Elektronische Bauelemente

SMTL431A

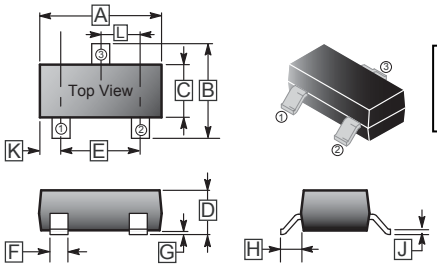
Adjustable Accurate Reference Source

RoHS Compliant Product
A suffix of "-C" specifies halogen or lead -free

DESCRIPTION

The SMTL431A 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

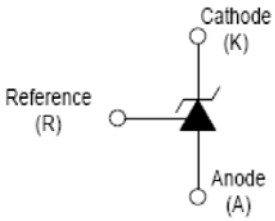
SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.09	0.18
B	2.10	2.65	H	0.35	0.65
C	1.20	1.40	J	0.08	0.20
D	0.89	1.17	K	0.6 REF.	
E	1.78	2.04	L	0.95 BSC.	
F	0.30	0.50			

FEATURES

- The output voltage can be adjusted to 36V
- Low dynamic output impedance, its typical value is 0.2Ω
- 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 30 ppm/℃



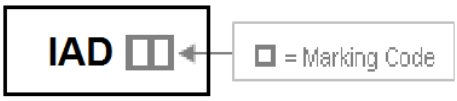
APPLICATIONS

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

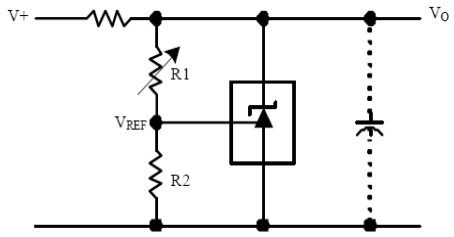
PACKAGE CODE

Package	MPQ	Leader Size
SOT-23	3K	7 inch

MARKING CODE



Block Diagram & Symbol



$V_O = (1+R1/R2)V_{REF}$

Figure 1. Shunt Regulator

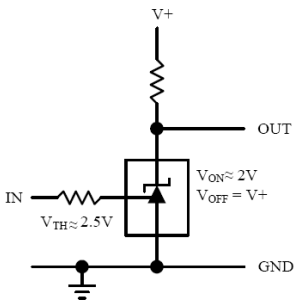


Figure 2. Single Supply Comparator with Temperature Compensated Threshold

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

Parameter	Symbol	Rating	Unit
Cathode Voltage[1]	V_{KA}	36	V
Cathode Current Range (Continuous)	I_K	1~100	mA
Thermal Resistance Junction To Ambient	$R_{\theta JA}$	833	°C / W
Reference Current Range	I_{ref}	-0.05~10	mA
Power Dissipation	P_D	0.15	W
Operating temperature	T_{OPR}	-40~85	°C
Junction Temperature Range	T_J	0~125	°C
Storage temperature Range	T_{STG}	-65~150	°C
Lead Temperature Range(Soldering, 10sec)	T_{LEAD}	260	°C

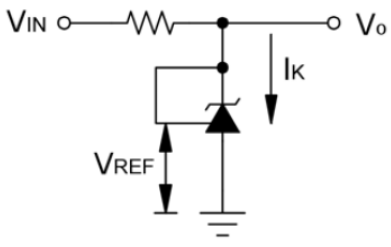
Note:
1. Voltage values are with respect to the anode terminal unless otherwise noted.

