

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

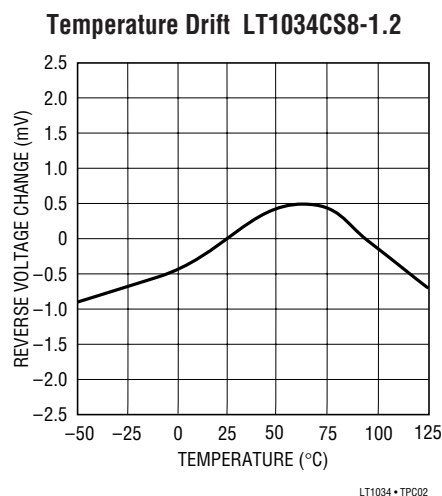
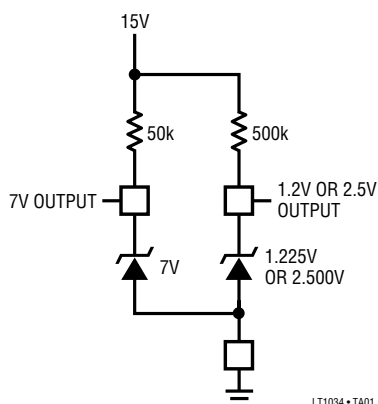
DESCRIPTION

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

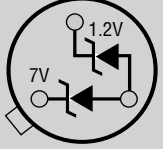
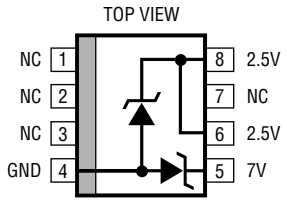
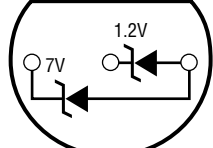


LT1034-1.2/LT1034-2.5

ABSOLUTE MAXIMUM RATINGS (Note 1)

Operating Current	20mA	Operating Temperature	
Forward Current (Note 2)	20mA	Commercial	0° to 70°C
Storage Temperature Range	–65°C to 150°C	Industrial	–40°C to 85°C
Lead Temperature (Soldering, 10 sec)	300°C	Military (OBsolete)	–55°C to 125°C

PACKAGE/ORDER INFORMATION

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

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)	●		0.5	2.0		1.0	3.0	mV
		●		1.0	4.0		1.5	6.0	mV
	$2\text{mA} \leq I_R \leq 20\text{mA}$	●		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	●		10	20		10	20	ppm/ $^\circ\text{C}$
	LT1034			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/ $\sqrt{\text{kh}}$

