

| REVISION RECORD |  |          |
|-----------------|--|----------|
| REV             | DESCRIPTION  | DATE     |
| 0               | INITIAL RELEASE  | 07/14/99 |
| A               | PAGE 10, FIGURE 5, CHANGED $\theta_{jc}$ .   | 11/17/99 |
| B               | PAGE 3, PARAGRAPH 3.8 CHANGED VERBIAGE ADDED "HEREIN" AFTER TABLE 1.<br>PAGE 4, PARAGRAPH 5.0 CHANGED VERBIAGE ADDED "HEREIN" AFTER TABLE 3.<br>PARAGRAPH 5.2 ADDED "HEREIN" AFTER TABLE 2.<br>PAGE 5, PARAGRAPH 6.2, 6.3 CHANGED VERBIAGE ADDED "HEREIN" AFTER TABLE 3.   | 12/13/99 |
| C               | <ul style="list-style-type: none"> <li>PAGE 3, PARAGRAPH 3.7.1, CHANGED THE DOSAGE RATE FROM "APPROXIMATELY 20 RADS PER SECOND" TO "LESS THAN OR EQUAL TO 10 RADS PER SECOND".</li> <li>PAGE 4, PARAGRAPH 6.1 CHANGED QUALITY ASSURANCE PROVISIONS TO STATE THAT LTC IS QML CERTIFIED AND THAT RAD HARD CANDIDATES ARE ASSEMBLED ON QUALIFIED ON CLASS S MANUFACTURING LINES.</li> <li>PAGES 6 THROUGH 12, ALL FIGURE TITLES CHANGED TO HAVE DEVICE OPTIONS AND PACKAGE TYPES AT TOP OF PAGE, AND HAVE ALL FIGURES AT BOTTOM OF PAGE.</li> <li>CONVERSION OF SPECIFICATION FROM WORD PERFECT TO MICROSOFT WORD.</li> <li>BURN-IN VOLTAGES CHANGED FROM V1 OF [+20V TO +22V] TO V1 OF [+15V TO +16.5V]; FROM V2 OF [-20V TO -22V] TO [-15V TO -16.5V] FOR BOTH OPTIONS.</li> <li>CHANGE <math>\theta_{jc}</math> ON FIGURE 5 FROM 15°C/W TO 40°C/W.</li> <li>TABLE I AND TABLE II CONDITIONS FOR <math>[V_{IN} - V_{OUT}]</math> CHANGED FROM <math>\leq 40V</math> TO <math>\leq 30V</math>.</li> <li>MAXIMUM IRRADIATION TOLERANCE IS 100K RADS.</li> </ul> | 11/08/02 |
| D               | <ul style="list-style-type: none"> <li>PAGE 3, CHANGED INITIAL RATE OF RADS TO 240 RADS/SEC.</li> </ul>  | 03/22/05 |

(CONTINUED ON NEXT PAGE)

**CAUTION: ELECTROSTATIC DISCHARGE SENSITIVE PART**

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|             |          |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
|             | ORIG     |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
|             | DSGN     |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
|             | ENGR     |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
|             | MFG      |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
|             | CM       |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
|             | QA       |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
|             | PROG     |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
| APPLICATION | FUNCT    |   |   |          |   |   |   |      |           |      |           |                |     |    |    |    |    |
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|             |          |   |   |          |   |   |   |      | CONTRACT: |      |           |                |     |    |    |    |    |
|             |          |   |   |          |   |   |   |      |           | SIZE | CAGE CODE | DRAWING NUMBER | REV |    |    |    |    |
|             |          |   |   |          |   |   |   |      |           |      | 64155     | 05-08-5113     | G   |    |    |    |    |

**LINEAR TECHNOLOGY CORPORATION**  
**MILPITAS, CALIFORNIA**  
 TITLE: **MICROCIRCUIT, LINEAR, RH137H AND RH137K NEGATIVE ADJUSTABLE REGULATOR DICE**

FOR OFFICIAL USE ONLY

| REVISION RECORD |  |                 |
|-----------------|--|-----------------|
| REV             | DESCRIPTION  | DATE            |
| E               | <ul style="list-style-type: none"><li>• PAGE 4, PARAGRAPH 3.7.1 CHANGED VERBIAGE.</li><li>• PAGE 5, PARAGRAPH 5.8 CHANGED “ALLOY 42” TO “ALLOY 52” FOR TO3 PACKAGE.</li><li>• PAGE 14,15 CHANGED DATASHEET TO INCLUDE 200K RADS @ (POST-IRRADIATION)</li></ul> | 05/01/08        |
| F               | <ul style="list-style-type: none"><li>• PAGE 16, CHANGED RH CANNED SAMPLE TABLE III FOR QUALIFYING DICE SALES<br/>ADDED TEMPERATURE CYCLE, CONSTANT ACCELERATION &amp; REMOVED PIND TEST.</li></ul>  | 02/17/09        |
| <b>G</b>        | <b>ADDED IDENTIFER #4 ON DIE PHOTO BOND PAD AND ADDED TEST TO PAD FUNCTION<br/>DESCRIBING PAD 4 AS “OUTPUT SENSE”.</b>   | <b>01/17/12</b> |

## 1.0 SCOPE:

- 1.1 This specification defines the performance and test requirements for a microcircuit processed to a space level manufacturing flow.

