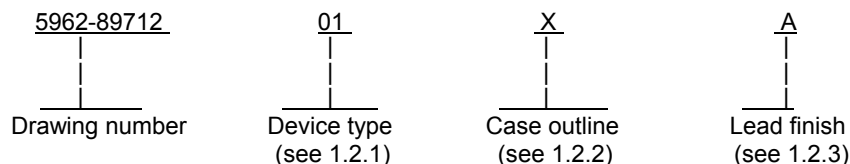


| REVISIONS                                                                                                                                                                         |                                                                    |  |  |  |                                   |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--|--|--|-----------------------------------|--|---|---|---|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---|-------------------|---|-----------------|----|----|----|----|
| LTR                                                                                                                                                                               | DESCRIPTION                                                        |  |  |  |                                   |  |   |   |   |                                                                                                                                              | DATE                      |   |                   |   | APPROVED        |    |    |    |    |
| A                                                                                                                                                                                 | Updated boilerplate. Added CAGE 75596 as a source of supply. - glg |  |  |  |                                   |  |   |   |   |                                                                                                                                              | 99-05-04                  |   |                   |   | Raymond Monnin  |    |    |    |    |
| B                                                                                                                                                                                 | Boilerplate update and part of five year review. tcr               |  |  |  |                                   |  |   |   |   |                                                                                                                                              | 07-06-05                  |   |                   |   | Robert M. Heber |    |    |    |    |
|                                                                                                                                                                                   |                                                                    |  |  |  |                                   |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
| REV                                                                                                                                                                               |                                                                    |  |  |  |                                   |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
| SHEET                                                                                                                                                                             |                                                                    |  |  |  |                                   |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
| REV                                                                                                                                                                               |                                                                    |  |  |  |                                   |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
| SHEET                                                                                                                                                                             |                                                                    |  |  |  |                                   |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
| REV STATUS<br>OF SHEETS                                                                                                                                                           |                                                                    |  |  |  | REV                               |  | B | B | B | B                                                                                                                                            | B                         | B | B                 | B | B               | B  | B  | B  |    |
|                                                                                                                                                                                   |                                                                    |  |  |  | SHEET                             |  | 1 | 2 | 3 | 4                                                                                                                                            | 5                         | 6 | 7                 | 8 | 9               | 10 | 11 | 12 | 13 |
| PMIC N/A                                                                                                                                                                          |                                                                    |  |  |  | PREPARED BY<br>Charles Reusing    |  |   |   |   | <b>DEFENSE SUPPLY CENTER COLUMBUS</b><br><b>COLUMBUS, OHIO 43218-3990</b><br><a href="http://www.dsccl.dla.mil">http://www.dsccl.dla.mil</a> |                           |   |                   |   |                 |    |    |    |    |
| <b>STANDARD<br/>MICROCIRCUIT<br/>DRAWING</b><br><br>THIS DRAWING IS<br>AVAILABLE<br>FOR USE BY ALL<br>DEPARTMENTS<br>AND AGENCIES OF THE<br>DEPARTMENT OF DEFENSE<br><br>AMSC N/A |                                                                    |  |  |  | CHECKED BY<br>Charles Reusing     |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
|                                                                                                                                                                                   |                                                                    |  |  |  | APPROVED BY<br>Michael A. Frye    |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
|                                                                                                                                                                                   |                                                                    |  |  |  | DRAWING APPROVAL DATE<br>91-05-08 |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |
|                                                                                                                                                                                   |                                                                    |  |  |  | REVISION LEVEL<br>B               |  |   |   |   | SIZE<br><b>A</b>                                                                                                                             | CAGE CODE<br><b>67268</b> |   | <b>5962-89712</b> |   |                 |    |    |    |    |
|                                                                                                                                                                                   |                                                                    |  |  |  | SHEET<br>1 OF 13                  |  |   |   |   |                                                                                                                                              |                           |   |                   |   |                 |    |    |    |    |

## 1. SCOPE

1.1 Scope. This drawing describes device requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as shown in the following example:



1.2.1 Device type(s). The device type(s) identify the circuit function as follows:

| <u>Device type</u> | <u>Generic number</u> 1/ | <u>Circuit function</u>        | <u>Access time</u> |
|--------------------|--------------------------|--------------------------------|--------------------|
| 01                 |                          | 16K X 4 SRAM with separate I/O | 45 ns              |
| 02                 |                          | 16K X 4 SRAM with separate I/O | 35 ns              |
| 03                 |                          | 16K X 4 SRAM with separate I/O | 25 ns              |
| 04                 |                          | 16K X 4 SRAM with separate I/O | 20 ns              |

1.2.2 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

| <u>Outline letter</u> | <u>Descriptive designator</u> | <u>Terminals</u> | <u>Package style</u>             |
|-----------------------|-------------------------------|------------------|----------------------------------|
| X                     | GDIP4-T28 or CDIP3-T28        | 28               | Dual-in-line package             |
| Y                     | GDFP2-F28                     | 28               | Flat package                     |
| Z                     | CQCC4-N28                     | 28               | Rectangular chip carrier package |
| U                     | CQCC3-N28                     | 28               | Rectangular chip carrier package |

