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TL431-TD(0.5)

產品規格說明書

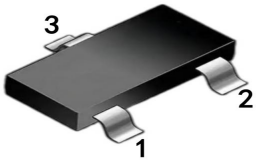
Features

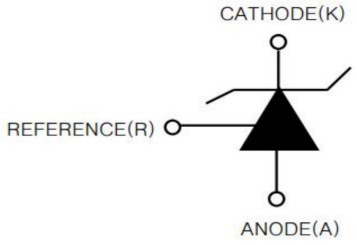
The **TL431-TD**is a three-terminal adjustable shunt regulator offering excellent temperature stability . This device has a typical dynamic output impedance of 0.2Ω. The device can be used as a replacement for zener diodes in many applications.

APPLICATION:

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

1.REFERENCE
2.CATHODE
3.ANODE





Order Information

Product	Package	Marking	Packing
TL431-TD	SOT-23	431	3000PCS/Reel

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

Parameter	Symbol	Value	Unit
Cathode Voltage	VKA	37	V
Cathode Current Range (Continuous)	IKA	-100~+150	mA
Reference Input Current Range	Iref	0.05~+150	mA
Power Dissipation	PD	300	mW
Thermal Resistance from Junction to Ambient	RθJA	417	℃/W
Operating Junction Temperature	Tj	150	℃
Operating Ambient Temperature Range	Topr	-25~+85	℃
Storage temperature Range	Tstg	-65~+150	℃

ELECTRICAL CHARACTERISTICS (Ta=25℃ unless otherwise specified)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Reference input voltage (Fig.1)	Vref	VKA=VREF, IKA=10mA		2.475	2.5	2.525	V
Deviation of reference input voltage	△Vref /△T	VKA =VREF, IKA =10mA			4.5	17	mV
over temperature (note) (Fig.1)		TMIN≤Ta≤TMAX					
Ratio of change in reference input	△Vref /△VKA	IKA=10mA	△ VKA=10V~VREF		-1.0	-2.7	mV/V
voltage to the change in cathode							
voltage (Fig.2)			△VKA=36V~10V		-0.5	-2.0	mV/V
Reference input current (Fig.2)	Iref	IKA=10mA, R1=10kΩ R2=∞			1.5	4	μA
Deviation Of reference input curren	△Iref /△T	IKA=10mA, R1=10kΩ R2=∞			0.4	1.2	μA
over full temperature range (Fig.2)		TA=-25 to 85℃					
Minimum cathode current for	IKA(min)	VKA=VREF, IKA=10mA			0.45	1.0	mA
regulation (Fig.1)							
Off-state cathode Current (Fig.3)	IKA(OFF)	VKA=36V,VREF=0			0.05	1.0	μA
Dynamic impedance	ZKA	VKA=VREF, IKA=1 to100mA f≤1.0kHz			0.15	0.5	Ω

Note: TMIN=-25℃ ,TMAX=+85℃

CLASSIFICATION of Vref

Rank	0.50%	1%
Range	2.487-2.513	2.475-2.525

Figure 1. Test Circuit for VKA = Vref

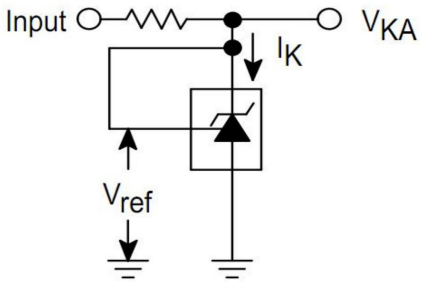


Figure 2. Test Circuit for VKA >Vref

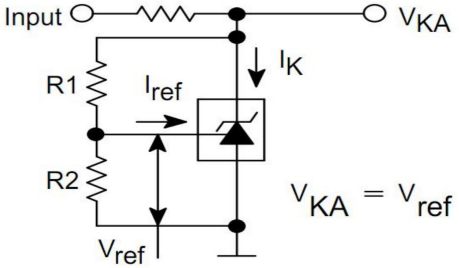
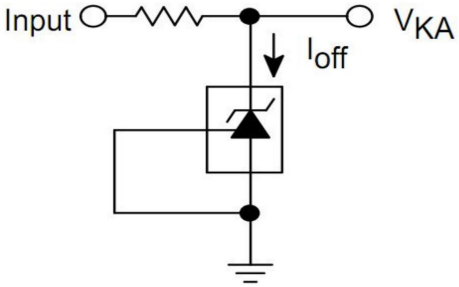


