

FEATURES

- **Guaranteed 20 ppm/°C Drift**
- **Guaranteed 40 ppm/°C Drift (SO-8 Package)**
- **20 μ A to 20mA Operation (1.2V)**
- **Dynamic Impedance: 1 Ω**
- **7V, 100 μ A Reference**


APPLICATIONS

- Portable Meters
- Precision Regulators
- Calibrators

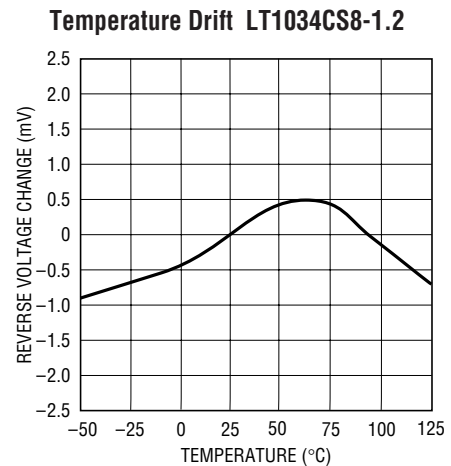
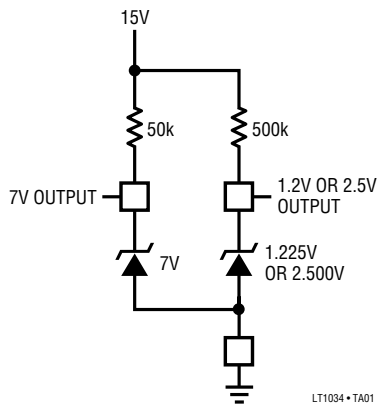
DESCRIPTION

The LT[®]1034 is a micropower, precision 1.2V/2.5V reference combined with a 7V auxiliary reference. The 1.2V/2.5V reference is a trimmed, thin-film, band-gap, voltage reference with 1% initial tolerance and guaranteed 20ppm/°C temperature drift. Operating on only 20 μ A, the LT1034 offers guaranteed drift, low temperature cycling hysteresis and good long-term stability. The low dynamic impedance makes the LT1034 easy to use from unregulated supplies. The 7V reference is a subsurface zener device for less demanding applications.

The LT1034 reference can be used as a high performance upgrade of the LM385 or LT1004, where guaranteed temperature drift is desired.

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TYPICAL APPLICATION



LT1034-1.2/LT1034-2.5

ABSOLUTE MAXIMUM RATINGS (Note 1)

Operating Current 20mA
 Forward Current (Note 2) 20mA
 Storage Temperature Range -65°C to 150°C
 Lead Temperature (Soldering, 10 sec)..... 300°C

Operating Temperature
 Commercial 0° to 70°C
 Industrial -40°C to 85°C
 Military (**OBsolete**) -55°C to 125°C

PACKAGE/ORDER INFORMATION

| | | | |
|--|--|--|--|
| <p>BOTTOM VIEW</p>  <p>H PACKAGE 3-LEAD TO-46 METAL CAN $T_{JMAX} = 150^{\circ}\text{C}$, $\theta_{JA} = 440^{\circ}\text{C/W}$, $\theta_{JC} = 80^{\circ}\text{C/W}$</p> <p>OBsolete PACKAGE Consider the Z Package for Alternate Source</p> | <p>ORDER PART NUMBER</p> <p>LT1034BCH-1.2 LT1034BCH-2.5 LT1034BMH-1.2 LT1034BMH-2.5 LT1034CH-1.2 LT1034CH-2.5 LT1034MH-1.2 LT1034MH-2.5</p> | <p>TOP VIEW</p>  <p>S8 PACKAGE 8-LEAD PLASTIC SO</p> <p>$T_{JMAX} = 175^{\circ}\text{C}$, $\theta_{JA} = 150^{\circ}\text{C/W}$</p> | <p>ORDER PART NUMBER</p> <p>LT1034CS8-1.2 LT1034CS8-2.5 LT1034IS8-1.2 LT1034IS8-2.5</p> |
| <p>BOTTOM VIEW</p>  <p>Z PACKAGE 3-LEAD TO-92 PLASTIC $T_{JMAX} = 100^{\circ}\text{C}$, $\theta_{JA} = 160^{\circ}\text{C/W}$</p> | <p>ORDER PART NUMBER</p> <p>LT1034BCZ-1.2 LT1034BCZ-2.5 LT1034BIZ-1.2 LT1034BIZ-2.5 LT1034CZ-1.2 LT1034CZ-2.5 LT1034IZ-1.2 LT1034IZ-2.5</p> | | <p>PART MARKING</p> <p>3401 3402 1034I12 34I02</p> |

