

# LM336-5.0/LM336B-5.0

## Programmable Shunt Regulator

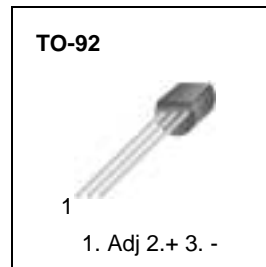
### Features

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

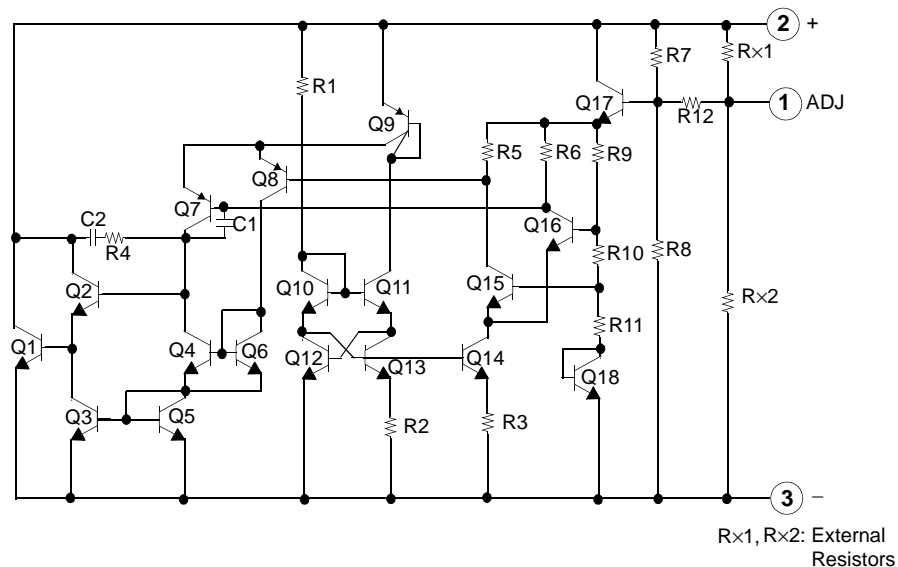
### Description

The LM336-5.0 / LM336B-5.0 integrated circuits are precision 5.0V shunt regulators. The monolithic IC voltage reference operates as a low temperature coefficient 5.0V zener with 0.6 ohm dynamic impedance. A third terminal on the LM336-5.0/LM336B-5.0 allows the reference voltage and temperature coefficient to be trimmed easily.

The LM336-5.0/LM336B-5.0 are useful as a precision 5.0V low voltage references which makes it convenient to obtain a stable reference from low voltage supplies. Further, since the LM336-5.0/LM336B-5.0 operate as shunt regulators, they can be used as either a positive or negative voltage reference.



### Internal Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Reverse Current	$I_R$	15	mA
Forward current	$I_F$	10	mA
Operating Temperature Range LM336/LM336B-0.5	$T_{OPR}$	0 ~ +70	°C
Storage Temperature Range	$T_{STG}$	-60 ~ +150	°C

## Electrical Characteristics

(0°C ≤  $T_A$  ≤ +70°C unless otherwise specified)

Parameter	Symbol	Conditions	LM336-5.0			LM336B-5.0			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Reverse Breakdown Voltage	$V_R$	$T_A = 25^\circ\text{C}$ , $I_R = 1\text{mA}$	4.8	5.0	5.2	4.9	5.0	5.1	V
Reverse Breakdown Change with Current	$\Delta V_R / \Delta I_R$	$T_A = 25^\circ\text{C}$ $600\mu\text{A} \leq I_R \leq 10\text{mA}$	-	6	20	-	6	20	mV
Reverse Dynamic Impedance	$Z_D$	$T_A = 25^\circ\text{C}$ , $I_R = 1\text{mA}$	-	0.6	2	-	0.6	2	$\Omega$
Temperature Stability	$ST_T$	$I_R = 1\text{mA}$	-	4	12	-	4	12	mV
Reverse Breakdown Change with Current	$\Delta V_R / \Delta I_R$	$600\mu\text{A} \leq I_R \leq 10\text{mA}$	-	6	24	-	6	24	mV
Reverse Dynamic Impedance	$Z_D$	$I_R = 1\text{mA}$	-	0.8	2.5	-	0.8	2.5	$\Omega$
Long Term Stability In Reference Voltage	ST	$I_R = 1\text{mA}$	-	20	-	-	20	-	ppm/Khr

