

| REVISIONS | | | |
|-----------|--|-----------------|----------------|
| LTR | DESCRIPTION | DATE (YR-MO-DA) | APPROVED |
| A | Pages 1, 2, 3, 4, 14, 15, 16, editorial changes. Pages 5, 6, 7, 8, symbol corrections. Page 18, added vendor. | 81-12-09 | M. A. Frye |
| B | Add device type 03. Type 02 inactive for new design: Use MIL-M-38510/52002 for case Q. Type 01 and new type 03 are still active. | 83-04-06 | M. A. Frye |
| C | Add device types 04 and 05. | 84-10-31 | M. A. Frye |
| D | Case temperature to +125°C. Add LCC package, electrical test improvements. | 85-11-12 | M. A. Frye |
| E | Change to military drawing format. Add device type 06, changes to 1.4, add vendor CAGE number 66958, delete vendor CAGE number 34335, changes to table I, changes to figures 1, 2, and 3. Editorial changes throughout. Change Code Ident. No. to 67268. | 87-12-17 | M. A. Frye |
| F | Update boilerplate to MIL-PRF-38535 requirements. Correct drawing title to indicate device function. - CFS | 03-06-11 | Thomas M. Hess |
| G | Correct marking requirements in 3.5. Update boilerplate in accordance with MIL-PRF-38535 requirements. - PHN. | 05-03-23 | Thomas M. Hess |

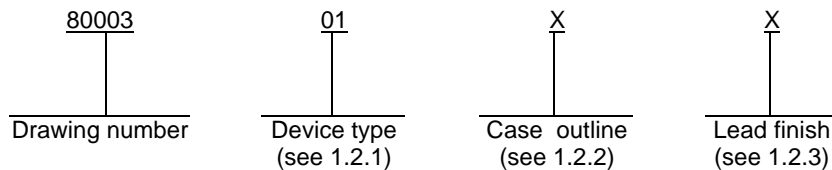
THE ORIGINAL FIRST SHEET OF THIS DRAWING HAS BEEN REPLACED.

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| REV | | | | | | | | | | | | | | | | | | | | |
| SHEET | | | | | | | | | | | | | | | | | | | | |
| REV | F | F | F | F | F | F | F | F | F | F | F | F | | | | | | | | |
| SHEET | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | |
| REV STATUS | | | | REV | | G | F | G | G | F | F | F | F | F | F | F | F | F | F | F |
| OF SHEETS | | | | SHEET | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| PMIC N/A | | | | PREPARED BY | | | | DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 http://www.dscc.dla.mil | | | | | | | | | | | | |
| STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A | | | | CHECKED BY | | | | | | | | | | | | | | | | |
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| | | | | DRAWING APPROVAL DATE | | | | | | | | | | | | | | | | |
| | | | | 80-07-21 | | | | MICROCIRCUIT, DIGITAL, 6-BIT N-CHANNEL SINGLE-CHIP MICROPROCESSOR, MONOLITHIC SILICON | | | | | | | | | | | | |
| | | | | REVISION LEVEL | | | | SIZE | | CAGE CODE | | 80003 | | | | | | | | |
| | | | | | | | | A | | 67268 | | | | | | | | | | |
| | | | | G | | | | SHEET 1 OF 26 | | | | | | | | | | | | |

1. SCOPE

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

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



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

| <u>Device type</u> | <u>Generic number</u> | <u>Frequency</u> | <u>Circuit function</u> |
|--------------------|-----------------------|------------------|---|
| 01 | Z8001 | 4.0 MHz | 16-Bit N-channel single-chip microprocessor |
| 02 | Z8002 | 4.0 MHz | 16-Bit N-channel single-chip microprocessor |
| 03 | Z8001A | 6.0 MHz | 16-Bit N-channel single-chip microprocessor |
| 04 | Z8001B | 10.0 MHz | 16-Bit N-channel single-chip microprocessor |
| 05 | Z8002B | 10.0 MHz | 16-Bit N-channel single-chip microprocessor |
| 06 | Z8002A | 6.0 MHz | 16-Bit N-channel single-chip microprocessor |

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

| <u>Outline letter</u> | <u>Descriptive designator</u> | <u>Terminals</u> | <u>Package style</u> |
|-----------------------|-------------------------------|------------------|------------------------------|
| Q | GDIP1-T40 or CDIP2-T40 | 40 | Dual-in-line |
| U | CQCC1-N52 | 52 | Square leadless chip carrier |
| X | See figure 1 | 48 | Dual-in-line |
| Y | CQCC1-N44 | 44 | Square leadless chip carrier |
| Z | CQCC1-N68 | 68 | Square leadless chip carrier |

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

1.3 Absolute maximum ratings.

| | |
|--|------------------------|
| Supply voltage range with respect to ground (V_{CC}) | -0.3 V dc to +7.0 V dc |
| Storage temperature range | -65°C to +150°C |
| Maximum power dissipation (P_D) (per device) | 2.2 W |
| Lead temperature (soldering, 5 seconds) | +270°C |
| Maximum junction temperature (T_J) | +150°C |
| Thermal resistance, junction-to-case (θ_{JC}): | |
| Case X | 14°C/W |
| Cases Q, U, Y, Z | See MIL-STD-1835 |

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1.4 Recommended operating conditions.

| | |
|---|--|
| Supply voltage range (V_{CC})..... | +4.5 V dc to +5.5 V dc |
| Minimum high level input voltage (V_{IH}): | |
| Logic inputs..... | +2.2 V dc to $V_{CC} + 0.3$ V dc |
| Clock input..... | $V_{CC} - 0.4$ V dc to $V_{CC} + 0.3$ V dc |
| RESET (NMI)..... | 2.4 V dc to $V_{CC} + 0.3$ V dc |
| Maximum low level input voltage (V_{IL}): | |
| Logic inputs..... | -0.3 V dc to +0.8 V dc |
| Clock input..... | -0.3 V dc to +0.45 V dc |
| Frequency of operation: | |
| 01, 02..... | 0.5 MHz to 4.0 MHz |
| 03, 06..... | 0.5 MHz to 6.0 MHz |
| 04, 05..... | 0.5 MHz to 10.0 MHz |
| Case operating temperature range (T_C)..... | -55°C to +125°C |
| Clock rise time (t_r): | |
| 01, 02..... | 20 ns maximum |
| 03, 06..... | 15 ns maximum |
| 04, 05..... | 10 ns maximum |
| Clock fall time (t_f): | |
| 01, 02..... | 20 ns maximum |
| 03, 06..... | 10 ns maximum |
| 04, 05..... | 15 ns maximum |

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.

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

DEPARTMENT OF DEFENSE HANDBOOKS

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

MIL-HDBK-780 - Standard Microcircuit Drawings.

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

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

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3. REQUIREMENTS

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

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

3.2.1 Case outlines. The case outlines shall be in accordance with 1.2.2 herein and on figure 1.

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

3.2.3 Logic functions. The logic functions shall be as specified on figure 3.

3.2.4 Timing waveforms. The timing waveforms shall be as specified on figure 4.

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

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

3.5 Marking. Marking shall be in accordance with MIL-PRF-38535, appendix A. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked.

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

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

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

3.8 Notification of change. Notification of change to DSCC-VA shall be required for any change that affects this drawing.

