

REVISIONS

| LTR | DESCRIPTION | DATE (YR-MO-DA) | APPROVED |
|-----|--|-----------------|----------------|
| E | Added changes in accordance with NOR 5962-R085-93 | 93-03-16 | M. A. Frye |
| F | Added device types 45, 46, and 47. Removed CAGE code 34168 for case outline 8, and added cage code 34168 for case outline 9. Editorial changes throughout. | 95-11-14 | M. A. Frye |
| G | Added device types 48-68. ICC1 changes for device types 18, 19, 46, and 47. Updated boilerplate. glg | 98-02-20 | Raymond Monnin |
| H | Updated boilerplate paragraphs as part of a 5 year review. ksr | 05-05-18 | Raymond Monnin |

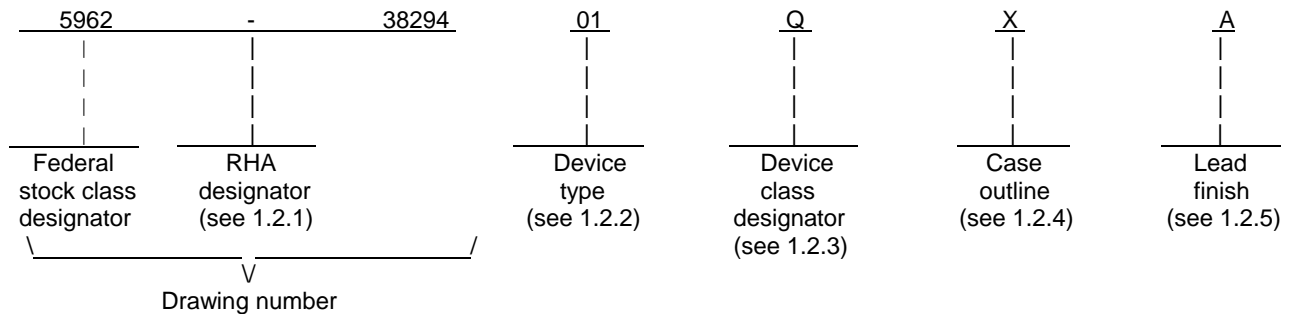
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|----------------------|----|----|----|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| REV | H | H | H | H | H | H | H | H | H | H | H | H | H | H | | | | | | | |
| SHEET | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | | | | | | | |
| REV | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | |
| SHEET | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | |
| REV STATUS OF SHEETS | | | | REV | | | | H | H | H | H | H | H | H | H | H | H | H | H | H | |
| | | | | SHEET | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

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|---|-----------------------------------|--|--|--|--|---------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| PMIC N/A | PREPARED BY Kenneth Rice | | | | <p align="center">DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 http://www.dsccl.dla.mil</p> | | | | | | | | | | | | | | | |
| <p align="center">STANDARD MICROCIRCUIT DRAWING</p> <p align="center">THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> | CHECKED BY Charles Reusing | | | | | | | | | | | | | | | | | | | |
| | APPROVED BY Michael A. Frye | | | | <p align="center">MICROCIRCUIT, MEMORY, DIGITAL, CMOS, 8K x 8 STATIC RANDOM ACCESS MEMORY (SRAM), MONOLITHIC SILICON</p> | | | | | | | | | | | | | | | |
| | DRAWING APPROVAL DATE 90-10-29 | | | | | | | | | | | | | | | | | | | |
| AMSC N/A | REVISION LEVEL H | | | | SIZE A | CAGE CODE 67268 | 5962-38294 | | | | | | | | | | | | | |
| | | | | | SHEET 1 OF 48 | | | | | | | | | | | | | | | |

1. SCOPE

1.1 Scope. This drawing documents two product assurance class levels consisting of high reliability (device classes Q and M) and space application (device class V). A choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of Radiation Hardness Assurance (RHA) levels are reflected in the PIN.

1.2 PIN. The PIN is as shown in the following example:



1.2.1 RHA designator. Device classes Q and V RHA marked devices meet the MIL-PRF-38535 specified RHA levels and are marked with the appropriate RHA designator. Device class M RHA marked devices meet the MIL-PRF-38535, appendix A specified RHA levels and are marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

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

| Device type | Generic number 1/ | Circuit function | Data retention | Access time |
|-------------|-------------------|------------------|----------------|-------------|
| 01 | | | No | 150 ns |
| 02 | | | Yes | 120 ns |
| 03 | | | No | 120 ns |
| 04 | | | Yes | 100 ns |
| 05 | | | No | 100 ns |
| 06 | | | Yes | 70 ns |
| 07 | | | No | 70 ns |
| 08 | | | Yes | 55 ns |
| 09 | | | No | 55 ns |
| 10 | | 8K x 8 CMOS SRAM | Yes | 45 ns |
| 11 | | | No | 45 ns |
| 12 | | | Yes | 35 ns |
| 13 | | | No | 35 ns |
| 14 | | | Yes | 25 ns |
| 15 | | | No | 25 ns |
| 16 | | | Yes | 20 ns |
| 17 | | | No | 20 ns |
| 18 | | | Yes | 15 ns |
| 19 | | | No | 15 ns |
| 20 | | | Yes | 70 ns |
| 21 | | | No | 70 ns |
| 22 | | | Yes | 55 ns |
| 23 | | | No | 55 ns |
| 24 | | | Yes | 45 ns |
| 25 | | | No | 45 ns |
| 26 | | | Yes | 35 ns |
| 27 | | | No | 35 ns |
| 28 | | | Yes | 25 ns |
| 29 | | | No | 25 ns |
| 30 | | | No | 20 ns |
| 31 | | | Yes | 100 ns |
| 32 | | | Yes | 70 ns |
| 33 | | | Yes | 55 ns |
| 34 | | | Yes | 45 ns |

1/ Generic numbers are listed on the Standard Microcircuit Drawing Source Approval Bulletin at the end of this document and will also be listed in MIL-HDBK-103 and QML-38535.

| | | | |
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| <u>Device type</u> | <u>Generic number 1/</u> | <u>Circuit function</u> | <u>Data retention</u> | <u>Access time</u> |
|--------------------|--------------------------|-------------------------|-----------------------|--------------------|
| 35 | | | Yes | 85 ns |
| 36 | | | Yes | 70 ns |
| 37 | | | Yes | 55 ns |
| 38 | | | Yes | 120 ns |
| 39 | | | Yes | 70 ns |
| 40 | | 8K x 8 CMOS SRAM | Yes | 120 ns |
| 41 | | | Yes | 70 ns |
| 42 | | | Yes | 55 ns |
| 43 | | | Yes | 55 ns |
| 44 | | | No | 55 ns |
| 45 | | | Yes | 120 ns |
| 46 | | | Yes | 12 ns |
| 47 | | | No | 12 ns |
| 48 | | | No | 70 ns |
| 49 | | | Yes | 55 ns |
| 50 | | | No | 55 ns |
| 51 | | | Yes | 45 ns |
| 52 | | | No | 45 ns |
| 53 | | | Yes | 35 ns |
| 54 | | | No | 35 ns |
| 55 | | | Yes | 25 ns |
| 56 | | | No | 25 ns |
| 57 | | | Yes | 20 ns |
| 58 | | | No | 20 ns |
| 59 | | | No | 70 ns |
| 60 | | | Yes | 55 ns |
| 61 | | | No | 55 ns |
| 62 | | | Yes | 45 ns |
| 63 | | | No | 45 ns |
| 64 | | | Yes | 35 ns |
| 65 | | | No | 35 ns |
| 66 | | | Yes | 25 ns |
| 67 | | | No | 25 ns |
| 68 | | | No | 20 ns |

1.2.3 Device class designator. The device class designator is a single letter identifying the product assurance level as follows:

| <u>Device class</u> | <u>Device requirements documentation</u> |
|---------------------|---|
| M | Vendor self-certification to the requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A |
| Q or V | Certification and qualification to MIL-PRF-38535 |

1.2.4 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 | GDIP1-T28 or CDIP2-T28 | 28 | Dual-in-line |
| Y | CQCC1-N32 | 32 | Rectangular chip carrier |
| Z | CDIP3-T28 or GDIP4-T28 | 28 | Dual-in-line |
| U | CQCC4-N28 | 28 | Rectangular chip carrier |
| T | GDFP2-F28 | 28 | Flat pack |
| M | CDFP4-F28 | 28 | Flat pack |
| N | See figure 1 | 28 | Flat pack |
| 9 | See figure 1 | 36 | Flat pack |
| 8 | See figure 1 | 36 | Flat pack |

^{1/} See footnote 1/, page 2.

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1.2.5 Lead finish. The lead finish is as specified in MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

1.3 Absolute maximum ratings. 2/ 3/

| | |
|---|---|
| Supply voltage range (V_{CC})----- | -0.5 V dc to +7.0 V dc |
| DC input voltage range (V_{IN})----- | -0.5 V dc to V_{CC} +0.5 V dc <u>4/</u> |
| DC output voltage range (V_{OUT})----- | -0.5 V dc to V_{CC} +0.5 V dc <u>4/</u> |
| Storage temperature range----- | -65°C to +150°C |
| Lead temperature (soldering, 10 seconds)----- | +260°C |
| Thermal resistance, junction-to-case (θ_{JC}): | |
| Cases X, Y, Z, U, T, and M----- | See MIL-STD-1835 |
| Case N----- | 10°C/W <u>5/</u> |
| Case 9----- | 2.0°C/W <u>5/</u> |
| Case 8----- | 3.3°C/W <u>5/</u> |
| Output voltage applied in high-Z state----- | -0.5 V dc to V_{CC} +0.5 V dc |
| Maximum power dissipation, (P_D)----- | 1.0 W |
| Maximum junction temperature (T_J)----- | +150°C <u>6/</u> |

1.4 Recommended operating conditions.

| | |
|---|---------------------------------------|
| Supply voltage range (V_{CC})----- | 4.5 V dc minimum to 5.5 V dc maximum |
| Supply voltage (V_{SS})----- | 0.0 V dc |
| High level input voltage range (V_{IH}): | |
| Device types 1-39,46-68,42,44 (TTL levels)----- | -2.2 V dc to V_{CC} + 0.5 V dc |
| Device types 40,41,43,45 (CMOS levels)----- | 0.8 x V_{CC} to V_{CC} + 0.5 V dc |
| Low level input voltage range (V_{IL}) | |
| Device types 1-39,46-68,42,44 (TTL levels)----- | -0.5 V dc to 0.8 V dc |
| Device types 40,41,43,45 (CMOS levels)----- | -0.5 V dc to 0.2 x V_{CC} |
| Case operating temperature range (T_C)----- | -55°C to +125°C |

1.5 Digital logic testing for device classes Q and V.

| | |
|---|-------------|
| Fault coverage measurement of manufacturing logic tests (MIL-STD-883, test method 5012)----- | 100 percent |
|---|-------------|

2/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

3/ All voltages referenced to V_{SS} (V_{SS} = ground) unless otherwise specified.

4/ Negative undershoots to a minimum of -3.0 V are allowed with a maximum of 20 ns pulse width.

5/ When the thermal resistance for this case is specified in MIL-STD-1835 that value shall supersede the value indicated herein.

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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 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents are the issues of the documents cited in the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM Standard F1192-95 - Standard Guide for the Measurement of Single Event Phenomena from Heavy Ion Irradiation of Semiconductor Devices.

(Applications for copies of ASTM publications should be addressed to: ASTM International, PO Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; <http://www.astm.org>.)

ELECTRONICS INDUSTRIES ASSOCIATION (EIA)

JEDEC Standard EIA/JESD78 - IC Latch-Up Test.

(Applications for copies should be addressed to the Electronics Industries Association, 2500 Wilson Boulevard, Arlington, VA 22201; <http://www.jedec.org>.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 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 for device classes Q and V shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. The individual item requirements for device class M shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein for device classes Q and V or MIL-PRF-38535, appendix A and herein for device class M.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein and figure 1.

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3.2.2 Terminal connections. The terminal connections shall be as specified on figure 2.

3.2.3 Truth table(s). The truth table(s) shall be as specified on figure 3.

3.2.4 Radiation exposure circuit. The radiation exposure circuit shall be as specified on figure 6 .

3.2.5 Functional tests. Various functional tests used to test this device are contained in appendix A herein. If the test patterns cannot be implemented due to test equipment limitations, alternate test patterns to accomplish the same results shall be allowed. For device class M, alternate test patterns shall be maintained under document revision level control by the manufacturer and shall be made available to the preparing or acquiring activity upon request. For device classes Q and V, alternate test patterns shall be under the control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the preparing or acquiring activity upon request.

3.2.6 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 and postirradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and postirradiation parameter limits are as specified in table IA 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 IIA. The electrical tests for each subgroup are defined in table IA.

3.5 Marking. 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 marking of 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. For RHA product using this option, the RHA designator shall still be marked. Marking for device classes Q and V shall be in accordance with MIL-PRF-38535. Marking for device class M shall be in accordance with MIL-PRF-38535, appendix A.

3.5.1 Certification/compliance mark. The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-PRF-38535. The compliance mark for device class M shall be a "C" as required in MIL-PRF-38535, appendix A.

3.6 Certificate of compliance. For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.6.1 herein). For device class M, 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 6.6.2 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device classes Q and V, the requirements of MIL-PRF-38535 and herein or for device class M, the requirements of MIL-PRF-38535, appendix A and herein.

3.7 Certificate of conformance. A certificate of conformance as required for device classes Q and V in MIL-PRF-38535 or for device class M in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DSCC-VA of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change that affects this drawing.

3.9 Verification and review for device class M. For device class M, 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.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number 41 (see MIL-PRF-38535, appendix A).

3.11 Substitution. Substitution data shall be as indicated in appendix B herein.

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TABLE IA. Electrical performance characteristics.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|------------------------------|-----------------|---|----------------------|----------------------------|-----------|-----|------|
| | | | | | Min | Max | |
| High level output voltage | V _{OH} | V _{CC} = 4.5 V, I _{OH} = -4.0 mA V _{IL} = 0.8 V, V _{IH} = 2.2 V | 1,2,3 | 01-39, 46-68, 42,44, | 2.4 | | V |
| | | V _{CC} = 4.5 V and 5.5 V, V _{IL} = 0.9 V and 1.1 V, V _{IH} = 3.6 V and 4.4 V, I _{OH} = -4.0 mA | | | | | |
| | | M,D,P,L,R,F, G,H | 1 <u>2/</u> | <u>3/</u> | <u>4/</u> | V | |
| Low level output voltage | V _{OL} | V _{CC} = 4.5 V, I _{OL} = 8.0 mA V _{IL} = 0.8 V, V _{IH} = 2.2 V | 1,2,3 | 01-39, 46-68, 42,44 | | 0.4 | V |
| | | V _{CC} = 4.5 V and 5.5 V, V _{IL} = 0.9 V and 1.1 V, V _{IH} = 3.6 V and 4.4 V, I _{OL} = 8.0 mA | | | | | |
| | | M,D,P,L,R,F, G,H | 1 <u>2/</u> | <u>3/</u> | <u>4/</u> | V | |
| High level input current | I _{IH} | V _{CC} = 5.5 V, V _{IN} = 5.5 V for pin being tested, all other pins not being tested at 0.0 V. | 1,2,3 | All | | 10 | μA |
| | | M,D,P,L,R,F, G,H | | | | | |
| Low level input current | I _{IL} | V _{CC} = 5.5 V, V _{IN} = 0.0 V for pin being tested, all other pins not being tested at 0.0 V. | 1,2,3 | All | -10 | | μA |
| | | M,D,P,L,R,F, G,H | | | | | |

See footnotes at end of table.

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TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions ^{1/} -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---|------------------|---|----------------------|----------------------------|-----------|-----|------|
| | | | | | Min | Max | |
| High impedance output leakage current | I _{OHZ} | V _{CC} = 5.5 V, V _O = 5.5 V V _{IL} = 0.0 V, V _{IH} = 5.0 V V _{IH} ≤ \overline{OE} ≤ V _{CC} | 1,2,3 | 01-39, 46-68, 42,44, | | 10 | μA |
| | | V _{CC} = 4.5 V and 5.5 V, V _O = 5.5 V, V _{IL} = .5 V, V _{IH} = V _{CC} - .5 V, 3.6 V ≤ \overline{OE} ≤ 4.4 V | | | | | |
| | | M,D,P,L,R,F, G,H | 1 <u>2/</u> | <u>3/</u> | <u>4/</u> | μA | |
| Low impedance output leakage current | I _{OLZ} | V _{CC} = 5.5 V, V _O = 0.0 V V _{IL} = 0.0 V, V _{IH} = 5.0 V V _{IH} ≤ \overline{OE} ≤ V _{CC} | 1,2,3 | 01-39, 46-68, 42,44, | -10 | | μA |
| | | V _{CC} = 4.5 V and 5.5 V, V _O = 0.0 V, V _{IL} = .5 V, V _{IH} = V _{CC} - .5 V, 3.6 V ≤ \overline{OE} ≤ 4.4 V | | | | | |
| | | M,D,P,L,R,F, G,H | 1 <u>2/</u> | <u>3/</u> | <u>4/</u> | μA | |

See footnotes at end of table.

