**FEATURES**

- Guaranteed Temperature Stability
- Maximum 0.6Ω Dynamic Impedance
- Adjustable for Minimum Temperature Coefficient
- Wide Operating Current Range

**APPLICATIONS**

- Reference for 5V Systems
- 8-Bit A/D and D/A Reference
- Digital Voltmeters
- Current Loop Measurement and Control Systems
- Power Supply Monitor

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**DESCRIPTION**

The LM136-2.5 is a general purpose shunt regulator diode designed to operate over a wide current range while maintaining good stability with time and temperature. The third terminal allows either the temperature coefficient to be minimized or the reference voltage to be adjusted without changing the temperature coefficient. Because it operates as a shunt regulator it can be used equally well as a positive or negative reference.

The LM136-2.5 is available with initial tolerances as low as 1% in either a TO-46 metal can for hermetic requirements or a low cost TO-92 plastic package.

Linear’s advanced design, test and process techniques have optimized the LM136-2.5 to achieve superior performance and reliability over previous designs. For more demanding precision reference applications requiring very low initial tolerance and temperature coefficients, consult the LT1009 data sheet. A typical 2.5V reference with trim is shown below.

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**TYPICAL APPLICATION**

![Diagram](image-url)

* Does not affect temperature coefficient

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*LTC and LT are registered trademarks of Linear Technology Corporation.*
LM136-2.5/LM336-2.5

**ABSOLUTE MAXIMUM RATINGS** *(Note 1)*

Operating Temperature Range
LM136-2.5 *(OBsolete)* .............. –55°C to 125°C
LM336-2.5 .............................................. 0°C to 70°C
Storage Temperature Range .............. –65°C to 150°C

Lead Temperature (Soldering, 10 sec) .............. 300°C
Reverse Current ................................................... 15mA
Forward Current ................................................... 10mA

**PACKAGE/ORDER INFORMATION**

Consult LTC Marketing for parts specified with wider operating temperature ranges.

**ELECTRICAL CHARACTERISTICS** The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at TA = 25°C. *(Note 2)*

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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>MIN</td>
<td>TYP</td>
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<tr>
<td>VZ</td>
<td>Reverse Breakdown Voltage</td>
<td>TA = 25°C, IR = 1mA</td>
<td>2.440</td>
<td>2.490</td>
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<td>AVZ/AR</td>
<td>Reverse Breakdown Change with Current</td>
<td>400µA ≤ IR ≤ 10mA, TMIN ≤ TA ≤ TMAX</td>
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<td>6</td>
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<td></td>
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<td>TA = 25°C</td>
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<td>10</td>
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<tr>
<td>rZ</td>
<td>Reverse Dynamic Impedance</td>
<td>IR = 1mA, TA = 25°C</td>
<td>0.2</td>
<td>0.6</td>
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<td></td>
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<td>TMIN ≤ TA ≤ TMAX</td>
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<td>1.0</td>
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<tr>
<td>AVZ/AT</td>
<td>Temperature Stability</td>
<td>VR Adjusted to 2.490V, IR = 1mA, TMIN ≤ TA ≤ TMAX (See Figure 1)</td>
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<td>18</td>
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<tr>
<td>AVZ/AT</td>
<td>Long Term Stability</td>
<td>TA = 25°C ± 0.1°C, IR = 1mA</td>
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Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Note 2: The LT1009 is an improved, low cost, pin for pin replacement for the “A” and “B” versions. For further information consult the LT1009 data sheet.

Figure 1. Adjusting the LM336 for Minimum Temperature Coefficient
**TYPICAL PERFORMANCE CHARACTERISTICS**

**Reverse Characteristics**

![Graph showing reverse characteristics](136/336 G01)

**Forward Characteristics**

![Graph showing forward characteristics](136/336 G02)

**Temperature Drift**

![Graph showing temperature drift](136/336 G03)

**Dynamic Impedance**

![Graph showing dynamic impedance](136/336 G04)

**Zener Noise Voltage**

![Graph showing zener noise voltage](136/336 G05)

**Response Time**

![Graph showing response time](136/336 G06)

**SCHEMATIC DIAGRAM**

![Schematic diagram](136/336 G07)

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**TYPICAL APPLICATIONS**

**Wide Supply Range, Reference**

**Low Temperature Coefficient Power Regulator**

**Switchable ±1.25V Bipolar Reference**

**Low Noise 2.5V Buffered Reference**

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**PACKAGE DESCRIPTION**

**H Package**

2-Lead and 3-Lead TO-46 Metal Can
(Reference LTC DWG # 05-08-1340)

**Z Package**

3-Lead Plastic TO-92 (Similar to TO-226)
(Reference LTC DWG # 05-08-1410)

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**RELATED PARTS**

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<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>COMMENTS</th>
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<td>LT1009</td>
<td>Precision 2.5V Shunt Reference</td>
<td>0.2% Max Initial Tolerance</td>
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