

REVISIONS

| LTR | DESCRIPTION | DATE (YR-MO-DA) | APPROVED |
|-----|--|-----------------|------------|
| A | Changes in accordance with N.O.R. 5962-R072-95. | 95-02-17 | M. A. FRYE |
| B | Add case outlines M and N. Delete vendor CAGE number 48726. Replace CAGE number U4637 with U3158. Make changes to 1.2.2, 1.3, table I, figure 1, and figure 2. Redrawn. - ro | 99-11-30 | R. MONNIN |
| C | Add radiation hardness requirements. Add CAGE 21845. - rrp | 00-02-24 | R. MONNIN |
| D | Add case outlines 4 and 5. Make corrections to case outline "N" pin assignments. - ro | 02-03-05 | R. MONNIN |
| E | Add a footnote to case outline U, TO-257 package as specified under 1.2.3 and figure 1. -rrp | 05-02-04 | R. MONNIN |
| F | For case outline T only, add footnote 1/ under 1.2.3 and make change to note 2 under figure 1. -rrp | 06-01-23 | R. MONNIN |
| G | Update drawing to current MIL-PRF-38535 requirements. -rrp | 15-02-19 | C. SAFFLE |



THE ORIGINAL FIRST SHEET OF THIS DRAWING HAS BEEN REPLACED.

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| REV | | | | | | | | | | | | | | | | | | | | |
| SHEET | | | | | | | | | | | | | | | | | | | | |
| REV | G | G | | | | | | | | | | | | | | | | | | |
| SHEET | 15 | 16 | | | | | | | | | | | | | | | | | | |

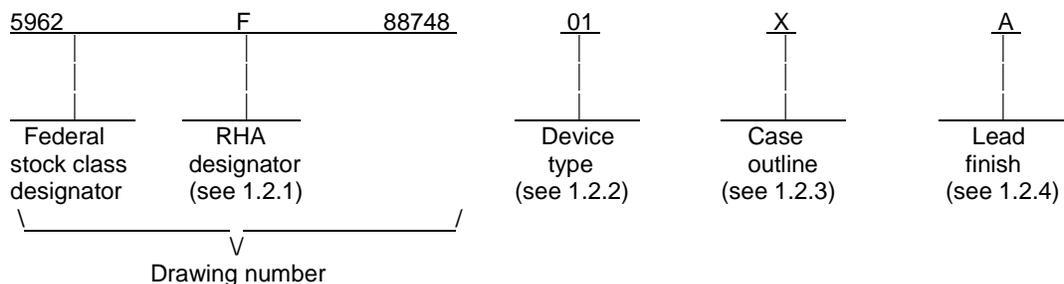
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| REV STATUS | REV | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |
| OF SHEETS | SHEET | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | | |

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|---|-----------------------------------|---|-----------|---------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| PMIC N/A | PREPARED BY JOSEPH A. KERBY | <p align="center">DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 http://www.landandmaritime.dla.mil</p> | | | | | | | | | | | | | | | | | |
| <p align="center">STANDARD MICROCIRCUIT DRAWING</p> <p>THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> <p align="center">AMSC N/A</p> | CHECKED BY CHARLES E. BESORE | | | | | | | | | | | | | | | | | | |
| | APPROVED BY MICHAEL A. FRYE | <p align="center">MICROCIRCUIT, LINEAR, 15 VOLT NEGATIVE REGULATOR FIXED, MONOLITHIC SILICON</p> | | | | | | | | | | | | | | | | | |
| | DRAWING APPROVAL DATE 89-08-24 | | | | | | | | | | | | | | | | | | |
| | REVISION LEVEL G | | SIZE A | CAGE CODE 67268 | 5962-88748 | | | | | | | | | | | | | | |
| | | SHEET 1 OF 16 | | | | | | | | | | | | | | | | | |

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 RHA designator. RHA marked devices shall meet the MIL-PRF-38535 or MIL-PRF-38535, Appendix A specified RHA levels and shall be 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:

| <u>Device type</u> | <u>Generic number</u> | <u>Circuit function</u> |
|--------------------|-----------------------|---|
| 01 | 7912A | 1.0 A negative regulator, fixed 12-volt |

1.2.3 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> |
|-----------------------|-------------------------------|------------------|---|
| M | See figure 1 | 3 | Power surface mount |
| N | CBCC2-N3 | 3 | Bottom terminal chip carrier |
| T ^{1/} | See figure 1 | 3 | TO-257 Single row flange mount with glass seal |
| U ^{1/} | See figure 1 | 3 | TO-257 Single row flange mount and isolated tab with glass seal |
| X | See figure 1 | 3 | TO-39 Can |
| Y | See figure 1 | 2 | TO-3 Flange mount |
| Z | MBFM4-P2 | 2 | TO-66 Flange mount |
| 2 | CQCC1-N20 | 20 | Square leadless chip carrier |
| 4 | See figure 1 | 3 | Flange mount, glass sealed with gull wing leads |
| 5 | CBCC1-N3 | 3 | Bottom terminal chip carrier |

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

^{1/} For outline letters T and U, CAGE 34333 manufacturers the TO-257 package with ceramic seal.