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

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TABLE I. Electrical performance characteristics.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|--|------------------|--|----------------------|----------------|-----------------------|-----------------------------|------|
| | | | | | Min | Max | |
| Clock input low voltage | V _{IL1} | Driven by external clock generator. | 1, 2, 3 | All | -0.3 1/ | 0.45 | V |
| Clock input high voltage | V _{IH1} | | 1, 2, 3 | All | V _{CC} - 0.4 | V _{CC} + 0.3 1/ | V |
| Input low voltage | V _{IL2} | | 1, 2, 3 | All | -0.3 1/ | 0.8 | V |
| Input high voltage | V _{IH2} | | 1, 2, 3 | All | 2.4 | V _{CC} + 0.3 1/ | V |
| Reset input high voltage (NMI) | V _{IH3} | | 1, 2, 3 | All | 2.4 | V _{CC} + 0.3 1/ | V |
| High level output voltage all outputs | V _{OH} | I _{OH} = -250 μA V _{CC} = 4.5 V | 1, 2, 3 | All | 2.4 | | V |
| Low level output voltage all outputs | V _{OL} | I _{OL} = +2.0 mA V _{CC} = 4.5 V | 1, 2, 3 | All | | 0.4 | V |
| High-impedance (off-state) output current (High) (In Float) | I _{ZH} | V _{IN} = 2.4 V V _{CC} = 5.5 V | 1, 2, 3 | All | -10 | +10 | μA |
| High-impedance (off-state) output current (Low) (In Float) | I _{ZL} | V _{IN} = 0.4 V V _{CC} = 5.5 V | 1, 2, 3 | All | -10 | +10 | μA |
| High level input current (input and bi-directional) | I _{IH} | V _{IN} = 2.4 V V _{CC} = 5.5 V | 1, 2, 3 | All | -10 | +10 | μA |
| Low level input current (input and bi-directional) | I _{IL} | V _{IN} = 0.4 V V _{CC} = 5.5 V | 1, 2, 3 | All | -10 | +10 | μA |
| Low level input current (SEGT) | I _{ILS} | 0.4 V ≤ V _{IN} ≤ 2.4 V 4.5 V ≤ V _{CC} ≤ 5.5 V | 1, 2, 3 | 01, 03, 04 | | +200 | μA |
| Supply current | I _{CC} | V _{CC} = 5.5 V | 1, 2, 3 | All | | 400 | mA |
| Functional tests | | See 4.3.1c | 7, 8 | All | | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|---|--------------------------|--|------------------------|----------------|--------|------|------|
| | | | | | Min | Max | |
| Clock pulse | t _{cyc} | See figure 4. See Reference No. 1 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 250 | 2000 | ns |
| | | | | 03, 06 | 165 | 2000 | |
| | | | | 04, 05 | 100 | 2000 | |
| Clock pulse width (Low) | t _{PWL1} | See figure 4. See Reference No. 2 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 105 | | ns |
| | | | | 03, 06 | 70 | | |
| | | | | 04, 05 | 40 | | |
| Clock pulse width (High) | t _{PWH1} | See figure 4. See Reference No. 3 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 105 | | ns |
| | | | | 03, 06 | 70 | | |
| | | | | 04, 05 | 40 | | |
| Clock ↑ to segment number valid | TdC(SNv) <u>3/ 4/</u> | See figure 4. See Reference No. 6 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01 | | 130 | ns |
| | | | | 03 | | 110 | |
| | | | | 04 | | 90 | |
| Clock ↑ to segment number not valid | TdC(SNn) <u>4/</u> | See figure 4. See Reference No. 7 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01 | 20 | | ns |
| | | | | 03 | 10 | | |
| | | | | 04 | 0 | | |
| Clock ↑ to bus float | TdC(Bz) <u>1/</u> | See figure 4. See Reference No. 8 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | | 65 | ns |
| | | | | 03, 06 | | 55 | |
| | | | | 04, 05 | | 50 | |
| Clock ↑ to address valid | TdC(A) | See figure 4. See Reference No. 9 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | | 100 | ns |
| | | | | 03, 06 | | 75 | |
| | | | | 04, 05 | | 65 | |
| Clock ↑ to address float | TdC(Az) <u>1/</u> | See figure 4. See Reference No. 10 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | | 65 | ns |
| | | | | 03, 06 | | 55 | |
| | | | | 04, 05 | | 50 | |
| Address valid to data in required valid | TdA(DR) | See figure 4. See Reference No. 11 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 <u>5/</u> | 01, 02 | | 475 | ns |
| | | | | 03, 06 | | 305 | |
| | | | | 04, 05 | | 180 | |
| Data to CLK ↓ setup time | TsDR(C) | See figure 4. See Reference No. 12 <u>2/</u> C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 30 | | ns |
| | | | | 03, 06 | 20 | | |
| | | | | 04, 05 | 10 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|---|---------------|--|----------------------|----------------------------|-------------------|-------------------|------|
| | | | | | Min | Max | |
| $\overline{DS} \uparrow$ to address active | TdDS(A) | See figure 4. See Reference No. 13 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 80 45 20 | | ns |
| Clock \uparrow to data out valid | TdC(DW) | See figure 4. See Reference No. 14 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 100 75 60 | ns |
| Data in to $\overline{DS} \uparrow$ hold time | ThDR(DS) | See figure 4. See Reference No. 15 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 0 0 0 | | ns |
| Data out valid to $\overline{DS} \uparrow$ delay | TdDW(DS) | See figure 4. See Reference No. 16 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 295 195 110 | | ns |
| Address valid to $\overline{MREQ} \downarrow$ delay | TdA(MR) | See figure 4. See Reference No. 17 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 55 35 20 | | ns |
| Clock \downarrow to $\overline{MREQ} \downarrow$ delay | TdC(MR) | See figure 4. See Reference No. 18 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 80 70 50 | ns |
| \overline{MREQ} width (High) | TwMRh | See figure 4. See Reference No. 19 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 210 135 80 | | ns |
| $\overline{MREQ} \downarrow$ to address not active | TdMR(A) 1/ | See figure 4. See Reference No. 20 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 70 35 15 | | ns |
| Data out valid to $\overline{DS} \downarrow$ (Write Delay) | TdDW (DSW) | See figure 4. See Reference No. 21 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 55 35 15 | | ns |
| $\overline{MREQ} \downarrow$ to data in required valid | TdMR(DR) | See figure 4. See Reference No. 22 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | | 370 230 140 | ns |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|--|-----------------|--|----------------------|----------------|--------|-----|------|
| | | | | | Min | Max | |
| Clock ↓ to $\overline{\text{MREQ}}$ ↑ delay | TdC(MR) | See figure 4. See Reference No. 23 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | | 80 | ns |
| | | | | 03, 06 | | 60 | |
| | | | | 04, 05 | | 50 | |
| Clock ↑ to $\overline{\text{AS}}$ ↓ delay | TdC(ASf) | See figure 4. See Reference No. 24 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | | 80 | ns |
| | | | | 03, 06 | | 60 | |
| | | | | 04, 05 | | 45 | |
| Address valid to $\overline{\text{AS}}$ ↑ delay | TdA(AS) | See figure 4. See Reference No. 25 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 | 55 | | ns |
| | | | | 03, 06 | 35 | | |
| | | | | 04, 05 | 20 | | |
| Clock ↓ to $\overline{\text{AS}}$ ↑ delay | TdC(ASr) | See figure 4. See Reference No. 26 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | | 90 | ns |
| | | | | 03, 06 | | 80 | |
| | | | | 04, 05 | | 45 | |
| $\overline{\text{AS}}$ ↑ to data in required valid | TdAS(DR) | See figure 4. See Reference No. 27 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 | | 360 | ns |
| | | | | 03, 06 | | 220 | |
| | | | | 04, 05 | | 140 | |
| $\overline{\text{DS}}$ ↑ to $\overline{\text{AS}}$ ↓ delay | TdDS(AS) | See figure 4. See Reference No. 28 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 | 70 | | ns |
| | | | | 03, 06 | 35 | | |
| | | | | 04, 05 | 15 | | |
| $\overline{\text{AS}}$ width (Low) | TwAS | See figure 4. See Reference No. 29 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 | 85 | | ns |
| | | | | 03, 06 | 55 | | |
| | | | | 04, 05 | 30 | | |
| $\overline{\text{AS}}$ ↑ to address not active delay | TdAS(A) 1/ | See figure 4. See Reference No. 30 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 | 70 | | ns |
| | | | | 03, 06 | 45 | | |
| | | | | 04, 05 | 15 | | |
