

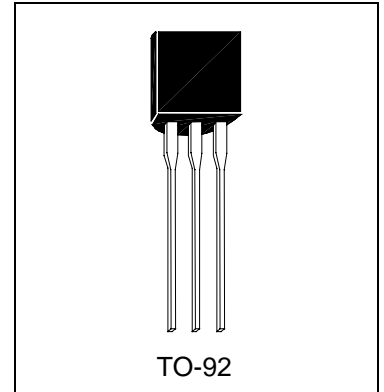


H431AA/BA/CA

ADJUSTABLE SHUNT REGULATOR

Description

The H431 series are three-terminal adjustable regulators with guaranteed thermal stability over applicable temperature ranges. The output voltage may be set to any value between V_{REF} (approximately 2.495 volts) and 36 volts with two external resistors. These devices have a typical dynamic output impedance of 0.2Ω . Active output circuitry provides a very sharp turn-on characteristic, making these devices excellent replacement for zener diodes in many applications.



Features

- Programmable output voltage
- Temperature coefficient is 50ppm/°C typical
- Temperature compensated for operation over full temperature range
- Low output noise voltage
- Fast turn on response

Classification

Rank	A	B	C
V_{REF}	$2.495\pm 2\%$	$2.495\pm 1\%$	$2.495\pm 0.5\%$

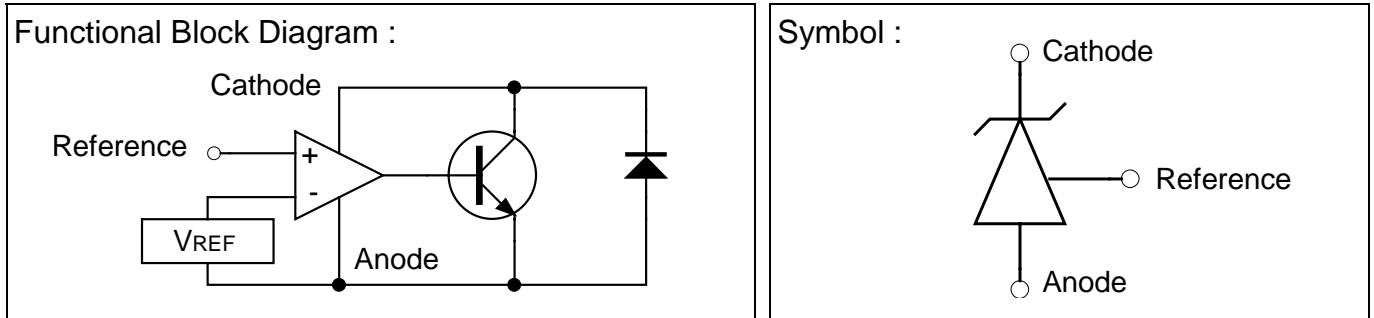
Absolute Maximum Ratings

(Operating temperature range applies unless otherwise specified)

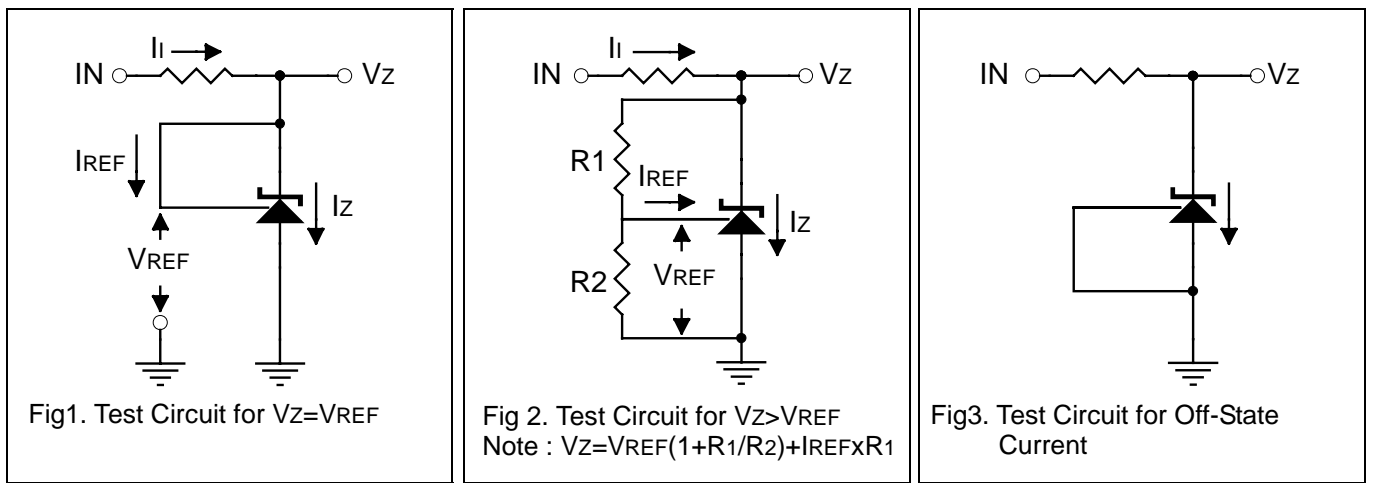
Characteristics	Symbol	Value	Unit
Cathode Voltage	V_{KA}	37	V
Cathode Current Range (Continuous)	I_K	-100~+150	mA
Reference Input Current Range	I_{REF}	0.05~+10	mA
Power Dissipation	P_D	770	mW
Operating Temperature Range	T_{opr}	0~+70	°C
Storage Temperature Range	T_{stg}	-65~+150	°C



