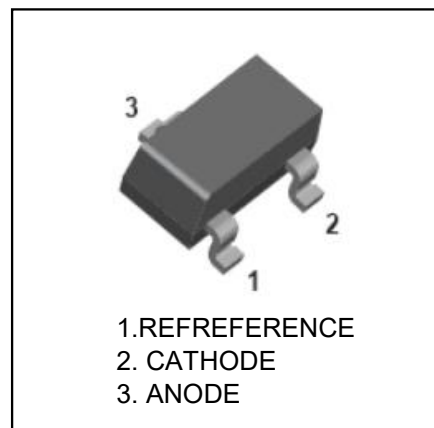


SOT-23 Plastic-Encapsulate Adjustable Reference Sourcer

Features

- Average Temperature Coefficient: 50 ppm/°C
- Full Operating Range Temperature Compensation
- Adjustable Output Voltage
- Fast Response Time
- Low Output Noise



Ordering Information

Part No	Marking	Package	Packing	Reel	Box	Carton
TL431A	431A	SOT-23	Tape&Reel	3000 PCS	45,000 PCS	180,000 PCS

Maximum Ratings@Ta=25°C

Full operating ambient temperature range applies unless otherwise specified

Symbol	Parameter	Value	Unit
V_{KA}	Cathode to Anode voltage	37	V
I_{KA}	Cathode current range, Continuous	-100~150	mA
I_{ref}	Reference input current range	10	mA
P_D	Power dissipation	280	mW
T_j	Operating junction temperature	-40~125	°C
T_{stg}	Storage temperature	-65~150	°C

Electrical Characteristics @ Ta=25°C unless otherwise specified

Parameter	Symbol	Test conditions	Min	Type	Max	Unit
Reference Input Voltage (Fig.1)	V_{REF}	$V_{KA}=V_{REF}, I_{KA}=10\text{ mA}$	2.48	2.5	2.52	V
Deviation of reference voltage over full temperature range (Fig.1)	$\Delta V_{REF} / \Delta T$	$V_{KA}=V_{REF}, I_{KA}=10\text{ mA}$	—	8.0	17	mV
Ratio of change in reference input voltage to change in Cathode to Anode voltage (Fig.2)	$\Delta V_{REF} / \Delta V_Z$	$I_{KA}=10\text{ mA}$, $V_{KA}=V_{REF} \sim 10\text{ V}$	—	-1.4	-2.7	mV/V
		$V_{KA}=10\text{ V} \sim 36\text{ V}$	—	-1.0	-2.0	
Reference Input Current (Fig.2)	I_{REF}	$R1=10\text{ K}\Omega, R2=\infty, I_{KA}=10\text{ mA}$	—	0.3	4.0	μA
Deviation of reference input current over full temperature range (Fig.2)	$\Delta I_{REF} / \Delta T$	$R1=10\text{ K}\Omega, R2=\infty, I_{KA}=10\text{ mA}$,	—	0.4	1.2	μA
Minimum Cathode current for regulation (Fig.1)	$I_{KA(\text{min})}$	$V_{KA}=V_{REF}$	—	0.4	1.0	mA
Off-state Cathode current (Fig.3)	$I_{KA(\text{off})}$	$V_{KA}=36\text{ V}, V_{REF}=0\text{ V}$	—	0.3	1.0	μA
Dynamic impedance (Fig.1)	Z_{KA}	$V_{KA}=V_{REF}, I_{KA}=1 \sim 100\text{ mA}, f \leq 1.0\text{ KHz}$	—	—	0.5	Ω
Rank		0.4%	0.5%	1.0%		
Range		2.49-2.51	2.4875-2.5125	2.48-2.528		

