DESCRIPTION

The A431L is a three-terminal Adjustable Shunt Voltage Reference. Output can be set to any value between VREF (1.24V) and 18V with two external resistors (see Figure 2).

The A431L operate from a lower voltage (1.24V) than the widely use A431, A431A and A432A shunt-regulator reference.

The A431L has a typical output impedance of 0.5 Ω. Active output circuitry provides a very sharp turn-on characteristic, making A431L excellent replacements for Zener diodes in many applications, including on-board regulation and adjustable power supplies.

The A431L is available in SOT-23 package.

FEATURES

- Low Voltage Operation: VREF=1.24V
- Adjustable Output Voltage: VREF to 18V
- Reference Voltage Tolerances
  -0.5% for A431L-A
  -1% for A431L-B
  -1.5% for A431L-C
- Low dynamic output impedance: 0.5Ω
- Low output noise voltage
- Fast on -state response
- Sink current capability of 0.1mA to100mA
- Available in SOT-23 package.

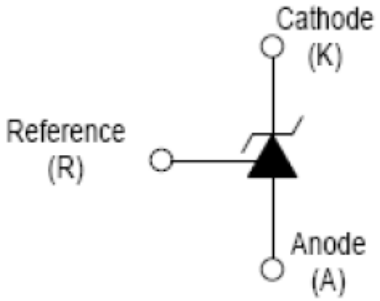
APPLICATION

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

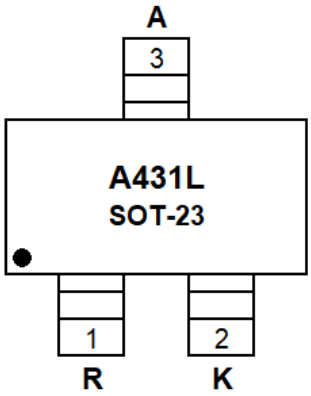
ORDERING INFORMATION

Package Type	Part Number	
SOT-23 SPQ: 3,000pcs/Reel	E3	A431LE3R-X
		A431LE3VR-X
Note	X: Output Voltage Tolerance: A, B or C A=0.5%, B=1%, C=1.5% R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	R	REFERENCE
2	K	CATHODE
3	A	ANODE

ABSOLUTE MAXIMUM RATINGS

Operating temperature rangeapplies unless otherwise specified

V_{KA}, Cathode Voltage	18V
I_{KA}, Cathode Current Range (Continuous)	100mA
I_{REF}, Reference Input Current Range	6μA
P_D, Power Dissipation	350mW
$R_{\theta JA}$, Thermal Resistance from Junction to Ambient	357℃/W
T_{OPR}, Operating Temperature	0℃~+70℃
T_J, Junction Temperature	150℃
T_{STG}, Storage Temperature	-65℃~ +150℃

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

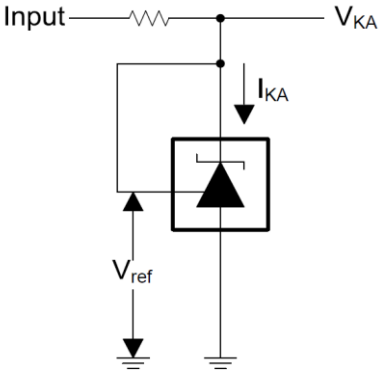
ELECTRICAL CHARACTERISTICS

T_A=25℃, unless otherwise specified

Parameter	Symbol	Conditions		Min	Typ.	Max	Unit
Reference Input Voltage(Fig 1)	V_{REF}	$V_{KA}=V_{REF}$, I_{KA}=10mA	0.5%	1.2338	1.24	1.2464	V
			1%	1.2276	1.24	1.2524	V
			1.5%	1.2214	1.24	1.2586	V
Deviation of Reference Voltage Over Full Temperature Range(Fig 1)	$\Delta V_{REF(DEV)}$	$V_{KA}=V_{REF}$, I_{KA}=10mA 0℃≤T_A≤70℃		-	-	16	mV
Ratio of Change in Reference Input Voltage to the change in Cathode Voltage (Fig 2)	$\Delta V_{REF}/\Delta V_{KA}$	I_{KA}=10mA ΔV_{KA}=1.25V~15V		-	-	2.4	mV/V
Deviation of Reference Input Voltage Over Temperature Range(Fig 2)	$\Delta I_{REF}/\Delta T$	I_{KA}=10mA, R_1=10kΩ, R_2=∞, 0℃≤T_A≤70℃		-	-	0.6	μA
Minimum Cathode Current for Regulation(Fig 1)	$I_{KA(MIN)}$	$V_{KA}=V_{REF}$		-	-	0.1	mA
Off-state Cathode Current(Fig 3)	I_{off}	V_{KA}=15V, V_{REF}=0		-	-	0.5	μA
Dynamic Impedance	Z_{KA}	$V_{KA}=V_{REF}$, I_{KA}=0.1~20mA, f≤1.0kHz		-	-	0.5	Ω