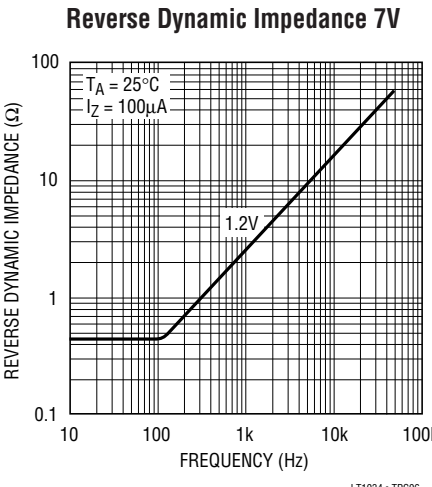
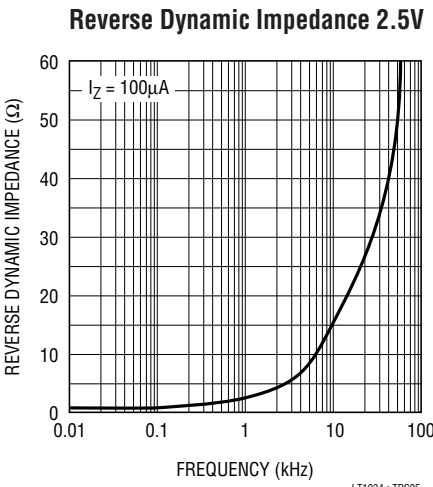
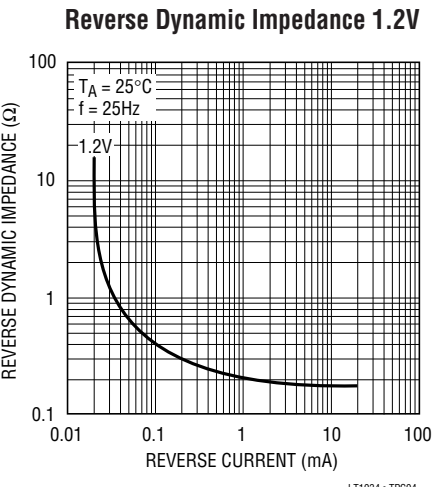
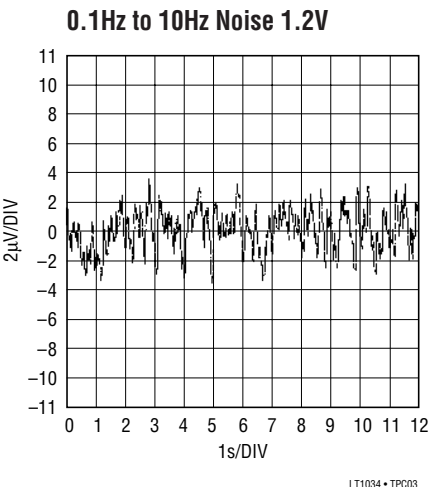
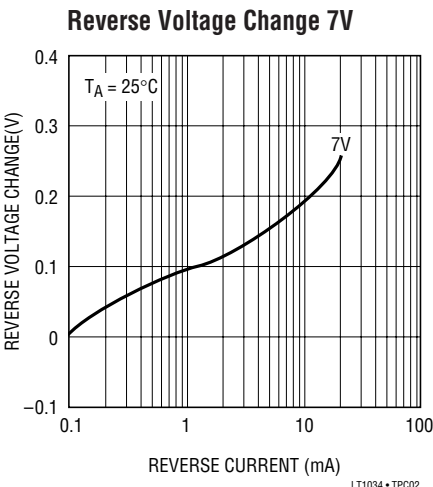
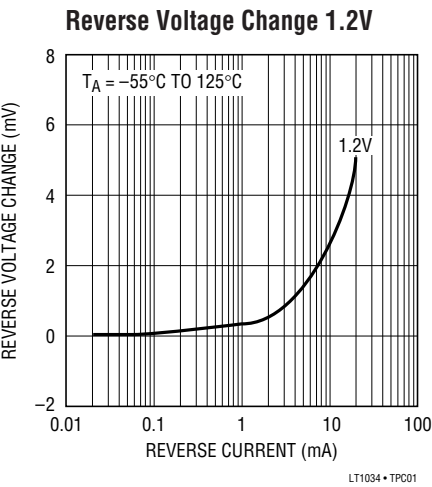
Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

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.

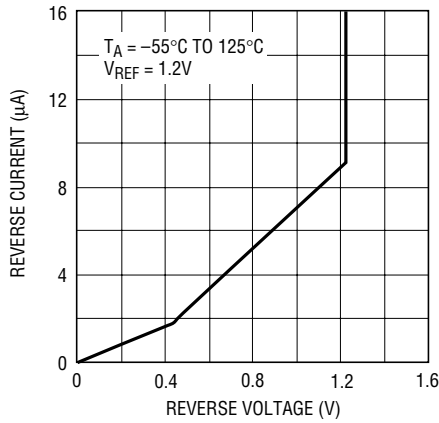
Note 4: For the LT1034-1.2: $20\mu\text{A} \leq I_R \leq 2\text{mA}$. For the LT1034-2.5: $30\mu\text{A} \leq I_R \leq 2\text{mA}$.

