

# LM336-2.5/LM336B-2.5

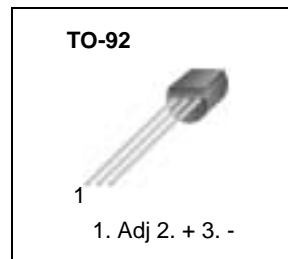
## Programmable Shunt Regulator

### Features

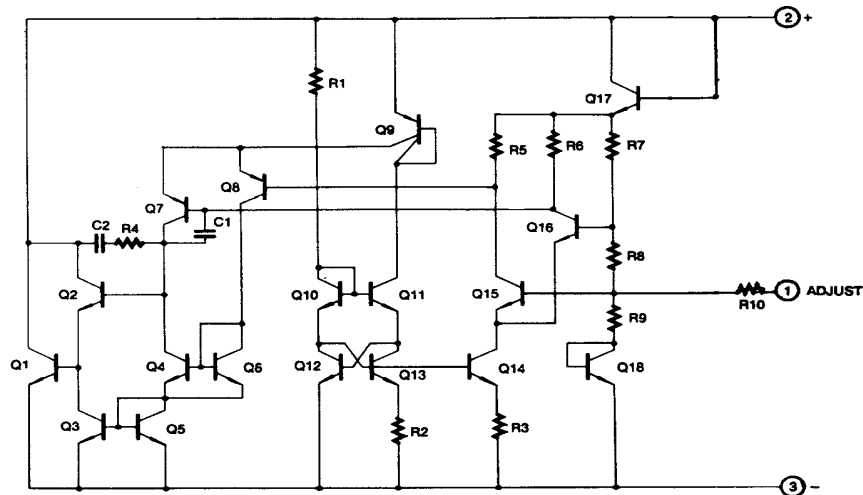
- Low temperature coefficient
- Guaranteed temperature stability 4mV typical
- 0.2Ω dynamic impedance
- ±1.0% initial tolerance available
- Easily trimmed for minimum temperature drift

### Description

The LM336-2.5/LM336B-2.5 integrated Circuits are precision 2.5V shunt regulators. The monolithic IC voltage reference operates as a low temperature coefficient 2.5V zener with 0.2W dynamic impedance. A third terminal on the LM336-2.5/LM336B-2.5 allow the reference voltage and temperature coefficient to be trimmed easily. LM336-2.5/LM336B-2.5 are useful as a precision 2.5V low voltage reference for digital voltmeters, power supplies or op amp circuitry. The 2.5V makes it convenient to obtain a stable reference from low voltage supplies. Further, since the LM336-2.5/LM336B-2.5 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 LM336-2.5/LM336B-2.5	$T_{OPR}$	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	LM336-2.5			LM336B-2.5			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Reverse Breakdown Voltage	$V_R$	$T_A = +25^\circ\text{C}$ $I_R = 1\text{mA}$	2.44	2.49	2.54	2.465	2.49	2.515	V
Reverse Breakdown Change with Current	$\Delta V_R/\Delta I_R$	$T_A = +25^\circ\text{C}$ $400\mu\text{A} \leq I_R \leq 10\text{mA}$	-	2.6	6	-	2.6	10	mV
Reverse Dynamic Impedance	$Z_D$	$T_A = +25^\circ\text{C}$ $I_R = 1\text{mA}$	-	0.2	0.6	-	0.2	1	$\Omega$
Temperature Stability	$ST_T$	$I_R = 1\text{mA}$	-	1.8	6	-	1.8	6	mV
Reverse Breakdown Change with Current	$\Delta V_R/\Delta I_R$	$400\mu\text{A} \leq I_R \leq 10\text{mA}$	-	3	10	-	3	12	mV
Reverse Dynamic Impedance	$Z_D$	$I_R = 1\text{mA}$	-	0.4	1	-	0.4	1.4	$\Omega$
Long Term Stability In reference voltage	ST	$I_R = 1\text{mA}$	-	20	-	-	20	-	ppm/Khr