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

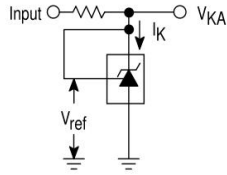


Figure 2. Test Circuit for $V_{KA} > V_{ref}$

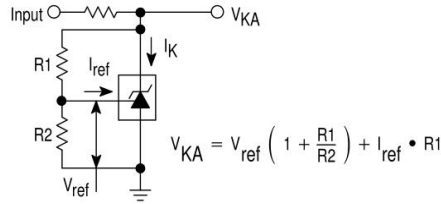
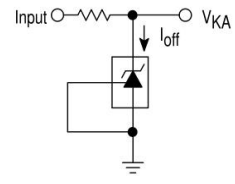
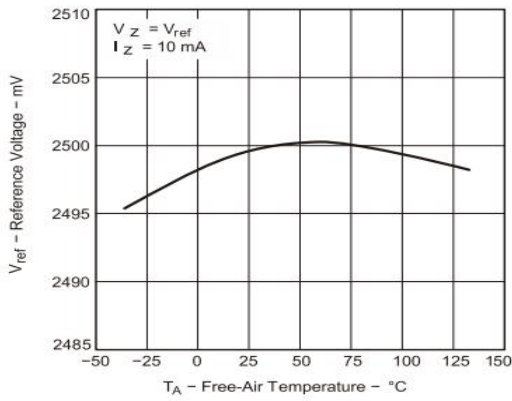


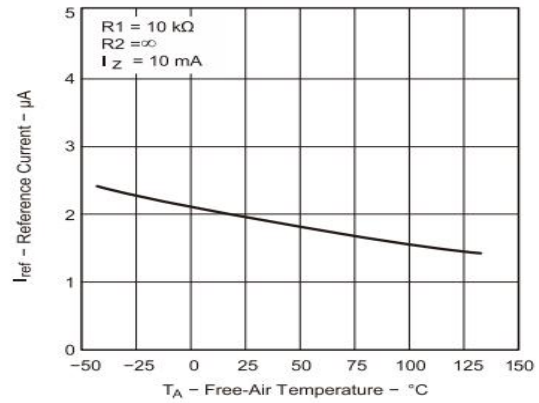
Figure 3. Test Circuit for I_{off}



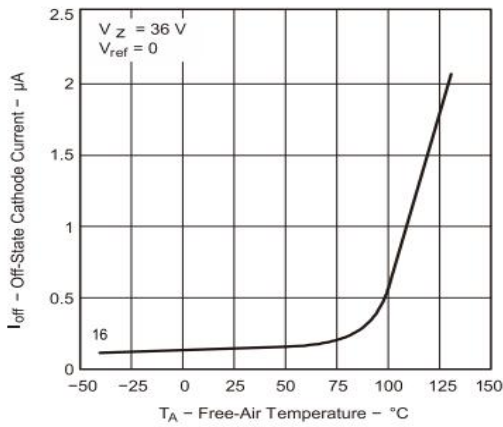
Typical Characteristics @ $T_a=25^\circ\text{C}$ unless otherwise specified



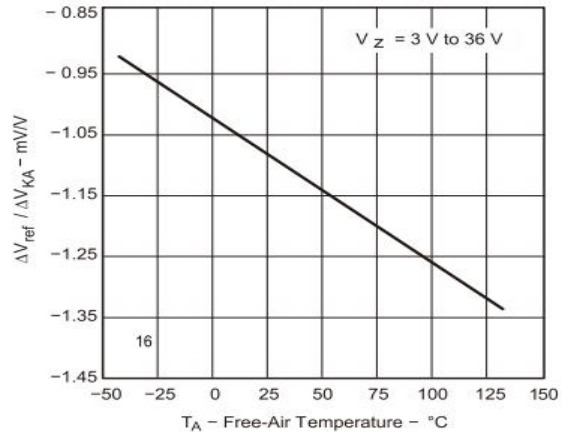
VREF -Reference Voltage vs Free-Air Temperature



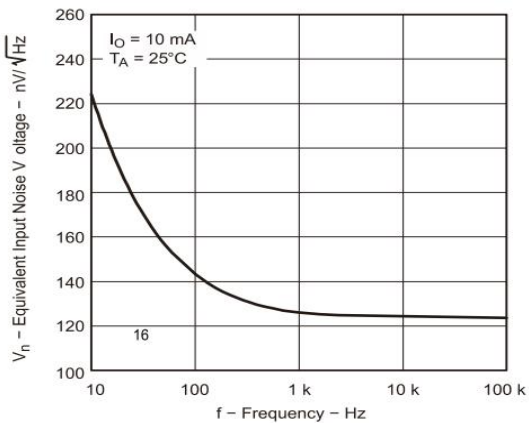
IREF-Reference Current vs Free-Air Temperature



