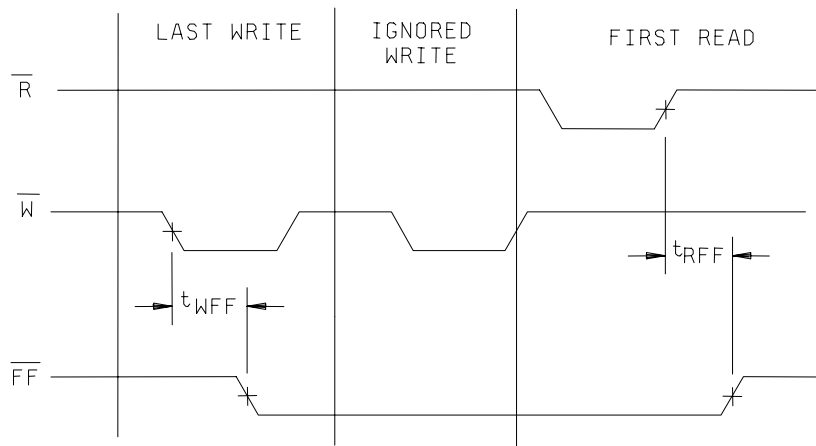


- Notes:
- $\overline{EF}$ ,  $\overline{FF}$ , and  $\overline{HF}$  may change status during RESET but flags will be valid at  $t_{RSC}$ .
  - $\overline{W}$  and  $\overline{R} = V_{IH}$  around the rising edge of  $\overline{RS}$ .

FIGURE 4. Timing waveforms - continued.

|   |                             |                     |
|---|-----------------------------|---------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b>                            | <b>SIZE<br/>A</b>           | <b>5962-87531</b>   |
| <b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | <b>REVISION LEVEL<br/>C</b> | <b>SHEET<br/>12</b> |

FULL FLAG FROM LAST WRITE TO FIRST READ



EMPTY FLAG FROM LAST READ TO FIRST WRITE TIMING

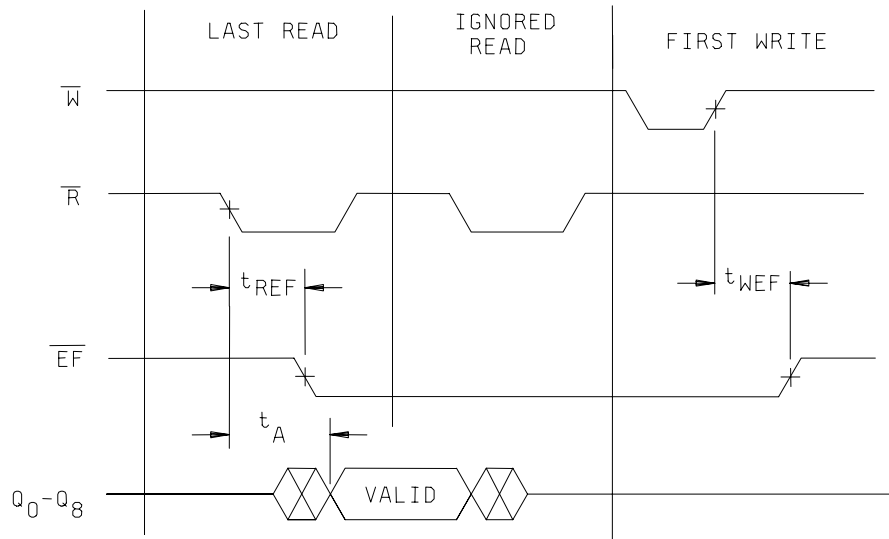
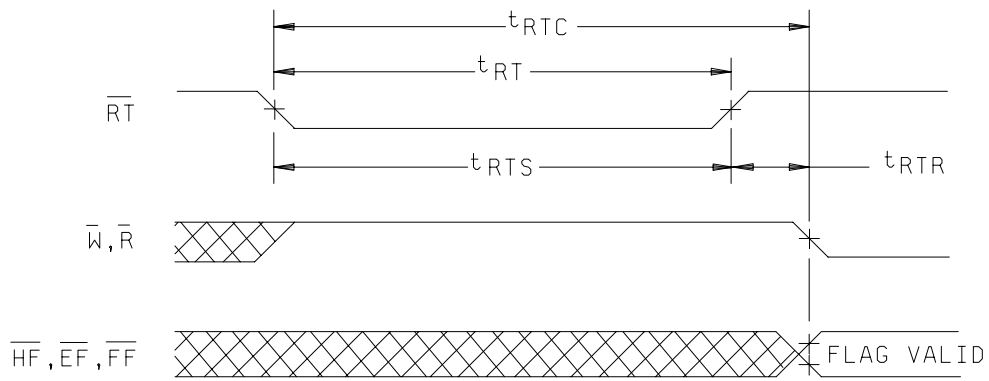