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1.3 Absolute maximum ratings.

Input voltage:

Operating or output shorted to ground -35 V dc
 Transient -50 V dc 2/

Power dissipation (P_D):

T_C = +25°C:

Cases M, N, T, U, Z, 4, and 5 15 W
 Cases X and 2 2 W
 Case Y 20 W

Power dissipation (P_D):

T_A = +25°C:

Cases M, N, T, U, and Z 3.0 W
 Cases X and 2 1.0 W
 Cases Y 3.6 W
 Case 4 1.7 W
 Case 5 1.3 W

Storage temperature range -65°C to +150°C

Lead temperature (soldering, 10 seconds) +300°C

Junction temperature (T_J) +150°C 3/

Thermal resistance, junction-to-case (θ_{JC}):

Case M 5.5°C/W
 Cases N and T 3.5°C/W
 Case U 4.2°C/W
 Case X 15°C/W
 Case Y 3°C/W
 Case Z 6°C/W
 Case 2 See MIL-STD-1835
 Case 4 5.1°C/W
 Case 5 3.6°C/W

Thermal resistance, junction-to-ambient (θ_{JA}):

Cases M, N, T, U, and Z 42°C/W
 Cases X and 2 120°C/W
 Case Y 35°C/W
 Case 4 60°C/W
 Case 5 80°C/W

1.4 Recommended operating conditions.

Input voltage range (V_{IN}) -14.5 V dc to -27 V dc

Ambient operating temperature range (T_A) -55°C to +125°C

1.5 Radiation features:

Maximum total dose available (dose rate = 50 – 300 rads(Si) / s) 300 Krads 4/

2/ The -50 volt input rating refers to the ability of the regulator to withstand high line or transient conditions without damage. Since the regulator's maximum current capability is reduced, the output may fall out of regulation at high input voltages under nominal loading.

3/ The device is protected by a thermal shutdown circuit which is designed to turn off the output transistor whenever the device junction temperature is in excess of +150°C.

4/ These parts may be dose rate sensitive in a space environment and may demonstrate enhanced low dose rate effects. Radiation end point limits for the noted parameters are guaranteed only for the conditions specified in MIL-STD-883, method 1019, condition A.

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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://quicksearch.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein. Product built to this drawing that is produced by a Qualified Manufacturer Listing (QML) certified and qualified manufacturer or a manufacturer who has been granted transitional certification to MIL-PRF-38535 may be processed as QML product in accordance with the 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. This drawing has been modified to allow the manufacturer to use the alternate die/fabrication requirements of paragraph A.3.2.2 of MIL-PRF-38535 or other alternative approved by the qualifying activity.

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 1.2.3 herein and figure 1.

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

3.2.3 Radiation exposure circuit. The radiation exposure circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing and acquiring activity upon request.

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 ambient 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. 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.

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TABLE I. Electrical performance characteristics.

| Test | Symbol | Conditions <u>1/ 2/ 3/</u> -55°C ≤ T _A ≤ +125°C unless otherwise specified | Group A subgroups | Device type | Limits | | Unit | | | | |
|---|---------------------------|---|----------------------|----------------|--|--------|------|--------|--|----|----|
| | | | | | Min | Max | | | | | |
| Output voltage | V _{OUT} | T _A = +25°C | 1 | 01 | -14.85 | -15.15 | V | | | | |
| | | | M,D,P,L,R,F | | 1 | -14.85 | | -15.15 | | | |
| | | V _{IN} = -17.5 V to -30 V <u>4/</u> | 1,2,3 | | -14.55 | -15.45 | | | | | |
| | | | M,D,P,L,R,F | | 1 | -14.55 | | -15.45 | | | |
| | | | | | | | | | | | |
| Line regulation <u>5/ 6/</u> | V _{RLINE} | V _{IN} = -17.5 V to -30 V, -55°C ≤ T _A ≤ +125°C | 1 | 01 | | 20 | mV | | | | |
| | | | 2,3 | | | 50 | | | | | |
| | | | M,D,P,L,R,F | | 1 | | | 20 | | | |
| | | V _{IN} = -20 V to -26 V, -55°C ≤ T _A ≤ +125°C | 1 | | | 15 | | | | | |
| | | | 2,3 | | | 25 | | | | | |
| | | | M,D,P,L,R,F | | 1 | | | 15 | | | |
| | | Load regulation <u>5/</u> | V _{RLOAD} | | I _O = 5.0 mA to 1.5 A, <u>7/</u> -55°C ≤ T _A ≤ +125°C | 1 | | 01 | | 35 | mV |
| | | | | | | 2,3 | | | | 75 | |
| M,D,P,L,R,F | 1 | | | | | 35 | | | | | |
| I _O = 250 mA to 750 mA, <u>7/</u> -55°C ≤ T _A ≤ +125°C | 1 | | | | 21 | | | | | | |
| | 2,3 | | | | 45 | | | | | | |
| | M,D,P,L,R,F | | | 1 | | 21 | | | | | |
| I _O = 5.0 mA to 500 mA, <u>8/</u> -55°C ≤ T _A ≤ +125°C | 1 | | | | 50 | | | | | | |
| | 2,3 | | | | 75 | | | | | | |
| | | | | | | | | | | | |
| Standby current drain | I _{SCD} | | 1 | 01 | | 6.0 | mA | | | | |
| | | | 2,3 | | | 6.5 | | | | | |
| | | | M,D,P,L,R,F | | 1 | | | 6.0 | | | |
| Standby current drain change with line | ΔI _{SCD} line | V _{IN} = -17.5 V to -30 V | 1,2,3 | 01 | | 0.8 | mA | | | | |
| | | | M,D,P,L,R,F | | 1 | | | 0.8 | | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued.