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TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions ^{1/} -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit | |
|-----------------------------|---------------------|---|----------------------|---|--------|------------|------|-----|
| | | | | | Min | Max | | |
| Operating supply current | I _{CC1} | V _{CC} = 5.5 V, I _{OUT} = 0 mA, $\overline{CE}_1 = 0.8$ V dc, f = 1/t _{AVAV} , $\overline{OE} = \overline{WE} = CE_2 = 2.2$ V dc | 1,2,3 | 02,04, 31,38 | | 60 | mA | |
| | | | | 01,03,05 | | 80 | | |
| | | | | 06,20,32 | | 90 | | |
| | | | | 07,08,10, 21,22,24, 33,34 | | 105 | | |
| | | | | 12,14,26, 28,39,42 | | 110 | | |
| | | | | 09,11, 16,23,25 13,27 | | 125 130 | | |
| | | | | 15,17, 29,30 | | 135 | | |
| | | | | 48,49,51, 59,60,62 | | 145 | | |
| | | | | 35,36 | | 150 | | |
| | | | | 53,55,64, 66 | | 155 | | |
| | | | | 50,52,56, 57,58,61, 63,67,68 | | 160 | | |
| | | | | 18,19, 54,65 | | 170 | | |
| | | | | 37,46,47 | | 180 | | |
| | | | | V _{CC} = 5.5 V, I _{OUT} = 0 mA, $\overline{CE}_1 = 1.1$ V dc, f = 1/t _{AVAV} , $\overline{OE} = \overline{WE} = CE_2 = 4.4$ V dc | 40,45 | | | 60 |
| | | | | V _{CC} = 5.5 V, I _{OUT} = 0 mA, $\overline{WE} = V_{CC}$, f = 20 MHz | 41,43 | | | 110 |
| | 44 | | 200 | | | | | |
| | M,D,P,L,R,F, G,H | 1 <u>2/</u> | <u>3/</u> | <u>4/</u> | | mA | | |

See footnotes at end of table.

| | | | |
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TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---|-------------------------------------|--|----------------------|--|--------|-----------|------|
| | | | | | Min | Max | |
| Standby supply current TTL levels | I _{CC2} | V _{CC} = 5.5 V, f = 0, $\overline{CE}_1 = V_{IH}$, CE ₂ = V _{IL} , $\overline{OE} = \overline{WE} = V_{IH}$, all other inputs = V _{IL} or V _{IH} | 1,2,3 | 38-43, 45 | | 500 | μA |
| | | | | 35-37 | | 10 | |
| | | | | 02,04,06, 20,31,32 | | 15 | |
| | | | | 01,03,05, 07,21,48, 59 | | 20 | mA |
| | | | | 08,10,12, 14,16,18, 22,24,26, 28,33,34, 46,47,49, 51,53,55, 57,60,62, 64,66 | | 30 | |
| | | | | 09,11,13, 15,17,19, 23,25,27, 29,30,50, 52,54,56, 58,61,63, 65,67,68 | | 40 | |
| | V _{CC} = 5.5 V, f = 0 | $\overline{AS} = \text{GND}$, all other inputs = 2.0 V | | | | 37.5 | |
| | | $\overline{CE}_1 = \overline{CE}_2 = V_{CC}$, all other inputs = 0.8 V | | 44 | | 12 | |
| | | M,D,P,L,R,F,G,H | 1 <u>2/</u> | <u>3/</u> | | <u>4/</u> | mA |
| | | | | 35-37 | | 15 | |

See footnotes at end of table.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 10 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit | |
|--|------------------|---|----------------------|--|-----------|-----------|------|----|
| | | | | | Min | Max | | |
| Standby supply current CMOS levels | I _{CC3} | V _{CC} = 5.5 V, f = 0 $\overline{CE}_1 \geq V_{CC} - 0.5 \text{ V}$, all other inputs = 0.5 V or V _{CC} - 0.5 V | 1,2,3 | 35-37 | | 200 | μA | |
| | | | | 38-43, 45 | | 500 | | |
| | | | | 01,02, 04,06, 20,31, 32,46, 47 | | 5 | | |
| | | | | 08,10,12, 14,16,18, 22,24,26, 28,33,34, 49,51,53, 55,57,60, 62,64,66 | | 10 | | |
| | | | | 03,05,07, 21,48,59 | | 15 | | |
| | | | | 09,11,13, 15,17,19, 23,25,27, 29,30,50, 52,54,56, 58,61,63, 65,67,68 | | 20 | | |
| | | V _{CC} = 5.5 V, f = 0 CE ₂ = \overline{AS} = GND all other inputs = V _{CC} | | 44 | | 2 | | |
| | | | M,D,P,L,R,F,G,H | 1 <u>2/</u> | <u>3/</u> | <u>4/</u> | mA | |
| Data retention current | I _{CC4} | V _{CC} = 2.0 V, f = 0 $\overline{CE}_1 \geq V_{CC} - 0.2 \text{ V}$, all other inputs = 0.2 V or V _{CC} - 0.2 V | 1,2,3 | 35-37 | | 3 | μA | |
| | | | | 31-37 | | 75 | | |
| | | | | 02,04 | | 200 | | |
| | | | | 06,08,10, 12,14,16, 18,20,22, 24,26,28, 38-43, 45,46,49, 51,53,55, 57,60,62, 64,66 | | 300 | | |
| | | | | | | | | |
| | | | M,D,P,L,R,F,G,H | 1 <u>2/</u> | <u>3/</u> | <u>4/</u> | μA | |
| | | | | | 35-37 | | 3 | mA |

See footnotes at end of table.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 11 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions ^{1/} -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|-------------------------------------|------------------|---|----------------------|-------------------------------|---------------|---------------|------|
| | | | | | Min | Max | |
| Input capacitance ^{5/} | C _{IN} | V _I = 0.0 V, T _A = +25°C, f = 1 MHz (see 4.4.1e) | 4 | All | | 15 | pF |
| Output capacitance ^{5/} | C _{OUT} | V _O = 0.0 V, T _A = +25°C, f = 1 MHz (see 4.4.1e) | 4 | All | | 20 | pF |
| Functional tests ^{6/} | | V _{CC} = 4.5 V verify output V _O (see 4.4.1c) | 7,8A,8B | All | L | H | V |
| | | | M,D,P,L,R,F, G,H | ⁷ ^{2/} | ^{3/} | ^{4/} | V |

Read cycle

| | | | | | | | |
|--------------------------|---------------------|-------------------------------|---------------|--|----------------|----|----|
| Read/Write cycle time | t _{AVAV} | See figures 4 and 5 | 9,10,11 | 01 | 150 | | |
| | | | | 02,03, 38,40, 45 | 120 | | |
| | | | | 04,05, 31 | 100 | | |
| | | | | 35 | 85 | | |
| | | | | 06,07,20, 21,32,36, 39,41,48, 59 | 70 | | ns |
| | | | | 08,09,22, 23,33,37, 42-44,49 50,60,61 | 55 | | |
| | | | | 10,11,24, 25,34,51, 52,62,63 | 45 | | |
| | | | | 12,13,26, 27,53,54, 64,65 | 35 | | |
| | | | | 14,15,28, 29,55,56, 66,67 | 25 | | |
| | | | | 16,17,30, 57,58,68 18,19, 46,47 | 20 15 12 | | |
| | M,D,P,L,R,F, G,H | ⁹ ^{2/} | ^{3/} | ^{4/} | | ns | |
| Output hold time | t _{AVQX} | | 9,10,11 | 35-44, 45 | 5 | | |
| | | | | 01-13, 20-27, 31-34, 48-54, 59-65 | 3 | | ns |
| | | | | 46,47 | 2 | | |
| | | | | 14-19, 28-30, 55-58, 66-68 | 0 | | |
| | M,D,P,L,R,F, G,H | ⁹ ^{2/} | ^{3/} | ^{4/} | | ns | |

See footnotes at end of table.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 12 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|--|-------------------|---|----------------------|--|-----------|---------------------|------|
| | | | | | Min | Max | |
| Read access time | t _{AVQV} | See figures 4 and 5 | 9,10,11 | 01 | | 150 | ns |
| | | | | 02,03 | | 120 | |
| | | | | 04,05,31 | | 100 | |
| | | | | 35 | | 85 | |
| | | | | 06,07,20, 21,32,36, 39,41,48, 59 | | 70 | |
| | | | | 08,09,22, 23,33,37, 38,40, 42-45,49 50,60,61 | | 55 | |
| | | | | 10,11,24, 25,34,51, 52,62,63 | | 45 | |
| | | | | 12,13,26, 27,53,54, 64,65 | | 35 | |
| | | | | 14,15,28, 29,55,56, 66,67 | | 25 | |
| | | | | 16,17,30, 57,58,68 | | 20 | |
| 18,19 | | 15 | | | | | |
| 46,47 | | 12 | | | | | |
| | | M,D,P,L,R,F, G,H | 9 <u>2/</u> | <u>3/</u> | | <u>4/</u> | ns |
| $\overline{\text{OE}}$ controlled output enabled time <u>5/ 7/</u> | t _{OLQX} | | 9,10,11 | 01-05, 31,44 | 5 | | ns |
| | | | | 06-30, 32-43, 45,46,47, 48-68 | 0 | | |
| | | M,D,P,L,R,F, G,H | 9 <u>2/</u> | <u>3/</u> | <u>4/</u> | | ns |
| $\overline{\text{OE}}$ controlled output three-state time <u>5/ 7/</u> | t _{OHQZ} | | 9,10,11 | 01 | | 50 | ns |
| | | | | 02-11, 20-25, 31-34, 48-52, 59-63 | | 40 | |
| | | | | 12,13,26, 27,53,54, 64,65 | | 30 | |
| | | | | 44 | | 20 | |
| | | | | 14-17, 28-30, 35-43,45 55-58, 66-68 | | 15 | |
| | | | | 18,19 | | 10 | |
| | | | | 46,47 | | 7 | |
| | | | | | | M,D,P,L,R,F, G,H | |

See footnotes at end of table.

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|---|------------------|----------------------------|--------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 13 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions ^{1/} -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|--|-------------------|---|----------------------|---|---------------------|----------------|------|
| | | | | | Min | Max | |
| OE controlled output enabled time (read cycle 3) | t _{OLQV} | See figures 4 and 5 | 9,10,11 | 01 | | 70 | ns |
| | | | | 02,03 | | 55 | |
| | | | | 04,05, 31 | | 45 | |
| | | | | 06,07,20, 21,32,35, 48,59 | | 30 | |
| | | | | 08,09,22, 23,33,49, 50,60,61 | | 25 | |
| | | | | 10,11,24, 25,34,44, 51,52,62, 62,63, | | 20 | |
| | | | | 12-17, 26-30, 36-43,45 53-58, 64-68 | | 15 | |
| | | | | 18,19 | | 12 | |
| | | | | 46,47 | | 8 | |
| | | | | | M,D,P,L,R,F, G,H | 9 <u>2/</u> | |
| CE controlled output enable time | t _{ELQX} | | 9,10,11 | 01-43,45 | 0 | | ns |
| | | | | 48-68 | | | |
| | | | | 44 | 5 | | |
| | | M,D,P,L,R,F, G,H | 9 <u>2/</u> | <u>3/</u> | <u>4/</u> | ns | |

See footnotes at end of table.

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|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 14 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit | | | |
|---|-------------------|---|----------------------|---|----------------|-----------|------|--|-----------|----|
| | | | | | Min | Max | | | | |
| $\overline{\text{CE}}$ controlled output access time | t _{ELQV} | See figures 4 and 5 | 9,10,11 | 01 | | 150 | ns | | | |
| | | | | 02,03 | | 120 | | | | |
| | | | | 04,05 | | 100 | | | | |
| | | | | 31 | | | | | | |
| | | | | 35 | | 85 | | | | |
| | | | | 06,07,20, 21,32,36, 39,41,48, 59 | | 70 | | | | |
| | | | | 08,09,22, 23,33,37, 38,40, 42-45, 49,50,60, 61 | | 55 | | | | |
| | | | | 10,11,24, 25,34,51, 52,62,63 | | 45 | | | | |
| | | | | 12,13,26, 27,53,54, 64,65 | | 35 | | | | |
| | | | | 14,15,28, 29,55,56, 66,67 | | 25 | | | | |
| | | | | 16,17,30 57,58,68 | | 20 | | | | |
| | | | | 18,19 | | 15 | | | | |
| | | | | 46,47 | | 12 | | | | |
| | | | | M,D,P,L,R,F, G,H | 9 <u>2/</u> | <u>3/</u> | | | <u>4/</u> | ns |
| $\overline{\text{CE}}$ high to high Z <u>5/ 7/</u> | t _{EHQZ} | | 9,10,11 | 01 | | 50 | ns | | | |
| | | | | 02,03 | | 40 | | | | |
| | | | | 04-07,20 21,31,32 48,59 | | 35 | | | | |
| | | | | 08-11, 22-25, 33-35,44 49-52, 60-63 | | 25 | | | | |
| | | | | 36-43, 45 | | 20 | | | | |
| | | | | 12-17, 26-30, 53-58, 64-68 | | 15 | | | | |
| | | | | 18,19 | | 10 | | | | |
| | | | | 46,47 | | 7 | | | | |
| | | | | M,D,P,L,R,F, G,H | 9 <u>2/</u> | <u>3/</u> | | | <u>4/</u> | ns |

See footnotes at end of table.

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| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 15 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions ^{1/} -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---|--|---|----------------------|---|----------|-----|------|
| | | | | | Min | Max | |
| Address setup time for write control | t _{AVWL} t _{AVEL} | See figures 4 and 5 | 9,10,11 | 01-43, 48-68, 45,46,47 | 0 | | ns |
| | | | | 44 | 10 | | |
| | | | M,D,P,L,R,F, G,H | 9 2/ | 3/ 4/ | | ns |
| CE low to write end | t _{ELWH} | | 9,10,11 | 38,40, 45 | 105 | | ns |
| | | | | 01 | 100 | | |
| | | | | 02,03 | 85 | | |
| | | | | 04,05, 31 | 80 | | |
| | | | | 35 | 65 | | |
| | | | | 06,07,20, 21,32,36, 39,41,48, 59 | 60 | | |
| | | | | 08,09,22, 23,33,37, 49,50,60, 61 | 50 | | |
| | | | | 42-44 | 45 | | |
| | | | | 10,11,24, 25,34,51, 52,62,63 | 40 | | |
| | | | | 12,13,26, 27,53,54, 64,65 | 30 | | |
| | | | | 14,15,28, 29,55,56, 66,67 | 20 | | |
| | | | | 16,17,30, 57,58,68 | 15 | | |
| | | | | 18,19 46,47 | 13 10 | | |
| | | | | | | | |

See footnotes at end of table.

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| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 16 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|----------------------------------|-------------------|---|----------------------|---|--------|---------------------|------|
| | | | | | Min | Max | |
| Address valid to end of write | t _{AVWH} | See figures 4 and 5 | 9,10,11 | 38,40, 45 | 105 | | ns |
| | | | | 01 | 100 | | |
| | | | | 02,03 | 85 | | |
| | | | | 04,05, 31 | 80 | | |
| | | | | 35 | 65 | | |
| | | | | 06,07,20, 21,32,36, 39,41,48, 59 | 60 | | |
| | | | | 08,09,22, 23,33,37, 49,50,60, 61 | 50 | | |
| | | | | 42-44 | 45 | | |
| | | | | 10,11,24, 25,34,51, 52,62,63 | 40 | | |
| | | | | 12,13,26, 27,53,54, 64,65 | 30 | | |
| | | | | 14,15,28, 29,55,56, 66,67 | 20 | | |
| | | | | 16,17,30, 57,58,68 | 15 | | |
| | | | | 18,19 | 13 | | |
| | | | | 46,47 | 10 | | |
| | | | | | | M,D,P,L,R,F, G,H | |

See footnotes at end of table.

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| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 17 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|-----------------------------------|--------------------|---|-----------------------|--|-----------|-----|------|
| | | | | | Min | Max | |
| Write pulse width | t _{WLWH} | See figures 4 and 5 | 9,10,11 | 38,40, 45 | 105 | | ns |
| | | | | 01 | 90 | | |
| | | | | 02,03 | 70 | | |
| | | | | 04-07,20 21,31,32, 39,41,48, 59 | 60 | | |
| | | | | 08,09,22, 23,33,35, 49,50,60, 61 | 50 | | |
| | | | | 42,43 | 45 | | |
| | | | | 10,11,24, 25,34,36, 37,51,52, 62,63 | 40 | | |
| | | | | 44 | 35 | | |
| | | | | 12,13,26, 27,53,54, 64,65 | 30 | | |
| | | | | 14,15,28, 29,55,56, 66,67 | 20 | | |
| | | | | 16,17,30, 57,58,68 | 15 | | |
| 18,19 | 13 | | | | | | |
| 46,47 | 10 | | | | | | |
| | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | | ns |
| Write recovery time | t _{WHA V} | | 9,10,11 | 01-43, 45,46,47, 48-68 | 0 | | ns |
| | | | | 44 | 10 | | |
| | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | | ns |
| Chip disable to address change | t _{EHAX} | | 9,10,11 | 01-43, 45,46,47, 48-68 | 0 | | ns |
| | | | | 44 | 5 | | |
| | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | | ns |

See footnotes at end of table.

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|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 18 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|--|--------|---|----------------------|--|-----------|-----------|------|
| | | | | | Min | Max | |
| $\overline{\text{WE}}$ high to low Z <u>5/ 7/</u> | tWHQX | See figures 4 and 5 | 9,10,11 | 01-45, 48-68 | 0 | | ns |
| | | | | 46,47 | 2 | | |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| $\overline{\text{WE}}$ low to high Z | tWLQZ | | 9,10,11 | 01 | | 50 | ns |
| | | | | 02,03 | | 40 | |
| | | | | 04-07,20 | | 35 | |
| | | | | 21,31,32, 48,59 | | | |
| | | | | 08,09,22, 23,33,49, 50,60,61 | | 30 | |
| | | | | 10,11,24, 25,34,51, 52,62,63 | | 25 | |
| | | | | 44 | | 20 | |
| | | | | 12-15, 26-29, 35-43,45 53-56, 64,67, | | 15 | |
| | | | | 16-19, 30,57,58, 68 | | 10 | |
| | | | | 46,47 | | 7 | |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |

See footnotes at end of table.

