

LM336-2.5

DATASHEET

Specification Revision History:

Version	Date	Description
V1.0	2019/06	New
V1.1	2021/01	Modify Ordering Information
V1.2	2025/02	Modify Ordering Information
V1.3	2025/03	Add application precautions and overall typesetting.

QUAD OPERATION AMPLIFIERS

The LM336-2.5 integrated circuits is precision 2.5V shunt regulator diodes. The monolithic references operate as low-temperature-coefficient 2.5V zeners with a 0.2Ω dynamic impedance. A third terminal provided on the circuit allows the reference voltage and temperature coefficient to be trimmed easily.

The LM336-2.5 is useful as precision 2.5V low-voltage references (VZ) for digital voltmeters, power supplies, or operational-amplifier circuitry. The 2.5V voltage reference makes it convenient to obtain a stable reference from 5-V logic supplies. The LM336-2.5 operate as shunt regulators, and can be used as either positive or negative voltage references.

The LM336-2.5 is available in TO92 package.

FEATURES

- Low Temperature Coefficient
- Wide Operating Current $400\mu\text{A}$ to 10mA
- 0.2Ω Dynamic Impedance
- $\pm 1.0\%$ Initial Tolerance Available
- Specified Temperature Stability
- Easily Trimmed for Minimum Temperature Drift



TO-92

Ordering Information

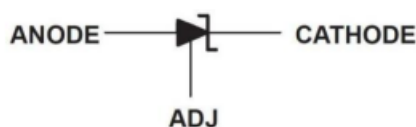
Product Model	Package Type	Marking	Packing	Packing Qty
LM336Z-2.5	TO-92	LM336 S412	Bulk	1000PCS/BOX

Pin Configuration

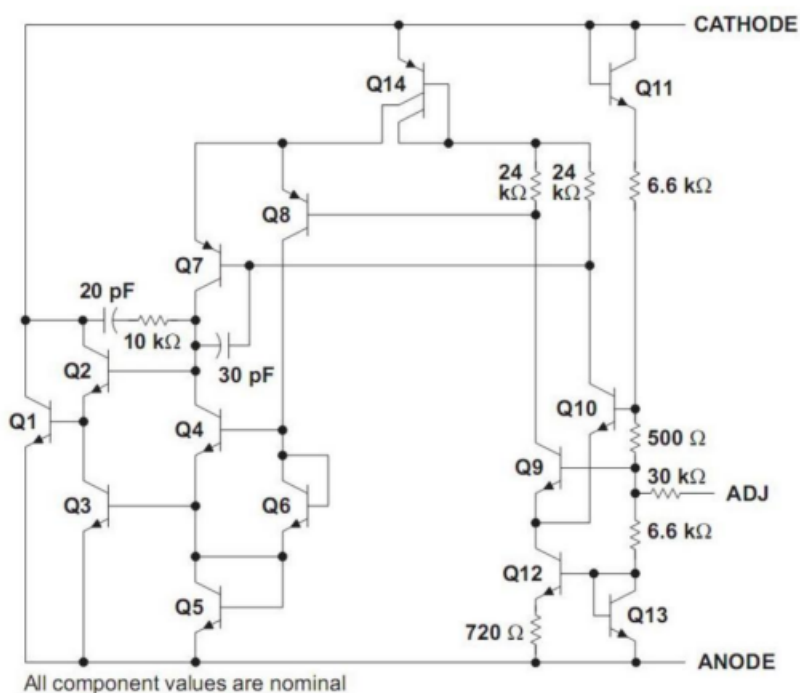


(TOP VIEW) LM336-2.5(TO92)

Symbol Configuration



Functional Block Diagram



Absolute Maximum Ratings (T_{amb}=25°C)

Parameter	Symbol	Value	Unit
Reverse Current	I_R	20	mA
Forward Current	I_F	10	mA
Thermal Resistance Junction to Ambient	θ_{JA}	156	°C/W
Lead Temperature (10 Seconds)	T_{lead}	260	°C
Storage Temperature Range	T_{stg}	-65~150	°C

Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Unit
Operating Free-air Temperature	T_A	0	70	°C

Electrical Characteristics at specified free-air temperature

(Unless otherwise specified)

Parameter	Test conditions	T_A	Symbol	Min.	Typ.	Max.	Unit
Reference Voltage	$I_Z = 1\text{mA}$	25°C	V_Z	2.39	2.49	2.59	V
Change in Reference Voltage with Temperature	V_Z adjusted to 2.490V $I_Z = 1\text{mA}$	Full range	$\Delta V_{Z(\Delta T)}$		1.8	6.0	mV
Change in Reference Voltage with Current	$I_Z = 400\mu\text{A}$ to 10mA	25°C	$\Delta V_{Z(\Delta I)}$		2.6	10	mV
		Full range			3	12	
Long-term Change in Reference Voltage	$I_Z = 1\text{mA}$	25°C	$\Delta V_{Z(\Delta t)}$		20		ppm/khr
Reference Dynamic Impedance	$I_Z = 1\text{mA}, f = 1\text{kHz}$	25°C	Z_D		0.2	1.0	Ω
		Full range			0.4	1.4	

*Full range is 0°C to +70°C.