## 2.0 APPLICABLE DOCUMENTS:

- 2.1 Government Specifications and Standards: the following documents listed in the Department of Defense Index of Specifications and Standards, of the issue in effect on the date of solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS:

|               |  |
|---------------|--|
| MIL-PRF-38535 | Integrated Circuits (Microcircuits) Manufacturing, General Specification for |
| MIL-STD-883   | Test Method and Procedures for Microcircuits                                 |
| MIL-STD-1835  | Microcircuits Case Outlines  |

- 2.2 Order of Precedence: In the event of a conflict between the documents referenced herein and the contents of this specification, the order of precedence shall be this specification, MIL-PRF-38535 and other referenced specifications.

## 3.0 REQUIREMENTS:

- 3.1 General Description: This specification details the requirements for the RH137, Negative Adjustable Regulator Dice and Element Evaluation Test Samples, processed to space level manufacturing flow as specified herein.

3.2 Part Number:

3.2.1 OPTION 1 – RH137H DICE

3.2.2 OPTION 2 – RH137K DICE

- 3.3 **Special Handling of Dice**: Rad Hard dice require special handling as compared to standard IC dice. Rad Hard dice are susceptible to surface damage due to the absence of silicon nitride passivation as on standard dice. Silicon nitride protects the dice surface from scratches by its hard and dense properties. The passivation on Rad Hard dice is silicon dioxide which is much “softer” than silicon nitride.

LTC recommends that dice handling be performed with extreme care so as to protect the dice surface from scratches. If the need arises to move the die around from the chip tray, use a Teflon tipped vacuum wand. This wand can be made by pushing a small diameter of Teflon tubing onto the tip of a steel tipped wand. The inside diameter of the Teflon tip should match the dice size for efficient pickup. The tip of the Teflon should be cut square and flat to ensure good vacuum to dice surface. Ensure the Teflon tip remains clean from debris by inspecting under stereo scope.

During die attach, care must be exercised to ensure no tweezers touch the top of the dice.

3.4 The Absolute Maximum Ratings:

|  |                    |
|--|--------------------|
| Power Dissipation . . . . .                    | Internally Limited |
| Input-Output Voltage Differential . . . . .    | 30V                |
| Operating Junction Temperature Range . . . . . | -55°C to 150°C     |
| Storage Temperature Range . . . . .            | -65°C to 150°C     |
| Lead Temperature (Soldering, 10 sec) . . . . . | 300°C              |

3.5 Design, Construction, and Physical Dimensions: Detail design, construction, physical dimensions, and electrical requirements shall be specified herein.

3.6 Outline Dimensions and Pad Functions: Dice outline dimensions, pad functions, and locations shall be specified in **Figure 1**.

3.7 Radiation Hardness Assurance (RHA):

3.7.1 The manufacturer shall perform a lot sample test as an internal process monitor for total dose radiation tolerance. The sample test is performed with MIL-STD-883 TM1019 Condition A as a guideline.

3.7.2 For guaranteed radiation performance to MIL-STD-883, Method 1019, total dose irradiation, the manufacturer will provide certified RAD testing and report through an independent test laboratory when required as a customer purchase order line item.

3.7.3 Total dose bias circuit is specified in **Figure 2**.

3.8 Wafer (or Dice) Probe: Dice shall be 100% probed at Ta = +25°C to the limits shown in **Table I** herein. All reject dice shall be removed from the lot. This testing is normally performed prior to dicing the wafer into chips. Final specifications after assembly are sample tested during the element evaluation.

3.9 Wafer Lot Acceptance: Wafer lot acceptance shall be in accordance with MIL-PRF-38535, Appendix A, except for the following: Top side glassivation thickness shall be a **minimum of 4KÅ**.

3.10 Wafer Lot Acceptance Report: SEM is performed per MIL-STD-883, Method 2018. Copies of SEM photographs shall be supplied with the Wafer Lot Acceptance Report as part of a Space Data Pack when specified as a customer purchase order line item.

3.11 Traceability: Wafer Diffusion Lot and Wafer traceability shall be maintained through Quality Conformance Inspection.

4.0 **QUALITY CONFORMANCE INSPECTION:** Quality Conformance Inspection shall consist of the tests and inspections specified herein.

5.0 **SAMPLE ELEMENT EVALUATION:** A sample from **each wafer supplying dice** shall be assembled and subjected to element evaluation per **Table III** herein.

5.1 100 Percent Visual Inspection: All dice supplied to this specification shall be inspected in accordance with MIL-STD-883, Method 2010, Condition A. All reject dice shall be removed from the lot.

5.2 Electrical Performance Characteristics for Element Evaluation: The electrical performance characteristics shall be as specified in **Table I** and **Table II** herein.