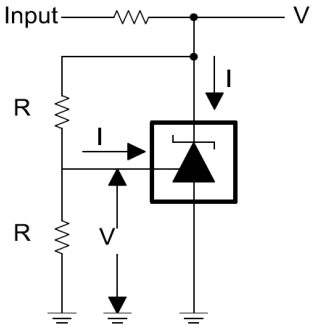
TEST CIRCUIT

Figure 1. Test Circuit for $V_{KA}=V_{ref}$



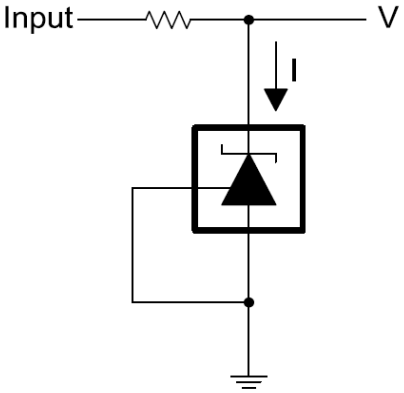
Test Circuit for $V_{KA}=V_{ref}$

Figure 2. Test Circuit for $V_{KA}=V_{ref}(1+R1/R2)+R1*I_{ref}$



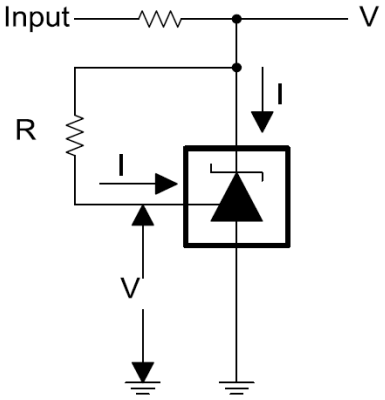
Test Circuit for $V_{KA}=V_{ref}(1+R1/R2)+R1*I_{ref}$