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| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 19 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---|-------------------|---|----------------------|--|-----------|-----------|------|
| | | | | | Min | Max | |
| Data setup time | t _{DVWH} | See figures 4 and 5 | 9,10,11 | 38,40, 45 | 105 | | ns |
| | | | | 01,39, 41 | 60 | | |
| | | | | 02-05, 31,35 | 50 | | |
| | | | | 42,43 | 45 | | |
| | | | | 36,37 | 40 | | |
| | | | | 06,07,20, 21,32,48, 59 | 35 | | |
| | | | | 08,09,22, 23,33,44, 49,50,60, 61 | 25 | | |
| | | | | 10,11,24, 25,34,51, 52,62,63 | 20 | | |
| | | | | 12-15, 26-29, 53-56, 64-67 | 15 | | |
| | | | | 16,17,30, 57,58,68 | 12 | | |
| | | | 18,19 | 10 | | | |
| | | | 46,47 | 7 | | | |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| Data hold time | t _{WHDX} | | 9,10,11 | 01-13, 20-27, 31-34, 44, 48-54, 59-65, | 5 | | ns |
| | | | | 14-19, 28-30, 35-43, 45,46,47 55-58, 66-68 | 0 | | |
| | | | | | | | |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| Chip deselect to data retention time <u>5/</u> | t _{CDR} | | 7,8A,8B | 02,04,06, 08,10,12, 14,16,18, 20,22,24, 26,28, 31-43, 45,46,49, 51,53,55, 57,60,62, 64,66 | 0 | | ns |
| | | | | | | | |
| | | | M,D,P,L,R,F, G,H | <u>7</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |

See footnotes at end of table.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 20 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions ^{1/} -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---|----------------|---|----------------------|--|-------------------|-----------|------|
| | | | | | Min | Max | |
| Operation recovery time <u>5/</u> | t _R | See figures 4 and 5 | 7,8A,8B | 02,04,06, 08,10,12, 14,16,18, 20,22,24, 26,28, 31-43, 45,46,49, 51,53,55, 57,60,62, 64,66 | t _{AVAV} | | ns |
| | | | M,D,P,L,R,F, G,H | <u>7</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | |

AC parameters only for device type 44 and 45 only

| | | | | | | | |
|--|-------------------|---------------------|---------------------|-----------------------|-----------|-----------|----|
| $\overline{\text{AS}}$ address latch control access time | t _{LLQV} | See figures 4 and 5 | 9,10,11 | 44,45 | | 65 | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| Address valid to end of write | t _{LLWH} | | 9,10,11 | 44 | | 45 | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| $\overline{\text{AS}}$ address latch control setup to start of write | t _{LLWL} | | 9,10,11 | 44,45 | 10 | | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| $\overline{\text{AS}}$ address latch control hold after end of write | t _{WHLL} | | 9,10,11 | 44,45 | | 0 | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| $\overline{\text{AS}}$ address latch control setup to end of write | t _{LLEH} | | 9,10,11 | 44 | | 45 | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |

See footnotes at end of table.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 21 |

TABLE IA. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions ^{1/} -55°C ≤ T _C ≤ +125°C GND = 0 V 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---|-------------------|---|----------------------|-----------------------|-----------|-----------|------|
| | | | | | Min | Max | |
| \overline{AS} address latch control setup to start of write | t _{LLEL} | See figures 4 and 5 | 9,10,11 | 44 | | 5 | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| \overline{AS} address latch control hold after end of write | t _{EHLL} | | 9,10,11 | 44 | 5 | | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| Address setup to address latch | t _{AVLH} | | 9,10,11 | 44,45 | 15 | | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| Address hold after address latch | t _{LHAX} | | 9,10,11 | 44,45 | 10 | | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| Address latch width | t _{LLLH} | | 9,10,11 | 44,45 | 20 | | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |
| Chip enable hold after address latch | t _{LHEL} | | 9,10,11 | 44 | 0 | | ns |
| | | | M,D,P,L,R,F, G,H | <u>9</u> <u>2/</u> | <u>3/</u> | <u>4/</u> | ns |

- ^{1/} AC measurements assume transition time ≤ 5 ns, input levels are from ground to 3.0 V, and output load C_L ≥ 30 pF except as noted on figure 5. Timing reference levels are 1.5 V. For devices 40, 41, and 43, input levels are V_{IL} = 0.5 V, V_{IH} = V_{CC} - 0.5 V.
- ^{2/} When performing postirradiation electrical measurements for any RHA level T_A = +25°C. Limits shown are guaranteed at T_A = +25°C ±5°C. The M, D, P, L, R, F, G, and H in the test condition column are the postirradiation limits for the device types specified in the device types column.
- ^{3/} Devices listed in 1.2.2 herein, that are to be marked with an RHA marking shall apply to all RHA levels unless otherwise specified.
- ^{4/} Preirradiation values for RHA marked devices shall also be the postirradiation values unless otherwise specified.
- ^{5/} Tested initially and after any design or process changes which may affect that parameter, and therefore shall be guaranteed to the limits specified in table IA.
- ^{6/} Functional tests shall include the test table and other test patterns used for fault detection as approved by the qualifying activity. Outputs are measured at V_{OL} < 1.5 V, V_{OH} > 1.5 V. For devices 40, 41, and 43, outputs are measured at V_{OL} < V_{CC} / 2, V_{OH} > V_{CC} / 2.
- ^{7/} This parameter measured ±500 mV from steady-state V_{OL} or V_{OH}.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 22 |

TABLE IB. Single event phenomena (SEP) test limits. 1/ 2/

| Device type | T _A =temperature (± 10°C) 3/ | Memory pattern | V _{CC} = 4.5 V | | Bias voltage for latch-up test V _{CC} = 5.5 V (minimum); no latch-up; LET = 100 3/ (minimum) |
|-------------|---|----------------|---|---|---|
| | | | Effective threshold LET no upsets (Mev/(mg/cm ²)) | Maximum device cross section (μm ²) | |
| 35 | +125°C | All 1s | ≥ 46 | 11.5 | 119 |
| 36 | +125°C | All 1s | ≥ 46 | 11.5 | 119 |
| 37 | +125°C | All 1s | ≥ 46 | 11.5 | 119 |
| 38 | +125°C | Parity | ≥ 35 | 48 | 119 |
| 39 | +125°C | Parity | ≥ 22 | 48 | 119 |
| 40 | +125°C | Parity | ≥ 35 | 48 | 119 |
| 41 | +125°C | Parity | ≥ 22 | 48 | 119 |
| 42 | +125°C | Parity | ≥ 22 | 48 | 119 |
| 43 | +125°C | Parity | ≥ 22 | 48 | 119 |
| 44 | +125°C | 4/ | ≥ 50 | ≤ 50 | 120 |
| 45 | +125°C | Parity | ≥ 35 | 45 | 119 |

1/ For SEP test conditions, see 4.4.4.2 herein.

2/ For QML product, technology characterization and model verification supplemented by in-line data may be used in lieu of end-of-line testing. Test plan must be approved by TRB and qualifying activity.

3/ Worst case temperature T_A = +125°C

4/ Testing shall be performed using checkerboard and checkerboard bar test patterns.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 23 |

Case N

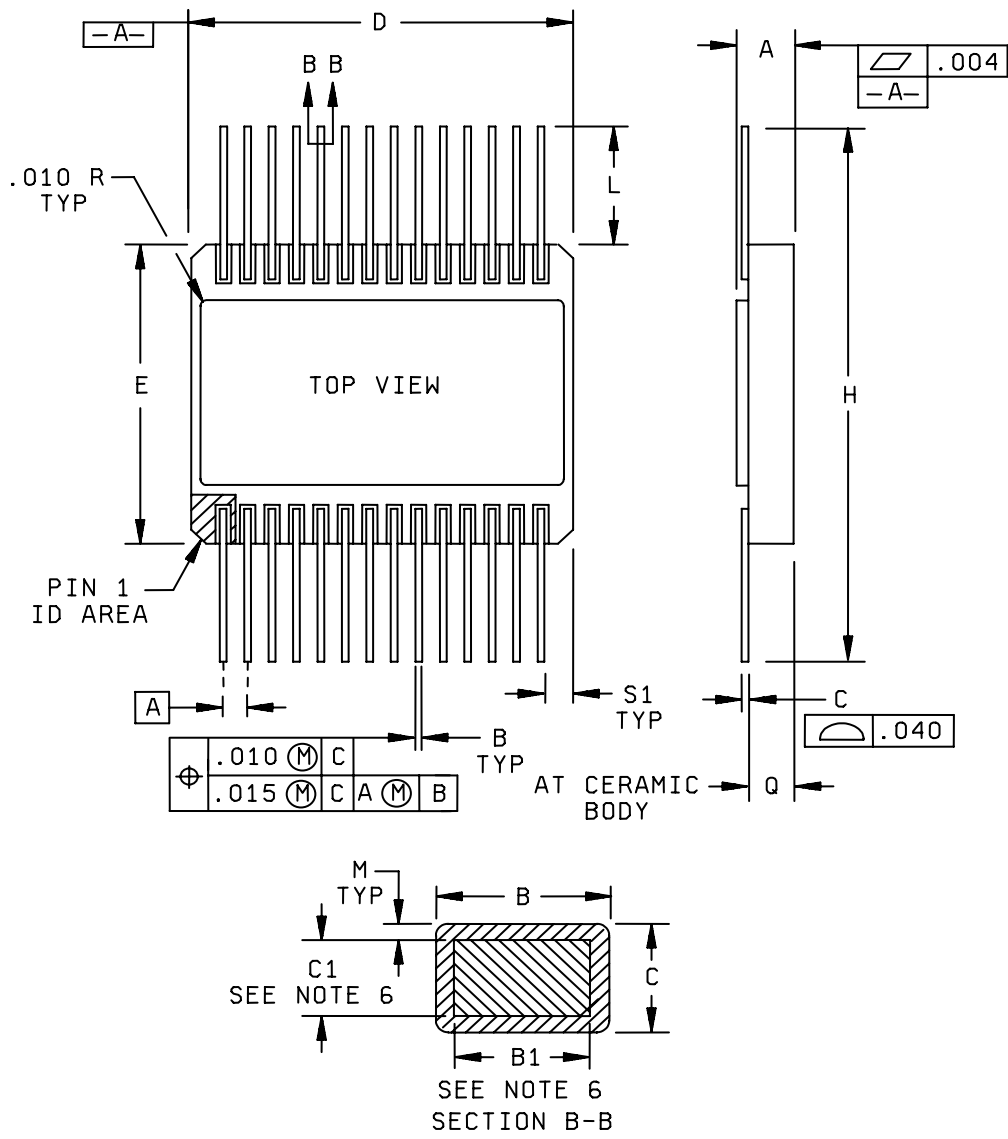


FIGURE 1. Case outlines.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 24 |

Case N – Continued.

| Symbol | Inches | | Millimeters | |
|--------|----------|-------|-------------|-------|
| | Min | Max | Min | Max |
| A | --- | .110 | --- | 2.79 |
| B | .014 | .021 | 0.36 | 0.53 |
| B1 | .014 | .018 | 0.36 | 0.46 |
| C | .006 | .012 | 0.15 | 0.30 |
| C1 | .006 | .009 | 0.15 | 0.23 |
| D | .735 | .765 | 18.67 | 19.43 |
| E | .685 | .715 | 17.40 | 18.16 |
| e | .050 BSC | | 1.27 BSC | |
| H | --- | 1.480 | --- | 37.59 |
| L | .330 | .400 | 8.38 | --- |
| M | --- | .0015 | --- | 0.038 |
| Q | .070 | .090 | 1.78 | 2.29 |
| S1 | .005 | --- | 0.13 | --- |

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Vendor option for pin one identifier. No alpha or numeric symbols allowed.
4. Dimension letters refer to MIL-STD-1835.
5. Leads must not overhang braze pads.
6. Dimensions B1 and C1 apply to base metal only. Dimension M applies to plating thickness.

FIGURE 1. Case outlines - Continued.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 25 |

Case 9

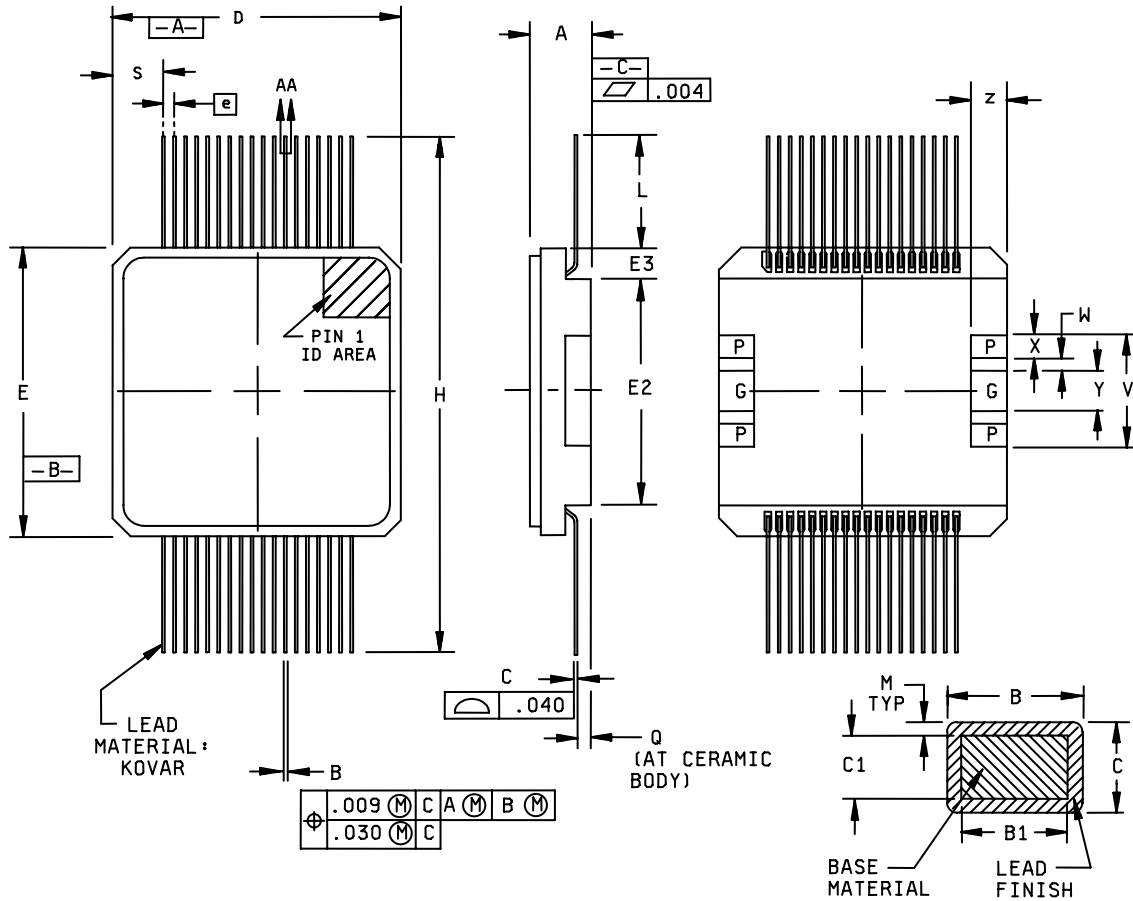


FIGURE 1. Case outlines - Continued.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 26 |

Case 9 – Continued.

| Symbol | Inches | | Millimeters | |
|--------|-----------|-------|-------------|--------|
| | Min | Max | Min | Max |
| A | --- | .150 | --- | 3.810 |
| B | .006 | .013 | 1.52 | .330 |
| B1 | .006 | .010 | 1.52 | .254 |
| C | .0045 | .0105 | .114 | .266 |
| C1 | .0045 | .0075 | .114 | .190 |
| D | .620 | .640 | 15.75 | 16.26 |
| e | .025 BSC | | .635 BSC | |
| E | .620 | .640 | 15.750 | 16.26 |
| E2 | .470 | .490 | 11.940 | 12.450 |
| E3 | .075 REF | | 1.910 REF | |
| H | --- | 1.20 | --- | 30.48 |
| L | .270 | --- | 6.858 | --- |
| M | .0015 TYP | | .038 TYP | |
| Q | .026 | --- | .660 | --- |
| S | .1025 REF | | 2.604 | |
| V | .260 REF | | 6.600 | |
| W | .030 REF | | .762 | |
| X | .050 REF | | 1.270 | |
| Y | .100 REF | | 2.540 | |
| Z | .080 REF | | 2.030 | |

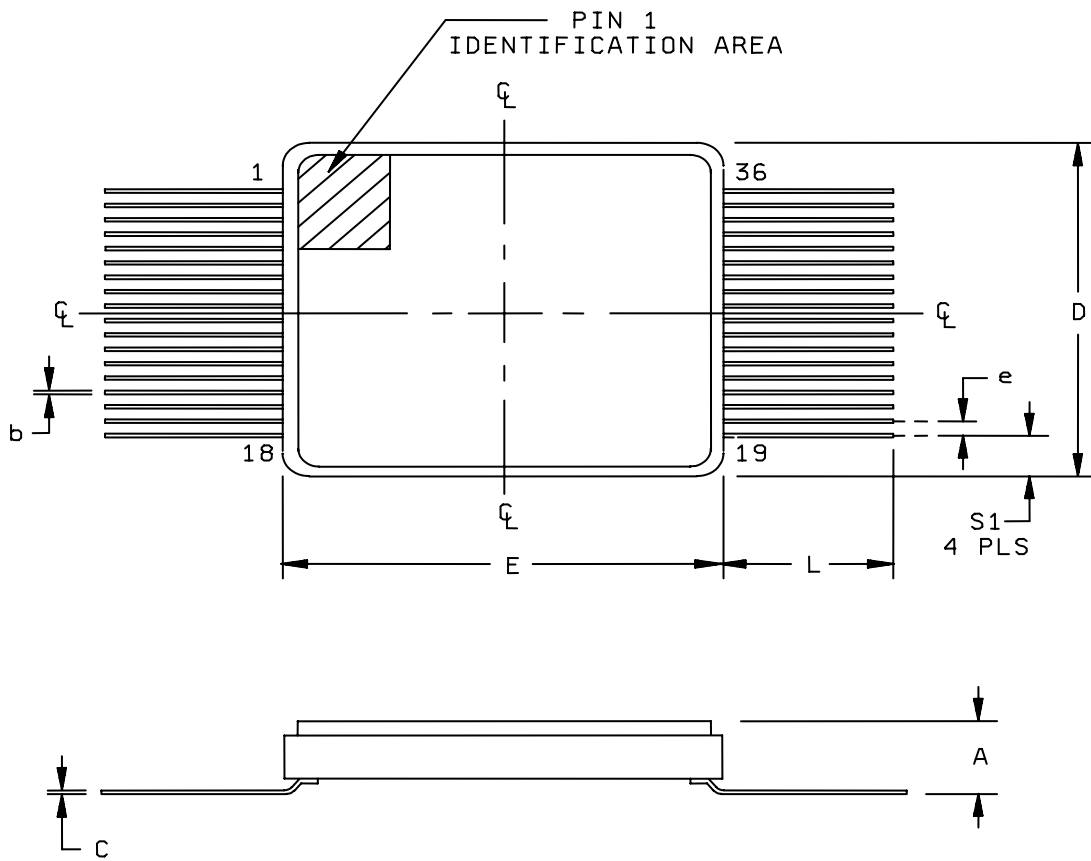
NOTES:

1. Package material: Opaque ceramic.
2. All exposed metallized areas pre gold plated over nickel plating in accordance with MIL-STD-1835.
3. Lead finish is in accordance with MIL-PRF-38535.
4. Capacitor pads P are electrically connected to V_{DD} . Capacitor pads G are electrically connected to V_{SS} .
5. Leads must not overhang braze pads.
6. Capacitors are optional at user level only. This document does not cover devices with capacitors installed.