Functional Block Diagram & Symbol



Test Circuits

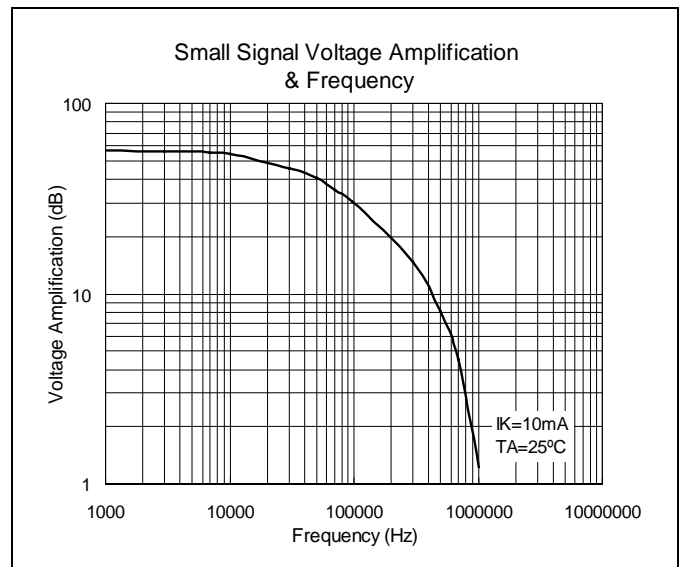
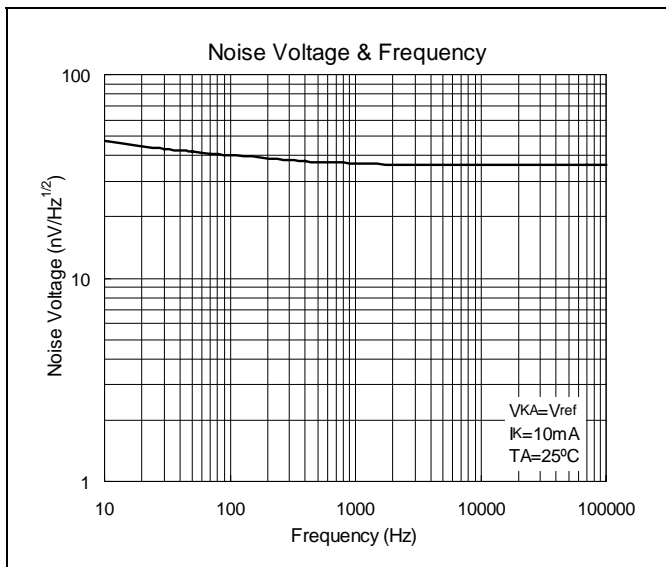
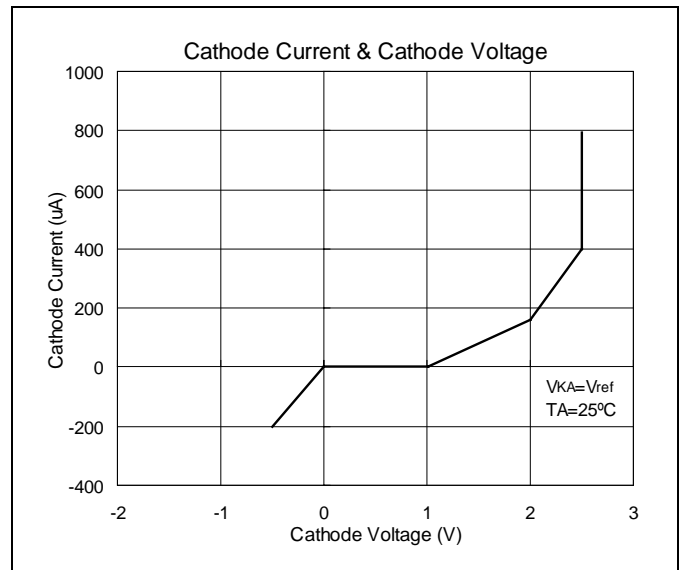
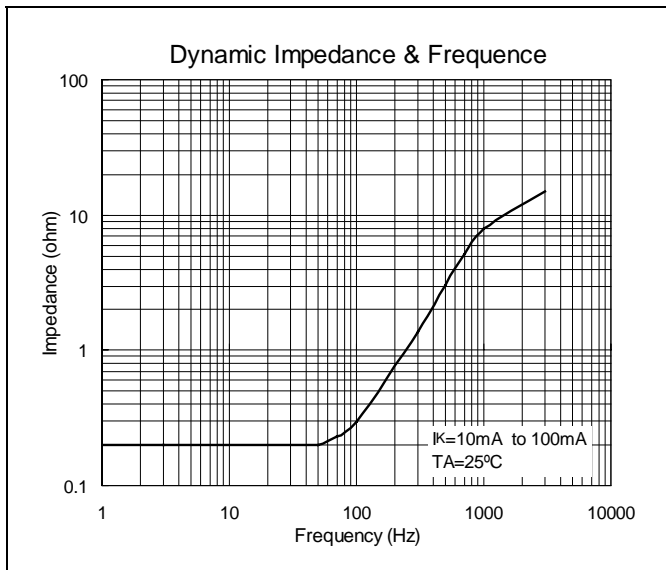
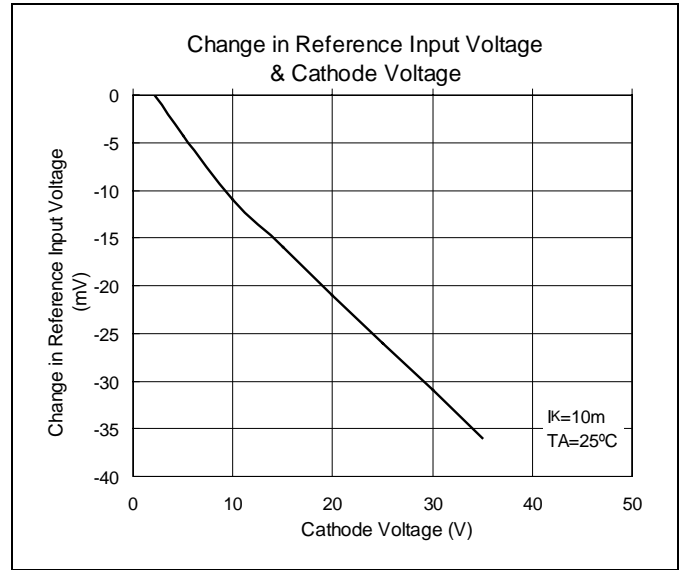
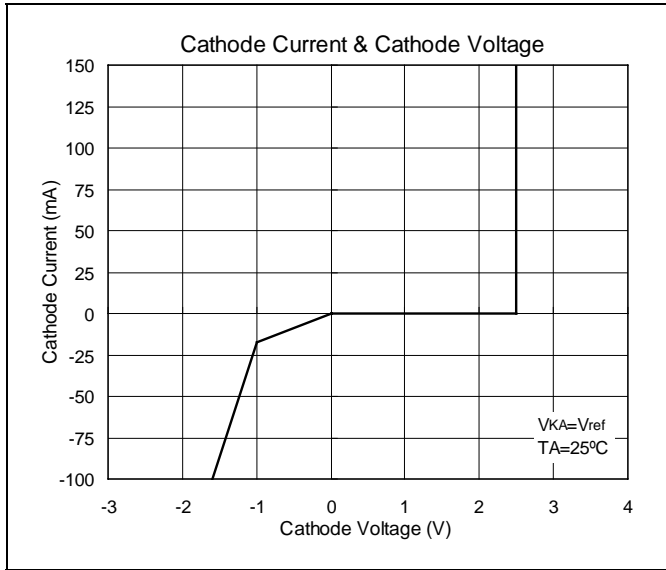