1.2.3 Lead finish. The lead finish is as specified in MIL-PRF-38535, appendix A.

### 1.3 Absolute maximum ratings.

|                                                              |                        |
|--------------------------------------------------------------|------------------------|
| Supply voltage to ground potential ( $V_{CC}$ ) .....        | -0.5 V dc to +7.0 V dc |
| DC voltage applied to outputs in high Z state .....          | -0.5 V dc to +7.0 V dc |
| DC input voltage ( $V_{IN}$ ) <u>2/</u> .....                | -0.5 V dc to +7.0 V dc |
| DC output current .....                                      | 20 mA                  |
| Maximum power dissipation .....                              | 1.0 W                  |
| Lead temperature (soldering, 10 seconds) .....               | +260°C                 |
| Thermal resistance, junction-to-case ( $\theta_{JC}$ ) ..... | See MIL-STD-1835       |
| Junction temperature ( $T_J$ ) <u>3/</u> .....               | +150°C                 |
| Storage temperature range .....                              | -65°C to +150°C        |
| Temperature under bias .....                                 | -55°C to +125°C        |

#### 1.4 Recommended operating conditions.

|                                                 |                        |
|-------------------------------------------------|------------------------|
| Supply voltage range ( $V_{CC}$ ).....          | +4.5 V dc to +5.5 V dc |
| Ground voltage (GND).....                       | 0 V dc                 |
| Input high voltage ( $V_{IH}$ ).....            | 2.2 V dc minimum       |
| Input low voltage ( $V_{IL}$ ).....             | 0.8 V dc maximum       |
| Operating case temperature range ( $T_C$ )..... | -55°C to +125°C        |

1/ Generic numbers are listed on the Standardized Military Drawing Source Approval Bulletin at the end of this document and will also be listed in MIL- HDBK -103 (see 6.6 herein).

2/  $V_{||}$  minimum = -3.0 V for pulse width less than 20 ns.

3/ Maximum junction temperature may be increased to 175°C during burn-in and steady state life.

|                                                                                                                     |                   |                             |                    |
|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------|--------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43218-3990</b> | <b>SIZE<br/>A</b> |                             | <b>5962-89712</b>  |
|                                                                                                                     |                   | <b>REVISION LEVEL<br/>B</b> | <b>SHEET<br/>2</b> |

## 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 cited in the solicitation or contract.

### DEPARTMENT OF DEFENSE SPECIFICATION

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

### DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.

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

### DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-103 - List of Standard Microcircuit Drawings.

MIL-HDBK-780 - Standard Microcircuit Drawings.

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

2.2 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 takes 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 form, fit, or function of the device. 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 only. Each coated microcircuit inspection lot (see inspection lot as defined in MIL-PRF-38535) shall be subjected to and pass the internal moisture content test at 5000 ppm (see method 1018 of MIL-STD-883). The frequency of the internal water vapor testing shall not be decreased unless approved by the preparing activity for class M. The TRB will ascertain the requirements as provided by MIL-PRF-38535 for classes Q and V. Samples may be pulled any time after seal.

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.

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.

|                                                                                                                     |                   |                             |                    |
|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------|--------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43218-3990</b> | <b>SIZE<br/>A</b> |                             | <b>5962-89712</b>  |
|                                                                                                                     |                   | <b>REVISION LEVEL<br/>B</b> | <b>SHEET<br/>3</b> |

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. 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. A compliance indicator "C" shall be marked on all non-JAN devices built in compliance to MIL-PRF-38535, appendix A. The compliance indicator "C" shall be replaced with a "Q" or "QML" certification mark in accordance with MIL-PRF-38535 to identify when the QML flow option is used.

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 for any change that affects this drawing.

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. VERIFICATION

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 D or E. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in 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 input capacitance. Sample size is 15 devices with no failures, and all input and output terminals tested.

d. Subgroups 7 and 8 shall include verification of the truth table.

|                                                                                                     |           |                     |            |
|-----------------------------------------------------------------------------------------------------|-----------|---------------------|------------|
| STANDARD<br>MICROCIRCUIT DRAWING<br><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43218-3990 | SIZE<br>A |                     | 5962-89712 |
|                                                                                                     |           | REVISION LEVEL<br>B | SHEET<br>4 |

TABLE I. Electrical performance characteristics.

