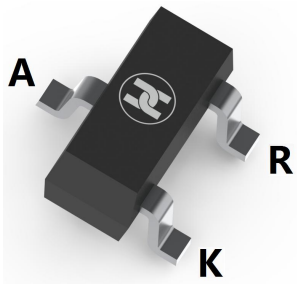
ADJUSTABLE ACCURATE REFERENCE SOURCE

FEATURES

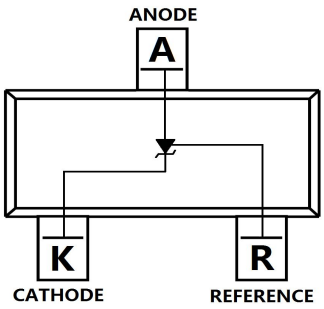
- The effective temperature compensation in the working range of full temperature
- The typical value of the equivalent temperature factor in the whole temperature scope is 50 ppm/°C
- The output voltage can be adjusted to 36V
- Low dynamic output impedance, its typical value is 0.2Ω
- Trapping current capability is 1 to 100mA
- Low output noise voltage
- Fast on-state response
- Surface Mount device



SOT-23

APPLICATION

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



MECHANICAL DATA

- Case: SOT-23
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.008 grams (approximate)

MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

Parameter	Symbol	Value	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 to Ambient	$R_{\theta JA}$	417	°C/W
Operating Temperature	T_{opr}	-20~+85	°C
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 ~+150	°C

ADJUSTABLE ACCURATE REFERENCE SOURCE

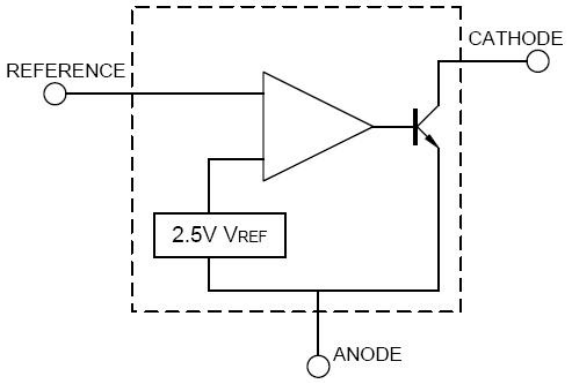
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

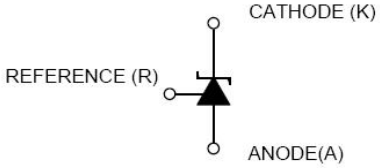
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Reference Input Voltage	V_{ref}	2.475	2.5	2.525	V	$V_{KA}=V_{REF}, I_{KA}=10mA$
Deviation of reference input voltage over temperature	$\Delta V_{ref}/\Delta T$		4.5	17	mV	$V_{KA}=V_{REF}, I_{KA}=10mA$ $-25°C \leq T_A \leq +85°C$
Ratio of change in reference input voltage to the change in cathode voltage	$\Delta V_{ref}/\Delta V_{KA}$		-1.0	-2.7	mV/V	$I_{KA}=10mA, \Delta V_{KA}=10V-V_{REF}$
			-0.5	-2.0	mV/V	$I_{KA}=10mA, \Delta V_{KA}=36V-10V$
Reference input current	I_{ref}		1.5	4	μA	$I_{KA}=10mA, R_1=10K\Omega, R_2=\infty$
Deviation of reference input current Over full temperature range	$\Delta I_{ref}/\Delta T$		0.4	1.2	μA	$I_{KA}=10mA, R_1=10K\Omega, R_2=\infty$, $-25°C \leq T_A \leq +85°C$
Emitter cut-off current	$I_{KA(min)}$		0.45	1.0	mA	$V_{KA}=V_{REF}$
Off-state Cathode Current	$I_{KA(OFF)}$		0.05	1.0	μA	$V_{KA}=36V, V_{REF}=0$
Dynamic Impedance	Z_{KA}		0.15	0.5	Ω	$V_{KA}=V_{REF}, I_{KA}=1\sim10mA, f \leq 1.0kHz$