Figure 3. Test Circuit for I_{off}



Test Circuit for I_{off}

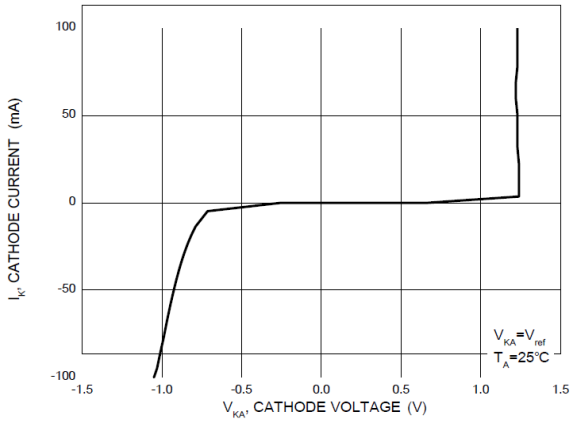
Figure 4. Test Circuit for I_{ref}



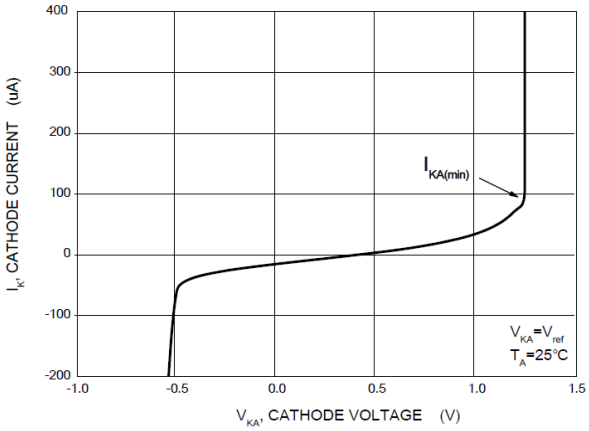
Test Circuit for I_{ref}

TYPICAL PERFORMANCE CHARACTERISTICS

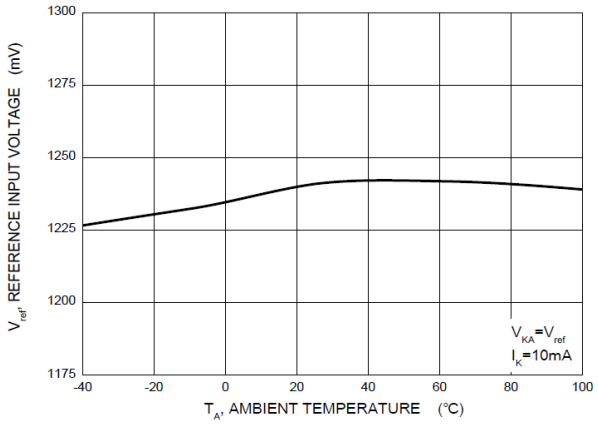
1. Cathode Current vs. Cathode Voltage



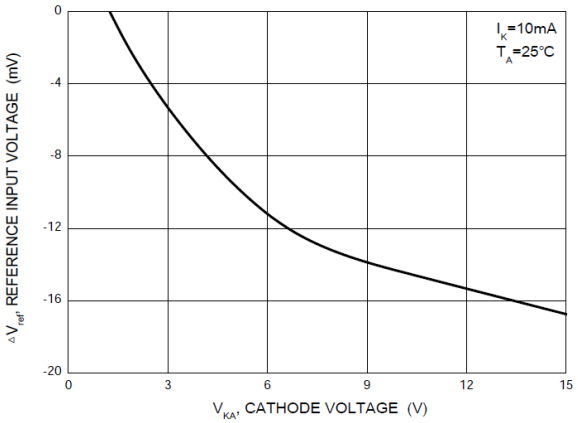
2. Cathode Current vs. Cathode Voltage



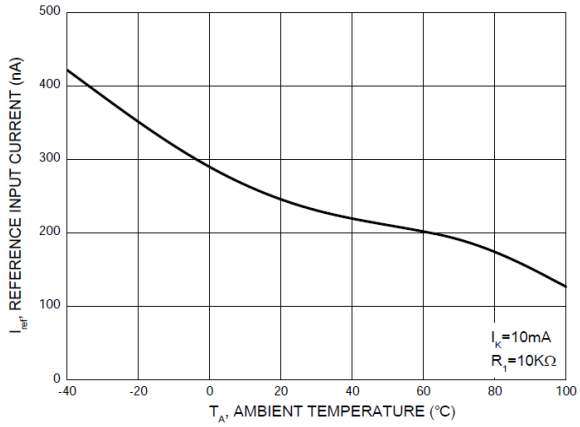
3. Reference Input Voltage vs. Ambient Temperature



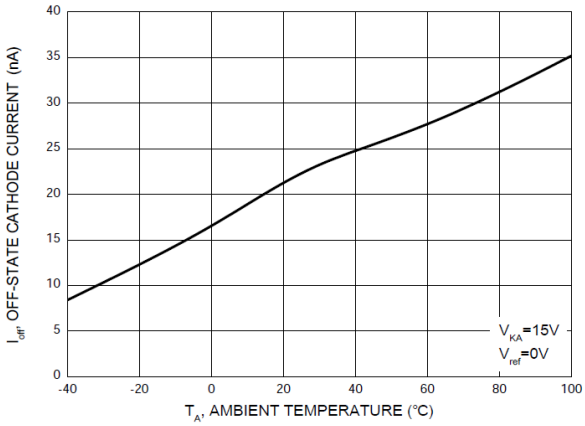
4. Change in Reference Input Voltage vs. Cathode Voltage



5. Reference Input Current vs. Ambient Temperature

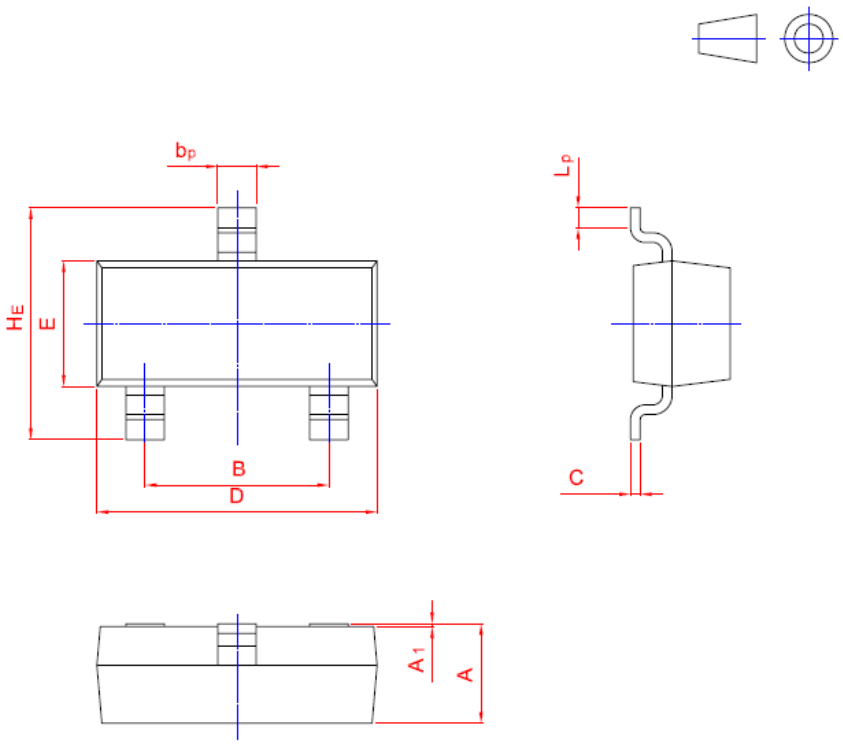


6. Off-State Cathode Current
7. vs. Ambient Temperature



PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)
Plastic surface mounted package; 3 leads



UNIT	A	B	b_p	C	D	E	H_E	A_1	L_p
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20

IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or servere property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.