Elektronische Bauelemente

TL431B

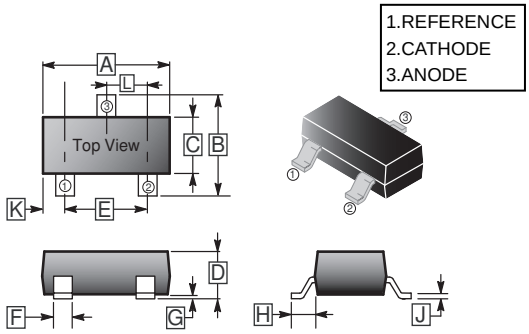
Adjustable Accurate Reference Source

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

DESCRIPTION

The TL431B 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



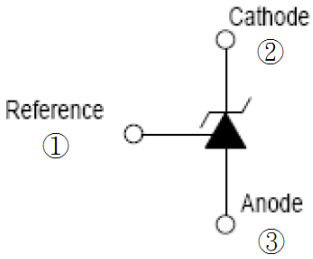
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0	0.18
B	2.10	2.95	H	0.55 REF.	
C	1.20	1.7	J	0.08	0.20
D	0.89	1.3	K	0.6 REF.	
E	1.70	2.3	L	0.95 BSC.	
F	0.30	0.50			

FEATURES

- The Output Voltage can be Adjusted to 36V
- Low Dynamic Output Impedance, its Typical Value is 0.2Ω
- Trapping Current Capability is 1~100mA
- 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/℃

APPLICATIONS

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



MARKING

431

CLASSIFICATION OF V_{ref}

Rank	1%
Range	2.475-2.525

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

ORDER INFORMATION

Part Number	Type
TL431B	Lead (Pb)-free
TL431B-C	Lead (Pb)-free and Halogen-free

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

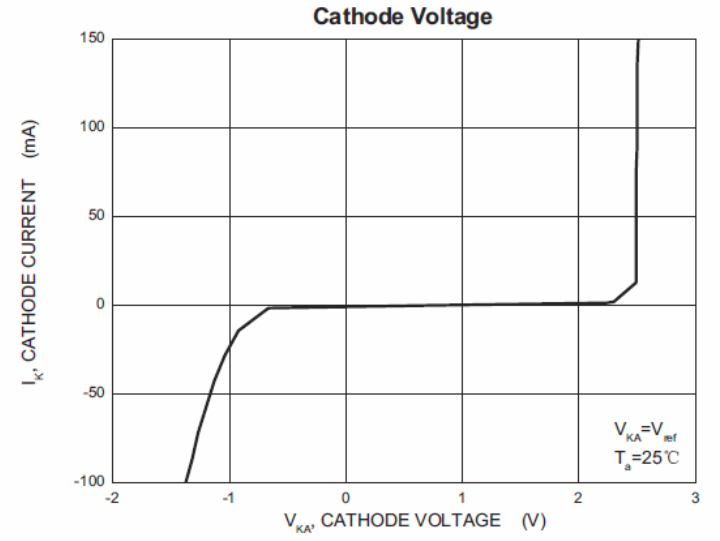
Parameter	Symbol	Ratings	Unit
Cathode Voltage	V_{KA}	36	V
Cathode Current Range (Continuous)	I_{KA}	-100~150	mA
Reference Input Current Range	I_{ref}	0.05~10	mA
Power Dissipation	P_D	300	mW
Thermal Resistance from Junction-Ambient	$R_{\theta JA}$	417	℃/W
Operating temperature	T_{opr}	-25~85	℃
Operating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

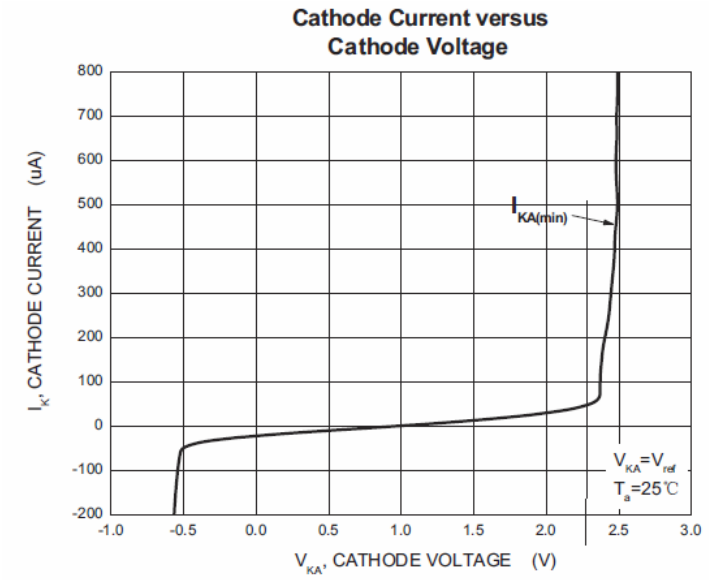
ELECTRICAL CHARACTERISTICS (T_A=25℃ unless otherwise specified)