Electrical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise specified)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Input Voltage H431AA H431BA H431CA	V_{REF}	$V_{KA}=V_{REF}, I_K=10\text{mA}$	2.445	2.495	2.545	V
			2.470	2.495	2.520	
			2.480	2.495	2.510	
Deviation of Reference Input Voltage Over-Temperature	$V_{REF(\text{dev})}$	$V_{KA}=V_{REF}, I_K=10\text{mA}$ $T_{\min} \leq T_a \leq T_{\max}$	-	4	17	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\Delta V_{REF} / \Delta V_{KA}$	$I_K=10\text{mA},$ $\Delta V_{KA}=10\text{V}-V_{REF}$	-	-1.4	-2.7	mV
		$I_K=10\text{mA},$ $\Delta V_{KA}=36\text{V}-10\text{V}$	-	-1.0	-2.0	V
Reference Input Current	I_{REF}	$I_K=10\text{mA}, R_1=10\text{k}\Omega,$ $R_2=\infty$	-	2	4	μA
Deviation of Reference Input Current Over Full Temperature Range	$I_{REF(\text{dev})}$	$I_K=10\text{mA}, R_1=10\text{k}\Omega,$ $R_2=\infty, T_a=\text{Full Range}$	-	0.4	1.2	μA
Minimum Cathode Current for Regulation	$I_{K(\text{min})}$	$V_{KA}=V_{REF}$	-	0.4	1.0	mA
Off-State Cathode Current	$I_{K(\text{off})}$	$V_{KA}=36\text{V}, V_{REF}=0$	-	0.1	1.0	μA
Dynamic impedance	Z_{KA}	$V_{KA}=V_{REF}, f \leq 1.0\text{KHz}$ $I_K=1 \text{ to } 100\text{mA}$	-	0.2	0.5	Ω