| Test                                  | Symbol                     | Conditions <u>1/ 2/</u><br>-55°C ≤ T <sub>C</sub> ≤ +125°C<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 |      |
| Output high voltage                   | V <sub>OH</sub>            | V <sub>CC</sub> = 4.5 V, I <sub>OH</sub> = -4.0 mA,<br>V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                  | 1, 2, 3              | All             | 2.4    |     | V    |
| Output low voltage                    | V <sub>OL</sub>            | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 8.0 mA<br>V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                    | 1, 2, 3              | All             |        | 0.4 | V    |
| Input high voltage                    | V <sub>IH</sub> <u>3/</u>  |                                                                                                                                                              | 1, 2, 3              | All             | 2.2    |     | V    |
| Input low voltage                     | V <sub>IL</sub> <u>3/</u>  |                                                                                                                                                              | 1, 2, 3              | All             |        | 0.8 | V    |
| Input leakage current                 | I <sub>IX</sub>            | V <sub>IN</sub> = 5.5 V to GND                                                                                                                               | 1, 2, 3              | All             | -10    | 10  | μA   |
| Output leakage<br>current             | I <sub>OZ</sub>            | V <sub>CC</sub> = 5.5 V<br>V <sub>OUT</sub> = 5.5 V to GND                                                                                                   | 1, 2, 3              | All             | -10    | 10  | μA   |
| Operating supply current              | I <sub>CC1</sub>           | V <sub>CC</sub> = 5.5 V, I <sub>OUT</sub> = 0 mA<br>$\overline{CE} = V_{IL}$ , f = f <sub>MAX</sub> <u>4/</u>                                                | 1, 2, 3              | 01,02           |        | 140 | mA   |
|                                       |                            |                                                                                                                                                              |                      | 03              |        | 155 |      |
|                                       |                            |                                                                                                                                                              |                      | 04              |        | 175 |      |
| Standby power supply<br>current, TTL  | I <sub>CC2</sub>           | V <sub>CC</sub> = 5.5 V, I <sub>OUT</sub> = 0 mA<br>$\overline{CE} \geq V_{IH}$ , f = 0 <u>4/</u><br>all other inputs ≤ V <sub>IL</sub> or ≥ V <sub>IH</sub> | 1, 2, 3              | 01,02           |        | 50  | mA   |
|                                       |                            |                                                                                                                                                              |                      | 03              |        | 60  |      |
|                                       |                            |                                                                                                                                                              |                      | 04              |        | 70  |      |
| Standby power supply<br>current, CMOS | I <sub>CC3</sub>           | $\overline{CE} \geq (V_{CC} - 0.2 \text{ V})$ ,<br>V <sub>CC</sub> = 5.5 V, f = 0 <u>4/</u><br>all other inputs ≤ 0.2 V or<br>≥ (V <sub>CC</sub> - 0.2 V)    | 1, 2, 3              | 01-03           |        | 20  | mA   |
|                                       |                            |                                                                                                                                                              |                      | 04              |        | 25  |      |
| Input capacitance                     | C <sub>IN</sub> <u>5/</u>  | V <sub>IN</sub> = 0.0 V, V <sub>CC</sub> = 5.0 V<br>T <sub>A</sub> = +25°C, f = 1 Mhz,<br>(see 4.3.1c)                                                       | 4                    | All             |        | 8   | pF   |
| Output capacitance                    | C <sub>OUT</sub> <u>5/</u> | V <sub>O</sub> = 0 V, V <sub>CC</sub> = 5.0 V<br>T <sub>A</sub> = +25°C, f = 1 Mhz,<br>(see 4.3.1c)                                                          | 4                    | All             |        | 8   | pF   |
| Functional tests                      |                            | See 4.3.1d                                                                                                                                                   | 7,8A,8B              | All             |        |     |      |

See footnotes at the end of the table.

STANDARD  
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A

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TABLE I. Electrical performance characteristics - continued.

| Test                                                    | Symbol            | Conditions <u>1/</u> <u>2/</u><br>-55°C ≤ T <sub>C</sub> ≤ +125°C<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>AVAV</sub> | See figures 3 and 4                                                                                                                | 9,10,11              | 01              | 45     |     | ns   |
|                                                         |                   |                                                                                                                                    |                      | 02              | 35     |     |      |
|                                                         |                   |                                                                                                                                    |                      | 03              | 25     |     |      |
|                                                         |                   |                                                                                                                                    |                      | 04              | 20     |     |      |
| Address access time                                     | t <sub>AVQV</sub> |                                                                                                                                    | 9,10,11              | 01              |        | 45  | ns   |
|                                                         |                   |                                                                                                                                    |                      | 02              |        | 35  |      |
|                                                         |                   |                                                                                                                                    |                      | 03              |        | 25  |      |
|                                                         |                   |                                                                                                                                    |                      | 04              |        | 20  |      |
| Output hold from<br>address change                      | t <sub>AVQX</sub> |                                                                                                                                    | 9,10,11              | All             | 5      |     | ns   |
| Chip enable access time                                 | t <sub>ELQV</sub> |                                                                                                                                    | 9,10,11              | 01              |        | 45  | ns   |
|                                                         |                   |                                                                                                                                    |                      | 02              |        | 35  |      |
|                                                         |                   |                                                                                                                                    |                      | 03              |        | 25  |      |
|                                                         |                   |                                                                                                                                    |                      | 04              |        | 20  |      |
| Chip enable to output<br>active <u>5/</u> <u>6/</u>     | t <sub>ELQX</sub> |                                                                                                                                    | 9,10,11              | All             | 5      |     | ns   |
| Chip select to output<br>inactive <u>5/</u> <u>6/</u>   | t <sub>EHQZ</sub> |                                                                                                                                    | 9,10,11              | 01,02           |        | 15  | ns   |
|                                                         |                   |                                                                                                                                    |                      | 03              |        | 10  |      |
|                                                         |                   |                                                                                                                                    |                      | 04              |        | 8   |      |
| Output enable to output<br>valid                        | t <sub>OLQV</sub> |                                                                                                                                    | 9,10,11              | 01              |        | 25  | ns   |
|                                                         |                   |                                                                                                                                    |                      | 02              |        | 20  |      |
|                                                         |                   |                                                                                                                                    |                      | 03              |        | 12  |      |
|                                                         |                   |                                                                                                                                    |                      | 04              |        | 10  |      |
| Output enable to output<br>active <u>5/</u> <u>6/</u>   | t <sub>OLQX</sub> |                                                                                                                                    | 9,10,11              | All             | 3      |     | ns   |
| Output enable to output<br>inactive <u>5/</u> <u>6/</u> | t <sub>OHQZ</sub> |                                                                                                                                    | 9,10,11              | 01,02           |        | 15  | ns   |
|                                                         |                   |                                                                                                                                    |                      | 03              |        | 10  |      |
|                                                         |                   |                                                                                                                                    |                      | 04              |        | 8   |      |