| Test | Symbol | Conditions <u>1/ 2/ 3/</u> -55°C ≤ T _A ≤ +125°C unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|---|---|---|----------------------|----------------|--------|-----|-------------|
| | | | | | Min | Max | |
| Standby current drain change with load | ΔI _{SCD} load | I _O = 5.0 mA to 1000 mA M,D,P,L,R,F | 1,2,3 | 01 | | 0.5 | mA |
| | | | 1 | | | 0.5 | |
| Dropout voltage | V _{DO} | ΔV _{OUT} = 100 mV, <u>7/</u> I _O = 1.0 A M,D,P,L,R,F | 1,2,3 | 01 | | 2.5 | V |
| | | | 1 | | | 2.5 | |
| | | 1,2,3 | | | 2.5 | | |
| Peak output current | I _{O(PK)} | T _A = +25°C <u>7/</u> M,D,P,L,R,F | 1 | 01 | 1.5 | 3.3 | A |
| | | | 1 | | 1.5 | 3.3 | |
| | | T _A = +25°C <u>8/</u> | 1 | | 0.5 | 1.7 | |
| Short circuit current <u>9/</u> | I _{OS} | V _{IN} = -35 V <u>7/</u> M,D,P,L,R,F | 1 | 01 | | 1.2 | A |
| | | | 2,3 | | | 2.8 | |
| | | 1 | | | 1.2 | | |
| | | V _{IN} = -35 V <u>8/</u> | 1 | | | 0.7 | |
| | | | 2,3 | | | 2.0 | |
| Ripple rejection <u>5/</u> | ΔV _{IN} / ΔV _{OUT} | ΔV _{IN} = 10 V, f = 120 Hz M,D,P,L,R,F | 4 | 01 | 53 | | dB |
| | | | 5,6 <u>10/</u> | | 50 | | |
| | | | 4 | | 53 | | |
| Output noise voltage <u>10/</u> | N _O | f = 10 Hz to 100 kHz, T _A = +25°C M,D,P,L,R,F | 7 | 01 | | 40 | μV/V rms |
| | | | 7 | | | 40 | |
| Long term stability <u>10/</u> | ΔV _{OUT} / Δt | T _A = +25°C, t = 1000 hours M,D,P,L,R,F | 7 | 01 | | 150 | mV |
| | | | 7 | | | 150 | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – Continued.

- 1/ Devices supplied to this drawing will meet all levels M, D, P, L, R, F of irradiation. However, this device is only tested at the 'F' level. Pre and Post irradiation values are identical unless otherwise specified in table I. When performing post irradiation electrical measurements for any RHA level, $T_A = +25^\circ\text{C}$.
- 2/ These parts may be dose rate sensitive in a space environment and may demonstrate enhanced low dose rate effects. Radiation end point limits for the noted parameters are guaranteed only for the conditions specified in MIL-STD-883, method 1019, condition A.
- 3/ Unless otherwise specified, $V_{IN} = -23\text{ V}$ and $I_O = 500\text{ mA}$ for cases M, N, T, U, Y, Z, 4, and 5, $V_{IN} = -23\text{ V}$ and $I_O = 100\text{ mA}$ for cases X and 2. Maximum test current for cases X and 2 is 500 mA.
- 4/ For cases X and 2, $I_O = 5\text{ mA}$ to 500 mA , $P \leq 2\text{ W}$. For case Y: $I_O = 5\text{ mA}$ to 1.0 A , $P \leq 20\text{ W}$. For cases M, N, T, U, Z, 4, and 5: $I_O = 5\text{ mA}$ to 1.0 A , $P \leq 15\text{ W}$.
- 5/ All measurements except output noise voltage and ripple rejection are made at constant junction temperature and with low duty cycle.
- 6/ Minimum load current for full line regulation is 5.0 mA.
- 7/ For cases M, N, T, U, Y, Z, 4, and 5 only.
- 8/ For cases X and 2 only.
- 9/ Short circuit protection is only assured up to $V_{IN} = -35\text{ V}$.
- 10/ Guaranteed, if not tested, to the limits specified in table I herein.