FIGURE 1. Case outlines - Continued.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 27 |

Case 8



| Symbol | Inches | | Millimeters | |
|--------|----------|------|-------------|-------|
| | Min | Max | Min | Max |
| A | .075 | .095 | 1.91 | 2.41 |
| b | .007 | .010 | .18 | .25 |
| S1 | .103 | .123 | 2.62 | 3.12 |
| c | .004 | .006 | .11 | .15 |
| D | .640 | .660 | 16.26 | 16.76 |
| E | .623 | .637 | 15.82 | 16.18 |
| e | .025 BSC | | .635 BSC | |
| L | .235 | .285 | 5.96 | 7.24 |

FIGURE 1. Case outlines - Continued.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 28 |

| Device types | 01-19, 31-38, 40, 42, 43, 46, 47, 48-58 | 20 - 30, 59 - 68 | 01 - 19, 31 - 37, 48 - 58 | 35 - 43 | 44 | 45 |
|-----------------|---|---------------------|---------------------------------|-------------------|-------------------|-------------------|
| Case outlines | X, Z, U, T, M, and N | U | Y | 9 | 8, 9 | 9 |
| Terminal number | Terminal symbol | | | | | |
| 1 | NC | A ₄ | NC | V _{SS} | GND | V _{SS} |
| 2 | A ₁₂ | A ₅ | NC | V _{CC} | V _{CC} | V _{CC} |
| 3 | A ₇ | A ₆ | A ₁₂ | NC | NC | NC |
| 4 | A ₆ | NC | A ₇ | A ₁₂ | A ₁₂ | A ₁₂ |
| 5 | A ₅ | A ₇ | A ₆ | A ₇ | A ₇ | A ₇ |
| 6 | A ₄ | A ₈ | A ₅ | A ₆ | A ₆ | A ₆ |
| 7 | A ₃ | A ₉ | A ₄ | A ₅ | A ₅ | A ₅ |
| 8 | A ₂ | A ₁₀ | A ₃ | A ₄ | A ₄ | A ₄ |
| 9 | A ₁ | A ₁₁ | A ₂ | A ₃ | A ₃ | A ₃ |
| 10 | A ₀ | A ₁₂ | A ₁ | A ₂ | A ₂ | A ₂ |
| 11 | I/O | I/O | A ₀ | A ₁ | A ₁ | A ₁ |
| 12 | I/O | I/O | NC | A ₀ | A ₀ | A ₀ |
| 13 | I/O | I/O | I/O | I/O | I/O | I/O |
| 14 | V _{SS} | V _{SS} | I/O | I/O | I/O | I/O |
| 15 | I/O | I/O | I/O | I/O | I/O | I/O |
| 16 | I/O | I/O | V _{SS} | NC | NC | NC |
| 17 | I/O | I/O | NC | V _{CC} | V _{CC} | V _{CC} |
| 18 | I/O | I/O | I/O | V _{SS} | GND | V _{SS} |
| 19 | I/O | I/O | I/O | V _{SS} | GND | V _{SS} |
| 20 | \overline{CE}_1 | \overline{CE}_1 | I/O | V _{CC} | V _{CC} | V _{CC} |
| 21 | A ₁₀ | A ₀ | I/O | I/O | I/O | I/O |
| 22 | \overline{OE} | \overline{OE} | I/O | I/O | I/O | I/O |
| 23 | A ₁₁ | A ₁ | \overline{CE}_1 | I/O | I/O | I/O |
| 24 | A ₉ | A ₂ | A ₁₀ | I/O | I/O | I/O |
| 25 | A ₈ | A ₃ | \overline{OE} | I/O | I/O | I/O |
| 26 | CE ₂ | CE ₂ | NC | \overline{CE}_1 | \overline{CE}_1 | \overline{CE}_1 |
| 27 | \overline{WE} | \overline{WE} | A ₁₁ | A ₁₀ | A ₁₀ | A ₁₀ |
| 28 | V _{CC} | V _{CC} | A ₉ | \overline{OE} | \overline{OE} | \overline{OE} |
| 29 | --- | --- | A ₈ | A ₁₁ | A ₁₁ | A ₁₁ |
| 30 | --- | --- | CE ₂ | A ₉ | A ₉ | A ₉ |
| 31 | --- | --- | \overline{WE} | A ₈ | A ₈ | A ₈ |
| 32 | --- | --- | V _{CC} | CE ₂ | \overline{AS} | CE ₂ |
| 33 | --- | --- | --- | \overline{WE} | CE ₂ | \overline{WE} |
| 34 | --- | --- | --- | NC | \overline{WE} | \overline{AS} |
| 35 | --- | --- | --- | V _{CC} | V _{CC} | V _{CC} |
| 36 | --- | --- | --- | V _{SS} | GND | V _{SS} |

FIGURE 2. Terminal connections.

| | | | |
|---|------------------|----------------------------|--------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 29 |

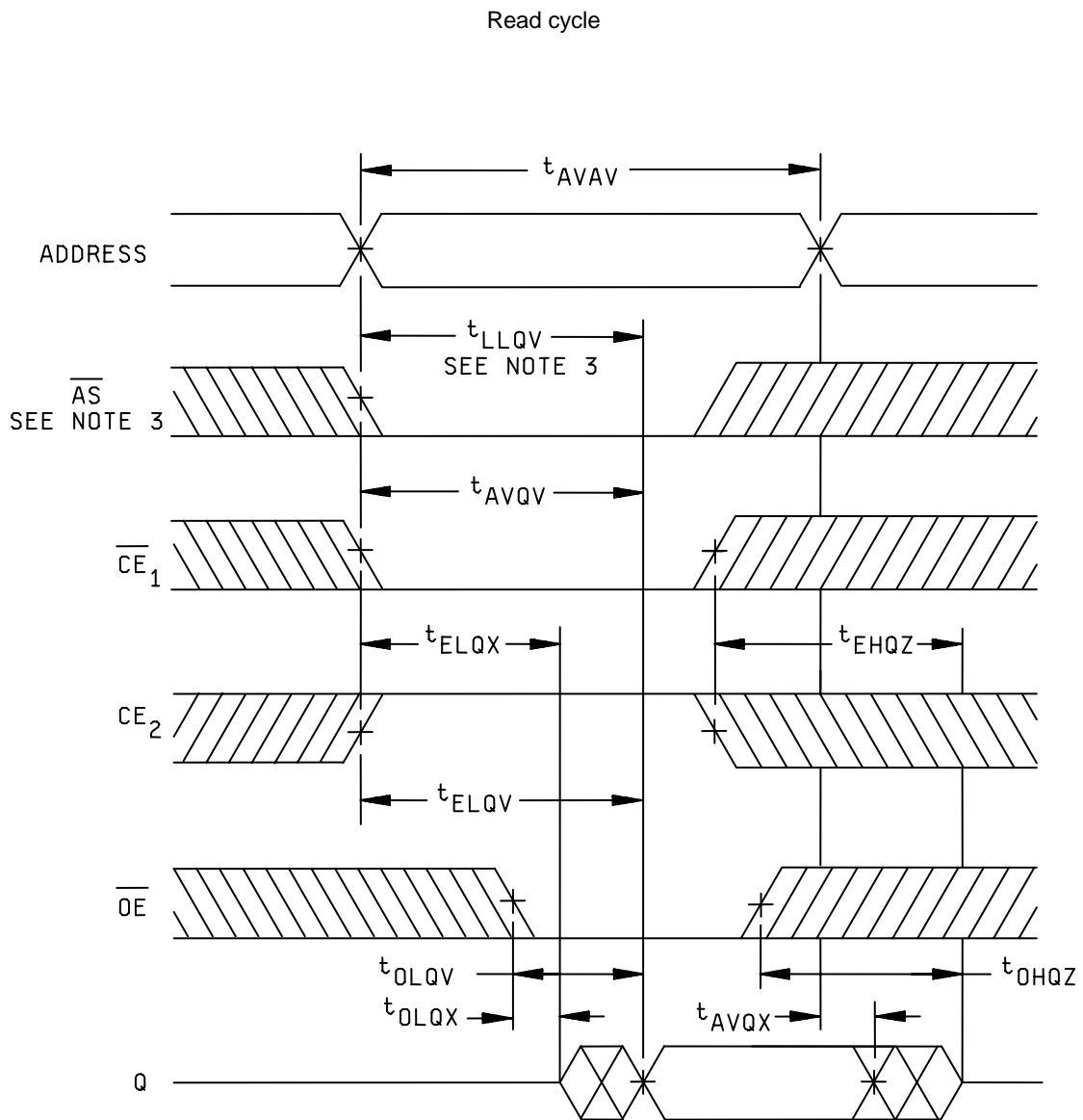
| Device types 01-43, 46-68 | | | | | |
|---------------------------|-------------------|-----------------|-----------------|-----------------|------------------|
| Mode | \overline{CE}_1 | CE ₂ | \overline{WE} | \overline{OE} | I/O |
| Standby | H | X | X | X | High Z |
| Standby | X | L | X | X | High Z |
| Read | L | H | H | L | D _{OUT} |
| Write | L | H | L | X | D _{IN} |
| Read | L | H | H | H | High Z |

| Device type 44,45 | | | | | | | |
|-----------------------------|-----------------|-------------------|-----------------|-----------------|-----------------|------------------|------------|
| Mode | CE ₂ | \overline{CE}_1 | \overline{WE} | \overline{OE} | \overline{AS} | I/O | Power |
| Write | H | L | L | X | X | D _{IN} | Active |
| Read | H | L | H | L | X | D _{OUT} | Active |
| Deselected | H | H | X | X | H | High Z | Deselected |
| Deselected, address load | H | H | X | X | L | High Z | Deselected |
| Standby | L | X | X | X | X | High Z | Standby |

NOTE: H = logic "1" state, L = logic "0" state. X = logic "don't care state, and Z = high impedance state.

FIGURE 3. Truth table.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 30 |



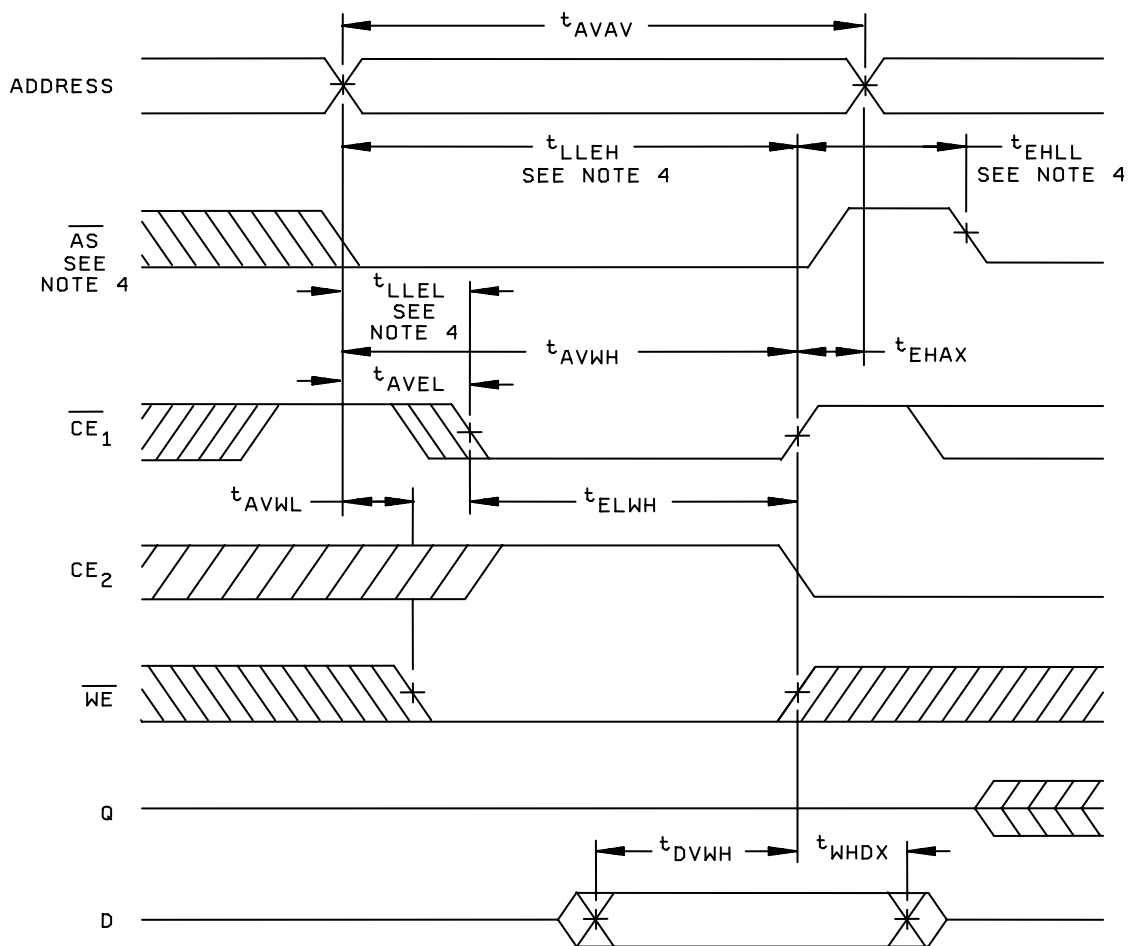
NOTES:

1. \overline{WE} is held high during the read cycle.
2. Timing measurement reference level is 1.5 V.
3. Device type 44 and 45 only.

FIGURE 4. Timing waveforms.

| | | | |
|---|------------------|----------------------------|--------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 31 |

Write cycle 1
(CE₁ or CE₂ controlled)



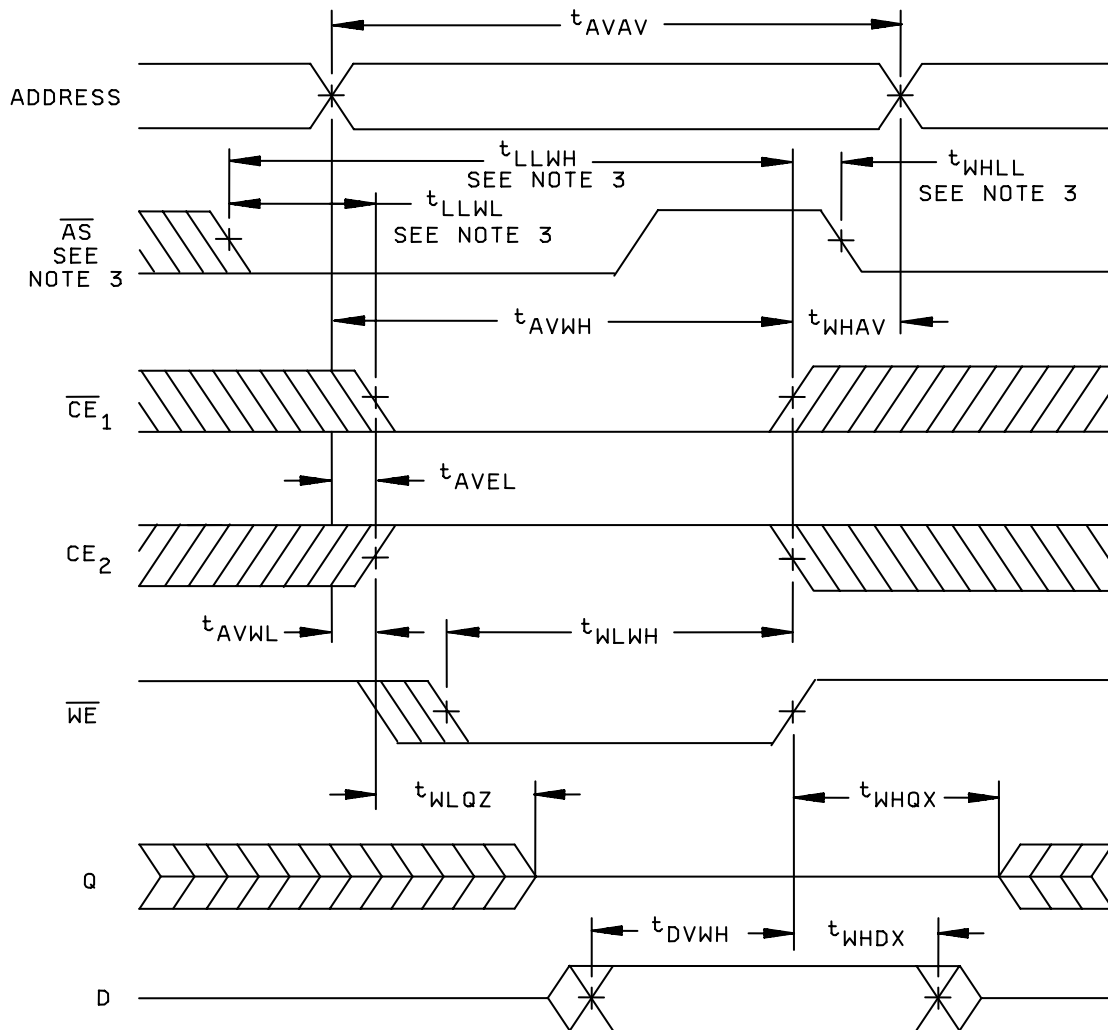
NOTES:

1. Either \overline{CE}_1 or CE₂ may be used to control the write cycle. If \overline{CE}_1 is used, CE₂ should be high when \overline{WE} is low. If CE₂ is used, \overline{CE}_1 should be low when \overline{WE} is low.
2. In a \overline{CE}_1 or CE₂ controlled write cycle, the outputs assume a high impedance state, whether \overline{OE} is high or low, as long as \overline{WE} is low.
3. Timing measurement reference is 1.5 V.
4. Device type 44 and 45 only.

FIGURE 4. Timing waveforms - Continued.

| | | | |
|---|------------------|----------------------------|--------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 32 |

Write cycle 2
(\overline{WE} controlled)

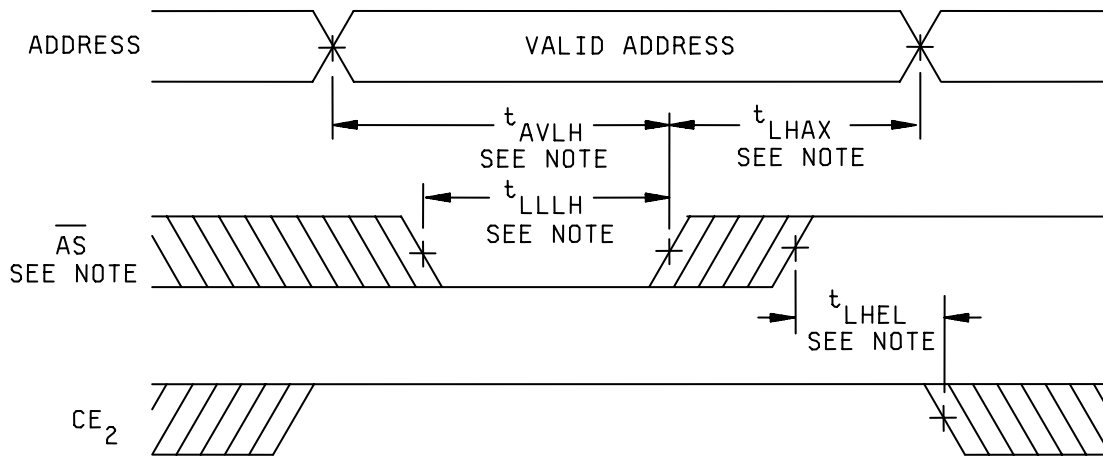


NOTES:

1. In the \overline{WE} controlled write cycle, while \overline{WE} is low, it will force the outputs into a high impedance state, whether \overline{OE} is high or low.
2. Timing measurement reference is 1.5 V.
3. Device type 44 and 45 only.

FIGURE 4. Timing waveforms - Continued.

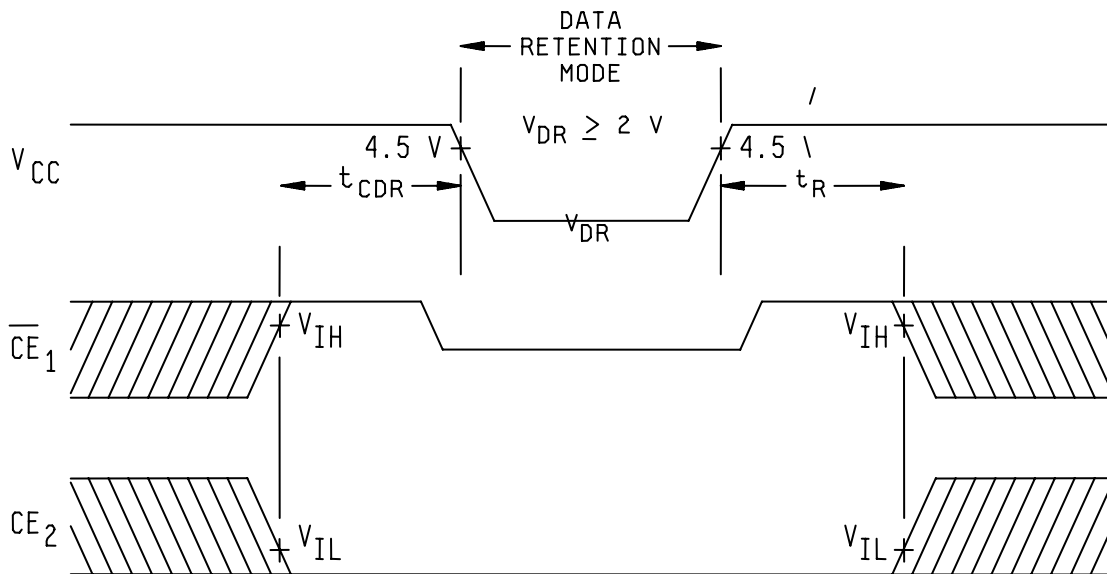
| | | | |
|---|------------------|----------------------------|--------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 33 |



NOTE: Device types 44 and 45 only.