- 5.3 Sample Testing: Each wafer supplying dice for delivery to this specification shall be subjected to element evaluation sample testing. No dice shall be delivered until all the lot sample testing has been performed and the results found to be acceptable unless the customer supplies a written approval for shipment prior to completion of wafer qualification as specified in this specification.
- 5.4 Part Marking of Element Evaluation Sample Includes:
- 5.4.1 LTC Logo
  - 5.4.2 LTC Part Number
  - 5.4.3 Date Code
  - 5.4.4 Serial Number
  - 5.4.5 ESD Identifier per MIL-PRF-38535, Appendix A
  - 5.4.6 Diffusion Lot Number
  - 5.4.7 Wafer Number
- 5.5 Burn-In Requirement: Burn-In circuit for TO39 package is specified in **Figure 3** and Burn-In circuit for TO3 package is specified in **Figure 4**.
- 5.6 Mechanical/Packaging Requirements: Case Outline and Dimensions are in accordance with **Figure 5** and **Figure 6**.
- 5.7 Terminal Connections: The terminal connections shall be as specified in **Figure 7** and **Figure 8**.
- 5.8 Lead Material and Finish: The lead material and finish shall be Kovar for device option 1 and Alloy 52 for device option 2, with hot solder dip (Finish letter A) in accordance with MIL-PRF-38535.
- 6.0 VERIFICATION (QUALITY ASSURANCE PROVISIONS)
- 6.1 Quality Assurance Provisions: Quality Assurance provisions shall be in accordance with MIL-PRF-38535. Linear Technology is a QML certified company and all Rad Hard candidates are assembled on qualified Class S manufacturing lines.
- 6.2 Sampling and Inspection: Sampling and Inspection shall be in accordance with **Table III** herein.
- 6.3 Screening: Screening requirements shall be in accordance with **Table III** herein.
- 6.4 Source Inspection:
- 6.4.1 The manufacturer will coordinate Source Inspection at wafer lot acceptance and pre-seal internal visual.
  - 6.4.2 The procuring activity has the right to perform source inspection at the supplier's facility prior to shipment for each lot of deliverables when specified as a customer purchase order line item. This may include wafer lot acceptance, die visual, and final data review.

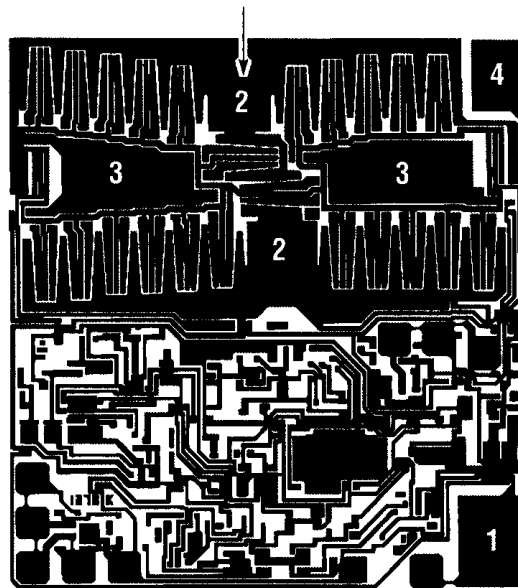
- 6.5 Deliverable Data: Deliverable data that will ship with devices when a Space Data Pack is ordered:
- 6.5.1 Lot Serial Number Sheets identifying all Canned Sample devices accepted through final inspection by serial number.
  - 6.5.2 100% attributes (completed element evaluation traveler).
  - 6.5.3 Element Evaluation variables data, including Burn-In and Op Life
  - 6.5.4 SEM photographs (3.10 herein)
  - 6.5.5 Wafer Lot Acceptance Report (3.9 herein)
  - 6.5.6 A copy of outside test laboratory radiation report if ordered
  - 6.5.7 Certificate of Conformance certifying that the devices meet all the requirements of this specification and have successfully completed the mandatory tests and inspections herein.

Note: Items 6.5.1 and 6.5.7 will be delivered as a minimum, with each shipment.

- 7.0 Packaging Requirements: Packaging shall be in accordance with Appendix A of MIL-PRF-38535. All dice shall be packaged in multicavity containers composed of conductive, anti-static, or static dissipative material with an external conductive field shielding barrier.

**DICE OUTLINE DIMENSIONS AND PAD FUNCTIONS**  
**OPTION 1, RH137H DICE AND OPTION 2, RH137K DICE**

This pad is NO CONNECT  
on H Package



**PAD FUNCTION**

- 1. ADJUST
- 2. OUTPUT
- 3. INPUT
- 4. OUTPUT SENSE  
(CONNECT TO OUTPUT)