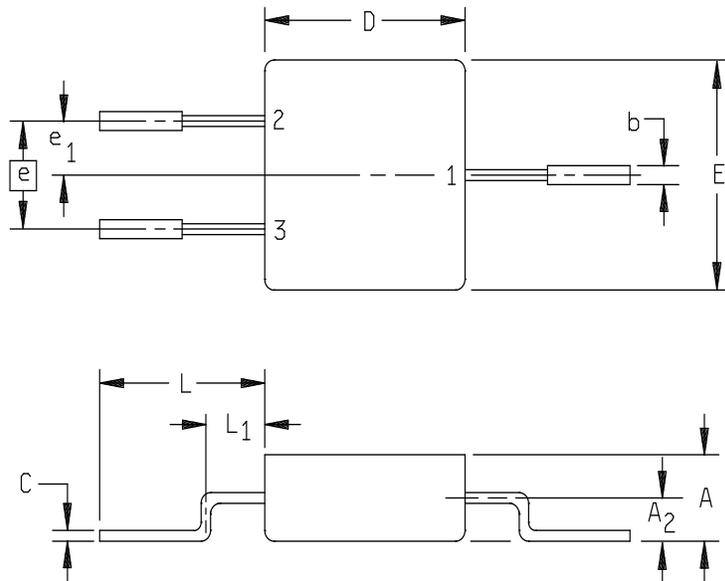
3.5.1 Certification/compliance mark. A compliance indicator "C" shall be marked on all non-JAN devices built in compliance to MIL-PRF-38535, appendix A. The compliance indicator "C" shall be replaced with a "Q" or "QML" certification mark in accordance with MIL-PRF-38535 to identify when the QML flow option is used. For product built in accordance with A.3.2.2 of MIL-PRF-38535, or as modified in the manufacturer's QM plan, the "QD" certification mark shall be used in place of the "Q" or "QML" certification mark.

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 DLA Land and Maritime -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.

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Case outline M



| Symbol | Inches | | Millimeters | |
|----------------|----------|------|-------------|------|
| | Min | Max | Min | Max |
| A | .160 | --- | 4.06 | --- |
| A ₂ | .080 | --- | 2.03 | --- |
| b | --- | .035 | --- | 0.89 |
| C | .020 | --- | 0.51 | --- |
| D | --- | .425 | --- | 10.8 |
| E | --- | .425 | --- | 10.8 |
| e | .200 BSC | | 5.08 BSC | |
| e ₁ | .100 BSC | | 2.54 BSC | |
| L | .350 | --- | 8.89 | --- |
| L ₁ | --- | .135 | --- | 3.43 |

NOTES:

1. The U.S. government preferred system of measurement is the metric SI system. However, since this item was originally designed using inch-pound units of measurement, in the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.
2. Three leads.

FIGURE 1. Case outline.

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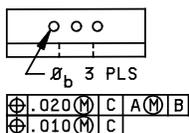
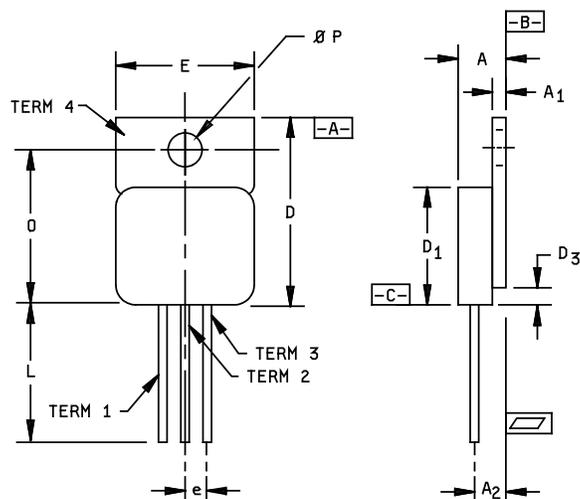
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Case outlines T and U



