



DEVICE DESCRIPTION

The HTL431ACDBZR is a three-terminal adjustable shunt regulator offering excellent temperature stability.

This device has a typical dynamic output impedance of 0.2Ω. The device can be used as a replacement for zener diodes in many applications.

FEATURES

- The output voltage can be adjusted to 36V
- Low dynamic output impedance, its typical value is 0.2K
- Trapping current capability is 1 to 100mA
- Low output noise voltage
- Fast on-state response
- The effective temperature compensation in the working range of full temperature
- The typical value of the equivalent temperature factor in the whole temperature scope is 50 ppm/°C

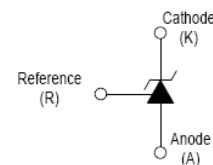
APPLICATION

- Shunt Regulator
- High-Current Shunt Regulator
- Precision Current Limiter



SOT-23

Equivalent Circuit



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HTL431ACDBZR	SOT-23	431	3000

ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

Parameter	Symbol	Value	Unit
Cathode Voltage	V_{KA}	36	V
Cathode Current Range (Continuous)	I_{KA}	-100~+150	mA
Reference Input Current Range	I_{ref}	0.05~+10	mA
Power Dissipation	P_D	300	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	417	°C/W
Operating Temperature	T_{opr}	-25~+85	°C
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-65~+150	°C



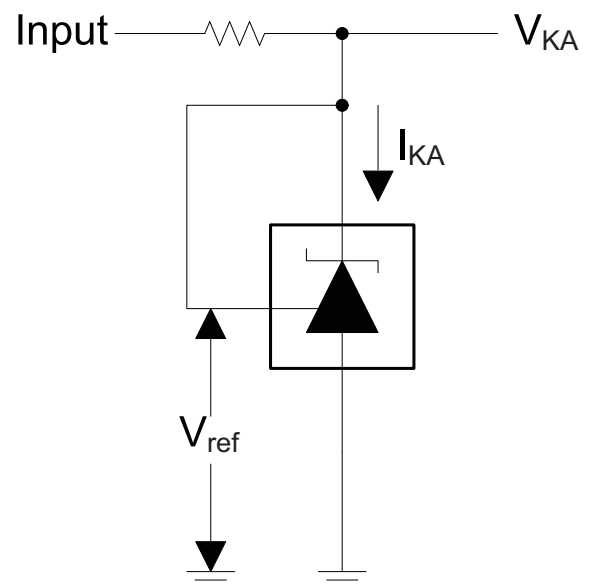
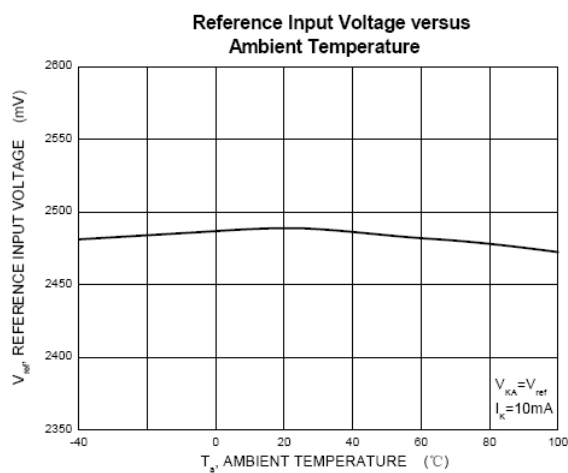
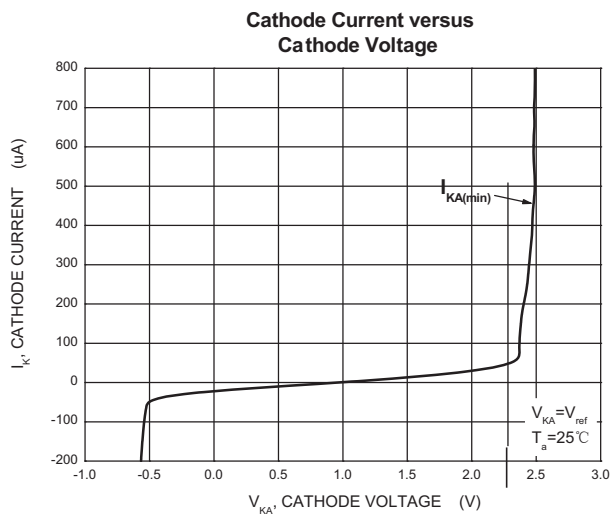
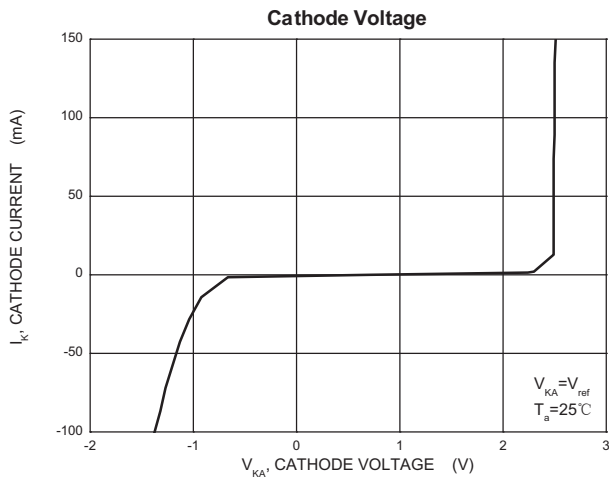
ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Reference input voltage	V_{ref}	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=10\text{mA}$	2.475	2.5	2.525	V
Deviation of reference Input voltage over temperature (note)	$\Delta V_{\text{ref}}/\Delta T$	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=10\text{mA}$ $T_{\text{MIN}}\leq T_a\leq T_{\text{MAX}}$		4.5	17	mV
Ratio of change in reference Input voltage to the change in cathode voltage	$\Delta V_{\text{ref}}/\Delta V_{\text{KA}}$	$I_{\text{KA}}=10\text{mA}$ $\Delta V_{\text{KA}}=10\text{V}\sim V_{\text{REF}}$		-1.0	-2.7	mV/V
		$\Delta V_{\text{KA}}=36\text{V}\sim 10\text{V}$		-0.5	-2.0	mV/V
Reference input current	I_{ref}	$I_{\text{KA}}=10\text{mA}, R_1=10\text{k}\Omega$ $R_2=\infty$		1.5	4	μA
Deviation of reference input current over full temperature range	$\Delta I_{\text{ref}}/\Delta T$	$I_{\text{KA}}=10\text{mA}, R_1=10\text{k}\Omega$ $R_2=\infty$ $T_a=-25$ to 85°C		0.4	1.2	μA
Minimum cathode current for regulation	$I_{\text{KA(min)}}$	$V_{\text{KA}}=V_{\text{REF}}$		0.45	1.0	mA
Off-state cathode current	$I_{\text{KA(OFF)}}$	$V_{\text{KA}}=36\text{V}, V_{\text{REF}}=0$		0.05	1.0	μA
Dynamic impedance	Z_{KA}	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=1$ to 100mA $f\leq 1.0\text{kHz}$		0.15	0.5	Ω