FIGURE 4. Timing waveforms - Continued.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 34 |

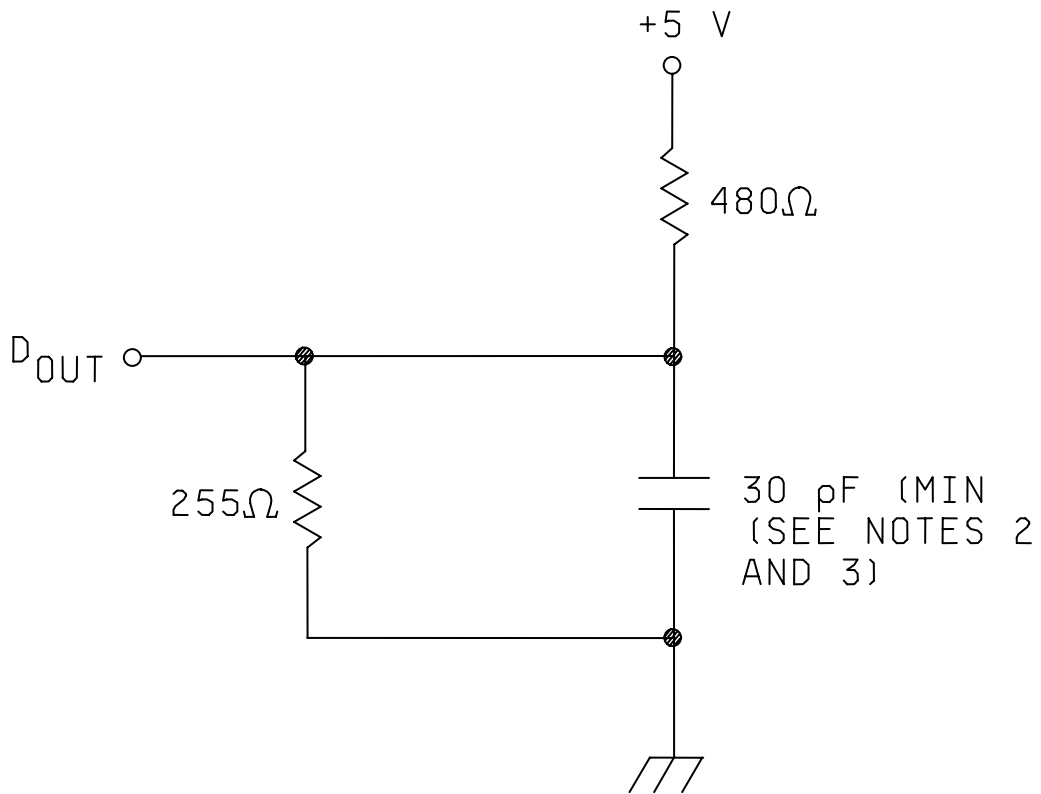


NOTES:

1. Either \overline{CE}_1 or CE_2 may be used to begin data retention mode.
2. For t_{CDR} and t_R : $\overline{CE}_1 \geq V_{CC} - 0.2V$ or $CE_2 \leq 0.2V$, $V_{IH} \geq V_{CC} - 2.0V$ or $V_{IL} \leq 0.2V$

FIGURE 4. Timing waveforms - Continued.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 35 |



NOTES:

1. Use this output load circuit or equivalent for testing.
2. Including scope and jig.
3. Minimum of 5 pF for t_{EHQZ} , t_{OHQZ} , t_{ELQX} , t_{OLQX} , and t_{WHQX} .

FIGURE 5. Output load circuit.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 36 |

Case 9

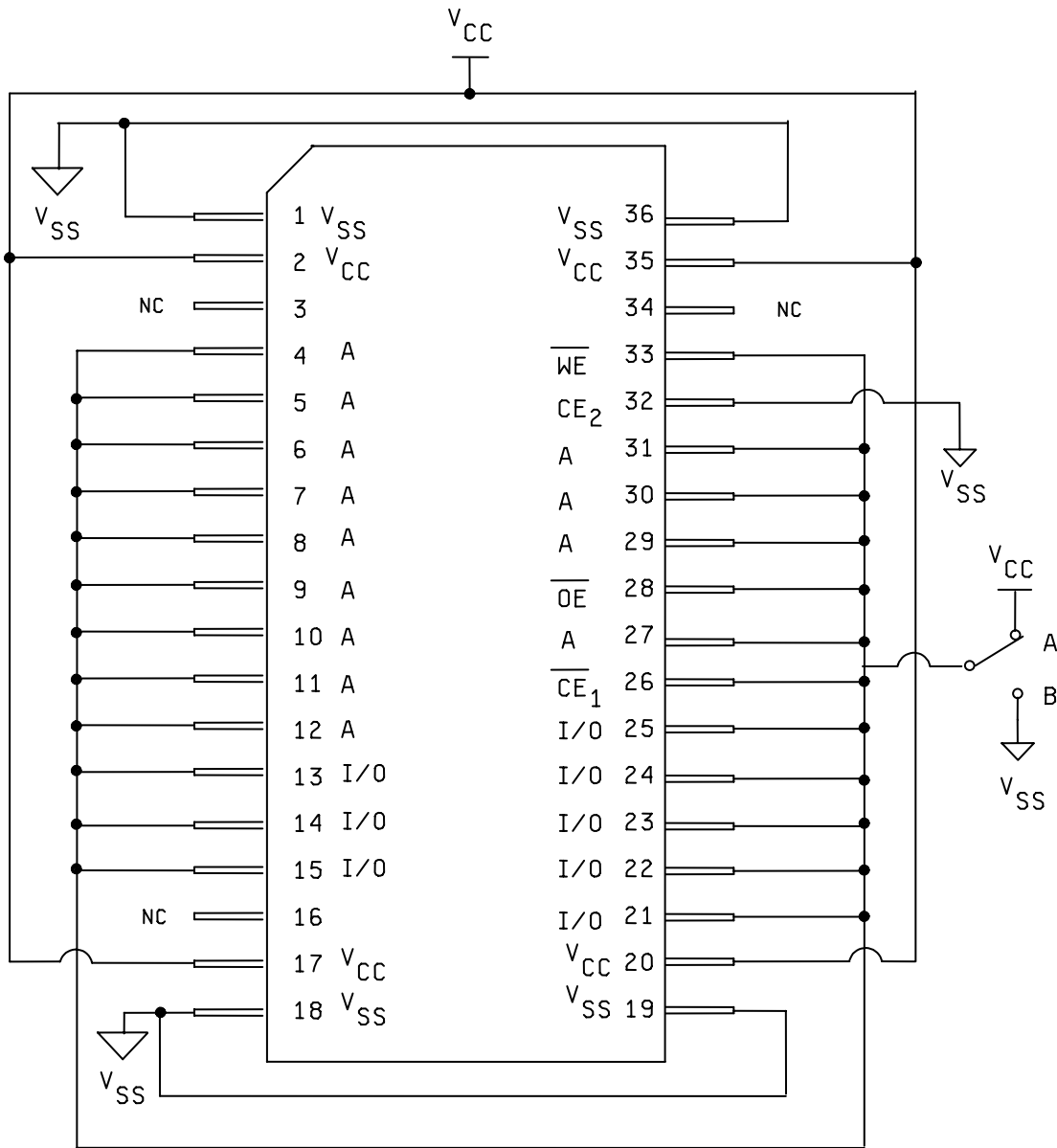
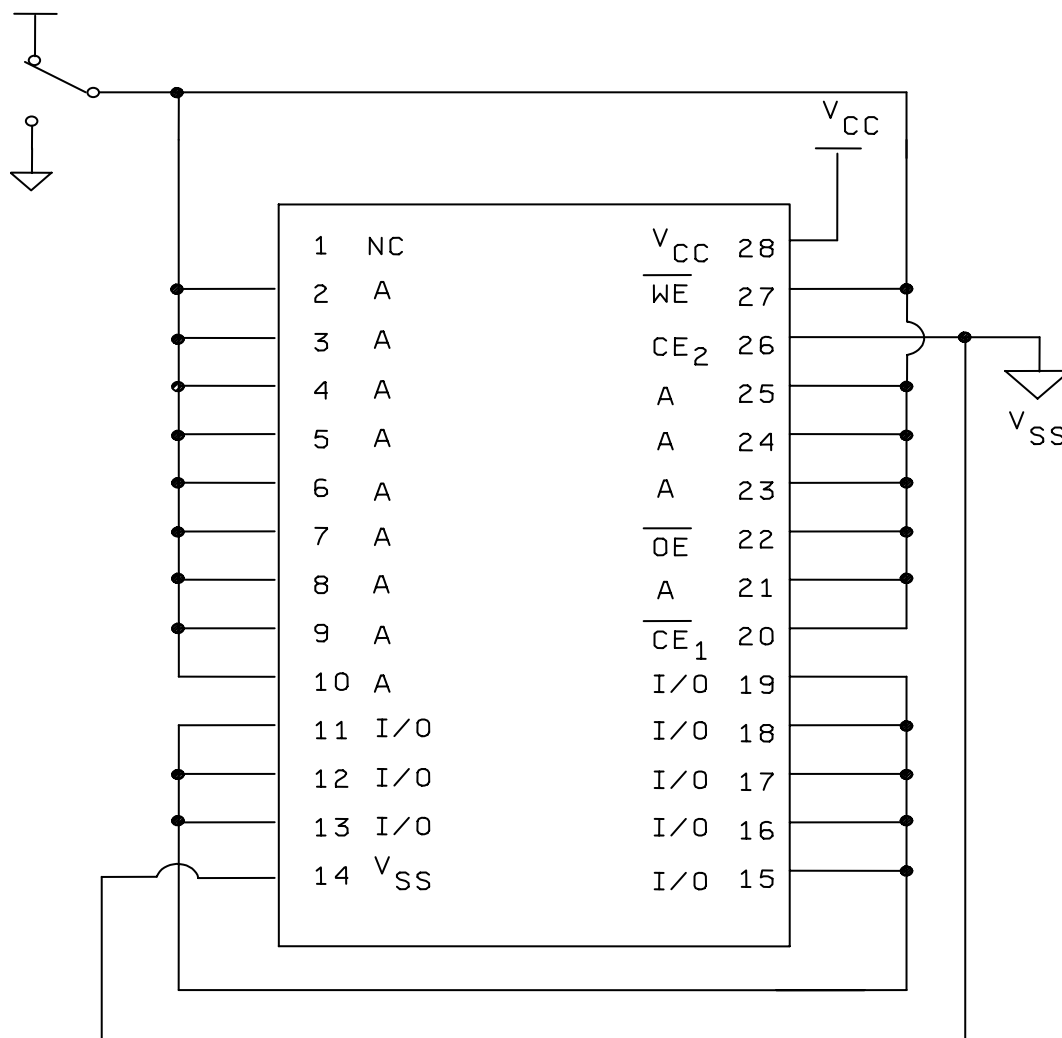


FIGURE 6. Radiation exposure circuit.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 37 |

Case X



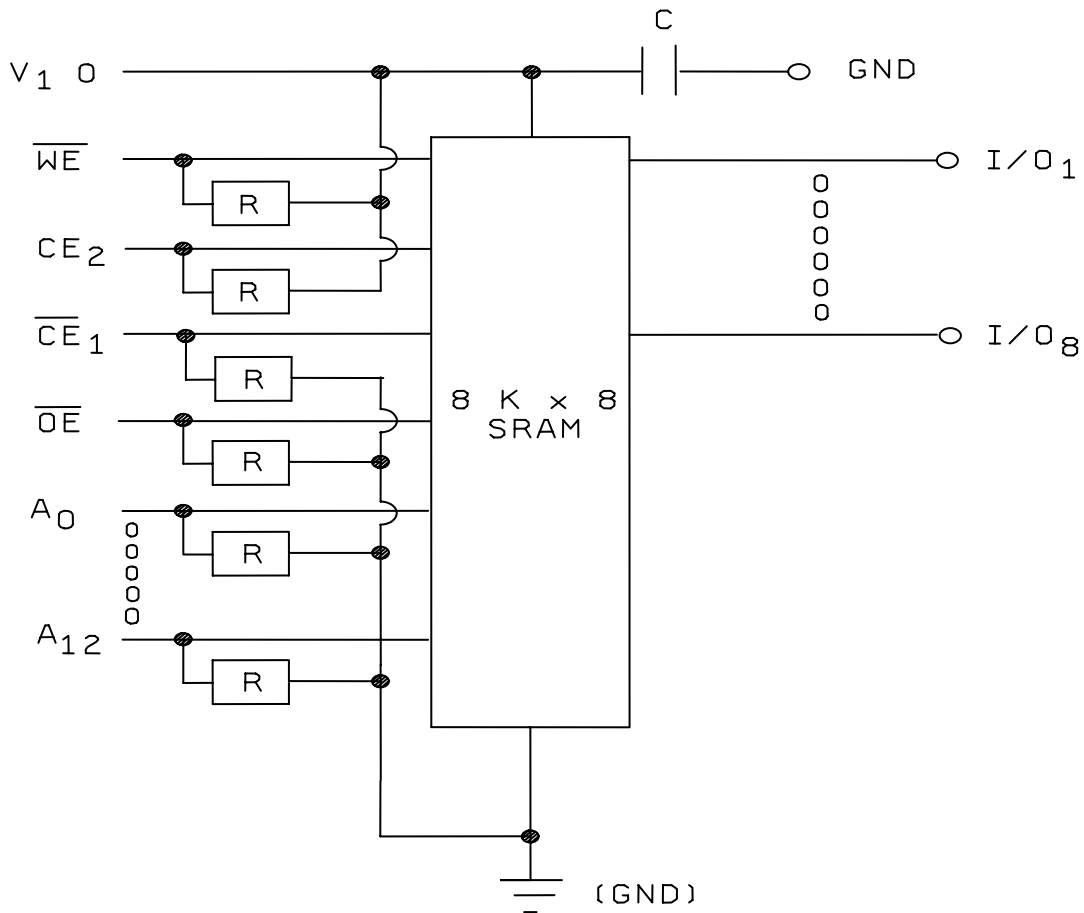
NOTES:

1. V_{CC} = 5.5 V dc (±10%).
2. Inputs = V_{CC}.
3. Outputs are open.
4. CE₂ = V_{SS} = 0 V dc.
5. Memory background shall be solid ones.

FIGURE 6. Radiation exposure circuit – Continued.

| | | | |
|---|------------------|---------------------|-------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-38294 |
| | | REVISION LEVEL H | SHEET 38 |

Case 8



NOTES:

1. Power pins connected to V₁.
2. The absolute voltage ratings of 1.3 shall not be exceeded.
3. ESD precautions shall be followed.
4. The pattern in the memory array will be checkerboard for irradiation and accelerated aging tests.
5. Pin conditions: During irradiation and accelerator aging tests.

| | | |
|--------------------------------|---|--|
| $\overline{CE}_1 = \text{GND}$ | $\overline{WE} = V_{CC}$ | $I/O_1 - I/O_8 = \text{FLOATING}$ |
| $CE_2 = V_{CC}$ | $A_0 - A_{12} = \text{GND}$ | $C = 0.1 \mu\text{F} \pm 10 \text{ percent}$ |
| $V_1 = V_{CC}$ | $R = 10 \text{ k}\Omega \pm 10 \text{ percent}$ | |
| $V_{CC} = 5.0 \text{ V}$ | $\overline{OE} = V_{CC}$ | |

FIGURE 6. Radiation exposure circuit - Continued.

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TABLE IIA. Electrical test requirements. 1/ 2/ 3/ 4/ 5/ 6/ 7/

| Line no. | Test requirements | Subgroups (in accordance with MIL-STD-883, TM 5005, table I) | Subgroups (in accordance with MIL-PRF-38535, table III) | |
|----------|---|---|---|---------------------------------------|
| | | Device class M | Device class Q | Device class V |
| 1 | Interim electrical parameters (see 4.2) | | 1, 7, 9 or 1,2,8A,10 | 1, 7, 9 or 1,2,8A,10 |
| 2 | Static burn-in I and II (method 1015) | Not required | Not required | Required |
| 3 | Same as line 1 | | | 1*, 7* Δ |
| 4 | Dynamic burn-in (method 1015) | Required | Required | Required |
| 5 | Same as line 1 | | | 1*, 7* Δ |
| 6 | Final electrical parameters | 1*, 2, 3, 7*, 8A, 8B, 9, 10, 11 | 1*, 2, 3, 7*, 8A, 8B, 9, 10, 11 | 1*, 2, 3, 7*, 8A, 8B, 9, 10, 11 |
| 7 | Group A test requirements (see 4.4) | 1, 2, 3, 4**, 7, 8A, 8B, 9, 10, 11 | 1, 2, 3, 4**, 7, 8A, 8B, 9, 10, 11 | 1, 2, 3, 4**, 7, 8A, 8B, 9, 10, 11 |
| 8 | Group C end-point electrical parameters (see 4.4) | 2, 3, 7, 8A, 8B | 1, 2, 3, 7, 8A, 8B | 1, 2, 3, 7, 8A, 8B, 9, 10, 11 Δ |
| 9 | Group D end-point electrical parameters (see 4.4) | 2, 3, 7, 8A, 8B | 2, 3, 7, 8A, 8B | 2, 3, 7, 8A, 8B |
| 10 | Group E end-point electrical parameters (see 4.4) | 1, 7, 9 | 1, 7, 9 | 1, 7, 9 |

1/ Blank spaces indicate tests are not applicable.

2/ Any or all subgroups may be combined when using high-speed testers.

3/ Subgroups 7 and 8 functional tests shall verify the truth table.

4/ * indicates PDA applies to subgroup 1 and 7.

5/ ** see 4.4.1e.

6/ Δ indicates delta limit (see table IIB) shall be required where specified, and the delta values shall be computed with reference to the previous interim electrical parameters (see line 1).

7/ See 4.4.1d.

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4. VERIFICATION

4.1 Sampling and inspection. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. For device class M, sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

4.2 Screening. For device classes Q and V, screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection.

4.2.1 Additional criteria for device class M.

- a. Delete the sequence specified as initial (preburn-in) electrical parameters through interim (postburn-in) electrical parameters of method 5004 and substitute lines 1 through 6 of table IIA herein.
- b. 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.
- c. Interim and final electrical parameters shall be as specified in table IIA herein.