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 $T_A = 25^\circ\text{C}$.

| PARAMETER | CONDITIONS | | LT1034-1.2 | | | LT1034-2.5 | | | UNITS |
|---------------------------------------|---|---|------------|-------|-------|------------|------|----------------------------|-----------------------|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Reverse Breakdown Voltage | $I_R = 100\mu\text{A}$ | ● | 1.210 | 1.225 | 1.240 | 2.46 | 2.5 | 2.54 | V |
| | | | 1.205 | 1.225 | 1.245 | 2.43 | 2.5 | 2.57 | V |
| Reverse Breakdown Change with Current | (Note 4) $2\text{mA} \leq I_R \leq 20\text{mA}$ | ● | | 0.5 | 2.0 | | 1.0 | 3.0 | mV |
| | | | | 1.0 | 4.0 | | 1.5 | 6.0 | mV |
| | | | | 4.0 | 8.0 | | 6.0 | 16.0 | mV |
| | | | | 6.0 | 15.0 | | 10.0 | 20.0 | mV |
| Minimum Operating Current | | ● | 10 | 20 | | 15 | 30 | μA | |
| Temperature Coefficient | $I_R = 100\mu\text{A}$ LT1034B LT1034 | ● | | 10 | 20 | | 10 | 20 | ppm/ $^\circ\text{C}$ |
| | | | | 20 | 40 | | 20 | 40 | ppm/ $^\circ\text{C}$ |
| Reverse Dynamic Impedance (Note 3) | $I_R = 100\mu\text{A}$ | ● | | 0.25 | 1.0 | | 0.5 | 1.5 | Ω |
| | | | | 0.50 | 2.0 | | 1.0 | 2.5 | Ω |
| Low Frequency Noise | $I_R = 100\mu\text{A}$, $0.1\text{Hz} \leq F \leq 10\text{Hz}$ | ● | | 4 | | | 6 | $\mu\text{V}_{\text{P-P}}$ | |
| Long-Term Stability | $I_R = 100\mu\text{A}$ | | | 20 | | | 20 | ppm/ $\sqrt{\text{kh}}$ | |

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at $T_A = 25^\circ\text{C}$.
7V Reference.

| PARAMETER | CONDITIONS | | MIN | TYP | MAX | UNITS |
|---------------------------------------|---|---|------|-----|-----|-------------------------|
| Reverse Breakdown Voltage | $I_R = 100\mu\text{A}$ | ● | 6.80 | 7.0 | 7.3 | V |
| | | | 6.75 | 7.0 | 7.4 | V |
| Reverse Breakdown Change with Current | $100\mu\text{A} \leq I_R \leq 1\text{mA}$ | ● | | 90 | 140 | mV |
| | $100\mu\text{A} \leq I_R \leq 1\text{mA}$ | | | 100 | 190 | mV |
| | $1\text{mA} \leq I_R \leq 20\text{mA}$ | | | 160 | 250 | mV |
| | $1\text{mA} \leq I_R \leq 20\text{mA}$ | | | 200 | 350 | mV |
| Temperature Coefficient | $I_R = 100\mu\text{A}$ | ● | | 40 | | ppm/ $^\circ\text{C}$ |
| Long-Term Stability | $I_R = 100\mu\text{A}$ | | | 20 | | ppm/ $\sqrt{\text{kh}}$ |

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

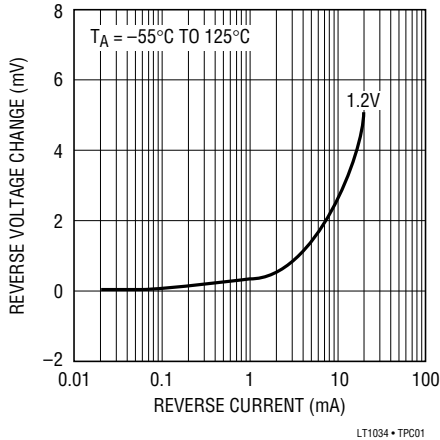
Note 2: Forward biasing either diode will affect the operation of the other diode.

