February 2002
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LM336Z5 • LM336BZ5
Programmable Shunt Regulator

General Description

The LM336Z5 and LM336BZ5 integrated circuits are precision 5.0V shunt regulators. The monolithic IC voltage reference operates as a low temperature coefficient 5.0V zener with 0.6Ω dynamic impedance. A third terminal on the LM336Z5 and LM336BZ5 allows the reference voltage and temperature coefficient to be trimmed easily.

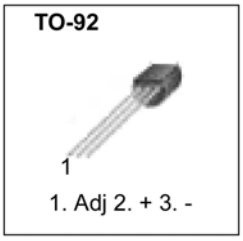
The LM336Z5 and LM336BZ5 are useful as precision 5.0V low voltage references which makes it convenient to obtain a stable reference from low voltage supplies. Further, since the LM336Z5 and LM336BZ5 operate as shunt regulators, they can be used as either a positive or negative voltage reference.

Features

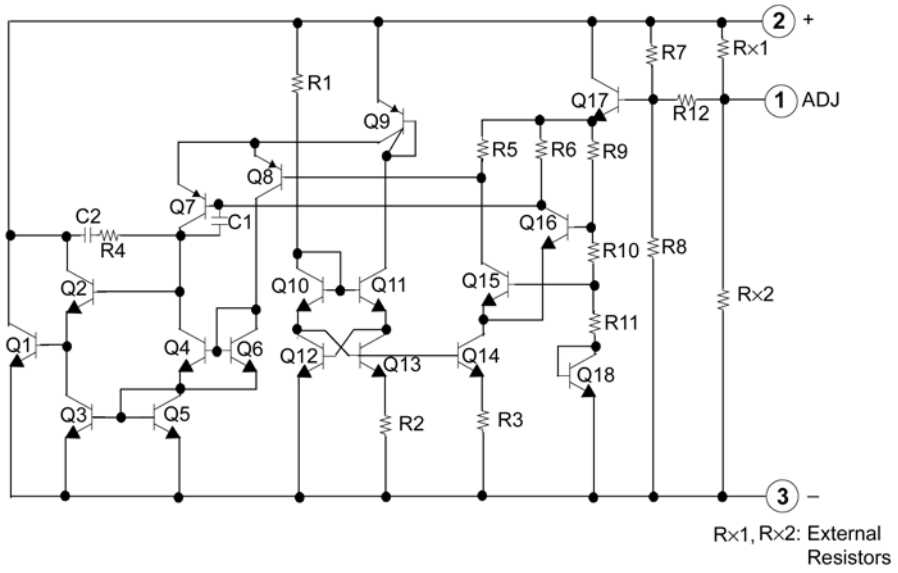
- Low Temperature Coefficient
- Adjustable 4V to 6V
- Wide Operating Range Current of 10mA to 400mA
- Three Lead Transistor Package (TO-92)
- 0.6Ω Dynamic Impedance
- ±1.0% Initial Tolerance Available
- Guaranteed Temperature Stability
- Easily Trimmed for Minimum Temperature Drift
- Fast Turn On

Ordering Code:

Product Number	Package	Packing	Operating Temperature
LM336Z5	TO-92	Bulk	0°C to +70°C
LM336Z5X		Tape and Reel	
LM336BZ50		Bulk	



Internal Block Diagram



Rx1, Rx2: External Resistors

Absolute Maximum Ratings(Note 1)

Parameter	Symbol	Value	Unit
Reverse Current	IR	15	mA
Forward Current	IF	10	mA
Operating Temperature Range	TOPR	0 ~ +70	°C
Storage Temperature Range	TSTG	– 60 ~ +150	°C

Note 1: The Absolute Maximum Ratings are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum rating.