4.2.2 Additional criteria for device classes Q and V.

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

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-PRF-38535. Inspections to be performed shall be those specified in MIL-PRF-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Technology conformance inspection for classes Q and V shall be in accordance with MIL-PRF-38535 including groups A, B, C, D, and E inspections and as specified herein except where option 2 of MIL-PRF-38535 permits alternate in-line control testing.. Quality conformance inspection for device class M shall be in accordance with MIL-PRF-38535, appendix A and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection.

- a. Tests shall be as specified in table IIA herein.
- b. Subgroups 5 and 6 of table I of method 5005 of MIL-STD-883 shall be omitted.
- c. For device class M, subgroups 7 and 8 tests shall be sufficient to verify the truth table. For device classes Q and V, subgroups 7 and 8 shall include verifying the functionality of the device. These tests shall have been fault graded in accordance with MIL-STD-883, test method 5012 (see 1.5 herein).
- d. O/V (latch-up) tests shall be measured only for initial qualification and after any design or process changes which may affect the performance of the device. For device class M, procedures and circuits shall be maintained under document revision level control by the manufacturer and shall be made available to the preparing activity or acquiring activity upon request. For device classes Q and V, the procedures and circuits shall be under the control of the device manufacturer's TRB in accordance with MIL-PRF-38535 and shall be made available to the preparing activity or acquiring activity upon request. Testing shall be on all pins, on five devices with zero failures. Latch-up test shall be considered destructive. Information contained in JEDEC Standard EIA/JESD78 may be used for reference.

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Table IIB. Delta limits at +25°C.

| Test <u>1/</u> | All device types |
|-------------------------------------|--------------------------------------|
| I _{CC3} standby | ± 10% of specified value in table IA |
| I _{IH} , I _{IL} | ± 10% of specified value in table IA |
| I _{OHZ} , I _{OLZ} | ± 10% of specified value in table IA |

1/ The above parameter shall be recorded before and after the required burn-in and life tests to determine the delta Δ.

- e. Subgroup 4 (C_{IN} and C_{OUT} measurements) shall be measured only for initial qualification and after any process or design changes which may affect input or output capacitance. Capacitance shall be measured between the designated terminal and GND at a frequency of 1 MHz. Sample size is 15 devices with no failures, and all input and output terminals tested.

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

- a. Test condition D. 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.
- b. T_A = +125°C, minimum.
- c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in method 1005 of MIL-STD-883.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.4 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein).

- a. End-point electrical parameters shall be as specified in table IIA herein.
- b. For device classes Q and V, the devices or test vehicle shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535 for the RHA level being tested. For device class M, the devices shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535, appendix A for the RHA level being tested. All device classes must meet the postirradiation end-point electrical parameter limits as defined in table I at T_A = +25°C ±5°C, after exposure, to the subgroups specified in table IIA herein.

4.4.4.1 Total dose irradiation testing. Total dose irradiation testing shall be performed in accordance with MIL-STD-883 method 1019 and as specified herein.

4.4.4.1.1 Accelerated aging test. Accelerated aging shall be performed on all devices requiring a RHA level greater than 5K rads(Si). The post-anneal end point electrical parameter limits shall be as specified in table I herein and shall be the pre-irradiation end point electrical parameter limit at 25°C ±5°C. Testing shall be performed at initial qualification and after any design or process changes which may effect the RHA response of the device.

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4.4.4.2 Single event phenomena (SEP). SEP testing shall be required on class V devices. SEP testing shall be performed on the SEC or alternate SEP test vehicle as approved by the qualifying activity at initial qualification and after any design or process changes which may affect the upset or latch-up characteristics. Test four devices with zero failures. ASTM standard F1192 may be used as a guideline when performing SEP testing. The test conditions for SEP are as follows:

- a. The ion beam angle of incidence shall be normal to the die surface and 60° to the normal, inclusive (i.e., $0^\circ \leq \text{angle} \leq 60^\circ$). No shadowing of the ion beam due to fixturing or package related effects is allowed.
- b. The fluence shall be greater than 100 errors or $\geq 10^7$ ions/cm².
- c. The flux shall be between 10^2 and 10^5 ion/cm²/s. The cross section shall be verified to be flux independent by measuring the cross section at two flux rates which differ by at least an order of magnitude.
- d. The particle range shall be ≥ 20 microns in silicon.
- e. The test temperature shall be +25°C and the maximum rated operating temperature $\pm 10^\circ\text{C}$.
- f. Bias conditions shall be $V_{CC} = 4.5$ V dc for the upset measurements and $V_{CC} = 5.5$ V dc for the latch-up measurements.
- g. For SEP test limits, see table IB herein.

4.4.4.3 Additional information. When specified in the purchase order or contract, a copy of the following additional data shall be supplied.

- a. RHA upset levels.
- b. Test conditions (SEP).
- c. Number of upsets (SEP).
- d. Number of transients (SEP).
- e. Occurrence of latch-up (SEP).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

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.

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

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 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.

6.3 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.

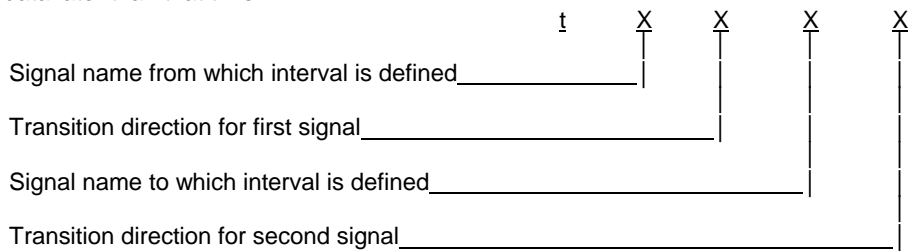
6.4 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0547.

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

- CIN -----Input and bidirectional output, terminal-to-GND capacitance.
- COUT -----Ground zero voltage potential.
- GND -----Supply current.
- ICC -----Input current low
- IIL -----Input current high
- I -----Case temperature.
- T_C -----Ambient temperature
- T_A -----Positive supply voltage.
- V_{CC} -----Positive input clamp voltage
- V_{IC} -----Latch-up over-voltage
- O/V -----Latch-up over-current
- O/I -----

6.5.1 Timing limits. The table of timing values shows either a minimum or a maximum limit for each parameter. Input requirements are specified from the external system point of view. Thus, address setup time is shown as a minimum since the system must supply at least that much time (even though most devices do not require it). On the other hand, responses from the memory are specified from the device point of view. Thus, the access time is shown as a maximum since the device never provides data later than that time.



a. Signal definitions:

- A = Address
- D = Data in
- Q = Data out
- W = Write enable
- E = Chip enable
- O = Output enable
- L = Address latch (device 44 and 45 only)

b. Transition definitions:

- H = Transition to high
- L = Transition to low
- V = Transition to valid
- X = Transition to invalid or don't care
- Z = Transition to off (high impedance)

6.5.2 Waveforms.

| Waveform symbol | Input | Output |
|-----------------|---------------------------------|-------------------------|
| | MUST BE VALID | WILL BE VALID |
| | CHANGE FROM H TO L | WILL CHANGE FROM H TO L |
| | CHANGE FROM L TO H | WILL CHANGE FROM L TO H |
| | DON'T CARE ANY CHANGE PERMITTED | CHANGING STATE UNKNOWN |
| | | HIGH IMPEDANCE |

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6.6 Sources of supply.

6.6.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DSCC-VA and have agreed to this drawing.

6.6.2 Approved sources of supply for device class M. Approved sources of supply for class M 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.

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APPENDIX A

FUNCTIONAL ALGORITHMS

A10. SCOPE

A10.1 Scope. Functional algorithms are test patterns which define the exact sequence of events used to verify proper operation of a random access memory (RAM). Each algorithm serves a specific purpose for the testing of the device. It is understood that all manufacturers do not have the same test equipment; therefore, it becomes the responsibility of each manufacturer to guarantee that the test patterns described herein are followed as closely as possible, or equivalent patterns be used that serve the same purpose. Each manufacturer should demonstrate that this condition will be met. Algorithms shall be applied to the device in a topologically pure fashion. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance.

A20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

A30. ALGORITHMS

30.1 Algorithm A (pattern 1).

A30.1.1 Checkerboard, checkerboard-bar.

- Step 1. Load memory with a checkerboard data pattern by incrementing from location 0 to maximum.
- Step 2. Read memory, verifying the output checkerboard pattern by incrementing from location 0 to maximum.
- Step 3. Load memory with a checkerboard-bar pattern by incrementing from location 0 to maximum.
- Step 4. Read memory, verifying the output checkerboard-bar pattern by incrementing from location 0 to maximum.

A30.2 Algorithm B (pattern 2).

A30.2.1 March.

- Step 1. Load memory with background data, incrementing from minimum to maximum address locations (All "0's").
- Step 2. Read data in location 0.
- Step 3. Write complement data to location 0.
- Step 4. Read complement data in location 0.
- Step 5. Repeat steps 2 through 4 incrementing X-fast sequentially, for each location in the array.
- Step 6. Read complement data in maximum address location.
- Step 7. Write data to maximum address location.
- Step 8. Read data in maximum address location.
- Step 9. Repeat steps 6 through 8 decrementing X-fast sequentially for each location in the array.
- Step 10. Read data in location 0.
- Step 11. Write complement data to location 0.
- Step 12. Read complement data in location 0.
- Step 13. Repeat steps 10 through 12 decrementing X-fast sequentially for each location in the array.
- Step 14. Read complement data in maximum address location.
- Step 15. Write data to maximum address location.
- Step 16. Read data in maximum address location.
- Step 17. Repeat steps 14 through 16 incrementing X-fast sequentially for each location in the array.
- Step 18. Read background data from memory, decrementing X-fast from maximum to minimum address locations.

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APPENDIX A – Continued.

A30.3 Algorithm C (pattern 3).

A30.3.1 XY March.

- Step 1. Load memory with background data, incrementing from minimum to maximum address locations (All "0's").
- Step 2. Read data in location 0.
- Step 3. Write complement data to location 0.
- Step 4. Read complement data in location 0.
- Step 5. Repeat steps 2 through 4 incrementing Y-fast sequentially, for each location in the array.
- Step 6. Read complement data in maximum address location.
- Step 7. Write data to maximum address location.
- Step 8. Read data in maximum address location.
- Step 9. Repeat steps 6 through 8 decrementing X-fast sequentially for each location in the array.
- Step 10. Read data in location 0.
- Step 11. Write complement data to location 0.
- Step 12. Read complement data in location 0.
- Step 13. Repeat steps 10 through 12 decrementing Y-fast sequentially for each location in the array.
- Step 14. Read complement data in maximum address location.
- Step 15. Write data to maximum address location.
- Step 16. Read data in maximum address location.
- Step 17. Repeat steps 14 through 16 incrementing X-fast sequentially for each location in the array.
- Step 18. Read background data from memory, decrementing Y-fast from maximum to minimum address locations.

A30.4 Algorithm D (pattern 4).

A30.4.1 CEDES - CE deselect checkerboard, checkerboard-bar.

- Step 1. Load memory with a checkerboard data pattern by incrementing from location 0 to maximum.
- Step 2. Deselect device, attempt to load memory with checkerboard-bar data pattern by incrementing from location 0 to maximum.
- Step 3. Read memory, verifying the output checkerboard pattern by incrementing from location 0 to maximum.
- Step 4. Load memory with a checkerboard-bar pattern by incrementing from location 0 to maximum.
- Step 5. Deselect device, attempt to load memory with checkerboard data pattern by incrementing from location 0 to maximum.
- Step 6. Read memory, verifying the output checkerboard-bar pattern by incrementing from location 0 to maximum

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APPENDIX B
SUBSTITUTION DATA

B10. SCOPE

B10.1 Scope. This appendix contains the PIN substitution information to support the one part-one part number system. SMD 5962-38294 supersedes SMDs 5962-85525 and 5962-89691. For new designs, after the date of this document the new PIN shall be used in lieu of the old PIN. For existing designs prior to the date of this document the new PIN can be used in lieu of the old PIN. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance. The PIN substitution data shall be as follows:

B20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

B30. SUBSTITUTION DATA

| <u>New PIN</u> | <u>Old PIN</u> | <u>New PIN</u> | <u>Old PIN</u> |
|-----------------|----------------|-----------------|----------------|
| 5962-3829401MXX | 5962-8552501XX | 5962-3829413MXX | 5962-8552507XX |
| 5962-3829401MYX | 5962-8552501YX | 5962-3829413MYX | 5962-8552507YX |
| 5962-3829402MXX | 5962-8552513XX | 5962-3829413MZX | 5962-8552507ZX |
| 5962-3829402MYX | 5962-8552513YX | 5962-3829413MTX | 5962-8552507TX |
| 5962-3829403MXX | 5962-8552502XX | 5962-3829414MXX | 5962-8969101XX |
| 5962-3829403MYX | 5962-8552502YX | 5962-3829414MZX | 5962-8969101ZX |
| 5962-3829404MXX | 5962-8552512XX | 5962-3829414MTX | 5962-8969101TX |
| 5962-3829404MYX | 5962-8552512YX | 5962-3829415MXX | 5962-8969102XX |
| 5962-3829405MXX | 5962-8552503XX | 5962-3829415MYX | 5962-8969102YX |
| 5962-3829405MYX | 5962-8552503YX | 5962-3829415MZX | 5962-8969102ZX |
| 5962-3829406MXX | 5962-8552511XX | 5962-3829415MUX | 5962-8969102NX |
| 5962-3829406MYX | 5962-8552511YX | 5962-3829415MTX | 5962-8969102TX |
| 5962-3829407MXX | 5962-8552504XX | 5962-3829417MXX | 5962-8969104XX |
| 5962-3829407MYX | 5962-8552504YX | 5962-3829417MYX | 5962-8969104YX |
| 5962-3829408MXX | 5962-8552510XX | 5962-3829417MZX | 5962-8969104ZX |
| 5962-3829408MYX | 5962-8552510YX | 5962-3829417MUX | 5962-8969104NX |
| 5962-3829408MZX | 5962-8552510ZX | 5962-3829417MTX | 5962-8969104TX |
| 5962-3829408MTX | 5962-8552510TX | 5962-3829419MXX | 5962-8969106XX |
| 5962-3829409MXX | 5962-8552505XX | 5962-3829419MYX | 5962-8969106YX |
| 5962-3829409MYX | 5962-8552505YX | 5962-3829419MZX | 5962-8969106ZX |
| 5962-3829409MZX | 5962-8552505ZX | 5962-3829419MUX | 5962-8969106NX |
| 5962-3829409MTX | 5962-8552505TX | 5962-3829419MTX | 5962-8969106TX |
| 5962-3829410MXX | 5962-8552509XX | 5962-3829422MUX | 5962-8552510UX |
| 5962-3829410MYX | 5962-8552509YX | 5962-3829423MUX | 5962-8552505UX |
| 5962-3829410MZX | 5962-8552509ZX | 5962-3829424MUX | 5962-8552509UX |
| 5962-3829410MTX | 5962-8552509TX | 5962-3829425MUX | 5962-8552506UX |
| 5962-3829411MXX | 5962-8552506XX | 5962-3829426MUX | 5962-8552508UX |
| 5962-3829411MYX | 5962-8552506YX | 5962-3829427MUX | 5962-8552507UX |
| 5962-3829411MZX | 5962-8552506ZX | 5962-3829428MUX | 5962-8969101UX |
| 5962-3829411MTX | 5962-8552506TX | 5962-3829429MUX | 5962-8969102UX |
| 5962-3829412MXX | 5962-8552508XX | 5962-3829430MUX | 5962-8969104UX |
| 5962-3829412MYX | 5962-8552508YX | 1/ | 5962-8969106UX |
| 5962-3829412MZX | 5962-8552508ZX | | |
| 5962-3829412MTX | 5962-8552508TX | | |

1/ Due to erroneous data received for document 5962-89691, there is no substitution part.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 05-05-18