Note 3: This parameter guaranteed by “reverse breakdown change with current” test.

Note 4: For the LT1034-1.2: $20\mu\text{A} \leq I_R \leq 2\text{mA}$. For the LT1034-2.5: $30\mu\text{A} \leq I_R \leq 2\text{mA}$.

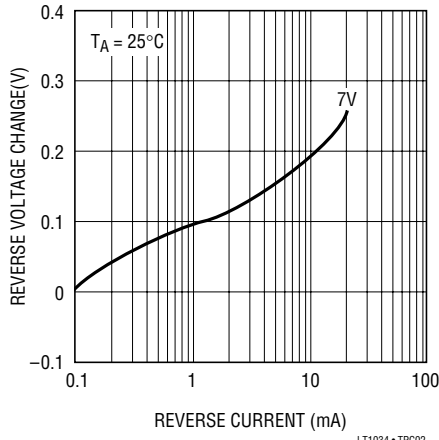
TYPICAL PERFORMANCE CHARACTERISTICS

Reverse Voltage Change 1.2V



LT1034 • TPC01

Reverse Voltage Change 7V



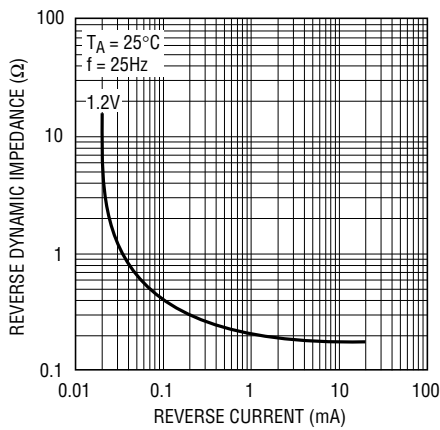
LT1034 • TPC02

0.1Hz to 10Hz Noise 1.2V



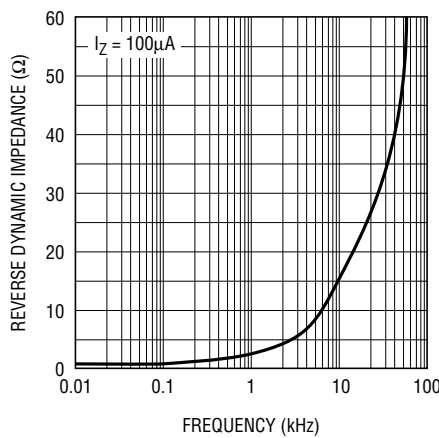
LT1034 • TPC03

Reverse Dynamic Impedance 1.2V



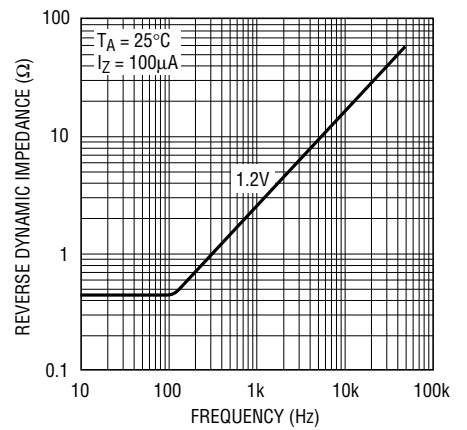
LT1034 • TPC04

Reverse Dynamic Impedance 2.5V



LT1034 • TPC05

Reverse Dynamic Impedance 7V



LT1034 • TPC06