| Address float to $\overline{\text{DS}}$ (Read) ↓ delay | TdAz(DSR) 1/ | See figure 4. See Reference No. 31 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 0 | | ns |
| | | | | 03, 06 | 0 | | |
| | | | | 04, 05 | 0 | | |
| $\overline{\text{AS}}$ ↑ to $\overline{\text{DS}}$ ↓ (Read) delay | TdAS(DSR) | See figure 4. See Reference No. 32 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 | 80 | | ns |
| | | | | 03, 06 | 55 | | |
| | | | | 04, 05 | 30 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|---|----------------|--|----------------------|----------------------------|-------------------|-------------------|------|
| | | | | | Min | Max | |
| \overline{DS} (Read) ↓ to data in required valid | TdDSR(DR) | See figure 4. See Reference No. 33 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | | 205 130 70 | ns |
| Clock ↓ to \overline{DS} ↑ delay | TdC(DSR) | See figure 4. See Reference No. 34 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 70 65 50 | ns |
| \overline{DS} ↑ to data out not valid | TdDS(DW) 1/ | See figure 4. See Reference No. 35 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 75 45 25 | | ns |
| Address valid to \overline{DS} (Read) ↓ delay | TdA(DSR) | See figure 4. See Reference No. 36 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 180 110 65 | | ns |
| Clock ↑ to \overline{DS} (Read) ↓ delay | TdC(DSR) | See figure 4. See Reference No. 37 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 120 85 65 | ns |
| \overline{DS} (Read) width (Low) | TwDSR | See figure 4. See Reference No. 38 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 275 185 110 | | ns |
| Clock ↓ to \overline{DS} (Write) ↓ delay | TdC(DSW) | See figure 4. See Reference No. 39 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 95 80 65 | ns |
| \overline{DS} (Write) width (Low) | TwDSW | See figure 4. See Reference No. 40 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 185 110 75 | | ns |
| \overline{DS} (Input) ↓ to data in required valid | TdDSI(DR) | See figure 4. See Reference No. 41 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | | 330 210 120 | ns |
| Clock ↓ to \overline{DS} (Io) ↓ delay | TdC(DSf) | See figure 4. See Reference No. 42 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 120 90 70 | ns |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|---|-----------|--|----------------------|----------------------------|--------------------|-------------------|------|
| | | | | | Min | Max | |
| $\overline{\text{DS}}$ (I/O) width (Low) | TwDS | See figure 4. See Reference No. 43 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 410 255 160 | | ns |
| $\overline{\text{AS}} \uparrow$ to $\overline{\text{DS}}$ (Acknowledge) ↓ delay | TdAS(DSA) | See figure 4. See Reference No. 44 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 1065 690 410 | | ns |
| Clock ↑ to $\overline{\text{DS}}$ (Acknowledge) ↓ delay | TdC(DSA) | See figure 4. See Reference No. 45 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 120 85 70 | ns |
| $\overline{\text{DS}}$ (Acknowledge) ↓ to data in required delay | TdDSA(DR) | See figure 4. See Reference No. 46 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | | 455 295 165 | ns |
| Clock ↑ to status valid delay | TdC(S) | See figure 4. See Reference No. 47 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 110 85 65 | ns |
| Status valid to $\overline{\text{AS}} \uparrow$ delay | TdS(AS) | See figure 4. See Reference No. 48 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 50 30 10 | | ns |
| $\overline{\text{RESET}}$ to clock ↑ set-up time | TsR(C) | See figure 4. See Reference No. 49 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 180 70 50 | | ns |
| $\overline{\text{RESET}}$ to clock ↑ hold time | ThR(C) | See figure 4. See Reference No. 50 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 0 0 0 | | ns |
| $\overline{\text{NMI}}$ width (Low) | TwNMI | See figure 4. See Reference No. 51 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 100 70 50 | | ns |
| $\overline{\text{NMI}}$ to clock ↑ set-up time | TsNMI(C) | See figure 4. See Reference No. 52 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 140 70 50 | | ns |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|--|----------------|--|----------------------|----------------|--------|-----|------|
| | | | | | Min | Max | |
| $\overline{\text{VI}}$, $\overline{\text{NVI}}$ to clock ↑ set-up time | TsVI(C) | See figure 4. See Reference No. 53 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 110 | | ns |
| | | | | 03, 06 | 50 | | |
| | | | | 04, 05 | 40 | | |
| $\overline{\text{VI}}$, $\overline{\text{NVI}}$ to clock ↑ hold time | ThVI(C) | See figure 4. See Reference No. 54 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 20 | | ns |
| | | | | 03, 06 | 20 | | |
| | | | | 04, 05 | 10 | | |
| $\overline{\text{SEGT}}$ to clock ↑ set-up time | TsSGT(C) 4/ | See figure 4. See Reference No. 55 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01 | 70 | | ns |
| | | | | 03 | 55 | | |
| | | | | 04 | 40 | | |
| $\overline{\text{SEGT}}$ to clock ↑ hold time | ThSGT(C) 4/ | See figure 4. See Reference No. 56 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01 | 0 | | ns |
| | | | | 03 | 0 | | |
| | | | | 04 | 0 | | |
| $\overline{\text{MI}}$ to clock ↑ set-up time | TsMI(C) | See figure 4. See Reference No. 57 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 180 | | ns |
| | | | | 03, 06 | 140 | | |
| | | | | 04, 05 | 80 | | |
| $\overline{\text{MI}}$ to clock ↑ hold time | ThMI(C) | See figure 4. See Reference No. 58 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 0 | | ns |
| | | | | 03, 06 | 0 | | |
| | | | | 04, 05 | 0 | | |
| Clock ↑ to $\overline{\text{MO}}$ delay time | TdC(MO) | See figure 4. See Reference No. 59 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | | 120 | ns |
| | | | | 03, 06 | | 85 | |
| | | | | 04, 05 | | 80 | |
| $\overline{\text{STOP}}$ to clock ↓ set-up time | TsSTP(C) | See figure 4. See Reference No. 60 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 140 | | ns |
| | | | | 03, 06 | 100 | | |
| | | | | 04, 05 | 50 | | |
| $\overline{\text{STOP}}$ to clock ↓ hold time | ThSTP(C) | See figure 4. See Reference No. 61 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 | 0 | | ns |
| | | | | 03, 06 | 0 | | |
| | | | | 04, 05 | 0 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C +4.5 V ≤ V _{CC} ≤ +5.5 V unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|---|---------------|--|----------------------|----------------------------|-----------------|-----------------|------|
| | | | | | Min | Max | |
| WAIT to clock ↓ set-up time | TsW(C) | See figure 4. See Reference No. 62 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 50 30 20 | | ns |
| WAIT to clock ↓ hold time | ThW(C) | See figure 4. See Reference No. 63 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 10 10 5 | | ns |
| BUSRQ to clock ↑ set-up time | TsBRQ(C) | See figure 4. See Reference No. 64 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 90 80 60 | | ns |
| BUSRQ to clock ↑ hold time | ThBRQ(C) | See figure 4. See Reference No. 65 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | 10 10 5 | | ns |
| Clock ↑ to BUSA _K ↑ delay | TdC(BAKr) | See figure 4. See Reference No. 66 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 100 75 65 | ns |
| Clock ↑ to BUSA _K ↓ delay | TdC(BAKf) | See figure 4. See Reference No. 67 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 | 01, 02 03, 06 04, 05 | | 100 75 65 | ns |
| Address valid width | TwA | See figure 4. See Reference No. 68 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 150 95 50 | | ns |
| DS ↑ to status not valid | TdDS(s) 1/ | See figure 4. See Reference No. 69 2/ C _L = 50 pF to 100 pF ±10%, all outputs | 9, 10, 11 5/ | 01, 02 03, 06 04, 05 | 80 55 30 | | ns |