# Typical Performance Characteristics

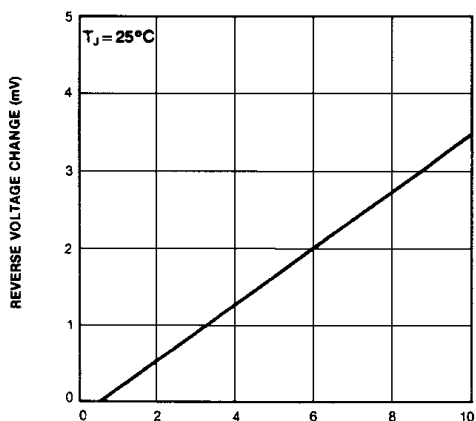


Figure 1. Reverse Voltage Change

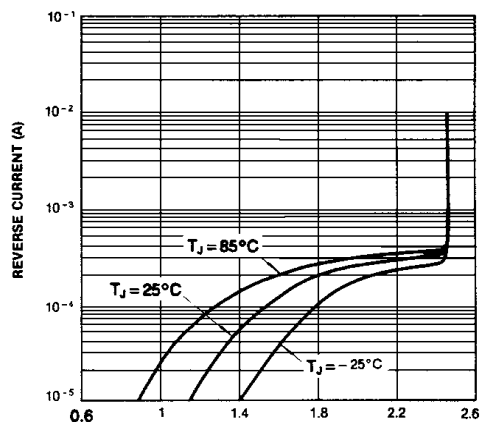


Figure 2. Reverse Characteristics

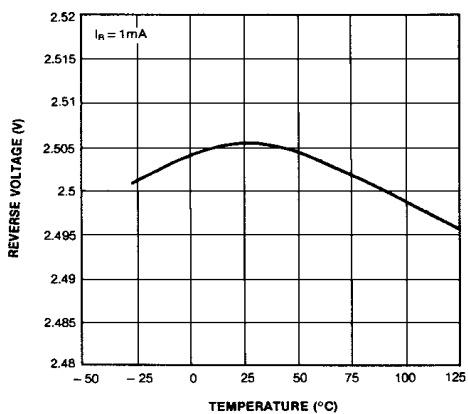


Figure 3. Temperature Drift

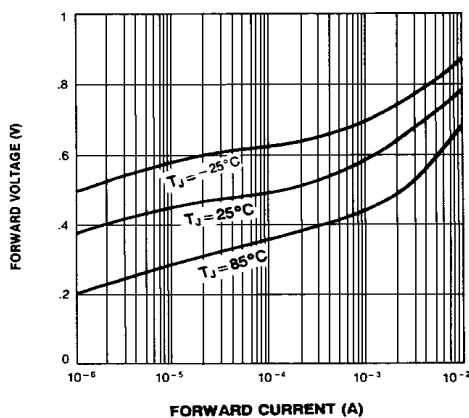
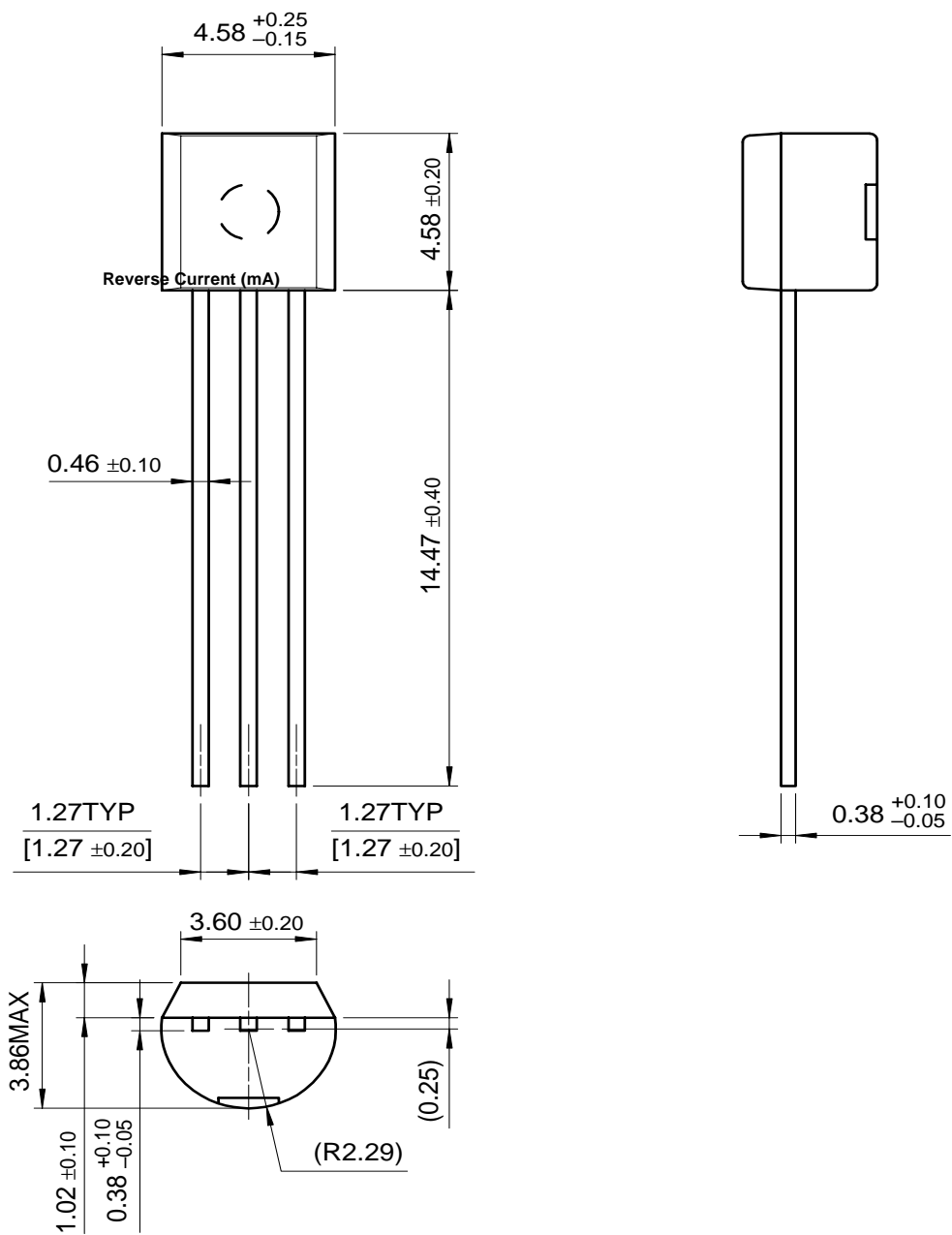


Figure 4. Forward Characteristics

# Mechanical Dimensions

## Package

### TO-92



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## Ordering Information

Product Number	Package	Operating Temperature
LM336Z2.5	TO-92	0°C to + 70°C
LM336BZ2.5		

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