See footnotes at the end of the table.

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TABLE I. Electrical performance characteristics - continued.

| Test                                   | Symbol                                 | Conditions <u>1/</u> <u>2/</u><br>-55°C ≤ T <sub>C</sub> ≤ +125°C<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 |      |
| Chip enable to power up<br><u>5/</u>   | t <sub>ELPU</sub>                      | See figures 3 and 4                                                                                                                | 9,10,11              | All             | 0      |     | ns   |
| Chip enable to power<br>down <u>5/</u> | t <sub>EHPD</sub>                      |                                                                                                                                    | 9,10,11              | 01              |        | 45  | ns   |
|                                        |                                        |                                                                                                                                    |                      | 02              |        | 35  |      |
|                                        |                                        |                                                                                                                                    |                      | 03              |        | 25  |      |
|                                        |                                        |                                                                                                                                    |                      | 04              |        | 20  |      |
| Write cycle time                       | t <sub>AVAV</sub>                      |                                                                                                                                    | 9,10,11              | 01              | 40     |     | ns   |
|                                        |                                        |                                                                                                                                    |                      | 02              | 30     |     |      |
|                                        |                                        |                                                                                                                                    |                      | 03              | 20     |     |      |
|                                        |                                        |                                                                                                                                    |                      | 04              | 20     |     |      |
| Chip enable to write end               | t <sub>ELWH</sub><br>t <sub>ELEH</sub> |                                                                                                                                    | 9,10,11              | 01              | 35     |     | ns   |
|                                        |                                        |                                                                                                                                    |                      | 02              | 25     |     |      |
|                                        |                                        |                                                                                                                                    |                      | 03              | 20     |     |      |
|                                        |                                        |                                                                                                                                    |                      | 04              | 17     |     |      |
| Address setup to end of<br>write       | t <sub>AVWH</sub><br>t <sub>AVEH</sub> |                                                                                                                                    | 9,10,11              | 01              | 35     |     | ns   |
|                                        |                                        |                                                                                                                                    |                      | 02              | 25     |     |      |
|                                        |                                        |                                                                                                                                    |                      | 03              | 20     |     |      |
|                                        |                                        |                                                                                                                                    |                      | 04              | 17     |     |      |
| Address hold from write<br>end         | t <sub>WHAX</sub><br>t <sub>EHAX</sub> |                                                                                                                                    | 9,10,11              | All             | 0      |     | ns   |
| Address setup to write<br>start        | t <sub>AVWL</sub><br>t <sub>AVEL</sub> |                                                                                                                                    | 9,10,11              | All             | 0      |     | ns   |

See footnotes at the end of the table.

**STANDARD  
MICROCIRCUIT DRAWING**

**DEFENSE SUPPLY CENTER COLUMBUS  
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SIZE  
**A**

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REVISION LEVEL  
B

SHEET  
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TABLE I. Electrical performance characteristics - continued.

