

LOW POWER, BANDGAP VOLTAGE REFERENCES

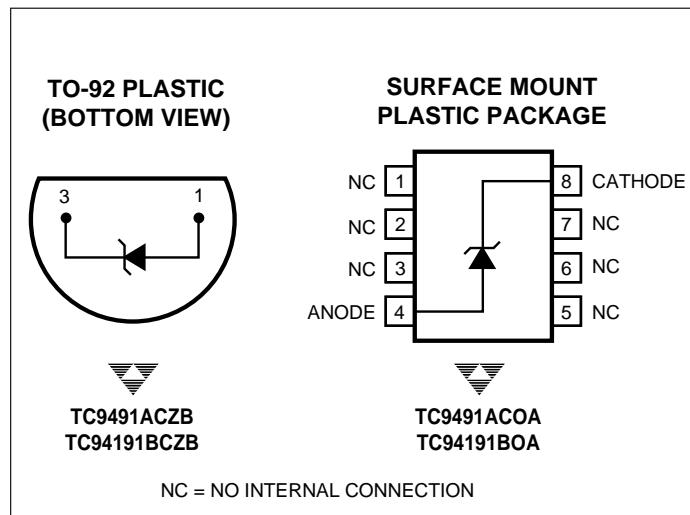
FEATURES

- Temperature Coefficient 50ppm/ $^{\circ}\text{C}$
- Wide Operating Current Range 15 μA to 20mA
- Dynamic Impedance 0.6 Ω
- Output Tolerance 1% or 2%
- Output Voltage Option 1.220V
- TO-92 Plastic Package
- 8-Pin Plastic Small Outline (SO) Package

APPLICATIONS

- ADC and DAC Reference
- Current Source Generation
- Threshold Detectors
- Power Supplies
- Multi-meters

PIN CONFIGURATIONS



GENERAL DESCRIPTION

The TC9491 (1.220V output) bipolar, two-terminal, bandgap voltage references offer precision performance without premium price. These devices do not require thin-film resistors, greatly lowering manufacturing complexity and cost.

A 50ppm/ $^{\circ}\text{C}$ output temperature coefficient and a 15 μA to 20mA operating current range make these devices attractive for multimeter, data acquisition converter, and telecommunication voltage references.

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ORDERING INFORMATION

Part No.	Package	Temperature Range	Tempco.
TC9491ACOA	8-Pin SOIC	0°C to +70°C	50 ppm/ $^{\circ}\text{C}$
TC9491BCOA	8-Pin SOIC	0°C to +70°C	100 ppm/ $^{\circ}\text{C}$
TC9491ACZM	TO-92	0°C to +70°C	50 ppm/ $^{\circ}\text{C}$
TC9491BCZM	TO-92	0°C to +70°C	100 ppm/ $^{\circ}\text{C}$

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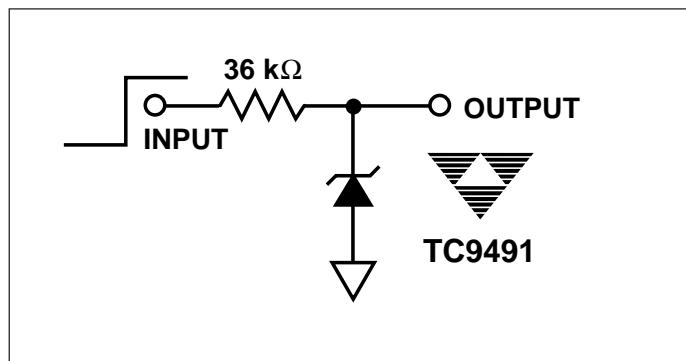
TC9491A TC9491B

ABSOLUTE MAXIMUM RATINGS*

Forward Current	+10mA
Reverse Current	+30mA
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	
TO-92 Package	0°C to +70°C
COA Surface Mount Package	0°C to +70°C
Lead Temperature (Soldering, 10 sec)	
TO-92 Package	+300°C
COA Surface Mount Package	+300°C
Power Dissipation	
Limited by Forward/Reverse Current	

*Functional operation above the absolute maximum stress ratings is not implied.