Electrical Characteristics ($0°C < T_A < +70°C$, unless otherwise specified)

Parameter	Symbol	Conditions	LM336Z5			LM336BZ5			
			Min	Typ	Max	Min	Typ	Max	Unit
Reverse Breakdown Voltage	V_R	$T_A = +25°C$, $I_R = 1mA$	4.8	5.0	5.2	4.9	5.0	5.1	V
Reverse Breakdown Change with Current	$\Delta V_R/\Delta I_R$	$T_A = +25°C$, $600\mu A \le I_R \le 10mA$	–	6.0	20.0	–	6.0	20.0	mV
Reverse Dynamic Impedance	Z_D	$T_A = +25°C$, $I_R = 1mA$	–	0.6	2.0	–	0.6	2.0	Ω
Temperature Stability	ST_T	$I_R = 1mA$	–	4.0	12.0	–	4.0	12.0	mV
Reverse Breakdown Change with Current	$\Delta V_R/\Delta I_R$	$600\mu A \le I_R \le 10mA$	–	6.0	24.0	–	6.0	24.0	mV
Reverse Dynamic Impedance	ZD	$I_R = 1mA$	–	0.8	2.5	–	0.8	2.5	Ω
Long Term Stability In Reference Voltage	ST	$I_R = 1mA$	–	20.0	–	–	20.0	–	ppm/Khr

Typical Performance Characteristics

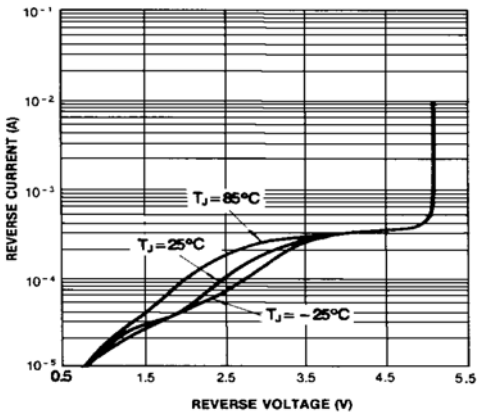


FIGURE 1. Reverse Voltage Change

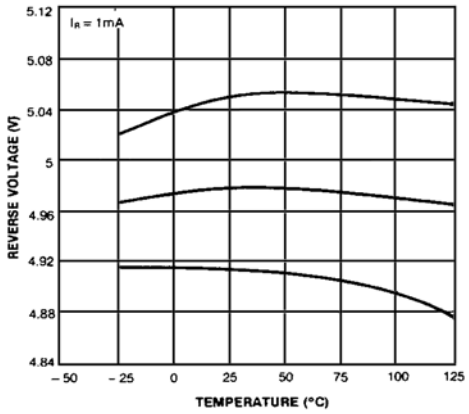


FIGURE 2. Reverse Characteristics

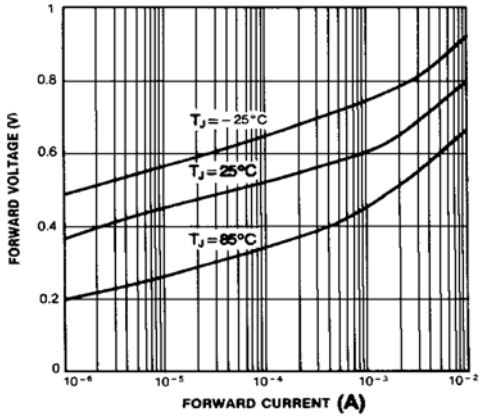


FIGURE 3. Temperature (°C)