IOFF vs Free-Air Temperature

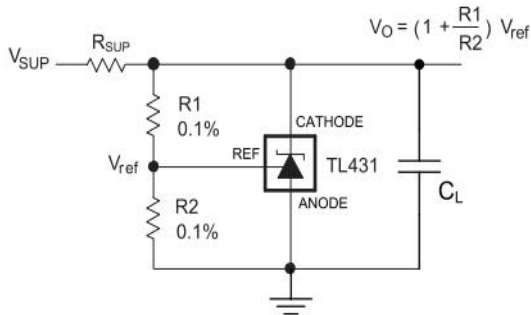


$\Delta V_{ref} / \Delta V_{KA}$ vs Free-Air Temperature

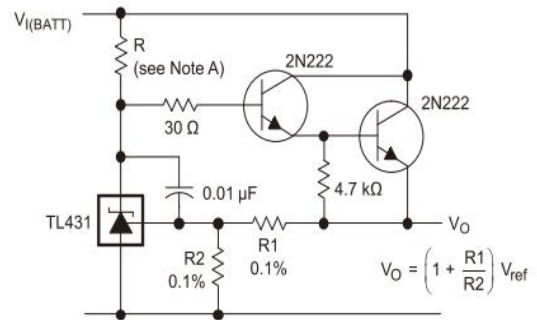


V_n vs f-Frequency

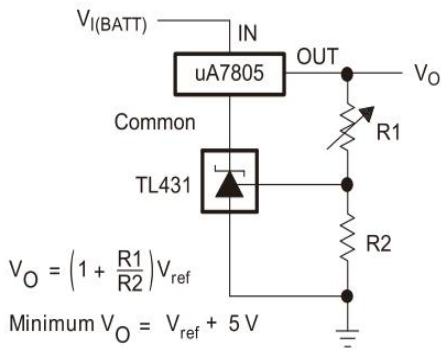
Typical Application Circuit



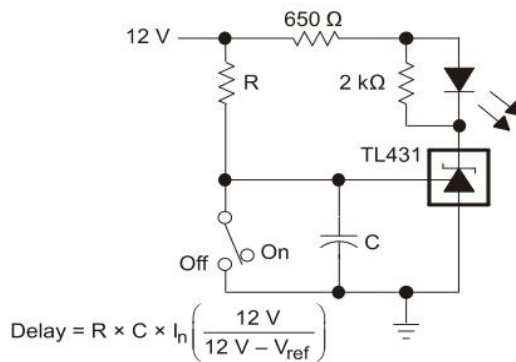
Shunt Regulation



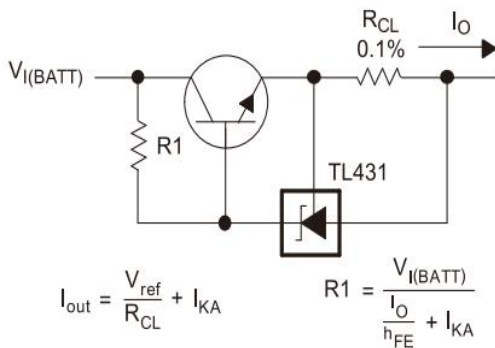
Series Regulation



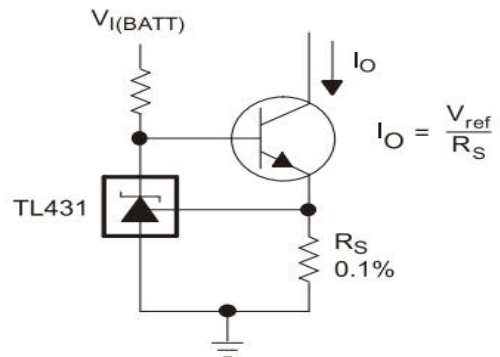
Three-Terminal Voltage Regulator



Time Delay Circuit

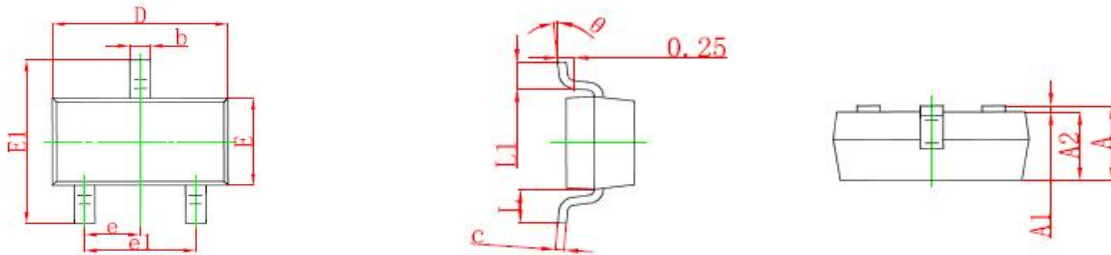


Current Source or Current Limiter