| Letter | Inches | | Millimeters | |
|--------|----------|------|-------------|-------|
| | Min | Max | Min | Max |
| A | .190 | .200 | 4.83 | 5.08 |
| A1 | .035 | .045 | 0.89 | 1.14 |
| A2 | .120 BSC | | 3.05 BSC | |
| phi b | .025 | .035 | 0.64 | 0.89 |
| D | .645 | .665 | 16.38 | 16.89 |
| D1 | .410 | .430 | 10.41 | 10.92 |
| D3 | .000 | .065 | 0.00 | 1.65 |
| e | .100 BSC | | 2.54 BSC | |
| E | .410 | .422 | 10.41 | 10.71 |
| L | .500 | .750 | 12.70 | 19.05 |
| O | .527 | .537 | 13.39 | 16.64 |
| phi P | .140 | .150 | 3.56 | 3.81 |

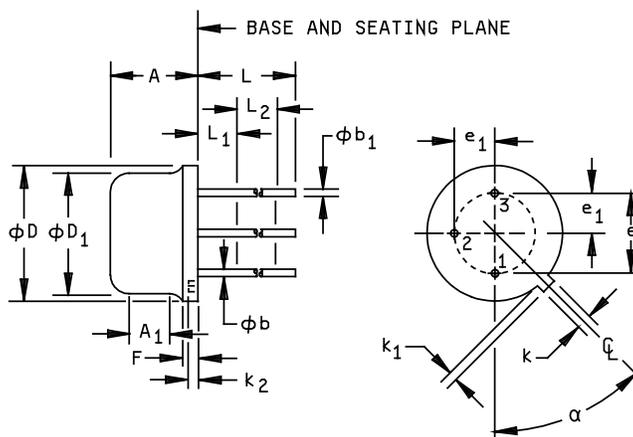
NOTES:

1. The U.S. government preferred system of measurement is the metric SI system. However, since this item was originally designed using inch-pound units of measurement, in the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.
2. For case outlines T and U only, CAGE 34333, the ceramic seal that protrudes from the seating plane is not to be considered in overall package dimensions. The ceramic seal protrusion is considered uncontrolled within an area 30 mils from the seating plane.

FIGURE 1. Case outline – Continued.

| | | | |
|--|------------------|----------------------------|-------------------|
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Case outline X



| Symbol | Inches | | Millimeters | | Notes |
|----------------|----------|------|-------------|------|-------|
| | Min | Max | Min | Max | |
| A | .165 | .185 | 4.19 | 4.70 | |
| A ₁ | --- | .100 | --- | 2.54 | |
| ϕb | .016 | .019 | 0.41 | 0.48 | 2 |
| ϕb_1 | .016 | .021 | 0.41 | 0.53 | 2 |
| ϕD | .335 | .370 | 8.51 | 9.40 | |
| ϕD_1 | .305 | .335 | 7.75 | 8.51 | |
| e | .200 BSC | | 5.08 BSC | | 4 |
| e ₁ | .100 BSC | | 2.54 BSC | | 4 |
| F | --- | .050 | --- | 1.27 | |
| k | .028 | .034 | 0.71 | 0.86 | |
| k ₁ | .029 | .045 | 0.74 | 1.14 | 3 |
| k ₂ | .009 | .041 | 0.23 | 1.04 | |
| L | .500 | --- | 12.70 | --- | |
| L ₁ | --- | .050 | --- | 1.27 | |
| L ₂ | .250 | --- | 6.35 | --- | |
| α | 45° T.P. | | 45° T.P. | | 4 |

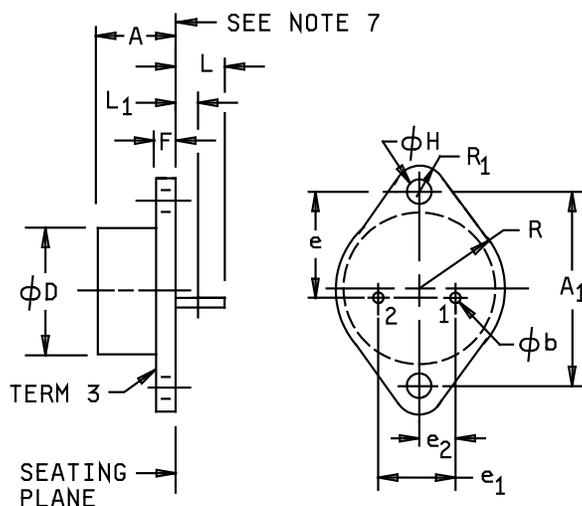
NOTES:

1. Dimensions shall be measured in inches. Metric equivalents are given for general information only.
2. (All leads) ϕb applies between L_1 and L_2 . ϕb_1 applies between the L_2 and .500 inch (12.70 mm) from the reference plane. Diameter is uncontrolled in L_1 and beyond .500 inch (12.70 mm) from the reference plane.
3. Measured from the maximum diameter of the product.
4. Leads having a maximum diameter of .019 inch (0.48 mm) measured in gauging plane .054 inch (1.37 mm) + .001 inch (0.03 mm) - .000 inch (0.00 mm) below the base plane of the product shall be within .007 inch (0.18 mm) of their true position relative to a maximum width tab.
5. The U.S. government preferred system of measurement is the metric SI system. However, since this item was originally designed using inch-pound units of measurement, in the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.