Figure 3. Test Circuit for Ioff



$$V_{KA} = V_{ref}\left(1 + \frac{R1}{R2}\right) + I_{ref} \bullet R1$$

Typical Electrical and Thermal Characteristics

Fig 1 Cathode Current Vs Cathode Voltage

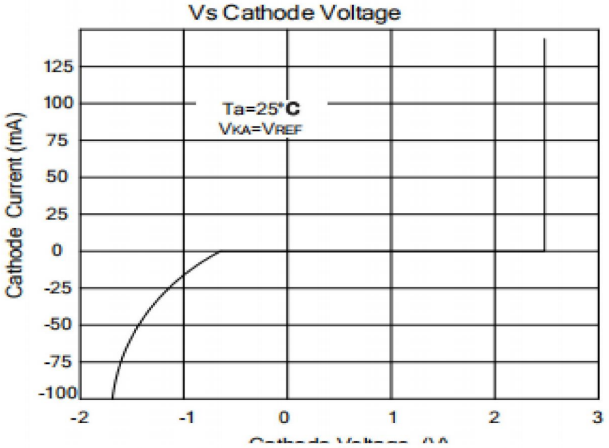


Fig 2 Cathode Current Vs Cahode Voltage

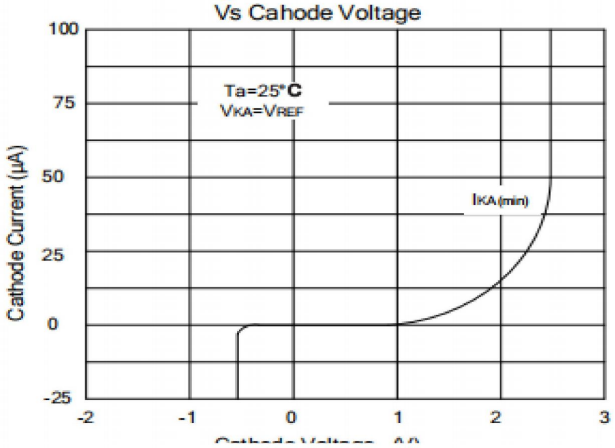


Fig 3 Change in Reference Input Voltage Vs Cathode voltage

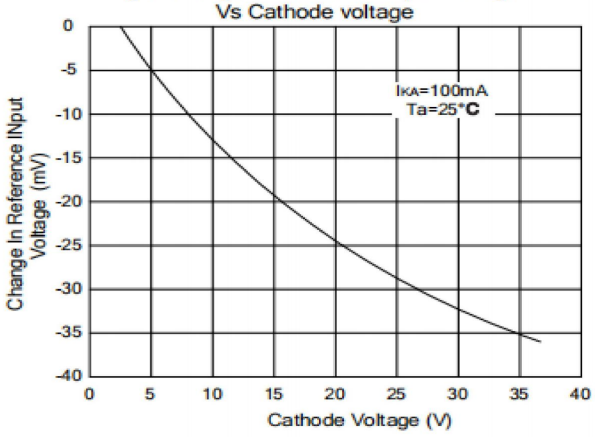


Fig 4 Pulse Response