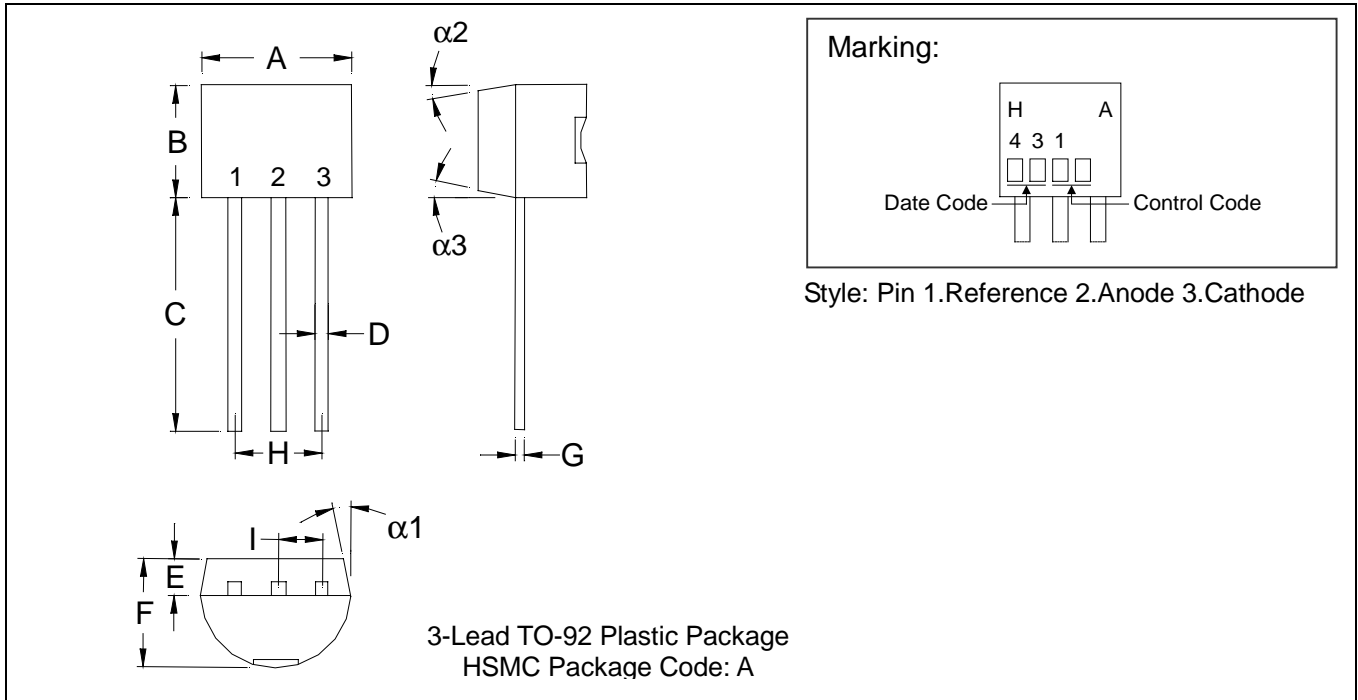


Characteristics Curve





TO-92 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1704	0.1902	4.33	4.83	G	0.0142	0.0220	0.36	0.56
B	0.1704	0.1902	4.33	4.83	H	-	*0.1000	-	*2.54
C	0.5000	-	12.70	-	I	-	*0.0500	-	*1.27
D	0.0142	0.0220	0.36	0.56	$\alpha 1$	-	*5°	-	*5°
E	-	*0.0500	-	*1.27	$\alpha 2$	-	*2°	-	*2°
F	0.1323	0.1480	3.36	3.76	$\alpha 3$	-	*2°	-	*2°

- Notes:**
- 1.Dimension and tolerance based on our Spec. dated Apr. 25,1996.
 - 2.Controlling dimension: millimeters.
 - 3.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 - 4.If there is any question with packing specification or packing method, please contact your local HSMC sales office.

Material:

- Lead: 42 Alloy; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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