CLASSIFICATION OF V_{ref}

Rank	0.5%	1%
Range	2.487-2.513	2.475-2.525

BLOCK DIAGRAM

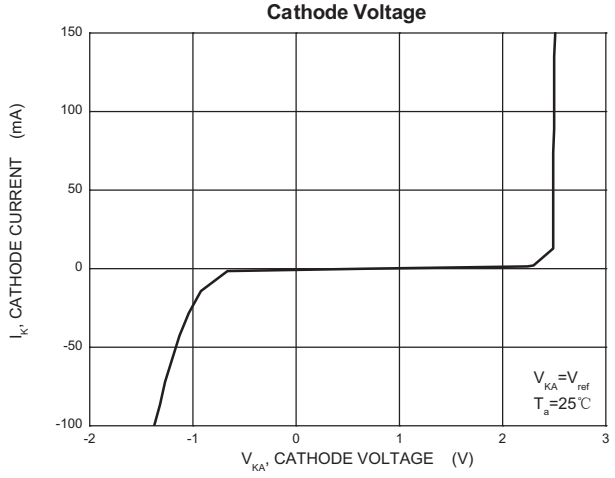




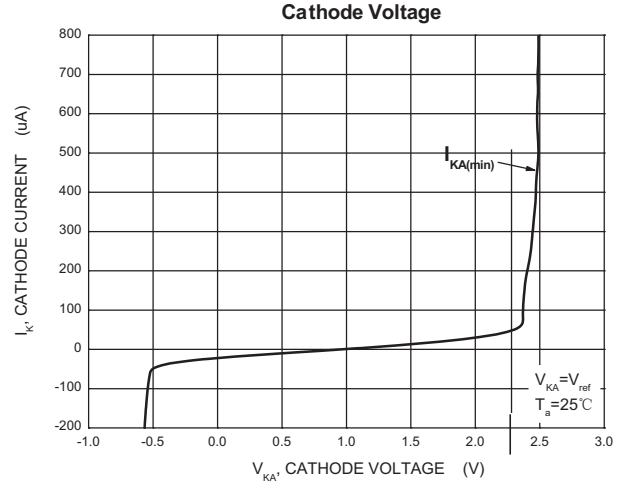
ADJUSTABLE ACCURATE REFERENCE SOURCE

Typical Characteristics

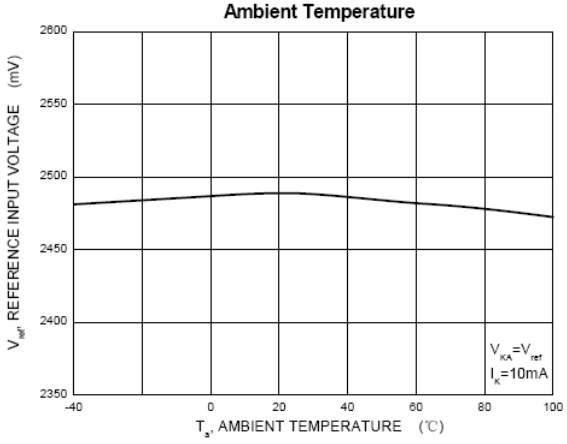
Cathode Voltage

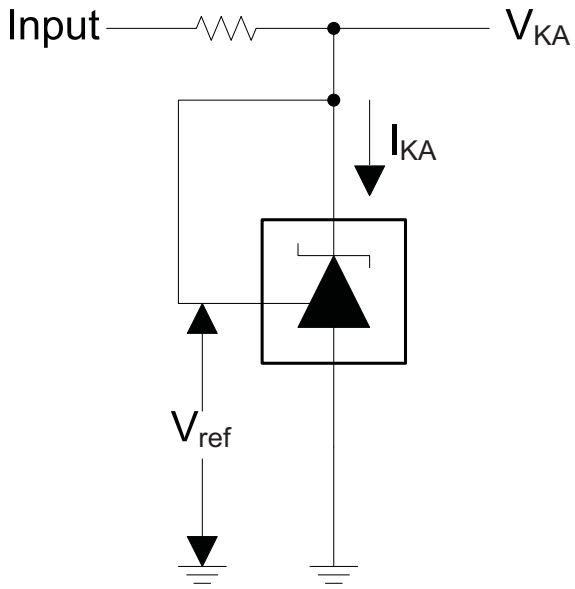


Cathode Current versus Cathode Voltage



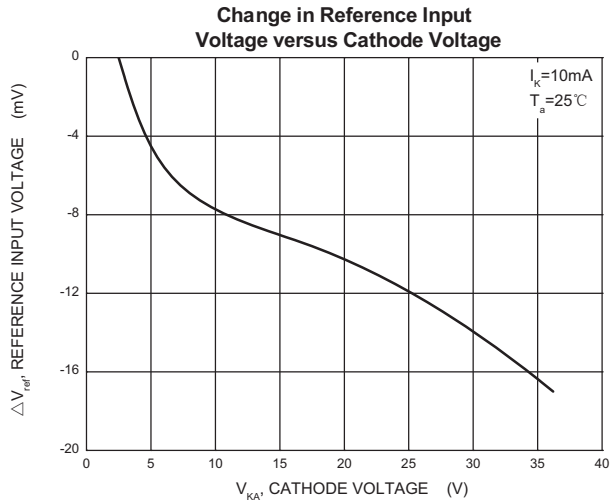
Reference Input Voltage versus Ambient Temperature