| Test                                                       | Symbol                                 | Conditions <u>1/</u> <u>2/</u><br>-55°C ≤ T <sub>C</sub> ≤ +125°C<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 |      |
| Write enable pulse width                                   | t <sub>WLWH</sub><br>t <sub>WLEH</sub> | See figures 3 and 4                                                                                                                | 9,10,11              | 01              | 35     |     | ns   |
|                                                            |                                        |                                                                                                                                    |                      | 02              | 25     |     |      |
|                                                            |                                        |                                                                                                                                    |                      | 03              | 20     |     |      |
|                                                            |                                        |                                                                                                                                    |                      | 04              | 17     |     |      |
| Data setup to write end                                    | t <sub>DVWH</sub><br>t <sub>DVEH</sub> |                                                                                                                                    | 9,10,11              | 01              | 20     |     | ns   |
|                                                            |                                        |                                                                                                                                    |                      | 02              | 15     |     |      |
|                                                            |                                        |                                                                                                                                    |                      | 03              | 13     |     |      |
|                                                            |                                        |                                                                                                                                    |                      | 04              | 10     |     |      |
| Data hold from write end                                   | t <sub>WHDX</sub><br>t <sub>EHDX</sub> |                                                                                                                                    | 9,10,11              | All             | 0      |     | ns   |
| Write enable high to<br>output active <u>5/</u> <u>6/</u>  | t <sub>WHQX</sub>                      |                                                                                                                                    | 9,10,11              | All             | 5      |     | ns   |
| Write enable low to<br>output inactive <u>5/</u> <u>6/</u> | t <sub>WLQX</sub>                      |                                                                                                                                    | 9,10,11              | 01              |        | 15  | ns   |
|                                                            |                                        |                                                                                                                                    |                      | 02              |        | 10  |      |
|                                                            |                                        |                                                                                                                                    |                      | 03,04           |        | 7   |      |

1/ AC tests are performed with input rise and fall times of 5 ns or less, timing references levels of 1.5 V, input pulse levels of 0 to 3.0 V, and the output load in figure 3, circuit A.

2/  $\overline{CE}_1$  and  $\overline{CE}_2$  are represented by  $\overline{CE}$  in table I.

3/ These are absolute values with respect to device ground and all overshoots due to system or tester noise are included.

4/ At f = f<sub>MAX</sub>, address and data inputs are cycling at the maximum frequency of 1/t<sub>AVAV</sub>.

5/ Tested initially and after any design or process changes that affect that parameter, and therefore shall be guaranteed to the limits specified in table I.

6/ Transition is measured at steady state high level -500 mV or steady state low level +500 mV on the output from 1.5 V level on the input with the load in figure 3, circuit B.

**STANDARD  
MICROCIRCUIT DRAWING**

**SIZE  
A**

**5962-89712**

**DEFENSE SUPPLY CENTER COLUMBUS  
COLUMBUS, OHIO 43218-3990**

**REVISION LEVEL  
B**

**SHEET  
8**

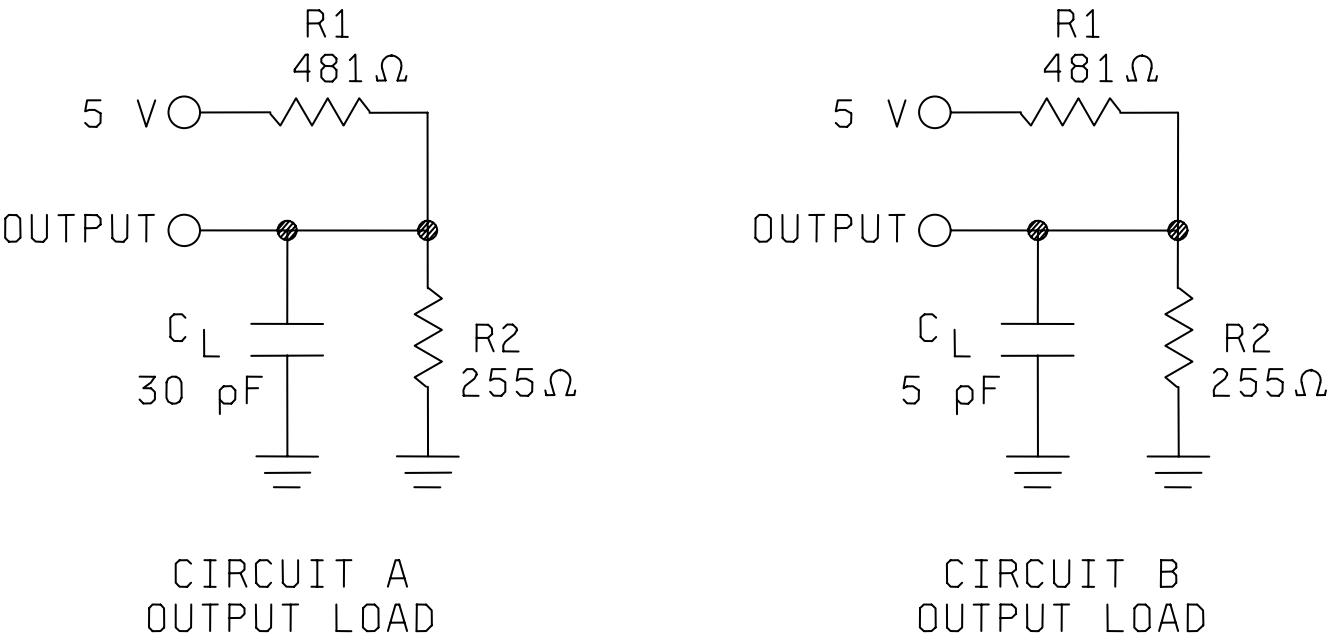
|                 |                   |
|-----------------|-------------------|
| Device types    | All               |
| Case outlines   | X, Y, Z, U        |
| Terminal number | Terminal Symbol   |
| 1               | A                 |
| 2               | A                 |
| 3               | A                 |
| 4               | A                 |
| 5               | A                 |
| 6               | A                 |
| 7               | A                 |
| 8               | A                 |
| 9               | A                 |
| 10              | I <sub>0</sub>    |
| 11              | I <sub>1</sub>    |
| 12              | $\overline{CE}_1$ |
| 13              | $\overline{OE}$   |
| 14              | GND               |
| 15              | $\overline{CE}_2$ |
| 16              | $\overline{WE}$   |
| 17              | O <sub>0</sub>    |
| 18              | O <sub>1</sub>    |
| 19              | O <sub>2</sub>    |
| 20              | O <sub>3</sub>    |
| 21              | I <sub>2</sub>    |
| 22              | I <sub>3</sub>    |
| 23              | A                 |
| 24              | A                 |
| 25              | A                 |
| 26              | A                 |
| 27              | A                 |
| 28              | V <sub>CC</sub>   |