Application Circuit

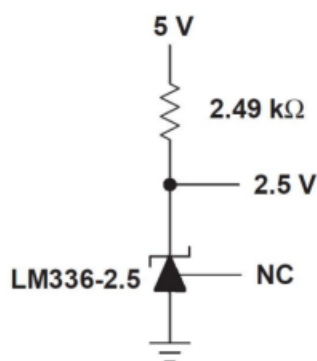


Figure 1. 2.5V Reference

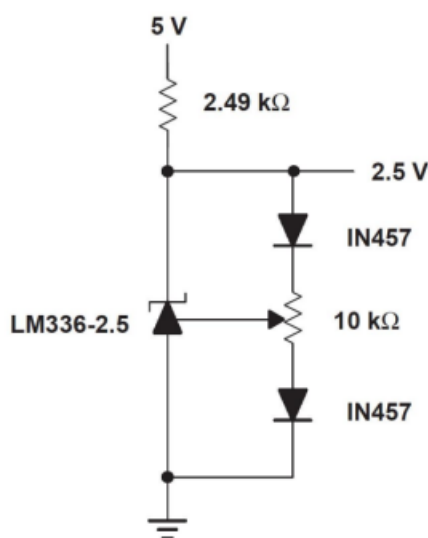


Figure 2. 2.5V Reference with Minimum Temperature Coefficient

Characteristic Curves

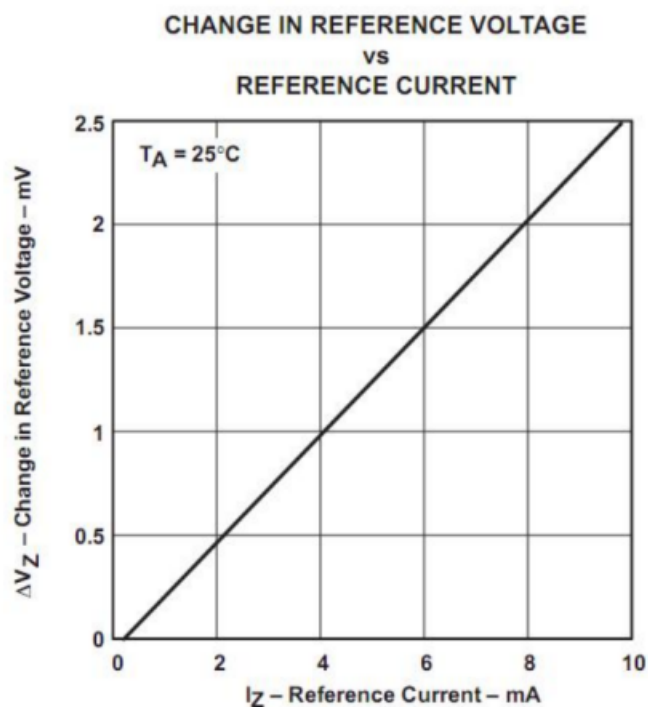


Figure 1

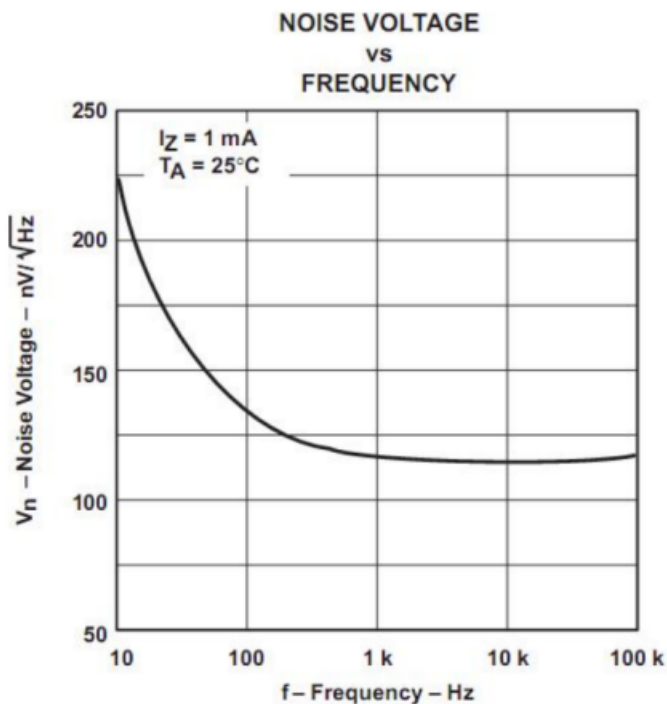


Figure 2

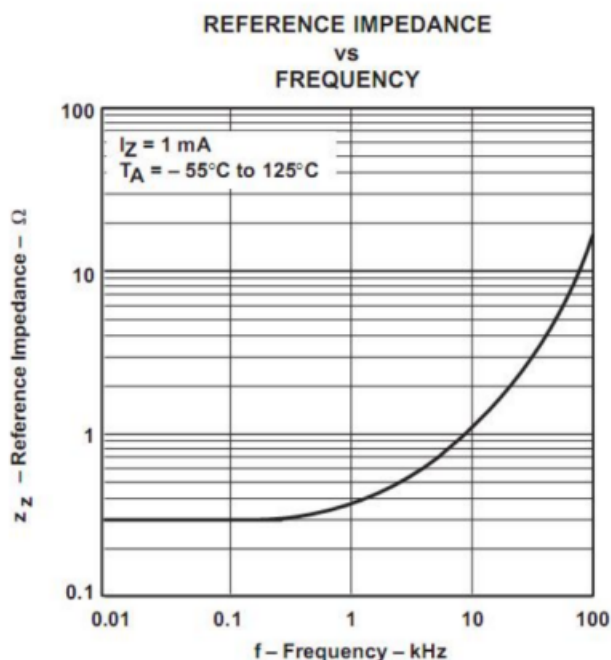
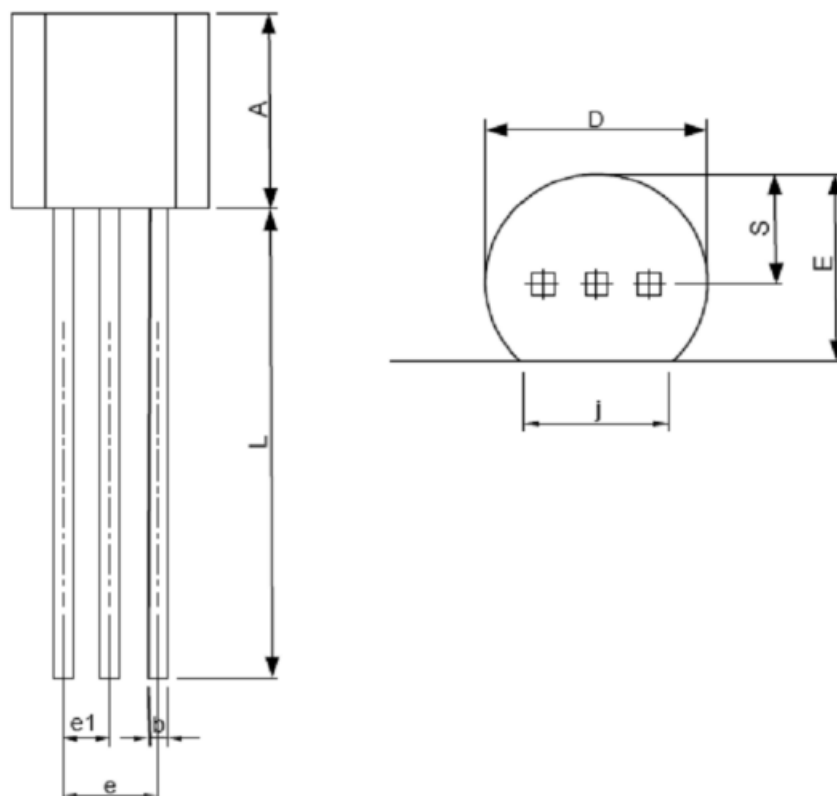


Figure 3

Outline Dimensions

TO-92

Unit : mm



Symbol	TO-92			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.32	5.33	0.170	0.210
b	0.41	0.53	0.016	0.021
D	4.45	5.20	0.175	0.205
E	3.18	4.19	0.125	0.165
e	2.42	2.66	0.095	0.105
e1	1.15	1.39	0.045	0.055
J	3.43	4.00	0.135	0.157
L	12.70	15.00	0.500	0.591
S	2.03	2.66	0.080	0.105

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