## Typical Performance Characteristics

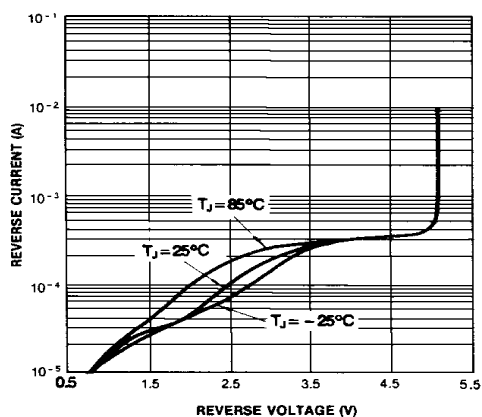


Figure 1. Reverse Characteristics

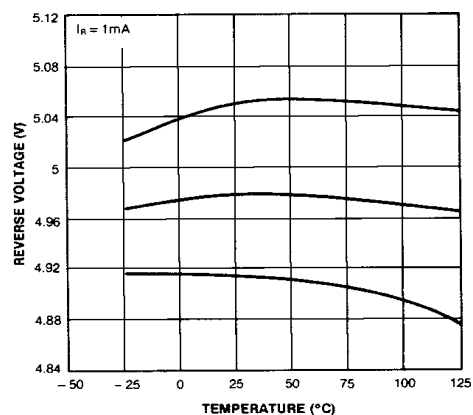


Figure 2. Temperature Drift

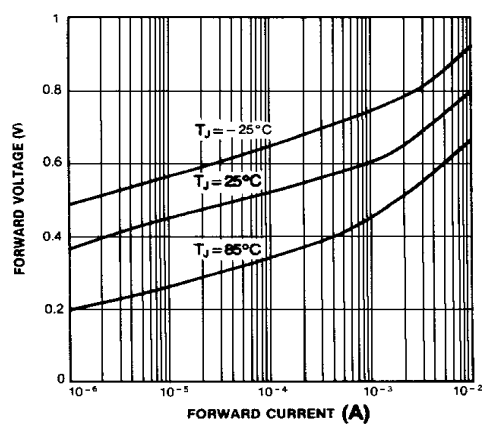


Figure 3. Forward Characteristics

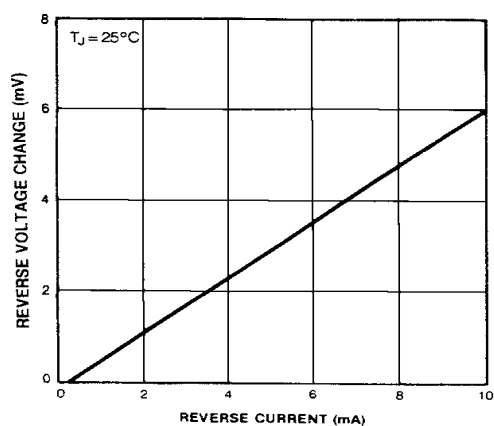


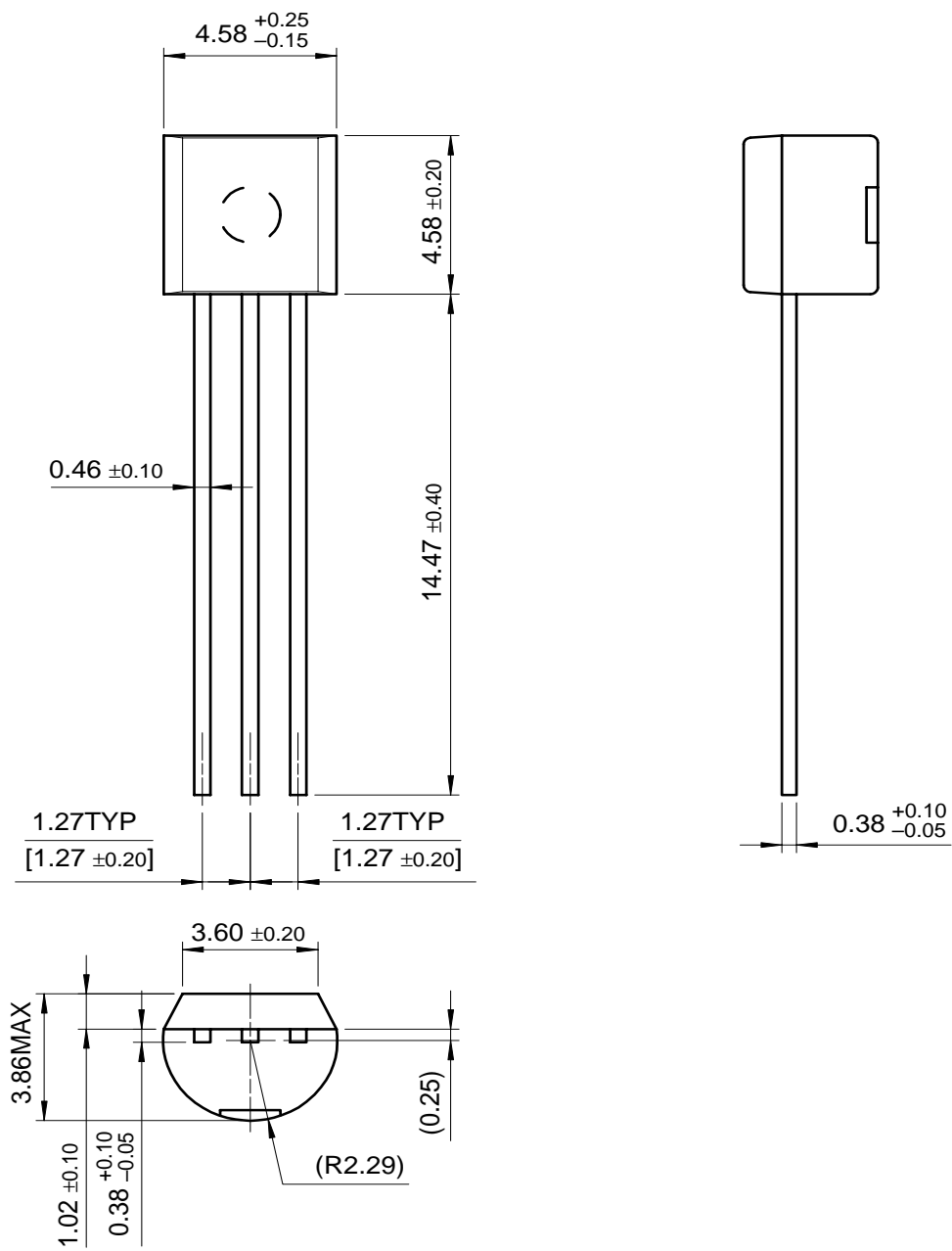
Figure 4. Reverse Voltage Change

Mechanical Dimensions

Package

Dimensions in millimeters

TO-92



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## Ordering Information

Product Number	Package	Operating Temperature
LM336Z5	TO-92	0 ~ +70°C
LM336BZ50		

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