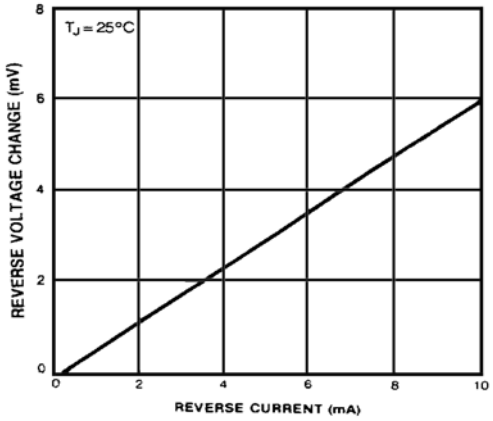


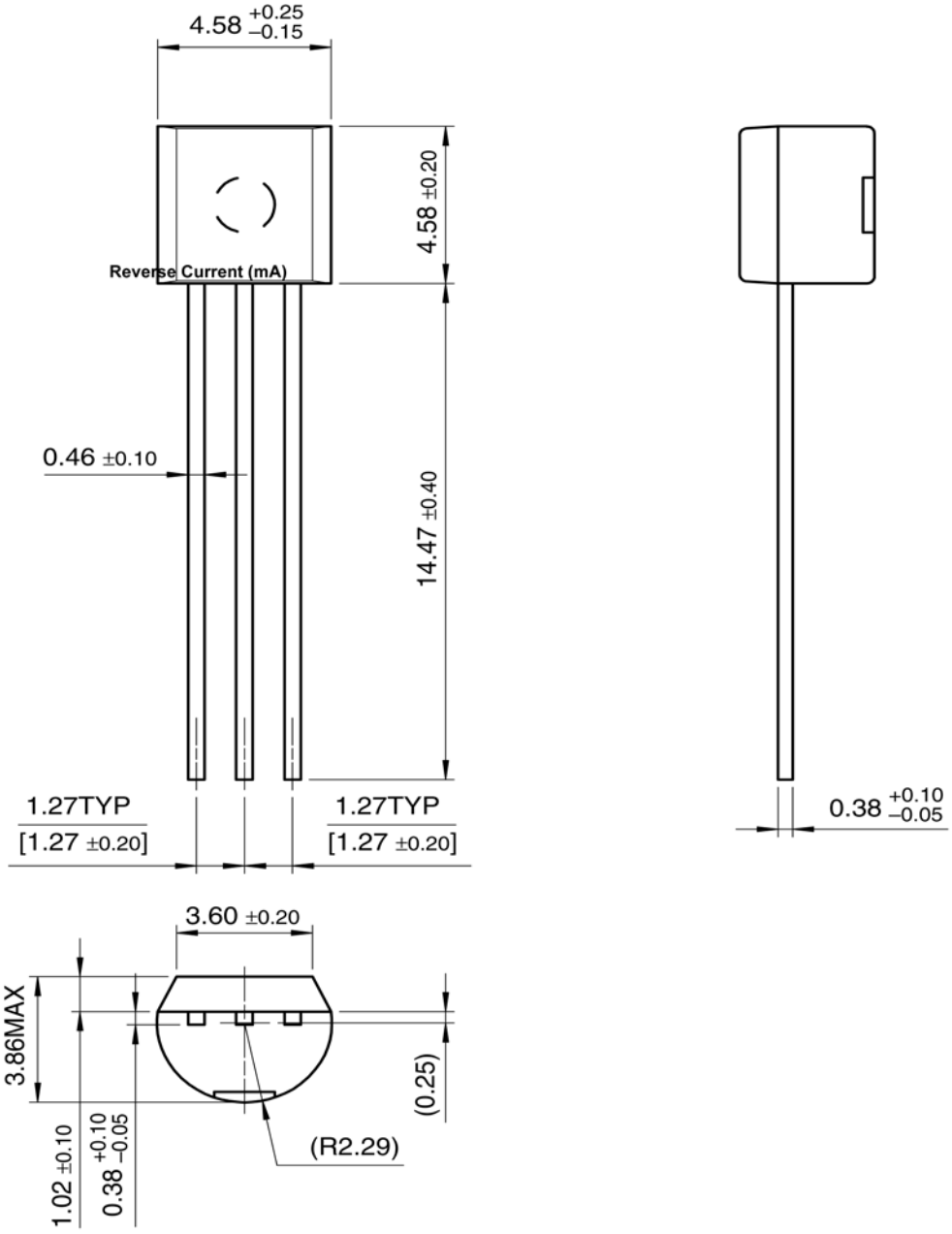
FIGURE 4. Forward Characteristics

Physical Dimensions inches (millimeters) unless otherwise noted

Package

Dimensions in millimeters

TO-92



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PRODUCT STATUS DEFINITIONS

Definition of terms

Datasheet Identification	Product Status	Definition
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