See footnotes on next sheet.

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TABLE I. Electrical performance characteristics - Continued.

- 1/ Guaranteed, if not tested.
 2/ The waveform reference number refers to the position where the parameter appears on figure 4.
 3/ For waveform reference number 6, $C_L = 50 \text{ pF} \pm 10\%$.
 4/ These parameters are for 01, 03, and 04 devices only.
 5/ These waveform reference number parameters are clock dependent. The limits provided are at F_{MAX} . To determine the limits at other frequencies use the following equations:

| Waveform reference number | Device types 01 and 02 | Device types 03 and 06 | Device types 04 and 05 |
|---------------------------|---|---|--|
| 11 | $2 t_{cyc} + t_{PWH1} - 130 \text{ ns}$ | $2 t_{cyc} + t_{PWH1} - 95 \text{ ns}$ | $2 t_{cyc} + t_{PWH1} - 60 \text{ ns}$ |
| 13 | $t_{PWL1} - 25 \text{ ns}$ | $t_{PWL1} - 25 \text{ ns}$ | $t_{PWL1} - 20 \text{ ns}$ |
| 16 | $t_{cyc} + t_{PWH1} - 60 \text{ ns}$ | $t_{cyc} + t_{PWH1} - 40 \text{ ns}$ | $t_{cyc} + t_{PWH1} - 30 \text{ ns}$ |
| 17 | $t_{PWH1} - 50 \text{ ns}$ | $t_{PWH1} - 35 \text{ ns}$ | $t_{PWH1} - 20 \text{ ns}$ |
| 19 | $t_{cyc} - 40 \text{ ns}$ | $t_{cyc} - 30 \text{ ns}$ | $t_{cyc} - 20 \text{ ns}$ |
| 20 | $t_{PWL1} - 35 \text{ ns}$ | $t_{PWL1} - 35 \text{ ns}$ | $t_{PWL1} - 20 \text{ ns}$ |
| 21 | $t_{PWH1} - 50 \text{ ns}$ | $t_{PWH1} - 35 \text{ ns}$ | $t_{PWH1} - 25 \text{ ns}$ |
| 22 | $2 t_{cyc} - 130 \text{ ns}$ | $2 t_{cyc} - 100 \text{ ns}$ | $2 t_{cyc} - 60 \text{ ns}$ |
| 25 | $t_{PWH1} - 50 \text{ ns}$ | $t_{PWH1} - 35 \text{ ns}$ | $t_{PWH1} - 20 \text{ ns}$ |
| 27 | $2 t_{cyc} - 140 \text{ ns}$ | $2 t_{cyc} - 110 \text{ ns}$ | $2 t_{cyc} - 60 \text{ ns}$ |
| 28 | $t_{PWL1} - 35 \text{ ns}$ | $t_{PWL1} - 35 \text{ ns}$ | $t_{PWL1} - 25 \text{ ns}$ |
| 29 | $t_{PWH1} - 20 \text{ ns}$ | $t_{PWH1} - 15 \text{ ns}$ | $t_{PWH1} - 10 \text{ ns}$ |
| 30 | $t_{PWL1} - 35 \text{ ns}$ | $t_{PWL1} - 25 \text{ ns}$ | $t_{PWL1} - 20 \text{ ns}$ |
| 32 | $t_{PWL1} - 25 \text{ ns}$ | $t_{PWL1} - 15 \text{ ns}$ | $t_{PWL1} - 10 \text{ ns}$ |
| 33 | $t_{cyc} + t_{PWH1} - 150 \text{ ns}$ | $t_{cyc} + t_{PWH1} - 105 \text{ ns}$ | $t_{cyc} + t_{PWH1} - 70 \text{ ns}$ |
| 35 | $t_{PWL1} - 30 \text{ ns}$ | $t_{PWL1} - 25 \text{ ns}$ | $t_{PWL1} - 15 \text{ ns}$ |
| 36 | $t_{cyc} - 70 \text{ ns}$ | $t_{cyc} - 55 \text{ ns}$ | $t_{cyc} - 35 \text{ ns}$ |
| 38 | $t_{cyc} + t_{PWH1} - 80 \text{ ns}$ | $t_{cyc} + t_{PWH1} - 50 \text{ ns}$ | $t_{cyc} + t_{PWH1} - 30 \text{ ns}$ |
| 40 | $t_{cyc} - 65 \text{ ns}$ | $t_{cyc} - 55 \text{ ns}$ | $t_{cyc} - 25 \text{ ns}$ |
| 41 | $2 t_{cyc} - 170 \text{ ns}$ | $2 t_{cyc} - 120 \text{ ns}$ | $2 t_{cyc} - 80 \text{ ns}$ |
| 43 | $2 t_{cyc} - 90 \text{ ns}$ | $2 t_{cyc} - 75 \text{ ns}$ | $2 t_{cyc} - 40 \text{ ns}$ |
| 44 | $4 t_{cyc} + t_{PWL1} - 40 \text{ ns}$ | $4 t_{cyc} + t_{PWL1} - 40 \text{ ns}$ | $4 t_{cyc} + t_{PWL1} - 30 \text{ ns}$ |
| 46 | $2 t_{cyc} + t_{PWH1} - 150 \text{ ns}$ | $2 t_{cyc} + t_{PWH1} - 105 \text{ ns}$ | $2 t_{cyc} + t_{PWH1} - 75 \text{ ns}$ |
| 48 | $t_{PWH1} - 55 \text{ ns}$ | $t_{PWH1} - 40 \text{ ns}$ | $t_{PWH1} - 30 \text{ ns}$ |
| 68 | $t_{cyc} - 90 \text{ ns}$ | $t_{cyc} - 70 \text{ ns}$ | $t_{cyc} - 50 \text{ ns}$ |
| 69 | $t_{PWL1} - 25 \text{ ns}$ | $t_{PWL1} - 15 \text{ ns}$ | $t_{PWL1} - 10 \text{ ns}$ |

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Case Outline X
Device types 01, 03, and 04.

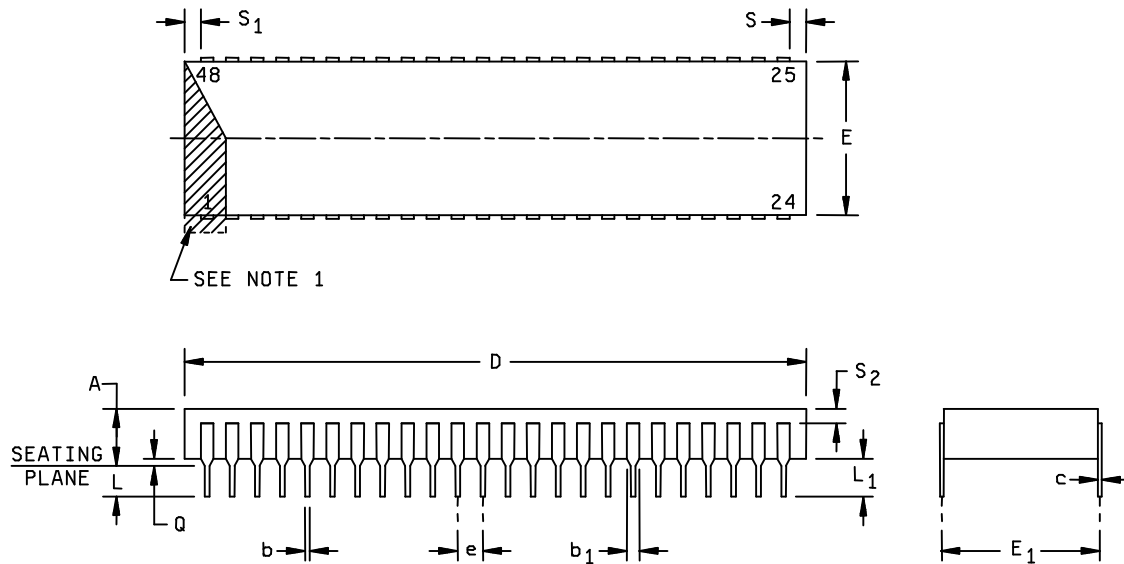


FIGURE 1. Case outlines.