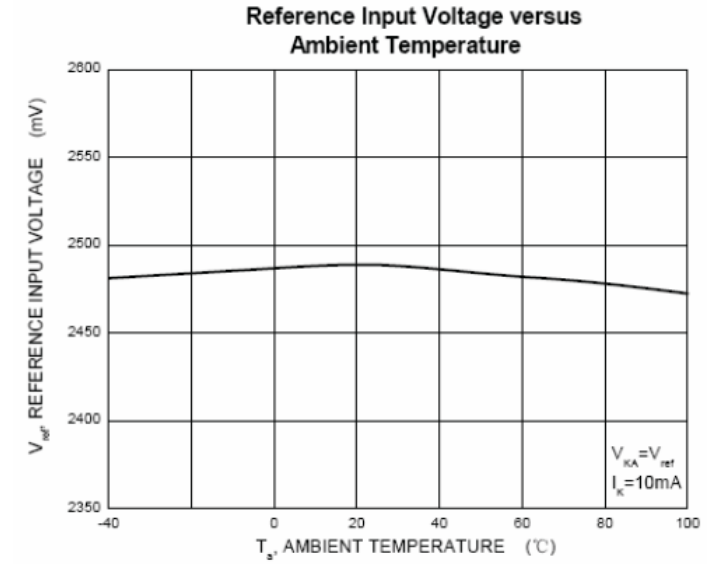
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Reference Input Voltage	V_{ref}	2.475	2.5	2.525	V	$V_{KA}=V_{ref}$, I_{KA}=10mA
Deviation of Reference Input Voltage Over Temperature [1]	$\triangle V_{ref}/\triangle T$	-	4.5	17	mV	$V_{KA}=V_{ref}$, I_{KA}=10mA $T_{Min} \leqq T_A \leqq T_{Max}$
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\triangle V_{ref}/\triangle V_{KA}$	-	-1	-2.7	mV/V	I_{KA}=10mA, $\triangle V_{KA}$=10V~V_{ref}
		-	-0.5	-2		I_{KA}=10mA, $\triangle V_{KA}$=10V~36V
Reference Input Current	I_{ref}	-	1.5	4	μA	I_{KA}=10mA, R_1=10KΩ, R_2=∞
Deviation of Reference Input Current Over Full Temperature Range	$\triangle I_{ref}/\triangle T$	-	0.4	1.2	μA	I_{KA}=10mA, R_1=10KΩ, R_2=∞ T_A= -25~85℃
Minimum Cathode Current for Regulation	$I_{KA(min)}$	-	0.45	1	mA	$V_{KA}=V_{ref}$
Off-State Cathode Current	$I_{KA(OFF)}$	-	0.05	1	μA	V_{KA}=36V, V_{ref}=0
Dynamic Impedance	Z_{KA}	-	0.15	0.5	Ω	$V_{KA}=V_{ref}$, I_{KA}=1~100mA, f≦1KHz

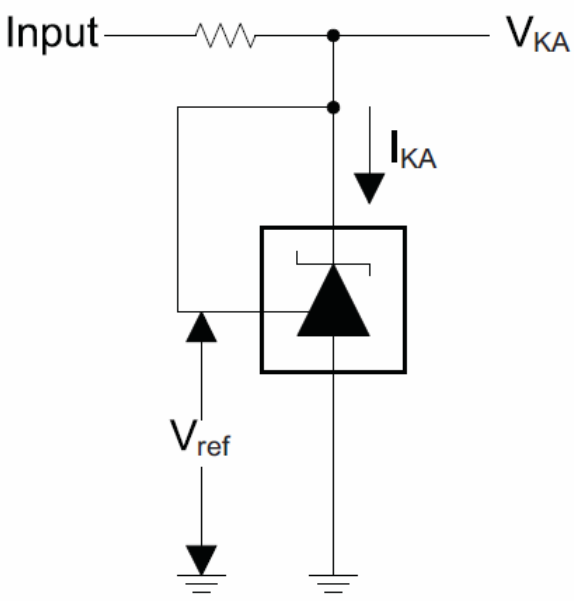
Note:
1. T_{MIN}= -25℃, T_{MAX}=85℃.

CHARACTERISTIC CURVE









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

CHARACTERISTIC CURVE