FIGURE 1. Case outline – Continued.

| | | | |
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Case outline Y



| Symbol | Inches | | Millimeters | | Notes |
|----------------|--------|-------|-------------|-------|-------|
| | Min | Max | Min | Max | |
| A | .250 | .450 | 6.35 | 11.43 | |
| A ₁ | 1.177 | 1.197 | 29.90 | 30.40 | |
| phi b | .038 | .043 | .97 | 1.09 | 3,7 |
| phi D | --- | .875 | --- | 22.22 | |
| e | .655 | .675 | 16.64 | 17.14 | 5 |
| e ₁ | .420 | .440 | 10.67 | 11.16 | 5 |
| e ₂ | .205 | .225 | 5.21 | 5.72 | |
| F | .060 | .135 | 1.52 | 3.43 | |
| phi H | .151 | .161 | 3.84 | 4.09 | 5,6 |
| L | .312 | .500 | 7.92 | 12.70 | 4 |
| L ₁ | --- | .050 | --- | 1.27 | 3,4 |
| R | .495 | .595 | 12.57 | 15.11 | |
| R ₁ | .131 | .188 | 3.33 | 4.78 | |

NOTES:

1. Dimensions shall be measured in inches.
2. Metric equivalents are given for general information only.
3. phi b applies between L₁ (all leads) and .500 inch (12.70 mm) from the seating plane.
4. Two leads.
5. Two holes.
6. Leads having a maximum diameter of .043 inch (1.09 mm) measured in gauging plane .054 inch (1.37 mm) + .001 inch (0.03 mm) - .000 inch (0.00 mm) below the base plane shall be located at true position within diameter .014 inch (0.36 mm).
7. The mounting surface of the header shall be flat to convex within .003 inch (0.08 mm) inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat to convex within .006 inch (0.15 mm) overall.
8. The U.S. government preferred system of measurement is the metric SI system. However, since this item was originally designed using inch-pound units of measurement, in the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.

FIGURE 1. Case outline – Continued.

**STANDARD
MICROCIRCUIT DRAWING**
DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990

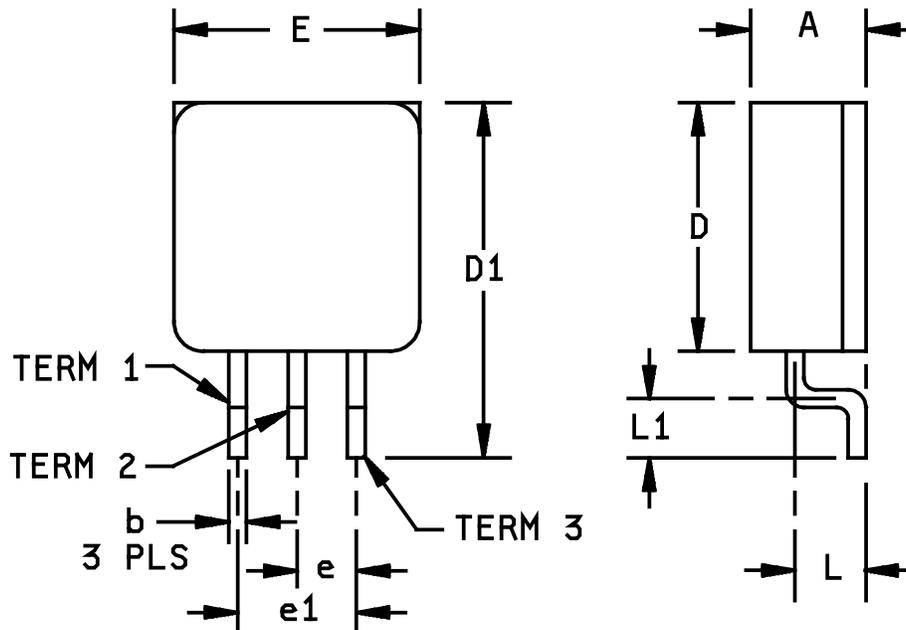
SIZE
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Case outline 4



| Symbol | Inches | | Millimeters | |
|--------|--------|------|-------------|-------|
| | Min | Max | Min | Max |
| A | .190 | .210 | 4.83 | 5.33 |
| b | --- | .030 | --- | 0.76 |
| D | .410 | .430 | 10.41 | 10.92 |
| D1 | .580 | .610 | 14.73 | 15.49 |
| e | --- | .100 | --- | 2.54 |
| e1 | --- | .200 | --- | 5.08 |
| E | .410 | .420 | 10.41 | 10.67 |
| L1 | .090 | .110 | 2.29 | 2.79 |
| L | .115 | .125 | 2.92 | 3.18 |
| N | 3 | | 3 | |

NOTE:

The U.S. government preferred system of measurement is the metric SI system. However, since this item was originally designed using inch-pound units of measurement, in the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.