FIGURE 1. Terminal connections.

|                                                                                                                     |                   |                             |                    |
|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------|--------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43218-3990</b> | <b>SIZE<br/>A</b> |                             | <b>5962-89712</b>  |
|                                                                                                                     |                   | <b>REVISION LEVEL<br/>B</b> | <b>SHEET<br/>9</b> |

| $\overline{CE}_1$ | $\overline{CE}_2$ | $\overline{WE}$ | $\overline{OE}$ | Mode           | D <sub>OUT</sub> | Power   |
|-------------------|-------------------|-----------------|-----------------|----------------|------------------|---------|
| H                 | X                 | X               | X               | Not selected   | High Z           | Standby |
| X                 | H                 | X               | X               | Not selected   | High Z           | Standby |
| L                 | L                 | L               | X               | Write          | High Z           | Active  |
| L                 | L                 | H               | L               | Read           | D <sub>OUT</sub> | Active  |
| L                 | L                 | H               | H               | Output disable | High Z           | Active  |

FIGURE 2. Truth table.



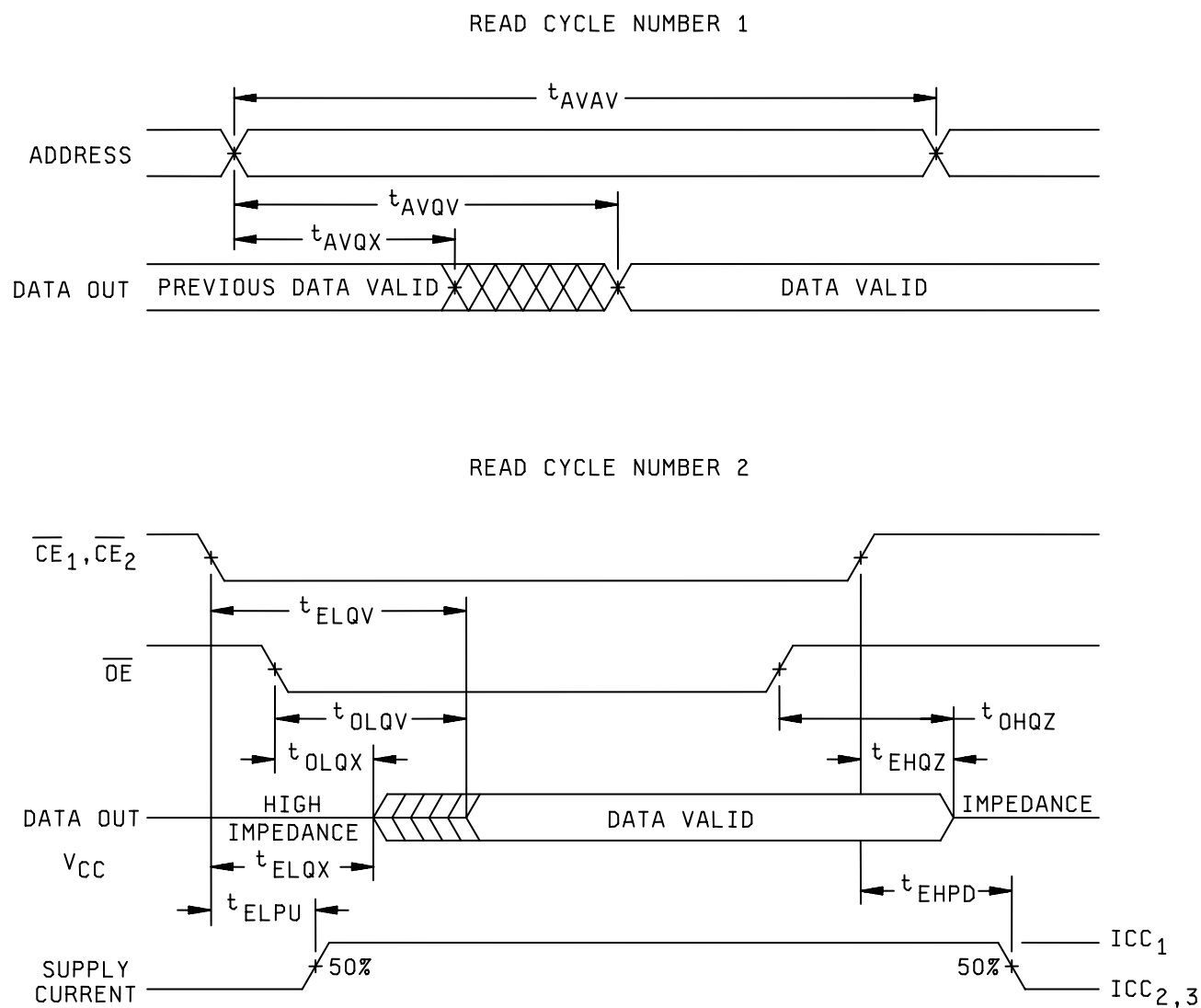
NOTE: Capacitance values include scope and jig capacitance.