TYPICAL PERFORMANCE CHARACTERISTICS

Reverse Characteristics 1.2V



LT1034 • TPC07

Reverse Characteristics 2.5V



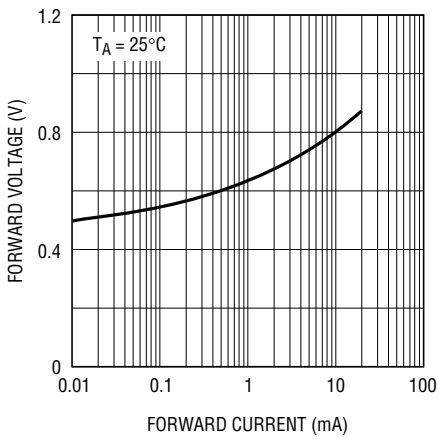
LT1034 • TPC02

Reverse Characteristics 7V



LT1034 • TPC09

Forward Characteristics



LT1034 • TPC10

Response Time



LT1180A • TPC11

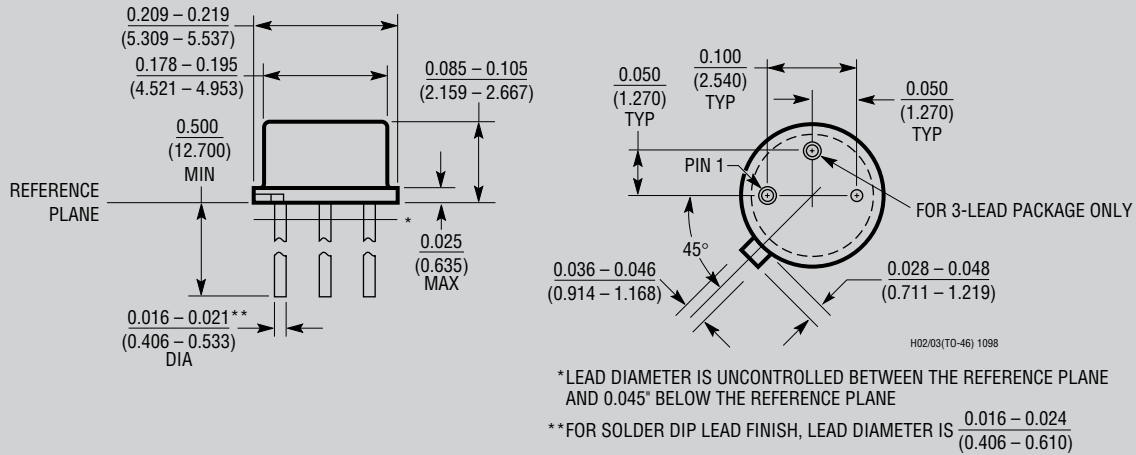
Response Time



LT1180A • TPC12

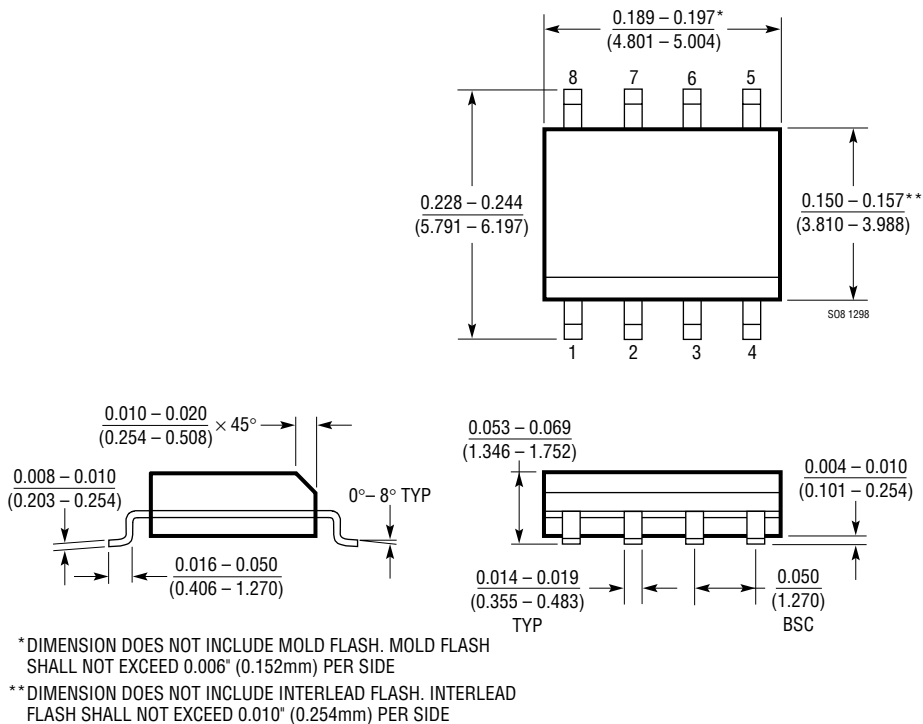
PACKAGE DESCRIPTION

H Package
8-Lead TO-5 Metal Can (.200 Inch PCD)
 (Reference LTC DWG # 05-08-1320)



OBsolete PACKAGE

S8 Package
8-Lead Plastic Small Outline (Narrow .150 Inch)
 (Reference LTC DWG # 05-08-1610)



PACKAGE DESCRIPTION

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