85mils × 89mils

**FIGURE 1**

TOTAL DOSE BIAS CIRCUIT

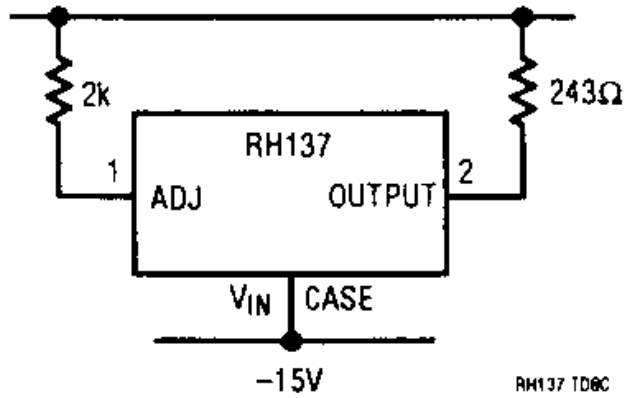
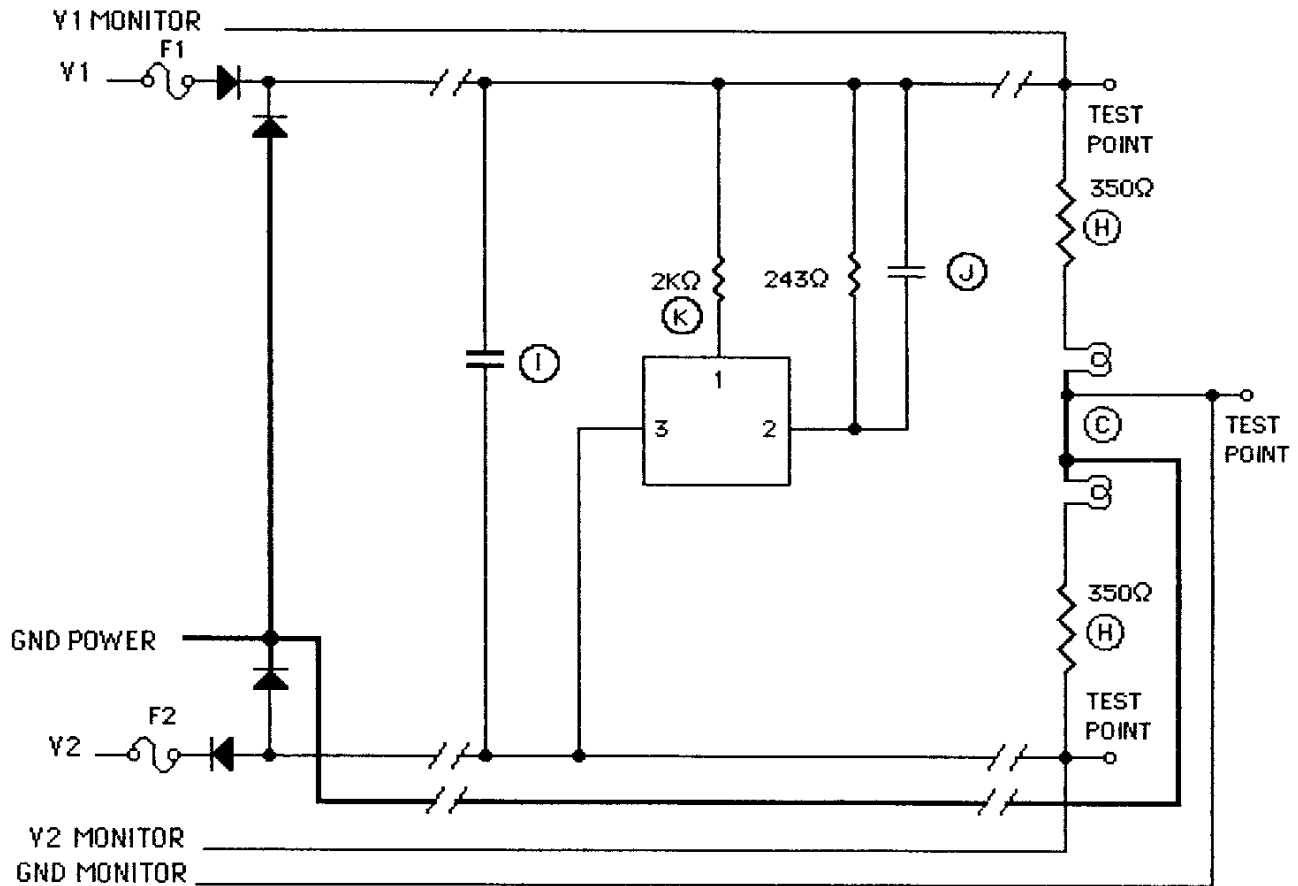