TYPICAL PERFORMANCE CHARACTERISTICS



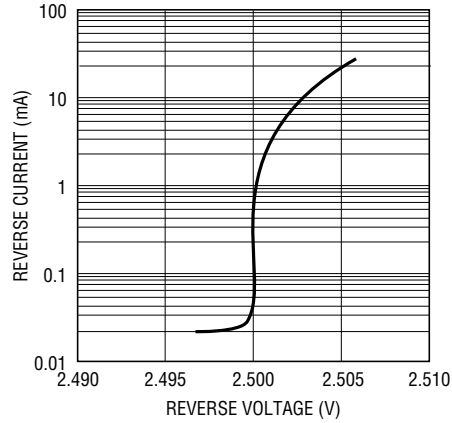
TYPICAL PERFORMANCE CHARACTERISTICS

Reverse Characteristics 1.2V



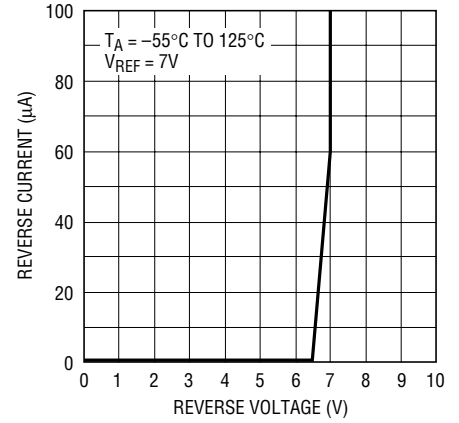
LT1034 • TPC07

Reverse Characteristics 2.5V



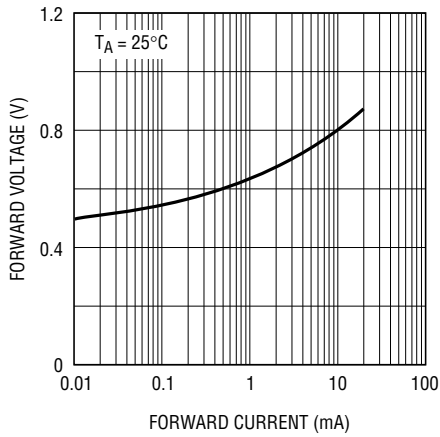
LT1034 • TPC02

Reverse Characteristics 7V



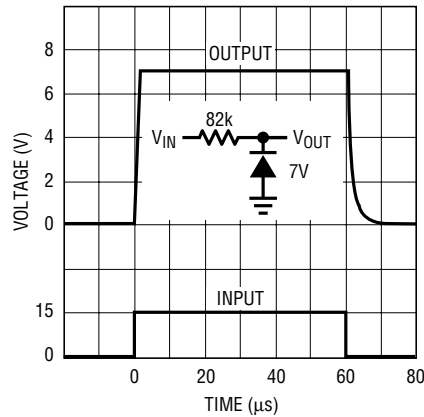
LT1034 • TPC09

Forward Characteristics



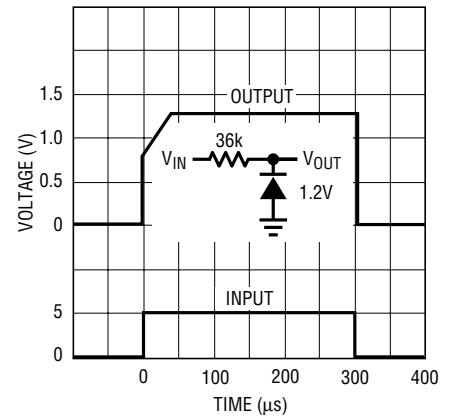
LT1034 • TPC10

Response Time



LT1180A • TPC11

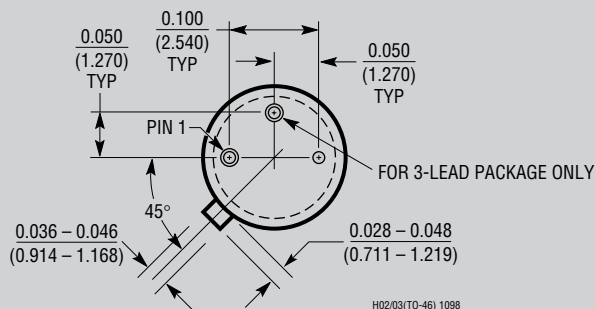
Response Time



LT1180A • TPC12

Technical drawing of a component showing dimensions and tolerances:

- Top Dimensions:**
 - Overall width: $0.209 - 0.219$ ($5.309 - 5.537$)
 - Inner width: $0.178 - 0.195$ ($4.521 - 4.953$)
 - Right side offset: $0.085 - 0.105$ ($2.159 - 2.667$)
- Central Feature:** A rectangular feature with a height dimension of 0.500 (12.700) MIN.
- Reference Plane:** Indicated by a horizontal line labeled "REFERENCE PLANE".
- Bottom Features:** Three vertical features below the reference plane, each with a diameter dimension of $0.016 - 0.021^{**}$ ($0.406 - 0.533$) DIA.
- Other Dimensions:**
 - A small step or fillet at the bottom left corner has a radius dimension of 0.025 (0.635) MAX.
 - A small gap or clearance between the central feature and the bottom features is indicated by a dimension line with arrows pointing to the gaps.