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Case Outline X

Device types 01, 03, and 04.

| Symbol | Inches | | Millimeters | | Notes |
|----------------|----------|-------|-------------|-------|-------|
| | Min | Max | Min | Max | |
| A | --- | .225 | --- | 5.72 | |
| b | .014 | .023 | 0.36 | 0.58 | 7 |
| b ₁ | .030 | .070 | 0.76 | 1.78 | 2, 7 |
| c | .008 | .015 | 0.20 | 0.38 | 7 |
| D | --- | 2.480 | --- | 62.99 | |
| E | .510 | .620 | 12.95 | 15.75 | |
| E ₁ | .520 | .620 | 13.21 | 15.75 | 6 |
| e | .100 BSC | | 2.54 BSC | | 4, 8 |
| L | .120 | .200 | 3.05 | 5.08 | |
| L ₁ | .150 | --- | 3.81 | --- | |
| Q | .020 | .060 | 0.51 | 1.52 | 3 |
| S | --- | .098 | --- | 2.40 | 5 |
| S ₁ | .005 | --- | 0.13 | --- | 5 |
| S ₂ | .005 | --- | 0.13 | --- | 9 |

Notes:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The minimum limit for dimension b₁ may be .020 (0.51 mm) for leads number 1, 24, 25, and 48 only.
3. Dimension Q shall be measured from the seating plane to the base plane.
4. The basic pin spacing is .100 (2.54 mm) between centerlines. Each pin centerline shall be located within ± 0.10 (0.25 mm) of its exact longitudinal position relative to pins 1 and 48.
5. Applies to all four corners (leads number 1, 24, 25, and 48) (see MIL-STD-1835).
6. Lead center when α is 0°. E₁ shall be measured at the centerline of the leads.
7. All leads – increase maximum limit by .003 (0.08 mm) measured at the center of the flat, when lead finish A is applied.
8. Forty-six spaces.
9. The top of the lead shall not exceed above the brazed pad top surface.

FIGURE 1. Case outlines - Continued.

| | | | |
|---|------------------|----------------------------|--------------------|
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Case outlines X and Q

| Device types: 01, 03, and 04 | | | |
|------------------------------|------------------|-----------------|-----------------|
| Terminal number | Terminal symbol | Terminal number | Terminal symbol |
| 1 | AD ₀ | 25 | SN ₁ |
| 2 | AD ₉ | 26 | SN ₀ |
| 3 | AD ₁₀ | 27 | BUSRQ |
| 4 | AD ₁₁ | 28 | WAIT |
| 5 | AD ₁₂ | 29 | BUSAK |
| 6 | AD ₁₃ | 30 | R/W |
| 7 | STOP | 31 | N/S |
| 8 | M _I | 32 | B/W |
| 9 | AD ₁₅ | 33 | NC |
| 10 | AD ₁₄ | 34 | AS |
| 11 | V _{CC} | 35 | CLOCK |
| 12 | VI | 36 | GND |
| 13 | NVI | 37 | SN ₂ |
| 14 | SEGT | 38 | AD ₁ |
| 15 | NMI | 39 | AD ₂ |
| 16 | RESET | 40 | AD ₃ |
| 17 | M _O | 41 | AD ₅ |
| 18 | MREQ | 42 | SN ₄ |
| 19 | DS | 43 | AD ₄ |
| 20 | ST ₃ | 44 | AD ₆ |
| 21 | ST ₂ | 45 | AD ₇ |
| 22 | ST ₁ | 46 | SN ₅ |
| 23 | ST ₀ | 47 | SN ₆ |
| 24 | SN ₃ | 48 | AD ₈ |

| Device types: 02 and 05 | | | |
|-------------------------|------------------|-----------------|-----------------|
| Terminal number | Terminal symbol | Terminal number | Terminal symbol |
| 1 | AD ₉ | 21 | ST ₀ |
| 2 | AD ₁₀ | 22 | BUSRQ |
| 3 | AD ₁₁ | 23 | WAIT |
| 4 | AD ₁₂ | 24 | BUSAK |
| 5 | AD ₁₃ | 25 | R/W |
| 6 | STOP | 26 | N/S |
| 7 | M _I | 27 | B/W |
| 8 | AD ₁₅ | 28 | NC |
| 9 | AD ₁₄ | 29 | AS |
| 10 | V _{CC} | 30 | CLOCK |
| 11 | VI | 31 | GND |
| 12 | NVI | 32 | AD ₁ |
| 13 | NMI | 33 | AD ₂ |
| 14 | RESET | 34 | AD ₃ |
| 15 | M _O | 35 | AD ₅ |
| 16 | MREQ | 36 | AD ₄ |
| 17 | DS | 37 | AD ₆ |
| 18 | ST ₃ | 38 | AD ₇ |
| 19 | ST ₂ | 39 | AD ₈ |
| 20 | ST ₁ | 40 | AD ₀ |

NC = No connection.

FIGURE 2. Terminal connections.

| | | | |
|---|------------------|----------------------------|--------------------|
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Case outline U

| Device types: 01, 03, and 04 | | | |
|------------------------------|---------------------------|-----------------|---------------------------|
| Terminal number | Terminal symbol | Terminal number | Terminal symbol |
| 1 | AD ₀ | 27 | SN ₁ |
| 2 | AD ₉ | 28 | SN ₀ |
| 3 | AD ₁₀ | 29 | $\overline{\text{BUSRQ}}$ |
| 4 | AD ₁₁ | 30 | $\overline{\text{WAIT}}$ |
| 5 | AD ₁₂ | 31 | $\overline{\text{BUSAk}}$ |
| 6 | AD ₁₃ | 32 | NC |
| 7 | NC | 33 | NC |
| 8 | $\overline{\text{STOP}}$ | 34 | R/ $\overline{\text{W}}$ |
| 9 | $\overline{\text{M}}_1$ | 35 | N/ $\overline{\text{S}}$ |
| 10 | AD ₁₅ | 36 | B/ $\overline{\text{W}}$ |
| 11 | AD ₁₄ | 37 | RESERVED |
| 12 | V _{CC} | 38 | $\overline{\text{AS}}$ |
| 13 | NC | 39 | CLK |
| 14 | $\overline{\text{VI}}$ | 40 | GND |
| 15 | $\overline{\text{NVI}}$ | 41 | SN ₂ |
| 16 | $\overline{\text{SEGT}}$ | 42 | AD ₁ |
| 17 | $\overline{\text{NMI}}$ | 43 | AD ₂ |
| 18 | $\overline{\text{RESET}}$ | 44 | AD ₃ |
| 19 | $\overline{\text{M}}_0$ | 45 | AD ₅ |
| 20 | $\overline{\text{MREQ}}$ | 46 | SN ₄ |
| 21 | $\overline{\text{DS}}$ | 47 | AD ₄ |
| 22 | ST ₃ | 48 | AD ₆ |
| 23 | ST ₂ | 49 | AD ₇ |
| 24 | ST ₁ | 50 | SN ₅ |
| 25 | ST ₀ | 51 | SN ₆ |
| 26 | SN ₃ | 52 | AD ₈ |

NC = No connection.

FIGURE 2. Terminal connections - Continued.