ELECTRICAL CHARACTERISTICS AND RECOMMENDED OPERATING CONDITIONS

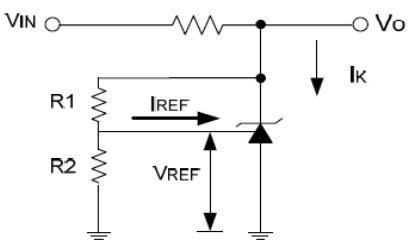
(T_A = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
Reference Input Voltage	V_{REF}	$V_{KA}=V_{ref}$, I_K=10mA		2.487	2.5	2.513	V
Deviation of reference input Voltage Over full temperature range	V_{DEV}	$V_{KA}=V_{ref}$, I_K=10mA T_A=Full range (Test circuit 1)		-	4	17	mV
Ratio Of Change in Reference Input Voltage to the change in Cathode Voltage	$\triangle V_{ref}/\triangle V_{KA}$	I_K=10mA	$\triangle V_{KA}$ =10V~ V_{ref}	-2.7	-1	-	mV/V
			$\triangle V_{KA}$ =36V~10V	-2	-0.4	-	mV/V
Reference Input Current	I_{ref}	I_K=10mA, R_1=10KΩ, R_2=∞ (Test circuit 2)		-	0.7	4	μA
Deviation Of Reference Input Current Over Full Temperature Range	$I_{REF(DEV)}$	I_K=10mA, R_1=10KΩ, R_2=∞ T_A=Full Temperature (Test circuit 2)		-	0.4	1.2	μA
Minimum cathode current for Regulation	$I_{K(Min)}$	V_{KA}= V_{ref} (Test circuit 1)		-	0.4	1	mA
Off-state cathode Current	$I_{K(Off)}$	V_{KA}=36V, V_{ref}=0		-	0.1	1	μA
Dynamic Impedance	$\|Z_{KA}\|$	$V_{KA}=V_{ref}$, I_K=1mA ~100mA, F<1KHz		-	0.2	0.5	Ω

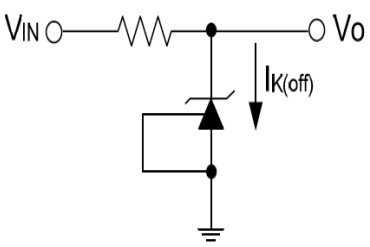
Test Circuits



Test Circuit 1.
$V_{KA}=V_{REF}$

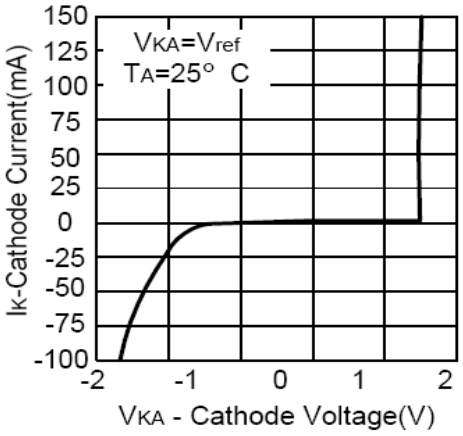


Test Circuit 2.
$V_{KA} > V_{REF}$

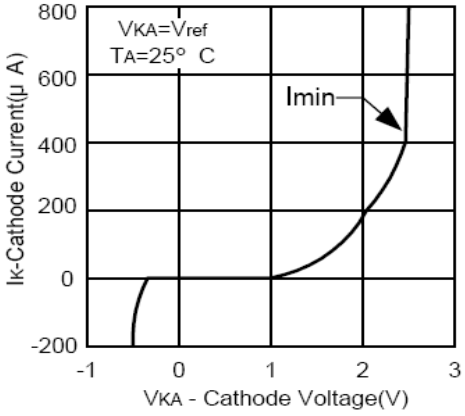


Test Circuit 3.
Off-State Current

TYPICAL PERFORMANCE CHARACTERISTICS

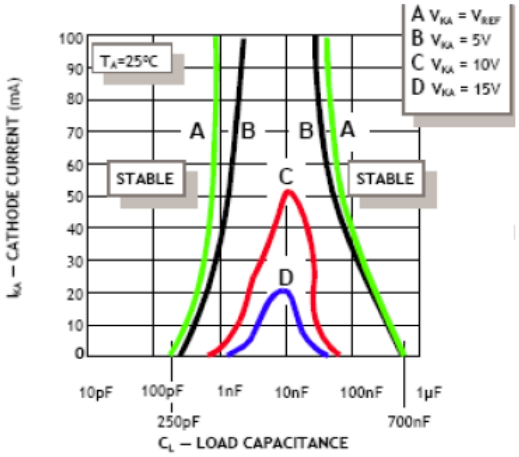


Cathode current vs. cathode voltage



Cathode current vs. cathode voltage

STABILITY BOUNDARY CONDITION



SMTL431A have not oscillation at Vka=15V and Vka=10V