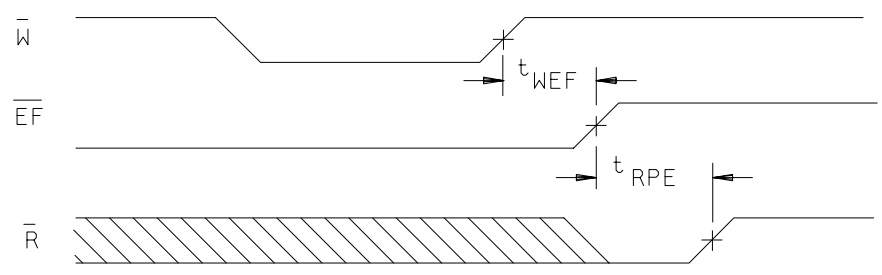
FIGURE 4. Timing waveforms - continued.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
|   |                  | REVISION LEVEL<br>C | SHEET<br>13       |

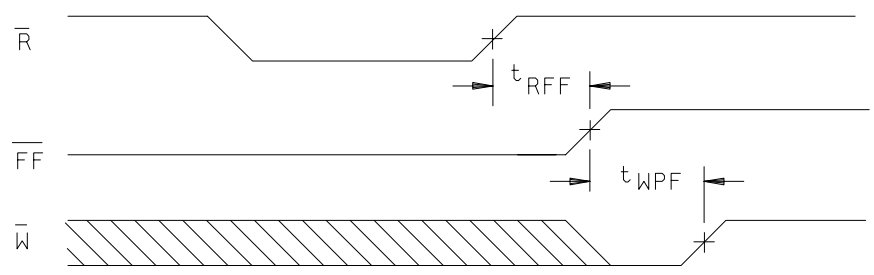
RETRANSMIT TIMING (SEE NOTE 3)



EMPTY FLAG TIMING



FULL FLAG TIMING



Note:  $\overline{EF}$ ,  $\overline{FF}$ , and  $\overline{HF}$  may change status during RETRANSMIT but flags will be valid to  $t_{RTC}$ .

FIGURE 4. Timing waveforms - continued.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
|   |                  | REVISION LEVEL<br>C | SHEET<br>14       |

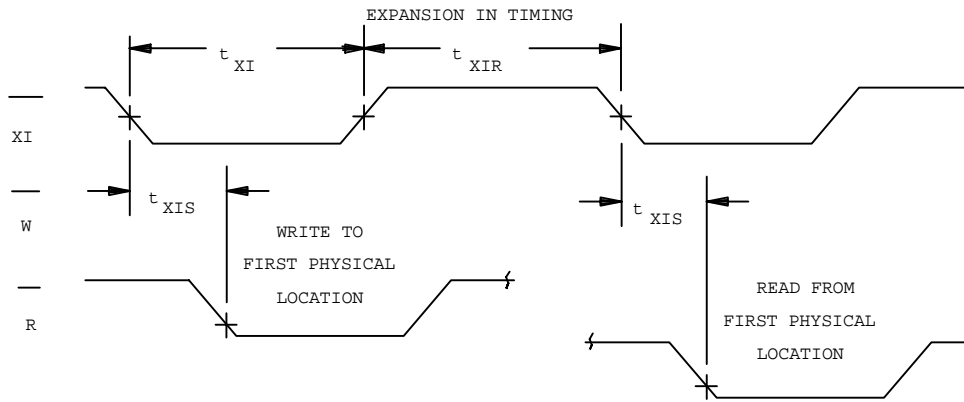
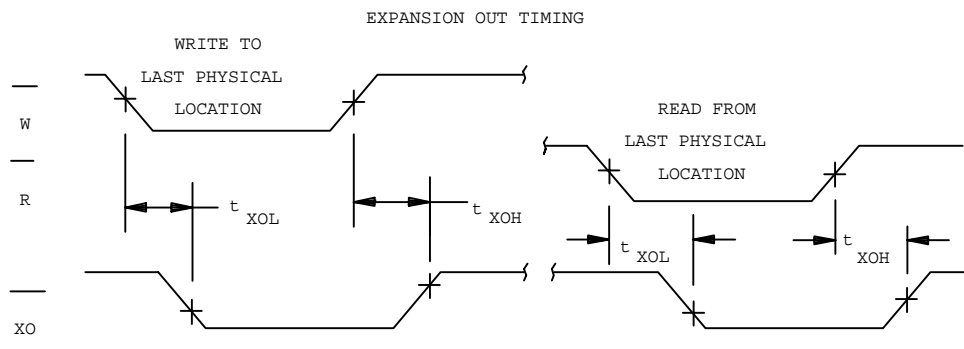
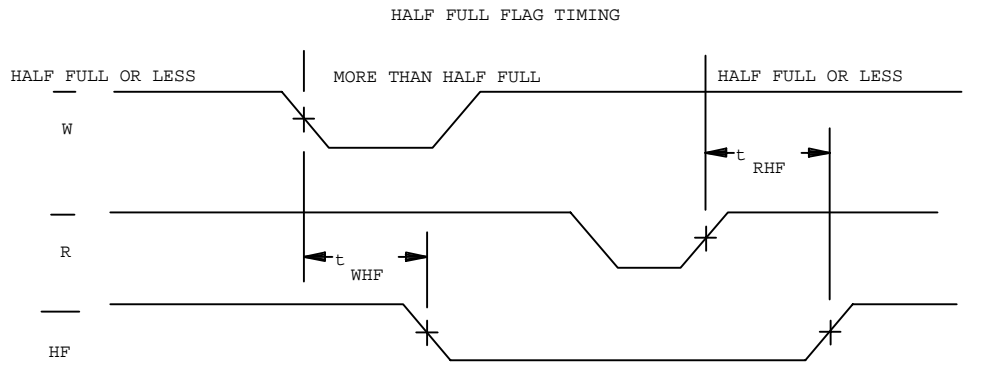