| | | | |
|---|------------------|---------------------|--------------------|
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Case outline Z

| Device types: 01, 03, and 04 | | | |
|------------------------------|---------------------------|-----------------|----------------------------------|
| Terminal number | Terminal symbol | Terminal number | Terminal symbol |
| 1 | GND | 35 | SN ₁ |
| 2 | +5V | 36 | SN ₀ |
| 3 | AD ₀ | 37 | $\overline{\text{BUSRQ}}$ |
| 4 | AD ₉ | 38 | $\overline{\text{WAIT}}$ |
| 5 | AD ₁₀ | 39 | $\overline{\text{BUSA}}\text{K}$ |
| 6 | AD ₁₁ | 40 | NC |
| 7 | AD ₁₂ | 41 | NC |
| 8 | AD ₁₃ | 42 | NC |
| 9 | NC | 43 | NC |
| 10 | NC | 44 | NC |
| 11 | $\overline{\text{STOP}}$ | 45 | $\overline{\text{R/W}}$ |
| 12 | $\overline{\text{M}}_1$ | 46 | $\overline{\text{N/S}}$ |
| 13 | AD ₁₅ | 47 | $\overline{\text{B/W}}$ |
| 14 | AD ₁₄ | 48 | RESERVED |
| 15 | +5V | 49 | $\overline{\text{AS}}$ |
| 16 | +5V | 50 | GND |
| 17 | GND | 51 | CLK |
| 18 | GND | 52 | +5V |
| 19 | $\overline{\text{VI}}$ | 53 | GND |
| 20 | $\overline{\text{NVI}}$ | 54 | SN ₂ |
| 21 | $\overline{\text{SEGT}}$ | 55 | AD ₁ |
| 22 | $\overline{\text{NMI}}$ | 56 | AD ₂ |
| 23 | $\overline{\text{RESET}}$ | 57 | AD ₃ |
| 24 | $\overline{\text{M}}_0$ | 58 | AD ₅ |
| 25 | $\overline{\text{MREQ}}$ | 59 | SN ₄ |
| 26 | NC | 60 | NC |
| 27 | NC | 61 | NC |
| 28 | NC | 62 | NC |
| 29 | $\overline{\text{DS}}$ | 63 | AD ₄ |
| 30 | ST ₃ | 64 | AD ₆ |
| 31 | ST ₂ | 65 | AD ₇ |
| 32 | ST ₁ | 66 | SN ₅ |
| 33 | ST ₀ | 67 | SN ₆ |
| 34 | SN ₃ | 68 | AD ₈ |

NC = No connection.

FIGURE 2. Terminal connections - Continued.

| | | | |
|---|------------------|----------------------------|--------------------|
| STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 | SIZE A | | 8003 |
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Case outline Y

| Device types: 02, 05, and 06 | | | |
|------------------------------|----------------------------------|-----------------|---------------------------|
| Terminal number | Terminal symbol | Terminal number | Terminal symbol |
| 1 | AD ₉ | 23 | ST ₀ |
| 2 | AD ₁₀ | 24 | NC |
| 3 | AD ₁₁ | 25 | NC |
| 4 | AD ₁₂ | 26 | $\overline{\text{BUSRQ}}$ |
| 5 | AD ₁₃ | 27 | $\overline{\text{WAIT}}$ |
| 6 | NC | 28 | $\overline{\text{BUSAk}}$ |
| 7 | $\overline{\text{STOP}}$ | 29 | R $\overline{\text{W}}$ |
| 8 | $\overline{\text{M}}_{\text{I}}$ | 30 | N $\overline{\text{S}}$ |
| 9 | AD ₁₅ | 31 | B $\overline{\text{W}}$ |
| 10 | AD ₁₄ | 32 | RESERVED |
| 11 | V _{CC} | 33 | $\overline{\text{AS}}$ |
| 12 | NC | 34 | CLK |
| 13 | $\overline{\text{VI}}$ | 35 | GND |
| 14 | $\overline{\text{NVI}}$ | 36 | AD ₁ |
| 15 | $\overline{\text{NMI}}$ | 37 | AD ₂ |
| 16 | $\overline{\text{RESET}}$ | 38 | AD ₃ |
| 17 | $\overline{\text{M}}_{\text{O}}$ | 39 | AD ₅ |
| 18 | $\overline{\text{MREQ}}$ | 40 | AD ₄ |
| 19 | $\overline{\text{DS}}$ | 41 | AD ₆ |
| 20 | ST ₃ | 42 | AD ₇ |
| 21 | ST ₂ | 43 | AD ₈ |
| 22 | ST ₁ | 44 | AD ₀ |

NC = No connection.

FIGURE 2. Terminal connections - Continued.

| | | | |
|---|------------------|----------------------------|--------------------|
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Device types 01, 03, and 04

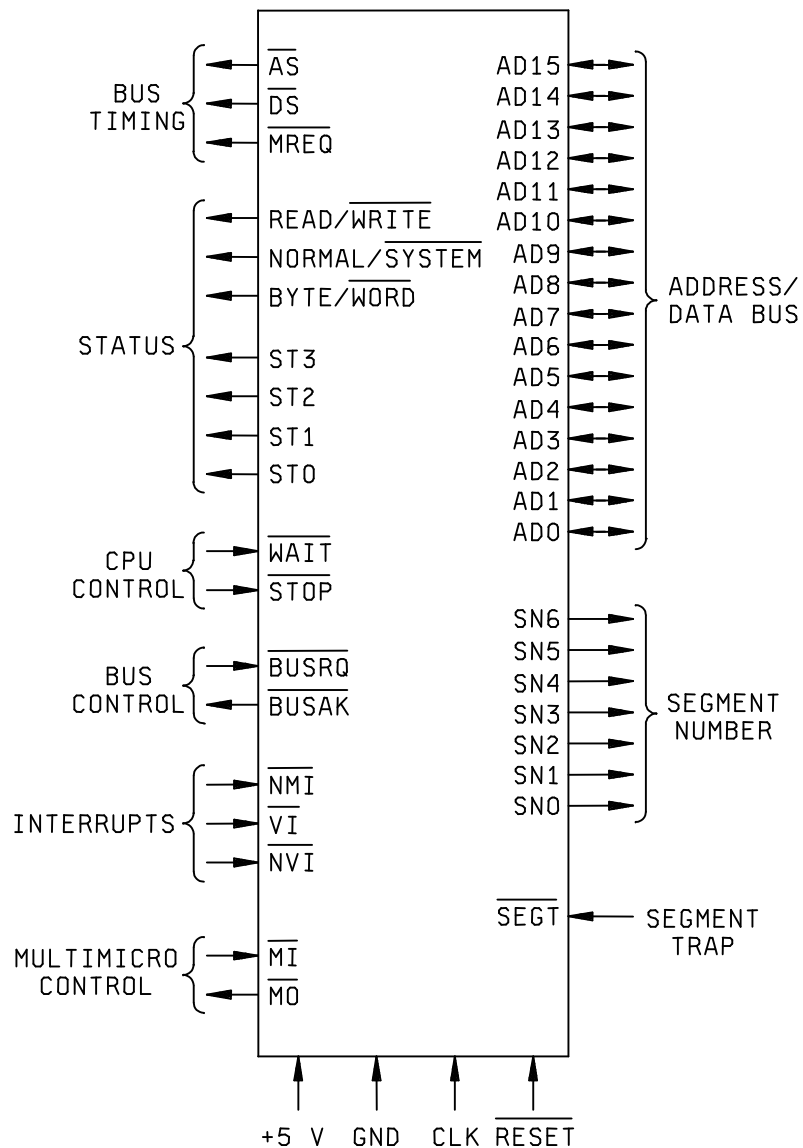


FIGURE 3. Logic functions.

| | | | |
|---|------------------|---------------------|--------------------|
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Device types 02, 05, and 06