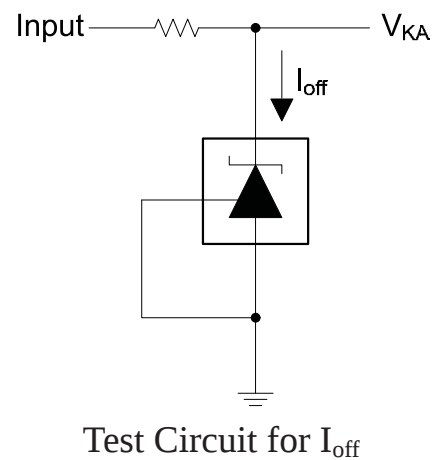
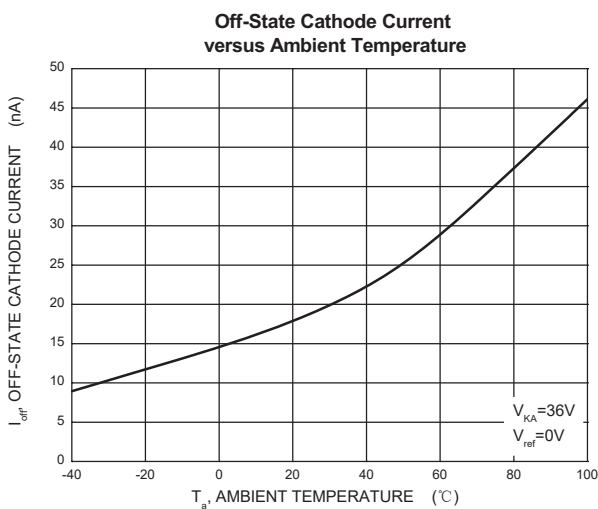
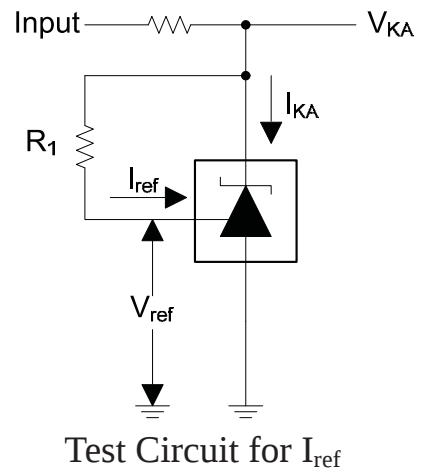
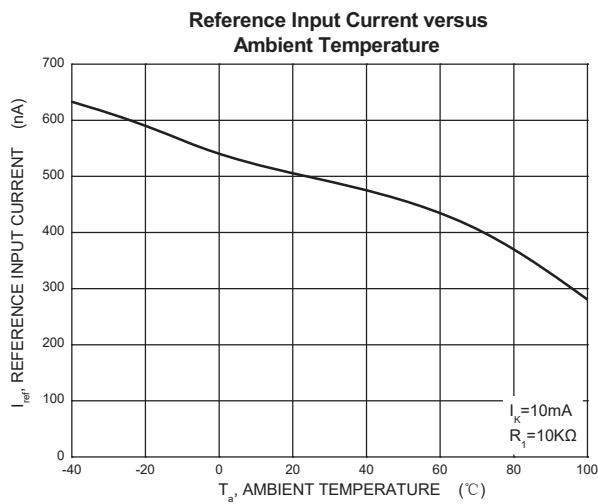
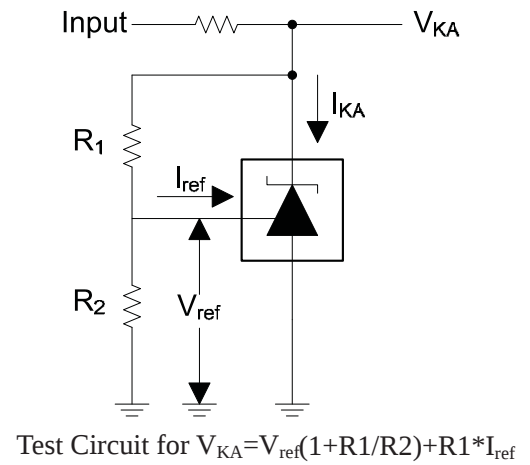
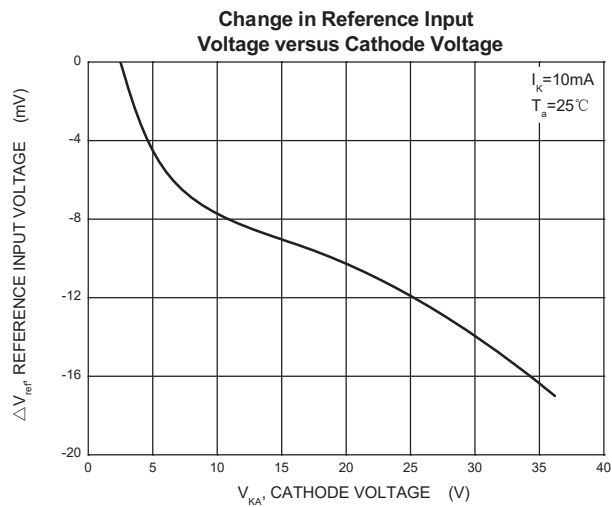
Note: $T_{\text{MIN}}=-25^{\circ}\text{C}$, $T_{\text{MAX}}=+85^{\circ}\text{C}$