FIGURE 1. Case outline – Continued.

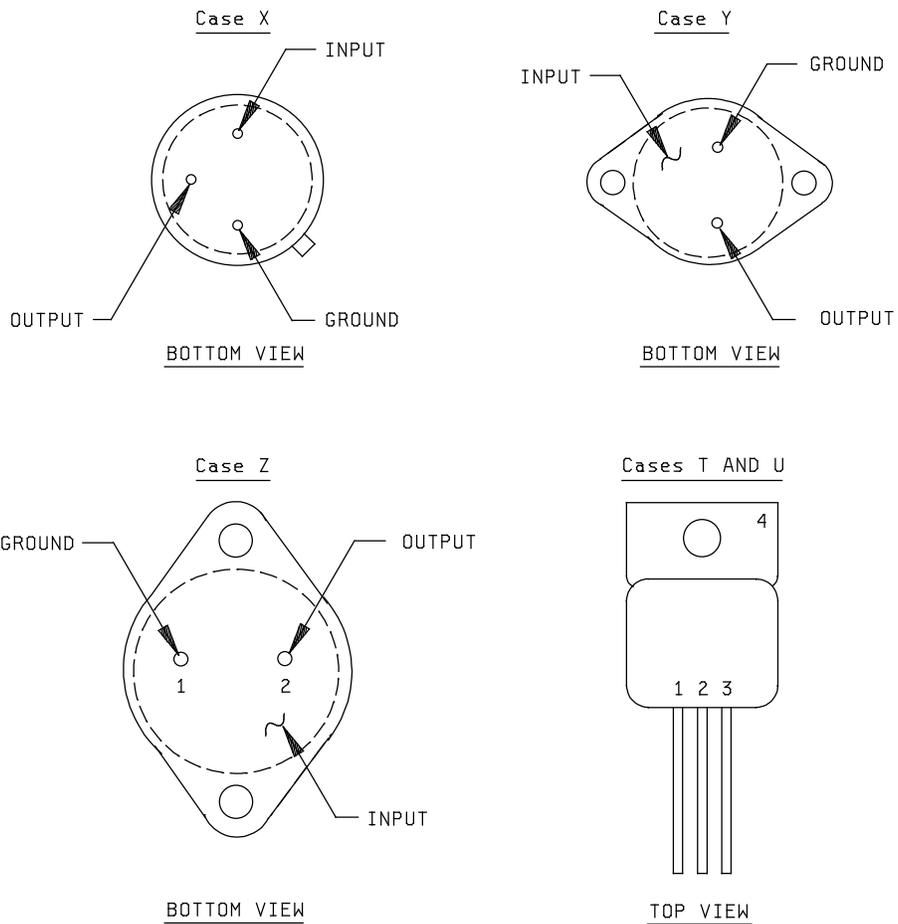
**STANDARD
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NOTE: Case is connected to ground.

FIGURE 2. Terminal connections.

| | | | |
|--|------------------|----------------------------|--------------------|
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| | | | | | |
|-----------------|-----------------|--------|--------|--------|--------|
| Device type | 01 | | | | |
| Case outlines | M | N | T | U | 2 |
| Terminal number | Terminal symbol | | | | |
| 1 | OUTPUT | OUTPUT | GROUND | GROUND | NC |
| 2 | ADJUST | GROUND | INPUT | INPUT | INPUT |
| 3 | INPUT | INPUT | OUTPUT | OUTPUT | NC |
| 4 | ISOLATED (CASE) | --- | INPUT | NC | OUTPUT |
| 5 | --- | --- | --- | --- | OUTPUT |
| 6 | --- | --- | --- | --- | NC |
| 7 | --- | --- | --- | --- | OUTPUT |
| 8 | --- | --- | --- | --- | NC |
| 9 | --- | --- | --- | --- | NC |
| 10 | --- | --- | --- | --- | NC |
| 11 | --- | --- | --- | --- | NC |
| 12 | --- | --- | --- | --- | NC |
| 13 | --- | --- | --- | --- | NC |
| 14 | --- | --- | --- | --- | NC |
| 15 | --- | --- | --- | --- | GROUND |
| 16 | --- | --- | --- | --- | NC |
| 17 | --- | --- | --- | --- | GROUND |
| 18 | --- | --- | --- | --- | NC |
| 19 | --- | --- | --- | --- | NC |
| 20 | --- | --- | --- | --- | INPUT |