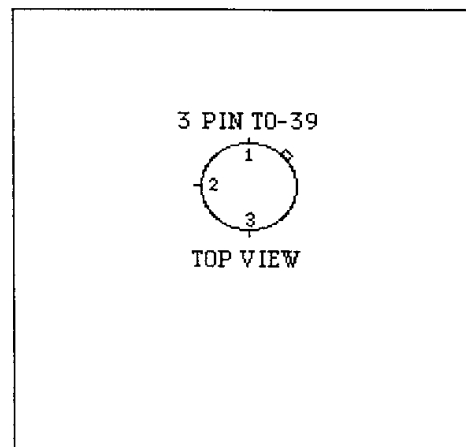
FIGURE 2

**TO39 STATIC BURN-IN CIRCUIT  
OPTION 1, T039 METAL CAN / 3 LEADS**



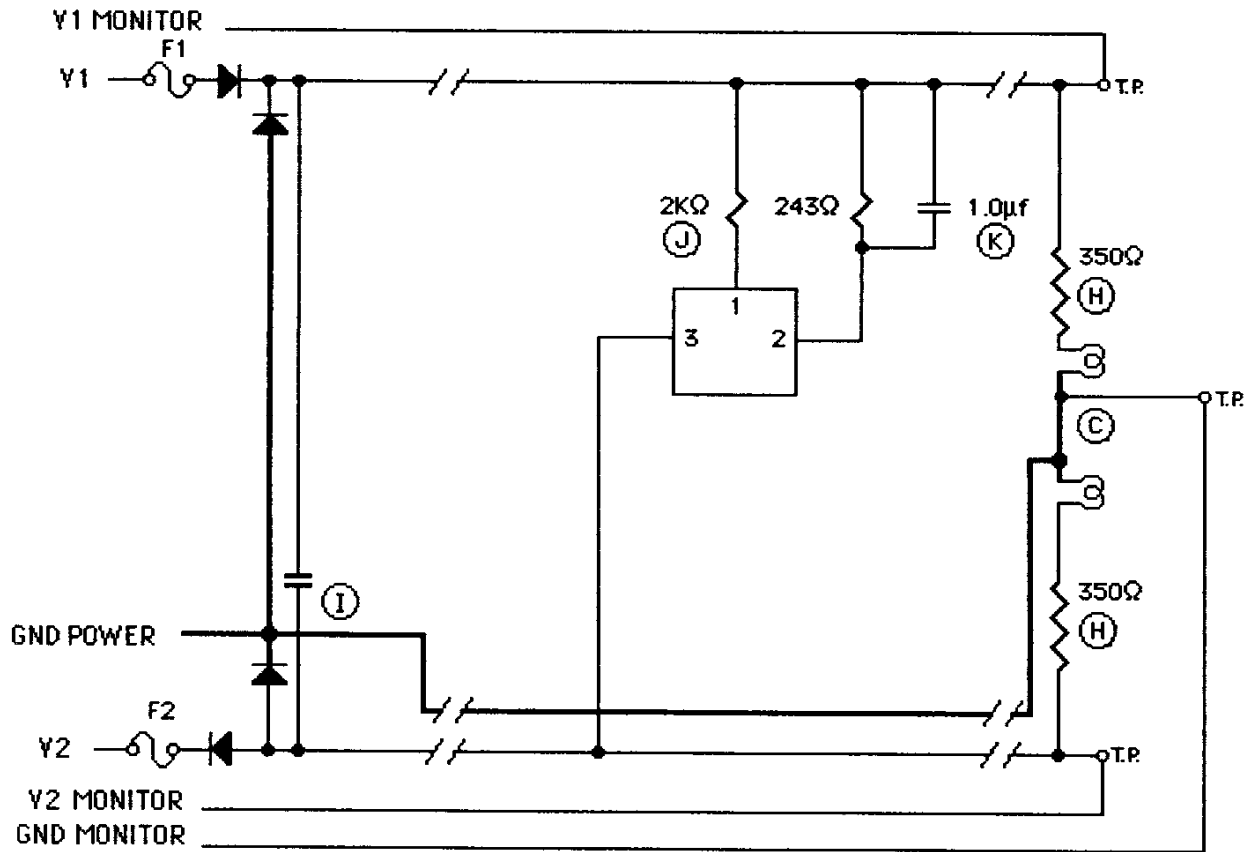
NOTES:

1. Unless otherwise specified, component tolerances shall be per military specification.
2.  $T_j = +170^\circ \text{C}$  maximum.
3.  $T_a = +150^\circ \text{C}$ .
4. Burn-in Voltages:  $V_1 = +15\text{V to } +16.5\text{V}$   
 $V_2 = -15\text{V to } -16.5\text{V}$
5. USE ALL OTHER INFORMATION ON # 04-06-0010



**FIGURE 3**

**STATIC BURN-IN CIRCUIT  
OPTION #2, TO3 / 2 LEADS**



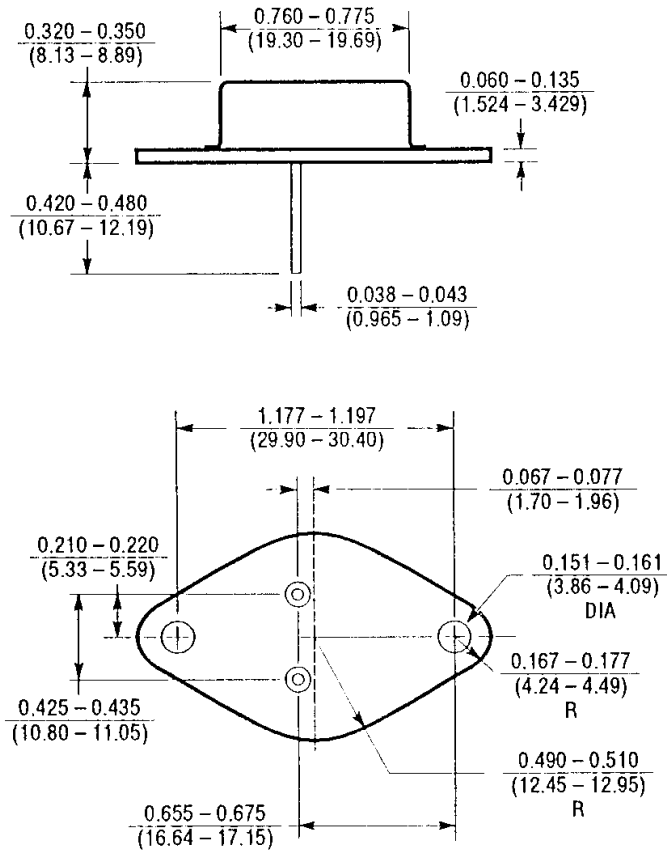
NOTES:

1. Unless otherwise specified, component tolerances shall be per military specification.
2.  $T_j = +161^\circ\text{C}$  maximum.
3.  $T_a = +150^\circ\text{C}$ .
4. Burn-in Voltages:  $V_1 = +15\text{V}$  to  $+16.5\text{V}$   
 $V_2 = -15\text{V}$  to  $-16.5\text{V}$
5. USE ALL OTHER INFORMATION ON # 04-06-0008

**FIGURE 4**



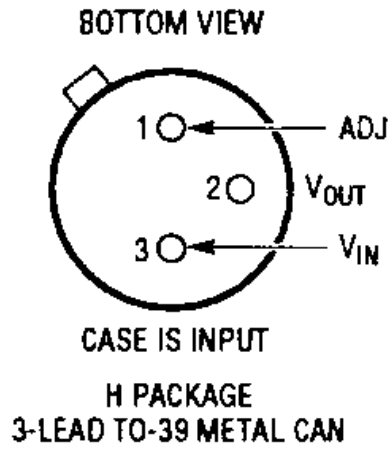
**DEVICE OPTION # 2**  
**(K) TO3 METAL CAN / 2 LEADS CASE OUTLINE**



$\theta_{ja} = +35^{\circ}\text{C/W}$   
 $\theta_{jc} = +3^{\circ}\text{C/W}$

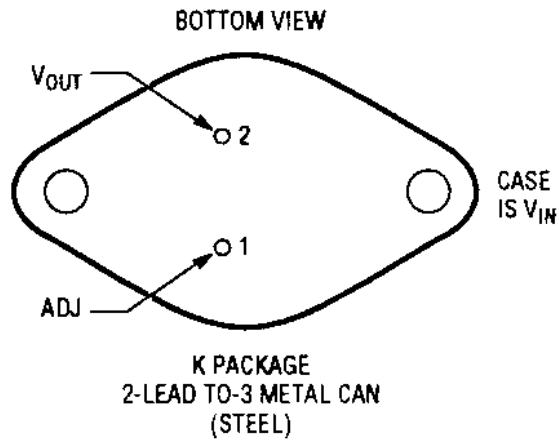
**FIGURE 6**

**TERMINAL CONNECTIONS**  
**DEVICE OPTION #1, TO39 / 3 LEAD METAL CAN**



**FIGURE 7**

**DEVICE OPTION #2, TO3 / 2 LEAD METAL CAN**



**FIGURE 8**

**TABLE I DICE ELECTRICAL CHARACTERISTICS – Element Evaluation (Note 1)**

| SYMBOL                                  | PARAMETER                 | CONDITIONS  | T <sub>A</sub> = 25°C  |                  | UNITS    |
|---|---------------------------|---|------------------------|------------------|----------|
|   |                           |   | MIN                    | MAX              |          |
| V <sub>REF</sub>                        | Reference Voltage         | V <sub>IN</sub> - V <sub>OUT</sub>   = 5V, I <sub>OUT</sub> = 10mA<br>3V ≤  V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 30V, 10mA ≤ I <sub>OUT</sub> ≤ 200mA<br>P ≤ P <sub>MAX</sub> | -1.225<br>-1.200       | -1.275<br>-1.300 | V<br>V   |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN}}$  | Line Regulation           | 3V ≤  V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 30V  |                        | 0.02             | %/V      |
| $\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$ | Load Regulation           | 10mA ≤ I <sub>OUT</sub> ≤ I <sub>MAX</sub> ,  V <sub>OUT</sub>   ≤ 5V (Note 2)<br>10mA ≤ I <sub>OUT</sub> ≤ I <sub>MAX</sub> ,  V <sub>OUT</sub>   ≥ 5V (Note 2)                |                        | 25<br>0.5        | mV<br>%  |
| I <sub>ADJ</sub>                        | Adjust Pin Current        |   |                        | 100              | μA       |
| ΔI <sub>ADJ</sub>                       | Adjust Pin Current Change | 10mA ≤ I <sub>OUT</sub> ≤ I <sub>MAX</sub><br>3V ≤  V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 30V  |                        | 5<br>5           | μA<br>μA |
| I <sub>MIN</sub>                        | Minimum Load Current      | V <sub>IN</sub> - V <sub>OUT</sub>   = 30V<br> V <sub>IN</sub> - V <sub>OUT</sub>   = 3V  |                        | 5<br>3           | mA<br>mA |
|   | Current Limit             | V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 15V  | H Package<br>K Package | 0.5<br>1.5       | A<br>A   |
|   |                           | V <sub>IN</sub> - V <sub>OUT</sub>   = 30V  | H Package<br>K Package | 0.15<br>0.24     | A<br>A   |