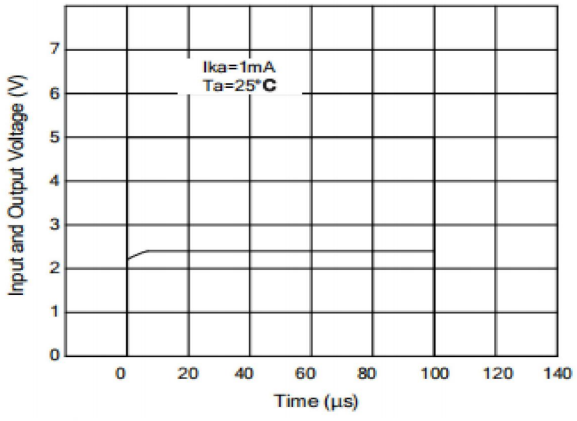


Fig 5 Dynamic Impedance Vs Frequency

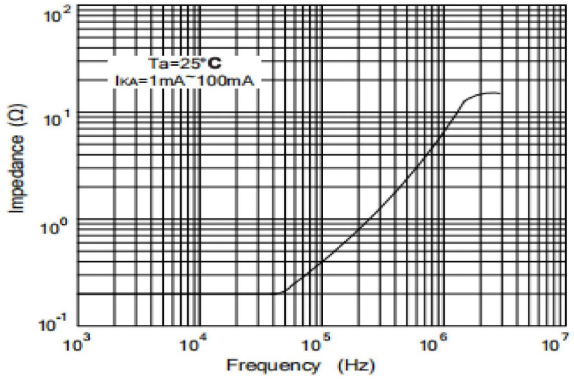
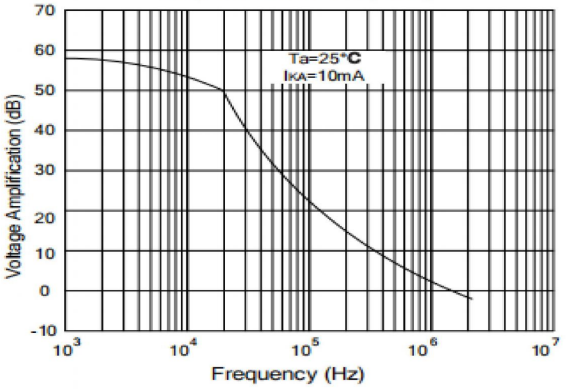
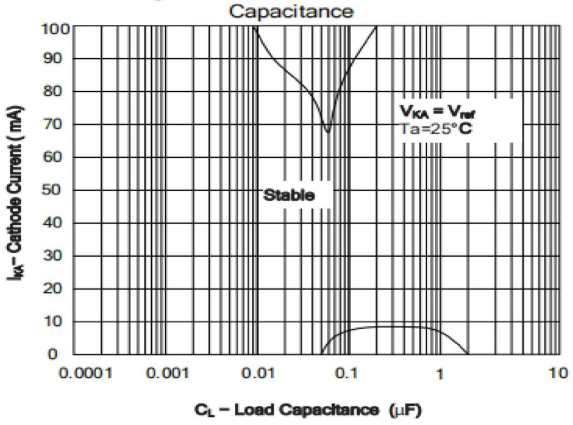


Fig 6 Small Signal Voltage Amplification Vs Frequency

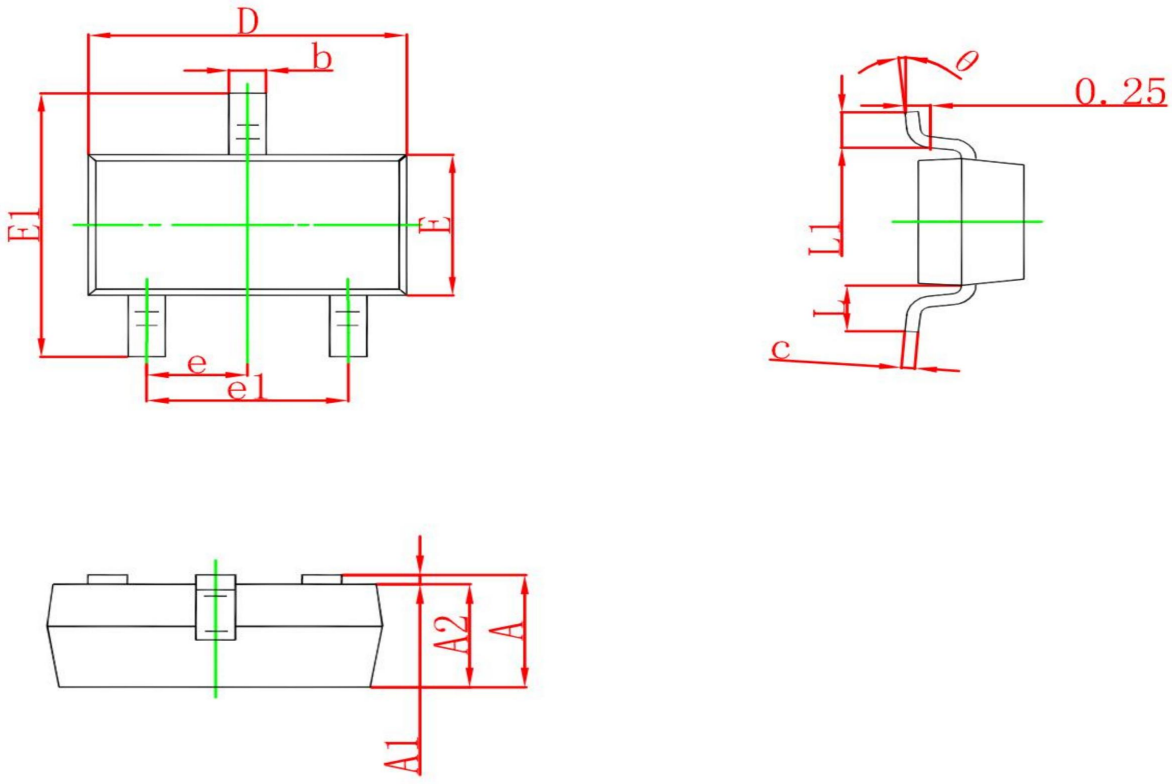


Typical Electrical and Thermal Characteristics

Fig 7 Cathode Current Vs Load Capacitance



SOT-23 Package Outline Dimesions



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°