Approved sources of supply for SMD 5962-38294 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 drawing PIN <u>1</u> / | Vendor CAGE number | Vendor similar PIN <u>2</u> / |
|--|--|---|
| 5962-3829401MXA | <u>3</u> / <u>3</u> / <u>3</u> / | IDT7164S150DB EDI8810H150DB AM99C88-15/BXC |
| 5962-3829401MYA | <u>3</u> / <u>3</u> / <u>3</u> / | IDT7164S150L32B EDI8810H150LB AM99C88-15/BUC |
| 5962-3829401MZA | <u>3</u> / | IDT7164S150TCB |
| 5962-3829401MTA | <u>3</u> / | IDT7164S150XEB |
| 5962-3829402MXA | <u>3</u> / <u>3</u> / | IDT7164L120DB EDI8810H120DB |
| 5962-3829402MYA | <u>3</u> / <u>3</u> / | IDT7164L120L32B EDI8810H120LB |
| 5962-3829402MZA | <u>3</u> / | IDT7164L120TCB |
| 5962-3829402MTA | <u>3</u> / | IDT7164L120XEB |
| 5962-3829403MXA | <u>3</u> / <u>3</u> / <u>3</u> / <u>3</u> / | IDT7164S120DB EDI8810H120DB P4C164L-120DWMB AM99C88-12/BXC |
| 5962-3829403MYA | <u>3</u> / <u>3</u> / <u>3</u> / | IDT7164S120L32B EDI8810H120LB AM99C88-12/BUC |
| 5962-3829403MZA | <u>3</u> / | IDT7164S120TCB |
| 5962-3829403MTA | <u>3</u> / | IDT7164S120XEB |
| 5962-3829404MXA | <u>3</u> / <u>3</u> / <u>3</u> / | IDT7164L100DB EDI8810H100DB P4C164L-100DWMB |
| 5962-3829404MYA | <u>3</u> / <u>3</u> / | IDT7164L100L32B EDI8810H100LB |
| 5962-3829404MZA | <u>3</u> / | IDT7164L100TCB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN <u>1/</u> | Vendor CAGE number | Vendor similar PIN <u>2/</u> |
|---|--|---|
| 5962-3829404MTA | <u>3/</u> | IDT7164L100XEB |
| 5962-3829405MXA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | IDT7164S100DB EDI8810H100DB P4C164-100DWMB AM99C88-10/BXC |
| 5962-3829405MYA | <u>3/</u> <u>3/</u> <u>3/</u> | IDT7164S100L32B EDI8810H100LB AM99C88-10/BUC |
| 5962-3829405MZA | <u>3/</u> | IDT7164S100TCB |
| 5962-3829405MTA | <u>3/</u> | IDT7164S100XEB |
| 5962-3829406MXA | 61772 <u>3/</u> <u>3/</u> | IDT7164L70DB L7C185IMB70 EDI8810H70DB |
| 5962-3829406MYA | <u>3/</u> 61772 <u>3/</u> <u>3/</u> <u>3/</u> 0EU86 | P4C164L-70DWMB IDT7164L70L32B EDI8810H-70LB L7C185TMB70 IMS1630W-70LM MT5C6408ECW-70L |
| 5962-3829406MZA | 61772 0EU86 <u>3/</u> | IDT7164L70TDB MT5C6408C-70L L7C185CMB70 |
| 5962-3829406MUA | <u>3/</u> 0EU86 | L7C185KMB70 MT5C6408EC-70L |
| 5962-3829406MTA | <u>3/</u> <u>3/</u> | IDT7164L70XEB L7C185MMB70 |
| 5962-3829406MMA | 0EU86 | MT5C6408F-70L |
| 5962-3829407MXA | <u>3/</u> 61772 <u>3/</u> 3DTT2 <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> 0C7V7 | 6164-70/BXAJC IDT7164S70DB EDI8810H70DB P4C164-70DWMB MC5164-70/B AM99C88-70/BXC 6264-70/BXAJC L7C185IMB70 QP7C186A-70DMB |
| 5962-3829407MYA | <u>3/</u> <u>3/</u> 61772 <u>3/</u> 0EU86 <u>3/</u> <u>3/</u> 0C7V7 | MR5164-70/B 6164-70M/BUAJC IDT7164S70L32B EDI8810H70LB MT5C6408ECW-70 AM99C88-70/BUC L7C185TMB70 QP7C186A-70LMB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN <u>1/</u> | Vendor CAGE number | Vendor similar PIN <u>2/</u> |
|---|---|---|
| 5962-3829407MZA | 0EU86 <u>3/</u> 0C7V7 61772 | MT5C6408C-70 L7C185CMB700 QP7C185A-70DMB IDT7164S70TDB |
| 5962-3829407MTA | <u>3/</u> <u>3/</u> | IDT7164S70XEB L7C185MMB70 |
| 5962-3829407MUA | 0EU86 <u>3/</u> | MT5C6408EC-70 L7C185KMB70 |
| 5962-3829407MMA | 0EU86 <u>3/</u> | MT5C6408F-70 MF5164-70/B |
| 5962-3829408MXA | <u>3/</u> 61772 3DTT2 <u>3/</u> | EDI8810H55DB IDT7164L55DB P4C164L-55DWMB L7C185IMB55 |
| 5962-3829408MYA | <u>3/</u> 61772 0EU86 <u>3/</u> | EDI8810H55LB IDT7164L55L32B MT5C6408ECW-55L L7C185TMB55 |
| 5962-3829408MZA | <u>3/</u> 0EU86 61772 <u>3/</u> | P4C164L-55DMB MT5C6408C-55L IDT7164L55TDB L7C185CMB55 |
| 5962-3829408MUA | 0EU86 <u>3/</u> | MT5C6408EC-55L L7C185KMB55 |
| 5962-3829408MMA | 0EU86 | MT5C6408F-55L |
| 5962-3829408MTA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | IDT7164L55XEB P4C164L-55FMB CY7C185L-55KMB L7C185MMB55 |
| 5962-3829409MXA | 61772 <u>3/</u> <u>3/</u> <u>3/</u> 3DTT2 <u>3/</u> <u>3/</u> <u>3/</u> 0C7V7 | IDT7164S55DB 6164-55/BXAJC EDI8810H55DB CY7C186A-55DMB P4C164-55DWMB HM1E-65764N/883 6264-55/BXAJC L7C185IMB55 QP7C186A-55DMB |
| 5962-3829409MYA | 61772 <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> 0C7V7 0EU86 | IDT7164S55L32B 6164-55M/BUAJC EDI8810H55LB CY7C186A-55LMB L7C185TMB55 QP7C186A-55LMB MT5C6408ECW-55 |
| 5962-3829409MYC | <u>3/</u> | HM4-65764N/883 |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN <u>1/</u> | Vendor CAGE number | Vendor similar PIN <u>2/</u> |
|---|--|---|
| 5962-3829409MZA | <u>3/</u> 0EU86 3DTT2 61772 <u>3/</u> <u>3/</u> <u>3/</u> 0C7V7 | CY7C185A-55DMB MT5C6408C-55 P4C164-55DMB IDT7164S55TDB HM1-65764N/883 EDI8808CB55QB L7C185CMB55 QP7C185A-55DMB |
| 5962-3829409MUA | 0EU86 <u>3/</u> | MT5C6408EC-55 L7C185KMB55 |
| 5962-3829409MMA | 0EU86 | MT5C6408F-55 |
| 5962-3829409MTA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | CY7C185A-55KMB IDT7164S55XEB L7C185MMB55 P4C164-55FMB |
| 5962-3829410MXA | <u>3/</u> 61772 <u>3/</u> 3DTT2 <u>3/</u> <u>3/</u> | 62L64-45BXAJC IDT7164L45DB MC5164L-45/B P4C164L-45DWMB CY7C186L-45DMB L7C185IMB45 |
| 5962-3829410MYA | <u>3/</u> 61772 0EU86 <u>3/</u> | MR5164L-45/B IDT7164L45L32B MT5C6408ECW-45L L7C185TMB45 |
| 5962-3829410MZA | 0EU86 <u>3/</u> 61772 <u>3/</u> <u>3/</u> | MT5C6408C-45L P4C164L-45DMB IDT7164L45TDB CY7C185L-45DMB L7C185CMB45 |
| 5962-3829410MUA | 0EU86 <u>3/</u> | MT5C6408EC-45L L7C185KMB45 |
| 5962-3829410MMA | 0EU86 <u>3/</u> | MT5C6408F-45L MF5164L-45/B |
| 5962-3829410MTA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | IDT7164L45XEB P4C164L-45FMB CY7C185L-45KMB L7C185MMB45 |
| 5962-3829411MXA | <u>3/</u> <u>3/</u> 61772 <u>3/</u> 3DTT2 <u>3/</u> <u>3/</u> 0C7V7 | MC5164-45/B 6264-45/BXAJC IDT7164S45DB CY7C186A-45DMB P4C164-45DWMB HM1E-65764M/883 L7C185IMB45 QP7C186A-45DMB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN <u>1/</u> | Vendor CAGE number | Vendor similar PIN <u>2/</u> |
|---|--|---|
| 5962-3829411MYA | 0C7V7 <u>3/</u> 61772 0EU86 <u>3/</u> <u>3/</u> | QP7C186A-45LMB MR5164-45/B IDT7164S45L32B MT5C6408ECW-45 CY7C186A-45LMB L7C185TMB45 |
| 5962-3829411MYC | <u>3/</u> | HM4-65764M/883 |
| 5962-3829411MZA | <u>3/</u> 0EU86 <u>3/</u> 61772 <u>3/</u> <u>3/</u> 0C7V7 <u>3/</u> | CY7C185A-45DMB MT5C6408C-45 P4C164-45DMB IDT7164S45TDB HM1-65764M/883 EDI8808CB45QB QP7C185A-45DMB L7C185CMB45 |
| 5962-3829411MUA | 0EU86 <u>3/</u> | MT5C6408EC-45 L7C185KMB45 |
| 5962-3829411MMA | 0EU86 <u>3/</u> | MT5C6408F-45 MF5164-45/B |
| 5962-3829411MTA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | CY7C185A-45KMB MT5C6408F-45 L7C185MMB45 IDT7164S45XEB P4C164-45FMB |
| 5962-3829412MXA | 61772 <u>3/</u> 3DTT2 <u>3/</u> <u>3/</u> <u>3/</u> | IDT7164L35DB MC5164L-35/B P4C164L-35DWMB 62L64-35/BXAJC CY7C186L-35DMB L7C185IMB35 |
| 5962-3829412MYA | <u>3/</u> 61772 0EU86 <u>3/</u> | MR5164L-35/B IDT7164L35L32B MT5C6408ECW-35L L7C185TMB35 |
| 5962-3829412MZA | 61772 0EU86 <u>3/</u> <u>3/</u> | IDT7164L35TDB MT5C6408C-35L L7C185CMB35 P4C164L-35DMB |
| 5962-3829412MUA | <u>3/</u> 0EU86 <u>3/</u> <u>3/</u> | P4C164L-35CMB MT5C6408EC-35L L7C185KMB35 CY7C185L-35DMB |
| 5962-3829412MMA | 0EU86 <u>3/</u> | MT5C6408F-35L MF5164L-35/B |
| 5962-3829412MTA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | IDT7164L35XEB P4C164L-35FMB CY7C185L-35KMB L7C185MMB35 |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|--|---|
| 5962-3829413MXA | <u>3/</u> 61772 <u>3/</u> 3DTT2 <u>3/</u> <u>3/</u> 0C7V7 | MC5164-35/B 6264-35/BXAJC IDT7164S35DB CY7C186A-35DMB P4C164-35DWMB HM1E-65764K/883 L7C185IMB35 QP7C186A-35DMB |
| 5962-3829413MYA | <u>3/</u> 61772 <u>3/</u> 0EU86 <u>3/</u> 0C7V7 | MR5164-35/B IDT7164S35L32B CY7C186A-35LMB MT5C6408ECW-35 L7C185TMB35 QP7C186A-35LMB |
| 5962-3829413MYC | <u>3/</u> | HM4-65764K/883 |
| 5962-3829413MZA | <u>3/</u> 0EU86 <u>3/</u> 61772 <u>3/</u> <u>3/</u> <u>3/</u> 0C7V7 | CY7C185A-35DMB MT5C6408C-35 P4C164-35DMB IDT7164S35TDB HM1-65764K/883 L7C185CMB35 EDI8808CB35QB QP7C185A-35DMB |
| 5962-3829413MUA | 0EU86 <u>3/</u> | MT5C6408EC-35 L7C185KMB35 |
| 5962-3829413MMA | 0EU86 <u>3/</u> | MT5C6408F-35 MF5164-35/B |
| 5962-3829413MTA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | CY7C185A-35KMB IDT7164S35XEB P4C164-35FMB L7C185MMB35 |
| 5962-3829414MXA | <u>3/</u> 61772 3DTT2 <u>3/</u> | MC5164L-25/B IDT7164L25DB P4C164L-25DWMB L7C185HMB or IMB25 |
| 5962-3829414MYA | <u>3/</u> 61772 0EU86 <u>3/</u> | MR5164L-25/B IDT7164L25L32B MT5C6408ECW-25L L7C185TMB25 |
| 5962-3829414MZA | <u>3/</u> 61772 0EU86 <u>3/</u> | P4C164L-25DMB IDT7164L25TDB MT5C6408C-25L L7C185DMB CMB25 |
| 5962-3829414MUA | 0EU86 <u>3/</u> | MT5C6408EC-25L L7C185KMB25 |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---|--|
| 5962-3829414MMA | 3/ 0EU86 3/ 3DTT2 | MF5164L-25/B MT5C6408F-25L L7C185FMB25 P4C164-25FSMB |
| 5962-3829414MTA | 3/ 3/ 3/ 3DTT2 | P4C164L-25FMB IDT7164L25XEB L7C185MMB25 P4C164-25FMB |
| 5962-3829415MXA | 3DTT2 3/ 3/ 61772 3/ 3/ 0C7V7 | P4C164-25DWMB CY7C186A-25DMB MC5164-25/B IDT7164S25DB HM1E-65764H/883 L7C185HMB or IMB25 QP7C186A-25DMB |
| 5962-3829415MYA | 3/ 0EU86 3/ 61772 0C7V7 3/ | MR5164-25/B MT5C6408ECW-25 CY7C186A-25LMB IDT7164S25L32B QP7C186A-25LMB L7C185TMB25 |
| 5962-3829415MYC | 3/ | HM4-65764H/883 |
| 5962-3829415MZA | 3/ 0EU86 3/ 61772 3/ 3/ 3/ 0C7V7 | P4C164-25DMB MT5C6408C-25 CY7C185A-25DMB IDT7164S25TDB HM1-65764H/883 L7C185DMB or CMB25 EDI8808CB25QB QP7C185A-25DMB |
| 5962-3829415MUA | 0EU86 3/ | MT5C6408EC-25 L7C185KMB25 |
| 5962-3829415MMA | 0EU86 3/ 3/ 3DTT2 | MT5C6408F-25 MF5164-25/B L7C185FMB25 P4C164-25FSMB |
| 5962-3829415MTA | 3/ 3DTT2 3/ 3/ | CY7C185A-25KMB P4C164-25FMB IDT7164S25XEB L7C185MMB25 |
| 5962-3829416MXA | 61772 3/ 3DTT2 | IDT7164L20DB L7C185HMB or IMB25 P4C164L-20DWMB |
| 5962-3829416MYA | 61772 0EU86 3/ | IDT7164L20L32B MT5C6408ECW-20L L7C185TMB20 |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---|---|
| 5962-3829416MZA | 61772 0EU86 <u>3/</u> <u>3/</u> | IDT7164L20TDB MT5C6408C-20L L7C185DMB or CMB20 P4C164L-20DWMB |
| 5962-3829416MUA | 0EU86 <u>3/</u> | MT5C6408EC-20L L7C185KMB20 |
| 5962-3829416MMA | 0EU86 <u>3/</u> | MT5C6408F-20L L7C185FMB20 |
| 5962-3829416MTA | <u>3/</u> <u>3/</u> <u>3/</u> | P4C164L-20FMB IDT7164L20XEB L7C185MMB20 |
| 5962-3829417MXA | <u>3/</u> 3DTT2 61772 <u>3/</u> <u>3/</u> 0C7V7 | CY7C186A-20DMB P4C164-20DWMB IDT7164S20DB HM1E-65764F/883 L7C185HMB or IMB20 QP7C186A-20DMB |
| 5962-3829417MYA | 0EU86 <u>3/</u> 61772 0C7V7 <u>3/</u> | MT5C6408ECW-20 CY7C186A-20LMB IDT7164S20L32B QP7C186A-20LMB L7C185TMB20 |
| 5962-3829417MYC | <u>3/</u> | HM4-65764F/883 |
| 5962-3829417MZA | <u>3/</u> 0EU86 <u>3/</u> 61772 <u>3/</u> <u>3/</u> 0C7V7 | P4C164-20DMB MT5C6408C-20 CY7C185A-20DMB IDT7164S20TDB HM1-65764F/883 L7C185DMB or CMB20 QP7C185A-20DMB |
| 5962-3829417MUA | 0EU86 <u>3/</u> | MT5C6408EC-20 L7C185KMB20 |
| 5962-3829417MMA | 0EU86 <u>3/</u> | MT5C6408F-20 L7C185FMB20 |
| 5962-3829417MTA | <u>3/</u> <u>3/</u> <u>3/</u> <u>3/</u> | P4C164-20FMB CY7C185A-20KMB IDT7164S20XEB L7C185MMB20 |
| 5962-3829418MXA | <u>3/</u> 3DTT2 | L7C185HMB or IMB15 P4C164L-15DWMB |
| 5962-3829418MYA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408ECW-15L L7C185TMB15 P4C164L-15L32MB |
| 5962-3829418MZA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408C-15L L7C185DMB or CMB15 P4C164L-15DMB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---------------------------------|--|
| 5962-3829418MUA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408EC-15L L7C185KMB15 P4C164L-15LMB |
| 5962-3829418MMA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408F-15L L7C185FMB15 P4C164L-15FSMB |
| 5962-3829418MTA | <u>3/</u> <u>3/</u> | L7C185MMB15 P4C164L-15FMB |
| 5962-3829419MXA | 3DTT2 <u>3/</u> <u>3/</u> | P4C164-15DWMB L7C185HMB or IMB15 CY7C186-15DMB |
| 5962-3829419MYA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408ECW-15 L7C185TMB15 P4C164-15L32MB |
| 5962-3829419MZA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408C-15 L7C185DMB or CMB15 P4C164-15DMB |
| 5962-3829419MUA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408EC-15 L7C185KMB15 P4C164-15LSMB |
| 5962-3829419MMA | 0EU86 <u>3/</u> 3DTT2 | MT5C6408F-15 L7C185FMB15 P4C164-15FSMB |
| 5962-3829419MTA | 3DTT2 <u>3/</u> <u>3/</u> | P4C164-15FMB L7C185MMB15 CY7C186-15KMB |
| 5962-3829420MXA | <u>3/</u> | L7C185IMB70 |
| 5962-3829420MYA | <u>3/</u> 0EU86 | L7C185TMB70 MT5C6408ECW -70L |
| 5962-3829420MZA | <u>3/</u> 0EU86 | L7C185CMB70 MT5C6408C -70L |
| 5962-3829420MUA | <u>3/</u> 0EU86 <u>3/</u> | P4C164L-70LMB MT5C6408EC -70L L7C185KMB70 |
| 5962-3829420MMA | 0EU86 | MT5C6408F-70L |
| 5962-3829420MTA | <u>3/</u> | L7C185MMB70 |
| 5962-3829421MXA | <u>3/</u> <u>3/</u> | L7C185IMB70 P4C164-70DWMB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---|--|
| 5962-3829421MYA | <u>3</u> / 0EU86 | L7C185TMB70 MT5C6408ECW -70 |
| 5962-3829421MZA | <u>3</u> / 0EU86 | L7C185CMB70 MT5C6408C -70 |
| 5962-3829421MUA | 3DTT2 0EU86 <u>3</u> / 0C7V7 | P4C164-70LMB MT5C6408EC-70 L7C185KMB70 QP7C185A-70LMB |
| 5962-3829421MTA | <u>3</u> / 0EU86 | L7C185MMB70 |
| 5962-3829421MMA | 0EU86 | MT5C6408F-70 |
| 5962-3829422MXA | <u>3</u> / <u>3</u> / 0EU86 | L7C185IMB55 P4C164L-55DWMB |
| 5962-3829422MYA | <u>3</u> / 0EU86 | L7C185TMB55 MT5C6408ECW -55L |
| 5962-3829422MZA | <u>3</u> / 0EU86 | L7C185CMB55 MT5C6408C -55L |
| 5962-3829422MUA | 3DTT2 0EU86 <u>3</u> / 0C7V7 | P4C164L-55LMB MT5C6408EC-55L L7C185KMB55 |
| 5962-3829422MTA | <u>3</u> / 0EU86 | L7C185MMB55 |
| 5962-3829422MMA | 0EU86 | MT5C6408F-55L |
| 5962-3829423MXA | <u>3</u> / <u>3</u> / 0EU86 | L7C185IMB55 P4C164-55DWMB |
| 5962-3829423MYA | <u>3</u> / 0EU86 | L7C185TMB55 MT5C6408ECW-55 |
| 5962-3829423MZA | <u>3</u> / 0EU86 | L7C185CMB55 MT5C6408C-55 |
| 5962-3829423MUA | 3DTT2 0EU86 <u>3</u> / <u>3</u> / 0C7V7 | P4C164-55LMB MT5C6408EC-55 L7C185KMB55 CY7C185A-55LMB QP7C185A-55LMB |
| 5962-3829423MTA | <u>3</u> / 0EU86 | L7C185MMB55 |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---|--|
| 5962-3829423MMA | 0EU86 | MT5C6408F-55 |
| 5962-3829424MXA | <u>3/</u> <u>3/</u> | L7C185IMB45 P4C164L-45DWMB |
| 5962-3829424MYA | <u>3/</u> 0EU86 | L7C185TMB45 MT5C6408ECW-45L |
| 5962-3829424MZA | <u>3/</u> 0EU86 | L7C185CMB45 MT5C6408C-45L |
| 5962-3829424MUA | 3DTT2 <u>3/</u> 0EU86 <u>3/</u> | P4C164L-45LMB CY7C185L-45LMB MT5C6408EC-45L L7C185KMB45 |
| 5962-3829424MTA | <u>3/</u> | L7C185MMB45 |
| 5962-3829424MMA | 0EU86 | MT5C6408F-45L |
| 5962-3829425MXA | <u>3/</u> <u>3/</u> | L7C185IMB45 P4C164-45DWMB |
| 5962-3829425MYA | <u>3/</u> 0EU86 | L7C185TMB45 MT5C6408ECW-45 |
| 5962-3829425MZA | <u>3/</u> <u>3/</u> 0EU86 | EDI8808CB45QB L7C185CMB45 MT5C6408C-45 |
| 5962-3829425MUA | 3DTT2 <u>3/</u> <u>3/</u> 0EU86 0C7V7 | P4C164-45LMB CY7C185A-45LMB L7C185KMB45 MT5C6408EC-45 QP7C185A-45LMB |
| 5962-3829425MTA | <u>3/</u> | L7C185MMB45 |
| 5962-3829425MMA | 0EU86 | MT5C6408F-45 |
| 5962-3829426MXA | <u>3/</u> <u>3/</u> | L7C185IMB35 P4C164L-35DWMB |
| 5962-3829426MYA | <u>3/</u> 0EU86 | L7C185TMB35 MT5C6408ECW-35L |
| 5962-3829426MZA | <u>3/</u> 0EU86 | L7C185CMB35 MT5C6408C-35L |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---|--|
| 5962-3829426MUA | 3DTT2 <u>3/</u> <u>3/</u> 0EU86 | P4C164L-35LMB CY7C185L-35LMB L7C185KMB35 MT5C6408EC-35L |
| 5962-3829426MTA | <u>3/</u> | L7C185MMB35 |
| 5962-3829426MMA | 0EU86 | MT5C6408F-35L |
| 5962-3829427MXA | <u>3/</u> <u>3/</u> | L7C185IMB35 P4C164-35DWMB |
| 5962-3829427MYA | <u>3/</u> 0EU86 | L7C185TMB35 MT5C6408ECW-35 |
| 5962-3829427MZA | <u>3/</u> <u>3/</u> 0EU86 | EDI8808CB35QB L7C185CMB35 MT5C6408C-35 |
| 5962-3829427MUA | <u>3/</u> 3DTT2 0EU86 <u>3/</u> 0C7V7 | CY7C185A-35LMB P4C164-35LMB MT5C6408EC-35 L7C185KMB35 QP7C185A-35LMB |
| 5962-3829427MTA | <u>3/</u> | L7C185MMB35 |
| 5962-3829427MMA | 0EU86 | MT5C6408F-35 |
| 5962-3829428MXA | <u>3/</u> <u>3/</u> | L7C185HMB or IMB25 P4C164L-25DWMB |
| 5962-3829428MYA | <u>3/</u> 0EU86 | L7C185TMB25 MT5C6408ECW-25L |
| 5962-3829428MZA | <u>3/</u> 0EU86 | L7C185DMB or CMB25 MT5C6408C-25L |
| 5962-3829428MUA | 3DTT2 <u>3/</u> 0EU86 | P4C164L-25LMB L7C185KMB25 MT5C6408EC-25L |
| 5962-3829428MMA | <u>3/</u> 0EU86 | L7C185FMB25 MT5C6408F-25L |
| 5962-3829428MTA | <u>3/</u> | L7C185MMB25 |
| 5962-3829429MXA | <u>3/</u> <u>3/</u> | L7C185HMB or IMB25 P4C164-25DWMB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---|--|
| 5962-3829429MYA | <u>3/</u> 0EU86 | L7C185TMB25 MT5C6408ECW-25 |
| 5962-3829429MZA | <u>3/</u> <u>3/</u> 0EU86 | L7C185DMB or CMB25 EDI8808CB25QB MT5C6408C-25 |
| 5962-3829429MUA | <u>3/</u> 3DTT2 <u>3/</u> 0EU86 0C7V7 | CY7C185A-25LMB P4C164-25LMB L7C185KMB25 MT5C6408EC-25 QP7C185A-25LMB |
| 5962-3829429MMA | <u>3/</u> 0EU86 | L7C185FMB25 MT5C6408F-25 |
| 5962-3829429MTA | <u>3/</u> | L7C185MMB25 |
| 5962-3829430MXA | <u>3/</u> <u>3/</u> | L7C185HMB or IMB20 P4C164-20DWMB |
| 5962-3829430MYA | <u>3/</u> 0EU86 | L7C185TMB20 MT5C6408ECW-20 |
| 5962-3829430MZA | <u>3/</u> <u>3/</u> 0EU86 | L7C185DMB or CMB20 EDI8808CB25QB MT5C6408C-20 |
| 5962-3829430MUA | <u>3/</u> 3DTT2 <u>3/</u> 0EU86 0C7V7 | CY7C185A-20LMB P4C164-20LMB L7C185KMB20 MT5C6408EC-20 QP7C185A-20LMB |
| 5962-3829430MMA | <u>3/</u> 0EU86 | L7C185FMB20 MT5C6408F-20 |
| 5962-3829430MTA | <u>3/</u> | L7C185MMB20 |
| 5962-3829431MXA | <u>3/</u> | EDI8810L100DB |
| 5962-3829431MYA | <u>3/</u> | EDI8810L100LB |
| 5962-3829432MXA | <u>3/</u> | EDI8810L70DB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|---------------------------------|---|
| 5962-3829432MYA | <u>3/</u> | EDI8810L70LB |
| 5962-3829433MXA | <u>3/</u> <u>3/</u> 3DTT2 | L7C185IMB55 EDI8810L55DB P4C164L-55DWMB |
| 5962-3829433MYA | <u>3/</u> <u>3/</u> | L7C185TMB55 EDI8810L55LB |
| 5962-3829433MZA | <u>3/</u> | L7C185CMB55 |
| 5962-3829433MUA | <u>3/</u> | L7C185KMB55 |
| 5962-3829433MMA | <u>3/</u> | 7C185-55 |
| 5962-3829433MTA | <u>3/</u> | L7C185MMB55 |
| 5962-3829434MXA | <u>3/</u> 3DTT2 | L7C185IMB45 P4C164L-45DWMB |
| 5962-3829434MYA | <u>3/</u> | L7C185TMB45 |
| 5962-3829434MZA | <u>3/</u> | L7C185CMB45 |
| 5962-3829434MUA | <u>3/</u> | L7C185KMB45 |
| 5962-3829434MMA | <u>3/</u> | 7C185-45 |
| 5962-3829434MTA | <u>3/</u> | L7C185MMB45 |
| 5962-3829435*-- | <u>3/</u> | UT6716485 |
| 5962H3829435BNA <u>4/</u> | 65342 5/ | UT6716485 |
| 5962H3829435BNC <u>4/</u> | 65342 5/ | UT6716485 |
| 5962H3829435BXA <u>4/</u> | 65342 5/ | UT6716485 |
| 5962H3829435BXC <u>4/</u> | 65342 5/ | UT6716485 |
| 5962H3829435SNA <u>4/</u> | 65342 5/ | UT6716485 |
| 5962H3829435SNC <u>4/</u> | 65342 5/ | UT6716485 |
| 5962H3829435SXA <u>4/</u> | 65342 5/ | UT6716485 |
| 5962H3829435SXC <u>4/</u> | 65342 5/ | UT6716485 |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|--------------------|-----------------------|
| 5962-3829436*-- | <u>3/</u> | MK48H64 |
| 5962H3829436BNA <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962H3829436BNC <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962H3829436BXA <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962H3829436BXC <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962H3829436SNA <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962H3829436SNC <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962H3829436SXA <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962H3829436SXC <u>4/</u> | 65342 <u>5/</u> | UT6716470 |
| 5962-3829437*-- | <u>3/</u> | UT6716455 |
| 5962H3829437BNA | <u>3/</u> | UT6716455 |
| 5962H3829437BNC | <u>3/</u> | UT6716455 |
| 5962H3829437BXA | <u>3/</u> | UT6716455 |
| 5962H3829437BXC | <u>3/</u> | UT6716455 |
| 5962H3829437SNA | <u>3/</u> | UT6716455 |
| 5962H3829437SXA | <u>3/</u> | UT6716455 |
| 5962H3829437SXC | <u>3/</u> | UT6716455 |
| 5962H3829438V9C | <u>3/</u> | HC6364/1XVHBT |
| 5962H3829438Q9C | <u>3/</u> | HC6364/1XQHBT |
| 5962H3829439*-- | <u>3/</u> | HC6364 |
| 5962H3829440V9C | <u>3/</u> | HC6364/1XVHBC |
| 5962H3829440Q9C | <u>3/</u> | HC6364/1XQHBC |
| 5962H3829441*-- | <u>3/</u> | HC6364 |
| 5962H3829442V9C | <u>3/</u> | HC6364/1XVHBC |
| 5962H3829442Q9C | <u>3/</u> | HC6364/1XQHBC |
| 5962H3829443V9C | <u>3/</u> | HC6364/1XVHBC |
| 5962H3829443Q9C | <u>3/</u> | HC6364/1XQHBC |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|--------------------|------------------------------------|
| 5962H3829444V8A | 3/ | IBM6408C-V55X |
| 5962H3829444Q8A | 3/ | IBM6408C-Q55X |
| 5962H3829444V9C | 3/ | LOR6408C-V55Y |
| 5962H3829444Q9C | 3/ | LOR6408C-Q55Y |
| 5962H3829445V9C | 3/ | HC6364/2XVHBC |
| 5962H3829445Q9C | 3/ | HC6364/2XQHBC |
| 5962-3829446MZA | 0EU86 3DTT2 | MT5C6408C-12L P4C164L-12DMB |
| 5962-3829446MUA | 0EU86 3DTT2 | MT5C6408EC-12L P4C164L-12LSMB |
| 5962-3829446MMA | 0EU86 3DTT2 | MT5C6408F-12L P4C164L-12FSMB |
| 5962-3829446MYA | 0EU86 | MT5C6408ECW-12L |
| 5962-3829447MZA | 0EU86 3DTT2 | MT5C6408C-12 P4C164-12DMB |
| 5962-3829447MUA | 0EU86 3DTT2 | MT5C6408EC-12 P4C164-12LSMB |
| 5962-3829447MMA | 0EU86 3DTT2 | MT5C6408F-12 P4C164-12FSMB |
| 5962-3829447MYA | 0EU86 | MT5C6408ECW-12 |
| 5962-3829448MXA | 3DTT2 | P4C164-70DWMB |
| 5962-3829448MYA | 0EU86 3DTT2 | MT5C6408ECW-70 P4C164-70L32MB |
| 5962-3829448MZA | 0EU86 3DTT2 | MT5C6408C-70 P4C164-70DMB |
| 5962-3829448MUA | 0EU86 3DTT2 | MT5C6408EC-70 P4C164-70LSMB |
| 5962-3829448MMA | 0EU86 3DTT2 | MT5C6408F-70 P4C164-70FSMB |
| 5962-3829449MXA | 3DTT2 | P4C164L-55DWMB |
| 5962-3829449MYA | 0EU86 3DTT2 | MT5C6408ECW-55L P4C164L-55L32MB |
| 5962-3829449MZA | 0EU86 3DTT2 | MT5C6408C-55L P4C164L-55DMB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|--------------------|-----------------------------------|
| 5962-3829449MTA | 3DTT2 | P4C164L-55FMB |
| 5962-3829449MUA | 0EU86 3DTT2 | MT5C6408ECW-55L P4C164L-55LSMB |
| 5962-3829449MMA | 0EU86 3DTT2 | MT5C6408F-55L P4C164L-55FSMB |
| 5962-3829450MXA | 3DTT2 | P4C164-55DWMB |
| 5962-3829450MYA | 0EU86 3DTT2 | MT5C6408ECW-55 P4C164-55L32MB |
| 5962-3829450MZA | 0EU86 3DTT2 | MT5C6408C-55 P4C164-55DMB |
| 5962-3829450MUA | 0EU86 3DTT2 | MT5C6408EC-55 P4C164-55LSMB |
| 5962-3829450MMA | 0EU86 | MT5C6408F-55 |
| 5962-3829450MTA | 3DTT2 | P4C164-55FMB |
| 5962-3829451MXA | 3DTT2 | P4C164L-45DWMB |
| 5962-3829451MYA | 0EU86 3DTT2 | MT5C6408ECW-45 P4C164L-45L32MB |
| 5962-3829451MZA | 0EU86 3DTT2 | MT5C6408C-45 P4C164L-45DMB |
| 5962-3829451MUA | 0EU86 3DTT2 | MT5C6408EC-45 P4C164L-45LSMB |
| 5962-3829451MMA | 0EU86 3DTT2 | MT5C6408F-45 P4C164L-45FSMB |
| 5962-3829451MTA | 3DTT2 | P4C164L-45FMB |
| 5962-3829452MXA | 3DTT2 | P4C164-45DWMB |
| 5962-3829452MYA | 0EU86 3DTT2 | MT5C6408ECW-45 P4C164-45L32MB |
| 5962-3829452MZA | 0EU86 3DTT2 | MT5C6408C-45 P4C164-45DMB |
| 5962-3829452MUA | 0EU86 3DTT2 | MT5C6408EC-45 P4C164-45LSMB |
| 5962-3829452MMA | 0EU86 3DTT2 | MT5C6408F-45 P4C164-45FSMB |
| 5962-3829452MTA | 3DTT2 | P4C164-45FMB |
| 5962-3829453MXA | 3DTT2 | P4C164L-35DWMB |
| 5962-3829453MYA | 0EU86 3DTT2 | MT5C6408ECW-35L P4C164-35L32MB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|--------------------|------------------------------------|
| 5962-3829453MZA | 0EU86 3DTT2 | MT5C6408C-35L P4C164L-35DMB |
| 5962-3829453MUA | 0EU86 3DTT2 | MT5C6408EC-35L P4C164L-35LSMB |
| 5962-3829453MMA | 0EU86 3DTT2 | MT5C6408F-35L P4C164L-35FSMB |
| 5962-3829453MTA | 3DTT2 | P4C164L-35FMB |
| 5962-3829454MXA | 3DTT2 | P4C164-35DWMB |
| 5962-3829454MYA | 0EU86 3DTT2 | MT5C6408ECW-35 P4C164-35L32MB |
| 5962-3829454MZA | 0EU86 3DTT2 | MT5C6408C-35 P4C164-35DMB |
| 5962-3829454MUA | 0EU86 3DTT2 | MT5C6408EC-35 P4C164-35LSMB |
| 5962-3829454MMA | 0EU86 3DTT2 | MT5C6408F-35 P4C164-35FSMB |
| 5962-3829454MTA | 3DTT2 | P4C164-35FMB |
| 5962-3829455MXA | 3DTT2 | P4C164L-25DWMB |
| 5962-3829455MYA | 0EU86 3DTT2 | MT5C6408ECW-25L P4C164L-25L32MB |
| 5962-3829455MZA | 0EU86 3DTT2 | MT5C6408C-25L P4C164L-25DMB |
| 5962-3829455MUA | 0EU86 3DTT2 | MT5C6408EC-25L P4C164L-25LSMB |
| 5962-3829455MMA | 0EU86 3DTT2 | MT5C6408F-25L P4C164L-25FSMB |
| 5962-3829455MTA | 3DTT2 | P4C164L-25FMB |
| 5962-3829456MXA | 3DTT2 | P4C164-25DWMB |
| 5962-3829456MYA | 0EU86 3DTT2 | MT5C6408ECW-25 P4C164-25L32MB |
| 5962-3829456MZA | 0EU86 3DTT2 | MT5C6408C-25 P4C164-25DMB |
| 5962-3829456MUA | 0EU86 3DTT2 | MT5C6408EC-25 P4C164-25LSMB |
| 5962-3829456MMA | 0EU86 3DTT2 | MT5C6408F-25 P4C164-25FSMB |
| 5962-3829456MTA | 3DTT2 | P4C164-25FMB |