**Note 1:** Dice are probe tested at 25°C to the limits shown except for high current tests. Dice are tested under low current conditions which assure full load current specifications when assembled in packaging systems approved by Linear Technology. For absolute maximum ratings, typical specifications, performance curves and finished product specifications, please refer to the standard product RH data sheet.

**Note 2:** Testing is done using a pulsed low duty cycle technique. See thermal regulation specifications for output changes due to heating effects.

**TABLE II ELECTRICAL CHARACTERISTICS (POSTIRRADIATION) (Notes 1 and 4)**

| SYMBOL                                  | PARAMETER         | CONDITIONS   | NOTES | 10KRAD(Si) |        | 20KRAD(Si) |        | 50KRAD(Si) |        | 100KRAD(Si) |        | 200KRAD(Si) |       | UNITS |
|---|-------------------|--|-------|------------|--------|------------|--------|------------|--------|-------------|--------|-------------|-------|-------|
|   |                   |  |       | MIN        | MAX    | MIN        | MAX    | MIN        | MAX    | MIN         | MAX    | MIN         | MAX   |       |
| V <sub>REF</sub>                        | Reference Voltage | V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 5V,<br>I <sub>OUT</sub> = 10mA  |       | -1.225     | -1.275 | -1.225     | -1.275 | -1.225     | -1.275 | -1.225      | -1.275 | -1.22       | -1.28 | V     |
|   |                   | 3V ≤  V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 30V,<br>10mA ≤ I <sub>OUT</sub> ≤ I <sub>MAX</sub> , P ≤ P <sub>MAX</sub> |       | -1.2       | -1.3   | -1.2       | -1.3   | -1.2       | -1.3   | -1.2        | -1.3   | -1.2        | -1.3  | V     |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN}}$  | Line Regulation   | 3V ≤  V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 30V,  | 2     |            | 0.02   |            | 0.02   |            | 0.02   |             | 0.02   |             | 0.02  | %/V   |
| $\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$ | Load Regulation   | 10mA ≤ I <sub>OUT</sub> ≤ I <sub>MAX</sub> ,<br> V <sub>OUT</sub>   ≤ 5V   | 2     |            | 25     |            | 25     |            | 25     |             | 25     |             | 25    | mV    |
|   |                   | 10mA ≤ I <sub>OUT</sub> ≤ I <sub>MAX</sub> ,<br> V <sub>OUT</sub>   ≥ 5V   | 2     |            | 0.5    |            | 0.5    |            | 0.5    |             | 0.5    |             | 0.5   | %     |

**NOTES:**

- REMAINDER OF THE TABLE II ELECTRICAL CHARACTERISTICS (POST-IRRADIATION) AND NOTES ARE ON PAGE 14.

**TABLE II ELECTRICAL CHARACTERISTICS (POST-IRRADIATION)(Notes 1 and 4)**  
**(Continued)**

| SYMBOL            | PARAMETER                 | CONDITIONS   | NOTES | 10KRAD(Si) |      | 20KRAD(Si) |      | 50KRAD(Si) |      | 100KRAD(Si) |      | 200KRAD(Si) |      | UNITS    |
|-------------------|---------------------------|--|-------|------------|------|------------|------|------------|------|-------------|------|-------------|------|----------|
|                   |                           |  |       | MIN        | MAX  | MIN        | MAX  | MIN        | MAX  | MIN         | MAX  | MIN         | MAX  |          |
| I <sub>ADJ</sub>  | Adjust Pin Current        |  |       | 100        |      | 100        |      | 100        |      | 100         |      | 100         |      | μA       |
| ΔI <sub>ADJ</sub> | Adjust Pin Current Change | 10mA ≤ I <sub>OUT</sub> ≤ I <sub>MAX</sub><br>3V ≤  V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 30V |       | 5          | 5    | 5          | 5    | 5          | 5    | 5           | 5    | 5           | 5    | μA<br>μA |
| I <sub>MIN</sub>  | Minimum Load Current      | V <sub>IN</sub> - V <sub>OUT</sub>   = 30V<br> V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 10V      |       | 5          | 3    | 5          | 3    | 5          | 3    | 5           | 3    | 5           | 3    | mA<br>mA |
|                   | Current Limit H Package   | V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 15V<br> V <sub>IN</sub> - V <sub>OUT</sub>   = 30V      |       | 0.5        | 0.15 | 0.5        | 0.15 | 0.5        | 0.15 | 0.5         | 0.15 | 0.5         | 0.15 | A<br>A   |
|                   | K Package                 | V <sub>IN</sub> - V <sub>OUT</sub>   ≤ 15V<br> V <sub>IN</sub> - V <sub>OUT</sub>   = 30V      |       | 1.5        | 0.24 | 1.5        | 0.24 | 1.5        | 0.24 | 1.5         | 0.24 | 1.5         | 0.24 | A<br>A   |