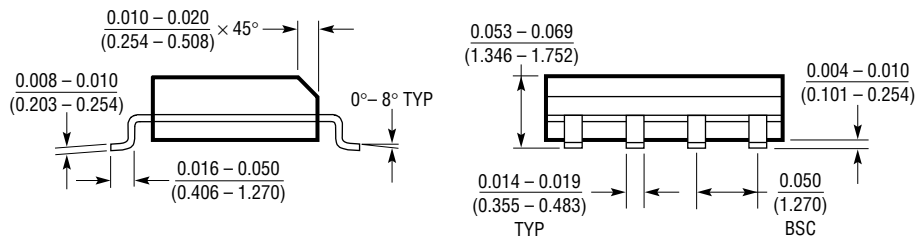
*LEAD DIAMETER IS UNCONTROLLED BETWEEN THE REFERENCE PLANE AND 0.045" BELOW THE REFERENCE PLANE

** FOR SOLDER DIP LEAD FINISH, LEAD DIAMETER IS $\frac{0.016 - 0.024}{(0.406 - 0.610)}$

OBSOLETE PACKAGE

Diagram illustrating the dimensions of the SO8 1298 package:

- Top width dimension: $0.189 - 0.197^*$ (4.801 – 5.004)
- Left height dimension: $0.228 - 0.244$ (5.791 – 6.197)
- Right height dimension: $0.150 - 0.157^{**}$ (3.810 – 3.988)
- Bottom width dimension: $0.189 - 0.197^*$ (4.801 – 5.004)
- Pin numbers 1 through 8 are indicated around the package perimeter.
- Reference: SO8 1298

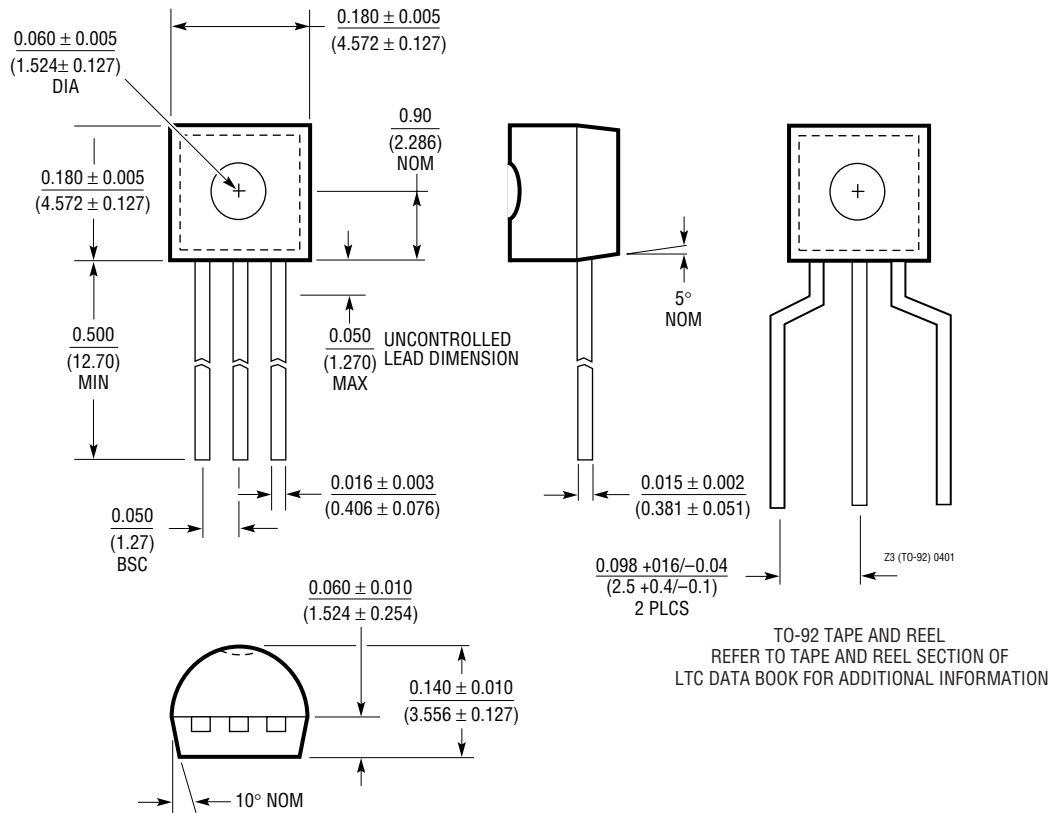


* DIMENSION DOES NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.006" (0.152mm) PER SIDE

**** DIMENSION DOES NOT INCLUDE INTERLEAD FLASH. INTERLEAD FLASH SHALL NOT EXCEED 0.010" (0.254mm) PER SIDE**

PACKAGE DESCRIPTION

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



LT1034-1.2/LT1034-2.5

RELATED PARTS

PART NUMBER	DESCRIPTION	COMMENTS
LT1004	Low Cost Precision Band-Gap	Micropower, SO-8, Industrial Temperature Options
LT1019	Precision Series or Shunt Band-Gap	Low Dropout, Multiple Output Options
LT1236	Precision Series or Shunt Buried Zener	Low Noise, Low Power, Multiple Output Options