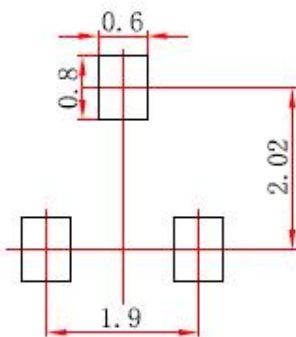
Constant Current Conversion

Package Outline Dimensions



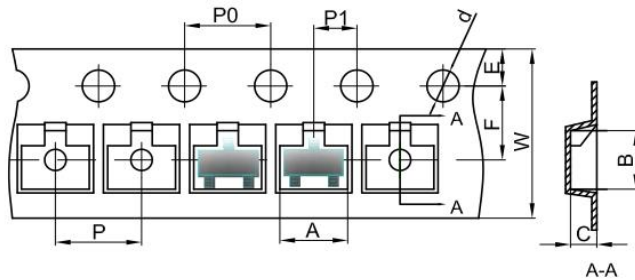
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 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°

Suggested Pad Layout



- Note:
- 1.The Pad Layout is for reference purposes only.
 - 2.All Dimensions are in mm.
 - 3.General tolerance:±0.05 mm.

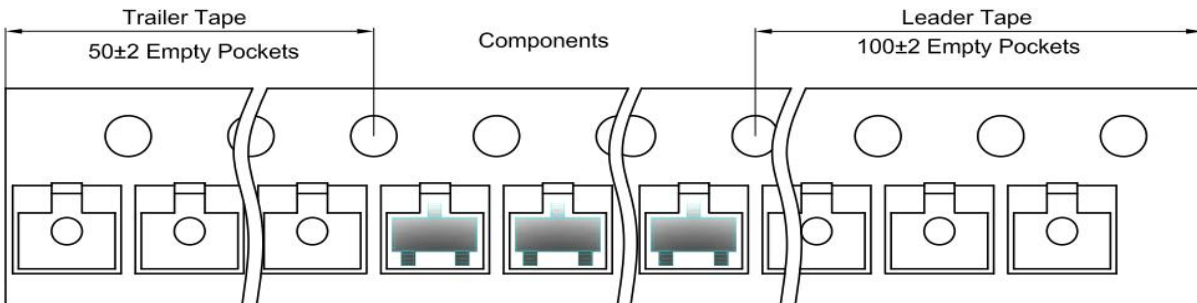
SOT-23 Embossed Carrier Tape



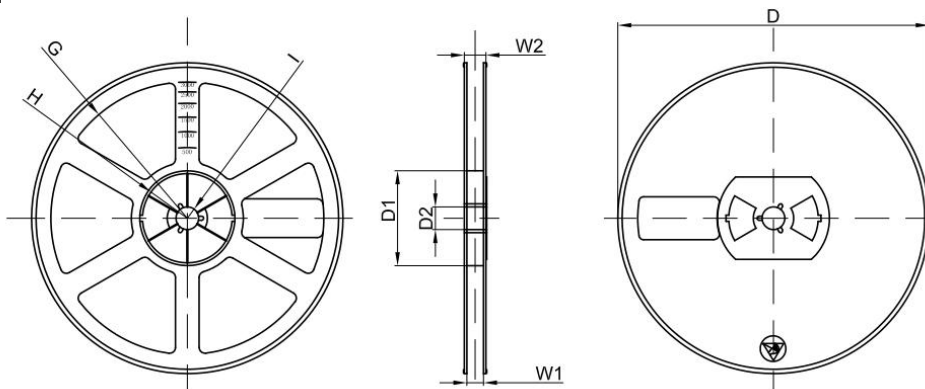
Packaging Description:
 SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	