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 test conditions.

|                                                                                                                     |                   |                             |                     |
|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------|---------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43218-3990</b> | <b>SIZE<br/>A</b> |                             | <b>5962-89712</b>   |
|                                                                                                                     |                   | <b>REVISION LEVEL<br/>B</b> | <b>SHEET<br/>10</b> |

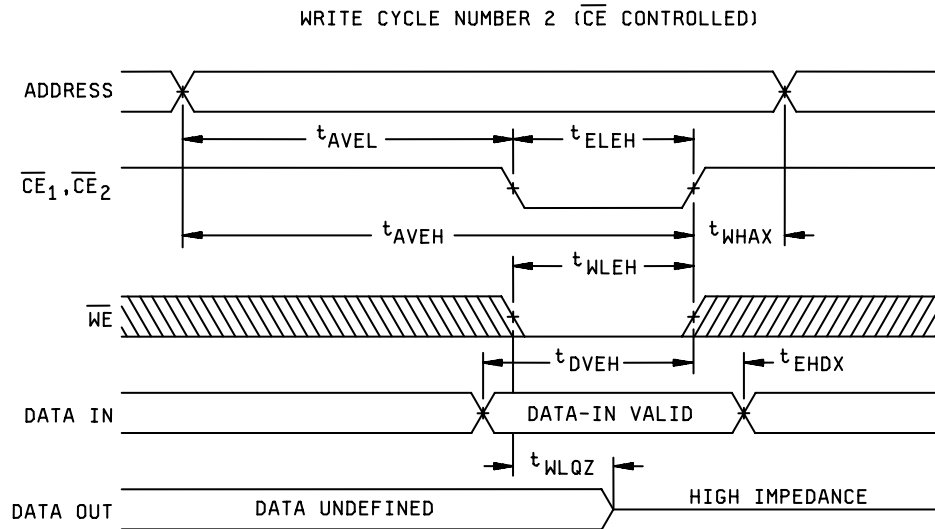
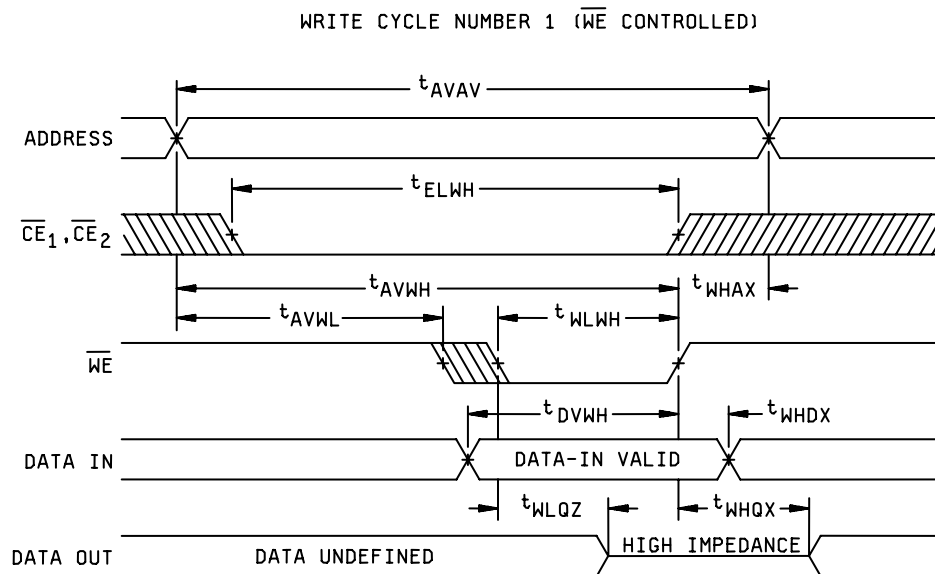


Notes on read operation:

1.  $\overline{WE}$  is high for read cycles.
2. For read cycle number 1, device is continuously selected,  $\overline{CE}$ ,  $\overline{OE} = V_{IL}$ .
3. For read cycle number 2, addresses are valid prior to or coincident with  $\overline{CE}$  transition low.