NC = No connection

| | | |
|-----------------|-----------------|--------|
| Device type | 01 | |
| Case outlines | 4 | 5 |
| Terminal number | Terminal symbol | |
| 1 | GROUND | OUTPUT |
| 2 | INPUT | GROUND |
| 3 | OUTPUT | INPUT |

FIGURE 2. Terminal connections – Continued.

| | | | |
|--|------------------|----------------------------|--------------------|
| STANDARD MICROCIRCUIT DRAWING DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 | SIZE A | | 5962-88748 |
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3.8 Notification of change. Notification of change to DLA Land and Maritime -VA shall be required for any change that affects this drawing.

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

4. VERIFICATION

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

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

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

(1) Test condition 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.

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 8, 9, 10 and 11 in table I, method 5005 of MIL-STD-883 shall be omitted.

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.

4.3.3 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein). RHA levels shall be as specified in MIL-PRF-38535 or MIL-PRF-38535, Appendix A. End-point parameters shall be as specified in table II herein.

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

| | | | |
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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) | 1 |
| Final electrical test parameters (method 5004) | 1*, 2, 3, 4 |
| Group A test requirements (method 5005) | 1, 2, 3, 4, 5**, 6**, 7** |
| Groups C and D end-point electrical parameters (method 5005) | 1 |
| Group E end-point electrical parameters (method 5005) | 1, 4, 7 |

* PDA applies to subgroup 1.

** Subgroups 5, 6, and 7, if not tested, shall be guaranteed to the limits specified in table I.

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 DLA Land and Maritime when a system application requires configuration control and the applicable SMD to that system. DLA Land and Maritime 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 DLA Land and Maritime -VA, telephone (614) 692-8108.

6.5 Comments. Comments on this drawing should be directed to DLA Land and Maritime -VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0540.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-HDBK-103 and QML-38535. The vendors listed in MIL-HDBK-103 and QML-38535 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DLA Land and Maritime -VA.

| | | | |
|--|------------------|----------------------------|--------------------|
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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 15-02-19

Approved sources of supply for SMD 5962-88748 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 DLA Land and Maritime -VA. This information bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535. DLA Land and Maritime maintains an online database of all current sources of supply at <http://www.landandmaritime.dla.mil/Programs/Smcr/>.

| Standard microcircuit drawing PIN <u>1</u> / | Vendor CAGE number | Vendor similar PIN <u>2</u> / |
|--|--------------------|-------------------------------|
| 5962-8874801MA | <u>3</u> / | OM1915SM/883B |
| 5962-8874801NA | <u>3</u> / | OM1915NM/883B |
| 5962-8874801TA | U3158 | IP7915AG-DESC |
| | <u>3</u> / | OM7915AH/883B |
| | <u>3</u> / | SDP7915ATMD |
| | 34333 | SG7915AG/883B |
| 5962-8874801UA | U3158 | IP7915AIG-DESC |
| | <u>3</u> / | FM915S7 |
| | 34333 | SG7915AIG/883B |
| | <u>3</u> / | OM7915AIH/883B |
| | <u>3</u> / | SDP7915AUMD |
| 5962F8874801UA | <u>3</u> / | OMR1915STM/883B |
| 5962-8874801XA | U3158 | IP79M15AH-DESC |
| | 34333 | SG7915AT/883B |
| 5962-8874801YA | U3158 | IP7915AK-DESC |
| | 34333 | SG7915AK/883B |
| | <u>3</u> / | OM1915NK/883B |
| 5962-8874801ZA | U3158 | IP7915AR-DESC |
| | 34333 | SG7915AR/883B |
| | <u>3</u> / | SDP7915AZMD |

STANDARD MICROCIRCUIT DRAWING BULLETIN – CONTINUED

DATE: 15-02-19

| Standard microcircuit drawing PIN <u>1/</u> | Vendor CAGE number | Vendor similar PIN <u>2/</u> |
|--|--------------------------|------------------------------------|
| 5962-88748012A | 34333 | SG7915AL/883B |
| | <u>3/</u> | OM1915N2/883B |
| | <u>3/</u> | SDP7915A2MD |
| 5962-88748014A | <u>3/</u> | OM1915SRM/883B |
| 5962-88748015A | <u>3/</u> | OM1915N5M/883B |

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

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

3/ Not available from an approved source of supply.

Vendor CAGE
number

Vendor name
and address

U3158

Semelab PLC
Coventry Road, Lutterworth
Leicestershire LE174JB
United Kingdom

34333

Microsemi Analog Mixed Signal Group
11861 Western Avenue
Garden Grove, CA 92841-2119

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