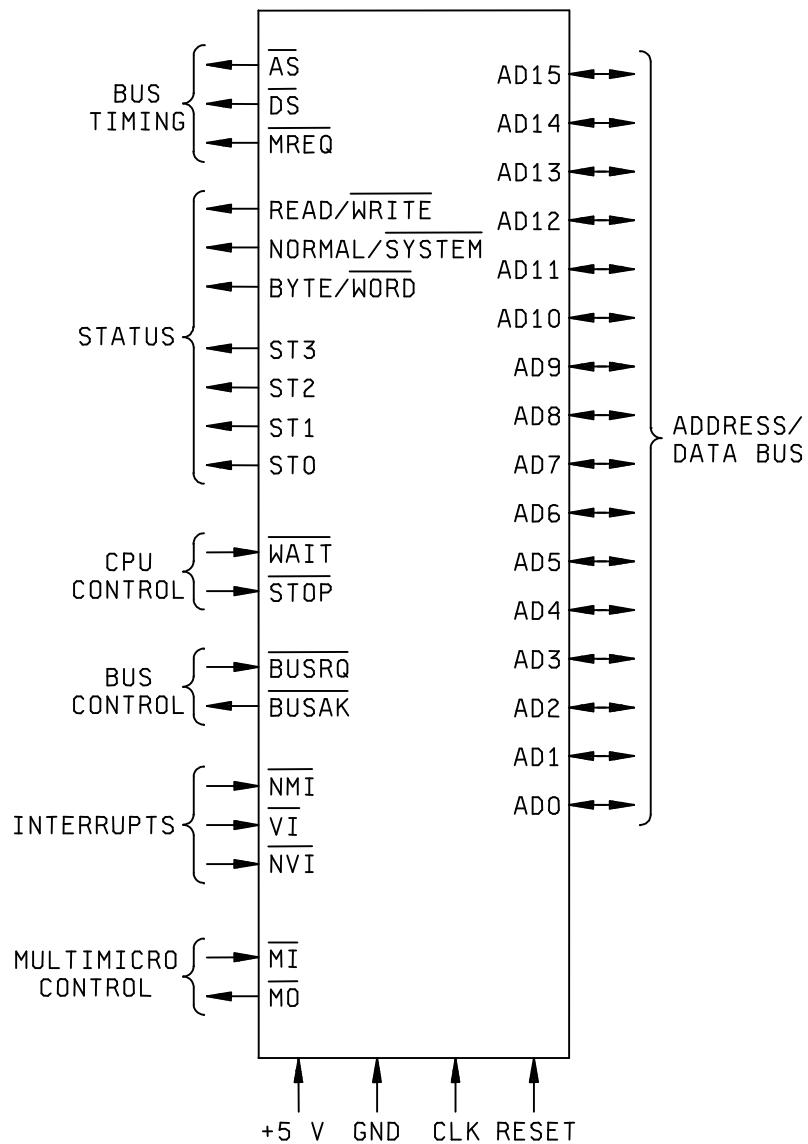


FIGURE 3. Logic functions - Continued.

| | | | |
|---|------------------|----------------------------|--------------------|
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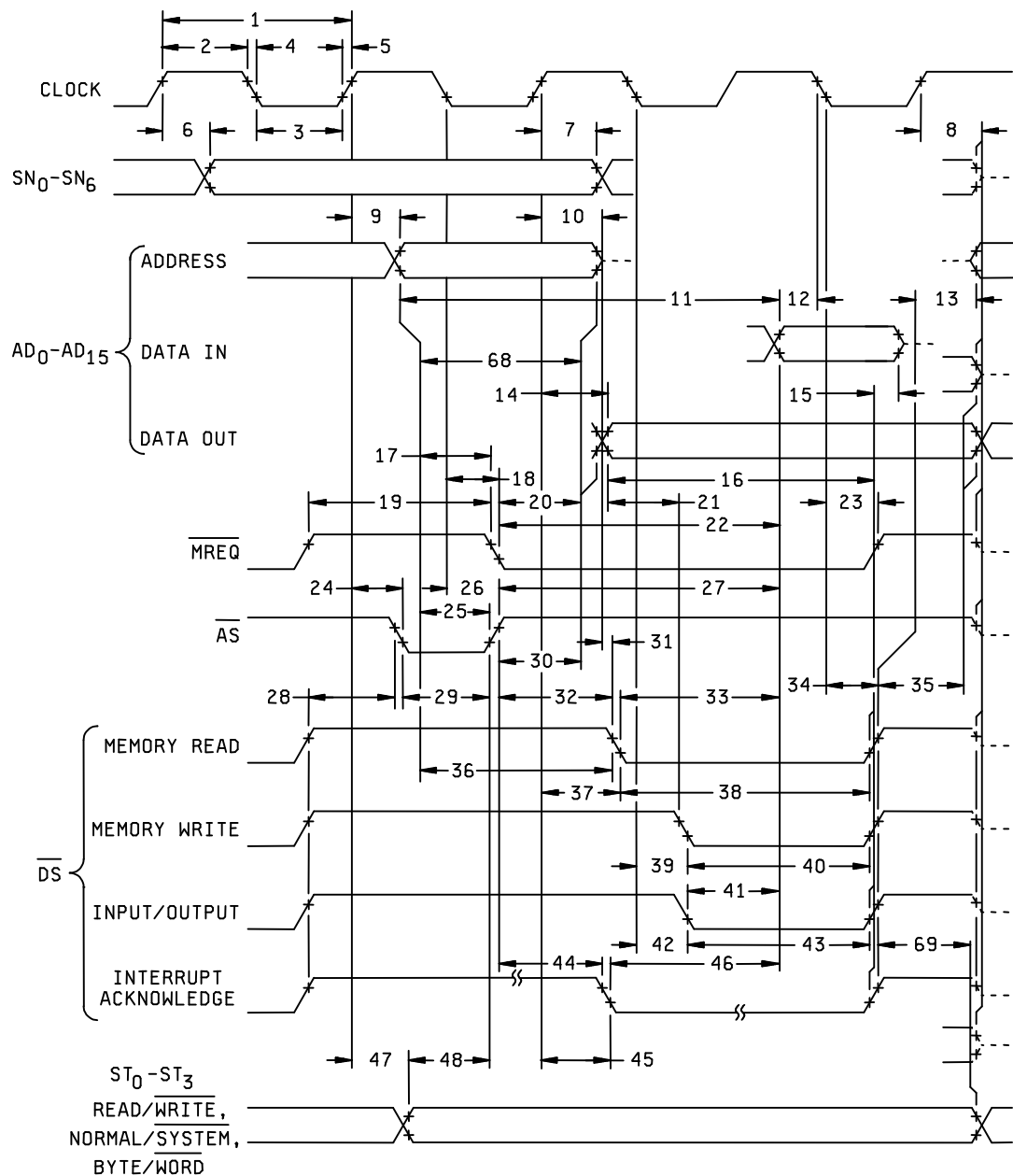


FIGURE 4. Timing waveforms.

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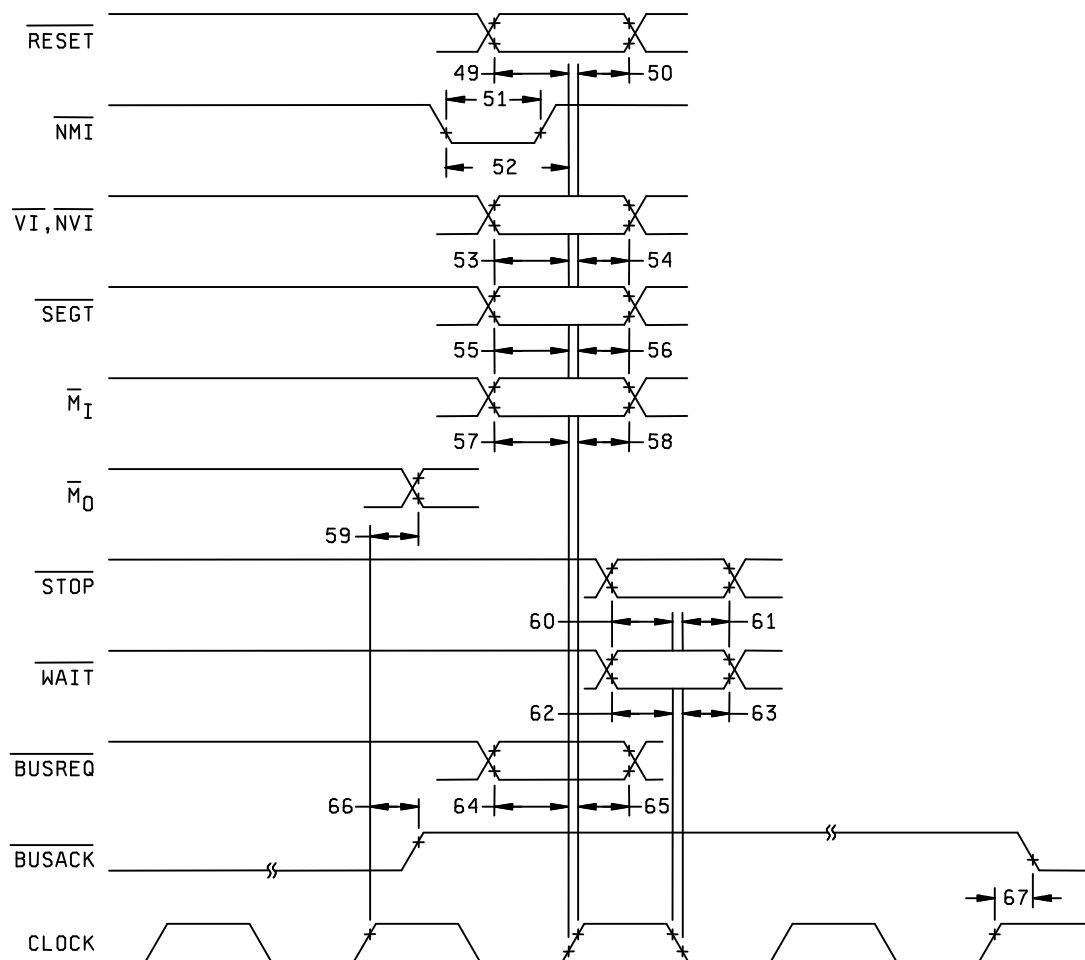


FIGURE 4. Timing waveforms - Continued.

| | | | |
|---|------------------|----------------------------|--------------------|
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4. VERIFICATION

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

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

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in method 1015 of MIL-STD-883.