RESPONSE TIME TEST CIRCUIT



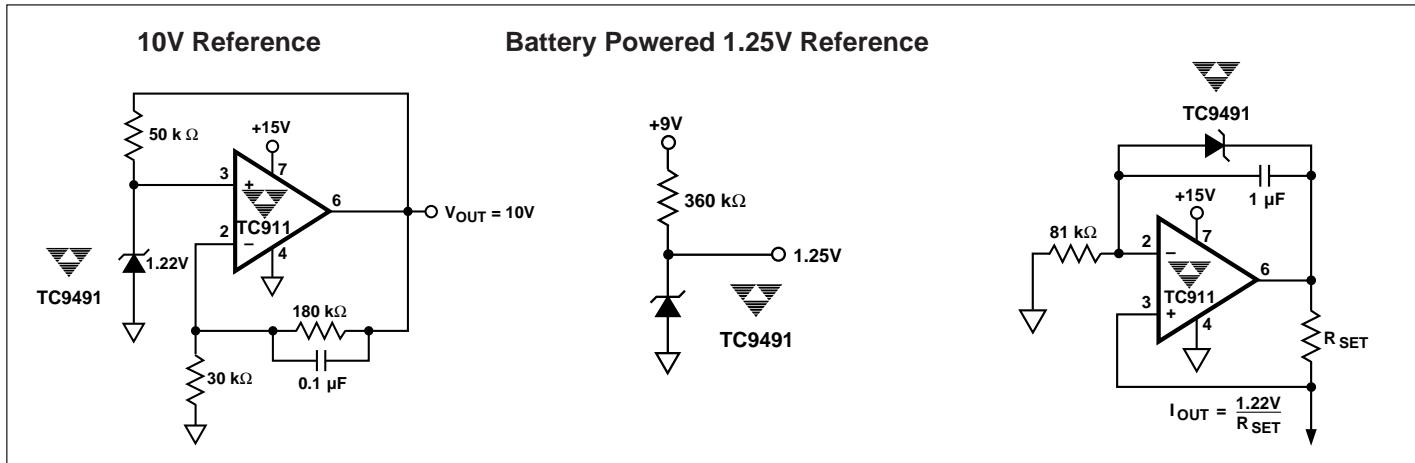
ELECTRICAL CHARACTERISTICS: $T_A = +25^\circ\text{C}$, unless otherwise specified.

Symbol	Parameter	Test Conditions	TC9491A			TC9491B			Unit
			Min	Typ	Max	Min	Typ	Max	
$V_{(BR)R}$	Reverse Breakdown Voltage	$I_R \leq 20\text{mA}$	1.200	1.22	1.250	1.200	1.220	1.250	V
	$T_A = 0^\circ\text{C} \text{ to } +70^\circ\text{C}$		1.180	—	1.290	1.219	—	1.260	
I_{RMIN}	Minimum Operating Current	$T_A = +25^\circ\text{C}$	—	8.0	15	—	8.0	15	μA
	$T_A = 0^\circ\text{C} \text{ to } +70^\circ\text{C}$		—	—	20	—	—	20	
$\Delta V_{(BR)R}$	Reverse Breakdown Voltage Change with Current	$I_{Rmin} = I_R = 1.0\text{mA}, T_A = +25^\circ\text{C}$	—	—	1.0	—	—	1.0	
	$T_A = 0^\circ\text{C} \text{ to } +70^\circ\text{C}$		—	—	1.5	—	—	1.5	
	$1.0\text{mA} = I_R = 20\text{mA}, T_A = +25^\circ\text{C}$		—	—	10	—	—	20	
	$T_A = 0^\circ\text{C} \text{ to } +70^\circ\text{C}$		—	—	20	—	—	25	
Z	Reverse Dynamic Impedance	$I_R = 100\mu\text{A}$	—	0.6	—	—	0.6	—	Ω
$\Delta V_{(BR)}/\Delta T$	Average Temperature Coefficient	$10\mu\text{A} = I_R = 20\text{mA}$	—	—	50	—	—	100	$\text{ppm}/^\circ\text{C}$
S	Long Term Stability	$I_R = 100\mu\text{A}, T_A = +25^\circ\text{C} \pm 0.1^\circ\text{C}$	—	20	—	—	20	—	ppm/kHR

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**TC9491A
TC9491B**

TYPICAL APPLICATIONS



TYPICAL CHARACTERISTICS