See footnotes at end of list.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

| Standard microcircuit drawing PIN 1/ | Vendor CAGE number | Vendor similar PIN 2/ |
|--------------------------------------|--------------------|------------------------------------|
| 5962-3829457MXA | 3DTT2 | P4C164L-20DWMB |
| 5962-3829457MYA | 0EU86 3DTT2 | MT5C6408ECW-20L P4C164L-20L32MB |
| 5962-3829457MZA | 0EU86 3DTT2 | MT5C6408C-20L P4C164L-20DMB |
| 5962-3829457MUA | 0EU86 3DTT2 | MT5C6408EC-20L P4C164L-20LSMB |
| 5962-3829457MMA | 0EU86 3DTT2 | MT5C6408F-20L P4C164L-20FSMB |
| 5962-3829457MTA | 3DTT2 | P4C164L-20FMB |
| 5962-3829458MXA | 3DTT2 | P4C164-20DWMB |
| 5962-3829458MYA | 0EU86 3DTT2 | MT5C6408ECW-20 P4C164-20L32MB |
| 5962-3829458MZA | 0EU86 3DTT2 | MT5C6408C-20 P4C164-20DMB |
| 5962-3829458MUA | 0EU86 3DTT2 | MT5C6408EC-20 P4C164-20LSMB |
| 5962-3829458MMA | 0EU86 3DTT2 | MT5C6408F-20 P4C164-20FSMB |
| 5962-3829458MTA | 3DTT2 | P4C164-20FMB |
| 5962-3829459MUA | 3DTT2 | P4C164-70LMB |
| 5962-3829460MUA | 3DTT2 | P4C164L-55LMB |
| 5962-3829461MUA | 3DTT2 | P4C164-55LMB |
| 5962-3829462MUA | 3DTT2 | P4C164L-45LMB |
| 5962-3829463MUA | 3DTT2 | P4C164-45LMB |
| 5962-3829464MUA | 3DTT2 | P4C164L-35LMB |
| 5962-3829465MUA | 3DTT2 | P4C164-35LMB |
| 5962-3829466MUA | 3DTT2 | P4C164L-25LMB |
| 5962-3829467MUA | 3DTT2 | P4C164-25LMB |
| 5962-3829468MUA | 3DTT2 | P4C164-20LMB |

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

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - Continued

- 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.
- 4/ These devices are manufactured and processed in accordance with MIL-PRF-38535 and are listed as approved parts in QML- 38535.
- 5/ Vendor has indicated end of life (EOL) date of 1/30/2006 for this device.

| <u>Vendor CAGE number</u> | <u>Vendor name and address</u> |
|-------------------------------|--|
| 61772 | Integrated Device Technology, Inc. 2975 Stender Way Santa Clara, CA 95054-8015 |
| 0EU86 | Austin Semiconductor 8701 Cross Park Drive Austin, TX 78754-4566 |
| 65342 | Aeroflex Colorado Springs, Inc. 4350 Centennial Blvd. Colorado Springs, CO 80907 |
| 3DTT2 | Pyramid Semiconductor Corp. 1340 Bordeaux Drive Sunnyvale, CA 94089 |
| 0C7V7 | QP Semiconductor 2945 Oakmead Village Court Santa Clara, CA 95051 |

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