**Note 1:** Unless otherwise specified, these specifications apply for |V<sub>IN</sub> - V<sub>OUT</sub>| = 5V; and I<sub>OUT</sub> = 0.1A for the H package (TO-39) and I<sub>OUT</sub> = 0.5A for the K package (TO-3) package. Although power dissipation is internally limited, these specifications are applicable for power dissipations of 2W for the TO-39 and 20W for the TO-3. I<sub>MAX</sub> is 0.2A for the TO-39 and 1.5A for the TO-3 package.

**Note 2:** Regulation is measured at a constant junction temperature using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification for thermal regulation.

**Note 3:** Guaranteed by design, characterization or correlation to other tested parameters.

**Note 4:** T<sub>J</sub> = 25°C unless otherwise noted.

**Note 5:** I<sub>SC</sub> is tested at the ambient temperatures of 25°C and -55°C. I<sub>SC</sub> cannot be tested at the maximum ambient temperature of 150°C due to the high power level required. I<sub>SC</sub> specification at 150°C ambient is guaranteed by characterization and correlation to 25°C testing.

**TABLE III RH ELEMENT EVALUATION TABLE QUALIFICATION OF DICE SALES**

|          |   | CLASS |     | OPERATION   | MIL-STD-883 |                              | QUANTITY<br>(ACCEPT NUMBER)<br>REF. METHOD 2018 FOR S/S |
|----------|---|-------|-----|---|-------------|------------------------------|---|
| SUBGROUP |   | K/S   | H/B |   | METHOD      | CONDITION                    |   |
| 1        | X |       |     | SEM   | 2018        | N/A                          |   |
| 2        | X | X     | X   | ELEMENT ELECTRICAL (WAFER SORT @ 25°C)  |             |                              | 100%  |
| 3        | X | X     | X   | ELEMENT VISUAL (2nd OP)   | 2010        | A                            | 100%  |
| 4        | X | X     | X   | INTERNAL VISUAL (3rd OP)  | 2010        | A                            | ASSEMBLED PARTS ONLY                                    |
|          | X | X     | X   | DIE SHEAR MONITOR   | 2019        |                              |   |
| 5        | X | X     | X   | BOND PULL MONITOR   | 2011        |                              | ASSEMBLED PARTS ONLY                                    |
|          | X | X     | X   | STABILIZATION BAKE  | 1008        | C                            |   |
|          | X | X     | X   | TEMPERATURE CYCLE   | 1010        | C                            |   |
|          | X | X     | X   | CONSTANT ACCELERATION   | 2001        | E                            |   |
| 6        | X | X     | X   | FINE LEAK   | 1014        | A                            | 43 (3)  |
|          | X | X     | X   | GROSS LEAK  | 1014        | C                            |   |
|          | X | X     | X   | FIRST ROOM ELECTRICAL - READ & RECORD<br>(REPLACE ANY ASSEMBLY RELATED REJECTS)<br>ELECT. READ & RECORD @ +125°C or +150°C, -55°C |             |                              |   |
| 7        | X | X     | X   | BURNIN +125°C/240 hrs. or +150°C/120 hrs.   | 1015        | +125°C MINIMUM<br>240 HOURS  | 15 (0) or 25 (1) - # of wires                           |
|          | X | X     | X   | POST BURNIN ELECTRICAL @ 25°C READ & RECORD   |             |                              |   |
|          | X | X     | X   | PRE OP LIFE ELECTRICAL @ 25°C READ & RECORD   |             |                              |   |
|          | X | X     | X   | OPERATING LIFE: +125°C/1000 hrs. or +150°C/500 hrs.   | 1005        | +125°C MINIMUM<br>1000 HOURS |   |
|          | X | X     | X   | POST OP LIFE ELECT. (R&R 25°C, +125°C or +150°C, -55°C)   |             |                              |   |
|          | X | X     | X   | WIRE BOND EVALUATION  | 2011        |                              |   |



RH CANNED SAMPLE TABLE FOR QUALIFYING DICE SALES

NOTE LTC is not qualified to process to MIL-PRF-38534. This is an LTC imposed element evaluation that follows MIL-STD-883 test methods and conditions. Please note the quantity and accept number from a Sample Size Series of 15% accept on 3, and note that the actual sample and accept number does not begin until Subgroup 6.

NOTE Tests within Subgroup 5 may be performed in any sequence.

NOTE LTC's radiation tolerant (RH) die has a top-side glassivation thickness of 4KÅ minimum.

NOTE Sample sizes on the travelers may be larger than that indicated in the above table; however, the larger sample size is to accommodate extra units for replacement devices in the event of equipment or operator error and for assembly related rejects in Subgroup 6, and for Wire Bond Evaluation, Subgroup 7. The larger sample size is at all times kept segregated and, if used for qualification, has all the required processing imposed.