(2) $T_A = +125^{\circ}\text{C}$, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

TABLE II. Electrical test requirements.

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

* PDA applies to subgroup 1.

** Subgroups 10 and 11, if not tested, shall be guaranteed to the specified limits in table I.

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

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 4 (C_{IN} measurement) shall be measured only for the initial test and after process or design changes which may affect input capacitance.

d. Subgroups 7 and 8 shall include verification of the functionality of the device. It forms a part of the vendor's test tape and shall be maintained and available from the approved sources of supply.

| | | | |
|---|-----------|---------------------|-------------|
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4.3.2 Groups C and D inspections.

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

5. PACKAGING

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

6. NOTES

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

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

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

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus (DSCC) when a system application requires configuration control and the applicable SMD. 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 microelectronics devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0544.

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

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

6.7 Pin descriptions.

| <u>Name</u> | <u>Description</u> |
|---|--|
| $AD_0 - AD_{15}$ (Address/Data Bus) | <u>Inputs/outputs, active High, three-state.</u> These multiplexed address and data lines are used for both I/O and to address memory. $AD_{15} = \text{MSB}$. |
| \overline{AS} (Address Strobe) | <u>Output, active Low, three-state.</u> The rising edge of \overline{AS} indicates addresses are valid. |
| \overline{BUSAK} (Bus Acknowledge) | <u>Output, active Low.</u> A low on this line indicates the CPU has relinquished control of the bus. This occurs after completion of the <u>current machine cycle</u> . \overline{BUSAK} goes inactive one clock cycle after the synchronization of \overline{BUSRQ} being released. |

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6.7 Pin descriptions - Continued.

| Name | Description |
|--|--|
| $\overline{\text{BUSRQ}}$ (Bus Request) | <u>Input, active Low.</u> This line must be driven Low to request the bus from the CPU. It is sampled for being active at the beginning of each machine cycle. When it is released, it is synchronized with the next rising clock edge. |
| $\overline{\text{DS}}$ (Data Strobe) | <u>Output, active Low, three-state.</u> This line times the data in and out of the CPU. |
| $\overline{\text{MREQ}}$ (Memory Request) | <u>Output, active Low, three-state.</u> A low on this line indicates that the address/data bus holds a memory address. |
| $\overline{\text{MI}}, \overline{\text{MO}}$ (Multi-Micro In, Multi-Micro Out) | <u>Input and output, active Low.</u> These two lines form a resource-request daisy chain that allows one CPU in a multi-microprocessor system to access a shared resource. MI is sampled on the rising edge of T_3 of the last machine cycle of any instruction and internally latched. |
| $\overline{\text{NMI}}$ (Non-Maskable Interrupt) | <u>Edge triggered, input, active Low.</u> A high-to-low transition on $\overline{\text{NMI}}$ request a non-maskable interrupt. The NMI interrupt has the highest priority of the three types of interrupts. The internal NMI latch is sampled on the rising edge of T_3 of the last machine cycle of any instruction. |
| $\overline{\text{NVI}}$ (Non-Vectored Interrupt) | <u>Input, active Low.</u> A low on this line requests a non-vectored interrupt. It is sampled on the rising edge of T_3 of the last machine cycle of any instruction. |
| CLK (System Clock) | <u>Input.</u> CLK is a 5 V single-phase time-base input. |
| $\overline{\text{RESET}}$ (Reset) | <u>Input, active Low.</u> A low on this line resets the CPU. $\overline{\text{RESET}}$ must be active for at least five clock cycles. |
| $\text{R}/\overline{\text{W}}$ (Read/Write) | <u>Output, Low = Write, three-state.</u> R/W indicates that the CPU is reading from or writing to memory or I/O. |
| $\text{ST}_0 - \text{ST}_3$ (Status) | <u>Outputs, active High, three-state.</u> These lines specify the CPU status. |
| $\overline{\text{STOP}}$ (Stop) | <u>Input, active Low.</u> This input can be used to single-step instruction execution. It is sampled on the last falling clock edge preceding any first instruction fetch cycle. |
| $\overline{\text{VI}}$ (Vectored Interrupt) | <u>Input, active Low.</u> A low on this line requests a vectored interrupt. It is sampled on the rising edge of T_3 of the last machine cycle of any instruction. |
| $\overline{\text{WAIT}}$ (Wait) | <u>Input, active Low.</u> This line indicates to the CPU that the memory or I/O device is not ready for data transfer. It is sampled on the falling edge of T_2 and any subsequent $\overline{\text{WAIT}}$ states. |
| $\text{B}/\overline{\text{W}}$ (Byte/Word) | <u>Output, Low = word, three-state.</u> This signal defines the type of memory reference on the 16-bit address/data bus. |
| $\text{N}/\overline{\text{S}}$ (Normal/System Mode) | <u>Output, Low = system mode, three-state.</u> $\text{N}/\overline{\text{S}}$ indicates the CPU is in the normal or system mode. |
| $\text{SN}_0 - \text{SN}_6$ (Segment Number) | <u>Outputs, active High, three-state.</u> These lines provide the 7-bit segment number used to address one of 128 segments by the memory management unit. Outputs by the 01, 03, and 04 parts only. SN_6 = MSB. |
| $\overline{\text{SEGT}}$ (Segment Trap) | <u>Input, active Low.</u> The memory management unit interrupts the CPU with a low on this line when the MMU detects a segmentation trap. Input on the 01, 03, and 04 parts only. It is sampled on the rising edge of T_3 of the last machine cycle of any instruction. |

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 05-03-23

Approved sources of supply for SMD 80003 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> |
|---|--------------------|------------------------------|
| 8000301UA | 0C7V7 | Z0800104LMB |
| 8000301XA | 0C7V7 | Z0800104CMB |
| 8000301ZA | <u>3/</u> | Z8001K2/883 |
| 8000302QA | 0C7V7 | Z0800204CMB |
| 8000302YA | 0C7V7 | Z0800204LMB |
| 8000303UA | 0C7V7 | Z0800106LMB |
| 8000303XA | 0C7V7 | Z0800106CMB |
| 8000303ZA | <u>3/</u> | Z8001AK2/883 |
| 8000304UA | 0C7V7 | Z0800110LMB |
| 8000304XA | 0C7V7 | Z0800110CMB |
| 8000304ZA | <u>3/</u> | Z8001BK2/883 |
| 8000305QA | 0C7V7 | Z0800210CMB |
| 8000305YA | 0C7V7 | Z0800210LMB |
| 8000306QA | 0C7V7 | Z0800206CMB |
| 8000306YA | 0C7V7 | Z0800206LMB |

- 1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the vendor to determine its availability.
- 2/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.
- 3/ Not available from an approved source of supply.

Vendor CAGE
number

0C7V7

Vendor name
and address

QP Semiconductor
2945 Oakmead Village Court
Santa Clara, CA 95051

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