FIGURE 4. Timing waveforms.

|                                                                                                                     |                   |                             |                     |
|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------|---------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43218-3990</b> | <b>SIZE<br/>A</b> |                             | <b>5962-89712</b>   |
|                                                                                                                     |                   | <b>REVISION LEVEL<br/>B</b> | <b>SHEET<br/>11</b> |



Notes on write operation:

1.  $\overline{CE}$  or  $\overline{WE}$  must be high during address transitions.
2. If  $\overline{CE}$  switches low coincident with or after  $\overline{WE}$  switches low, the outputs will stay in a high impedance state.
3. If  $\overline{CE}$  switches high coincident with or before  $\overline{WE}$  switches high, the outputs will stay in a high impedance state.
4. A write occurs during the overlap of  $\overline{CE}$  low and  $\overline{WE}$  low. Both signals must be low to initiate a write and either signal can terminate a write by going high. The data input setup and hold timing should be referenced to the rising edge of the signal that terminates the write.

FIGURE 4. Timing waveforms - continued.

|                                                                                                                     |                   |                             |                     |
|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------|---------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43218-3990</b> | <b>SIZE<br/>A</b> |                             | <b>5962-89712</b>   |
|                                                                                                                     |                   | <b>REVISION LEVEL<br/>B</b> | <b>SHEET<br/>12</b> |

TABLE II. Electrical test requirements.

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

\* PDA applies to subgroup 1 and 7.

\*\* For subgroup see 4.3.1c.

\*\*\* For subgroups 7, 8A and 8B, see 4.3.1d.

#### 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 D or E. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in 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.

## 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 (DSCC) 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) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43218-3990, or telephone 614-692-0547.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

|                                                                                                                     |                  |                     |                   |
|---------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br><br><b>DEFENSE SUPPLY CENTER COLUMBUS<br/>COLUMBUS, OHIO 43218-3990</b> | SIZE<br><b>A</b> |                     | <b>5962-89712</b> |
|                                                                                                                     |                  | REVISION LEVEL<br>B | SHEET<br>13       |

## STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 07-06-05

Approved sources of supply for SMD 5962-89712 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 information bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535. DSCC maintains an online database of all current sources of supply at <http://www.dscclia.mil/Programs/Smcr/>.

| Standard microcircuit <u>1/</u><br>drawing PIN | Vendor<br>CAGE number       | Vendor<br>similar PIN <u>2/</u>                  |
|------------------------------------------------|-----------------------------|--------------------------------------------------|
| 5962-8971201XA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-45DMB<br>IDT71982S45DB<br>P4C1982-45CMB |
| 5962-8971201YA                                 | 0C7V7<br>3DTT2              | CY7C162A-45KMB<br>P4C1982-45FMB                  |
| 5962-8971201UA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-45LMB<br>IDT71982S45LB<br>P4C1982-45LMB |
| 5962-8971201ZA                                 | 0C7V7<br>3DTT2              | CY7C162A-45LMB<br>P4C1982-45LMB                  |
| 5962-8971202XA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-35DMB<br>IDT71982S35DB<br>P4C1982-35CMB |
| 5962-8971202YA                                 | 0C7V7<br>3DTT2              | CY7C162A-35KMB<br>P4C1982-35FMB                  |
| 5962-8971202UA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-35LMB<br>IDT71982S35LB<br>P4C1982-35LMB |
| 5962-8971202ZA                                 | 0C7V7<br>3DTT2              | CY7C162A-35LMB<br>P4C1982-35LMB                  |
| 5962-8971203XA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-25DMB<br>IDT71982S25DB<br>P4C1982-25CMB |
| 5962-8971203YA                                 | 0C7V7<br>3DTT2              | CY7C162A-25KMB<br>P4C1982-25FMB                  |
| 5962-8971203UA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-25LMB<br>IDT71982S25LB<br>P4C1982-25LMB |
| 5962-8971203ZA                                 | 0C7V7<br>3DTT2              | CY7C162A-25LMB<br>P4C1982-25LMB                  |
| 5962-8971204XA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-20DMB<br>IDT71982S20DB<br>P4C1982-20CMB |
| 5962-8971204YA                                 | 0C7V7<br>3DTT2              | CY7C162A-20KMB<br>P4C1982-20FMB                  |
| 5962-8971204UA                                 | 0C7V7<br><u>3/</u><br>3DTT2 | CY7C162A-20LMB<br>IDT71982S20LB<br>P4C1982-20LMB |
| 5962-8971204ZA                                 | 0C7V7<br>3DTT2              | CY7C162A-20LMB<br>P4C1982-20LMB                  |

STANDARD MICROCIRCUIT DRAWING BULLETIN – continued.

- 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/ Not available from an approved source of supply.

Vendor CAGE  
number

Vendor name  
and address

0C7V7

QP Semiconductor  
2945 Oakmead Village Ct.  
Santa Clara, CA 95051-0812

3DTT2

Pyramid Semiconductor Corporation  
1340 Bordeaux Drive  
Sunnyvale, CA 94089 - 1005

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