CLASSIFICATION of V_{ref}

Rank	0.5%	1%
Range	2.487-2.513	2.475-2.525

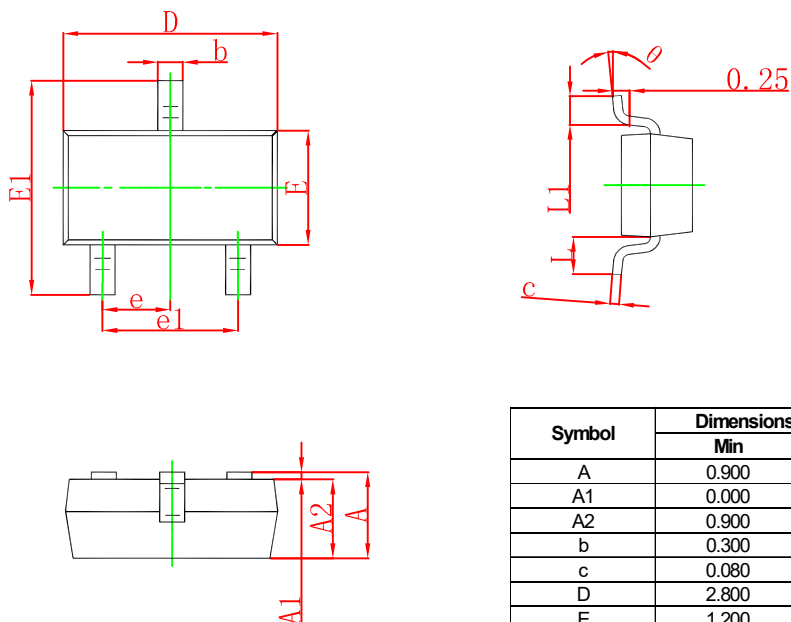


Test Circuit for $V_{KA} = V_{ref}$





SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.



Attention

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.