FIGURE 4. Timing waveforms - continued.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
|   |                  | REVISION LEVEL<br>C | SHEET<br>15       |

4.3.2 Groups C and D inspections.

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
  - (1) Test condition C or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or procuring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
  - (2)  $T_A = +125^{\circ}\text{C}$ , minimum.
  - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

TABLE II. Electrical test requirements. \*

| MIL-STD-883 test requirements                                | Subgroups (per method 5005, table I) |
|--|--------------------------------------|
| Interim electrical parameters (method 5004)                  | 1                                    |
| Final electrical test parameters (method 5004)               | 1*, 2, 3, 7*, 8, 9, 10, 11           |
| Group A test requirements (method 5005)                      | 1, 2, 3, 4**, 7, 8, 9, 10, 11        |
| Groups C and D end-point electrical parameters (method 5005) | 1, 2, 3, 7, 8A, 8B                   |

\* Indicates PDA applies to subgroups 1 and 7.

\*\* See 4.3.1c.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535, appendix A.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for government microcircuit applications (original equipment), design applications, and logistics purposes.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users should inform Defense Supply Center Columbus when a system application requires configuration control and which SMD's are applicable to that system. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0525.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43216-5000, or telephone 614-692-0674.

6.6 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendor listed herein has agreed to this drawing and a certificate of compliance (see 3.6 herein ) has been submitted to DSCC-VA.

|   |                  |                     |                   |
|---|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43216-5000</b> | SIZE<br><b>A</b> |                     | <b>5962-87531</b> |
|   |                  | REVISION LEVEL<br>C | SHEET<br>16       |



STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 01-01-17

Approved sources of supply for SMD 5962-87531 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535.

| Standard microcircuit <u>1/</u><br>drawing PIN | Vendor<br>CAGE number | Vendor<br>similar PIN <u>2/</u> |
|--|-----------------------|---------------------------------|
| 5962-8753101XA                                 | 61772                 | IDT7201LA30DB                   |
| 5962-8753101YA                                 | 61772                 | IDT7201LA30XB                   |
| 5962-8753101ZA                                 | <u>3/</u>             | IDT7201LA30XB                   |
| 5962-8753101UA                                 | 61772                 | IDT7201LA30XEB                  |
| 5962-8753101TA                                 | 61772                 | IDT7201LA30TCB                  |
| 5962-8753102XA                                 | 61772                 | IDT7201LA50DB                   |
| 5962-8753102YA                                 | 61772                 | IDT7201LA50XB                   |
| 5962-8753102ZA                                 | <u>3/</u>             | IDT7201LA50XB                   |
| 5962-8753102UA                                 | 61772                 | IDT7201LA50XEB                  |
| 5962-8753102TA                                 | 61772                 | IDT7201LA50TCB                  |
| 5962-8753103XA                                 | 61772                 | IDT7201LA80DB                   |
| 5962-8753103YA                                 | 61772                 | IDT7201LA80XB                   |
| 5962-8753103ZA                                 | <u>3/</u>             | IDT7201LA80XB                   |
| 5962-8753103UA                                 | 61772                 | IDT7201LA80XEB                  |
| 5962-8753103TA                                 | 61772                 | IDT7201LA80TCB                  |

1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the Vendor to determine its availability.

2/ **Caution.** Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

3/ No longer available from an approved source.

Vendor CAGE  
number

61772

Vendor name  
and address

Integrated Device Technology, Incorporated  
2975 Stender Way  
Santa Clara, CA 95054

The information contained herein is disseminated for convenience only and the Government assumes no liability whatsoever for any inaccuracies in the information bulletin.