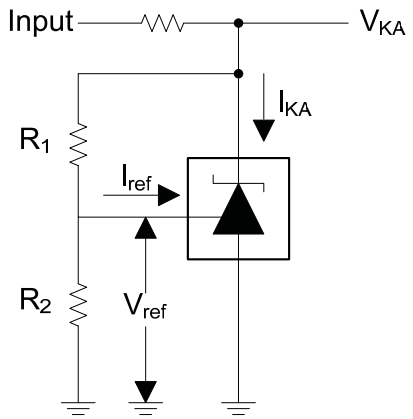




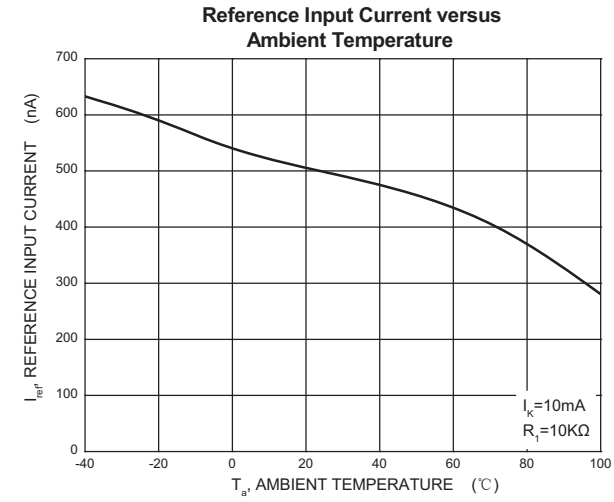
Test Circuit for $V_{KA}=V_{ref}$

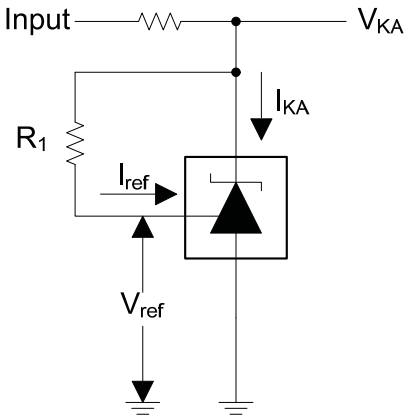
ADJUSTABLE ACCURATE REFERENCE SOURCE



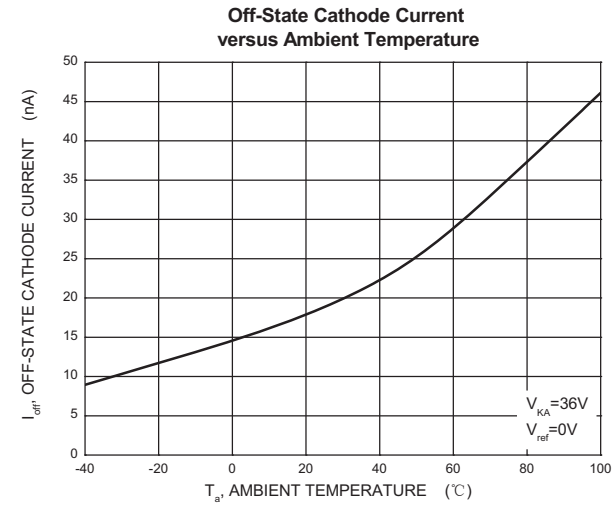


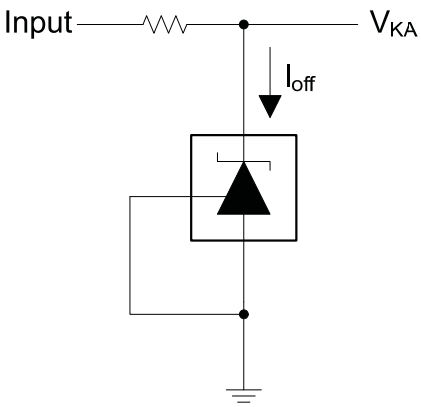
Test Circuit for $V_{KA}=V_{ref}(1+R1/R2)+R1*I_{ref}$





Test Circuit for I_{ref}

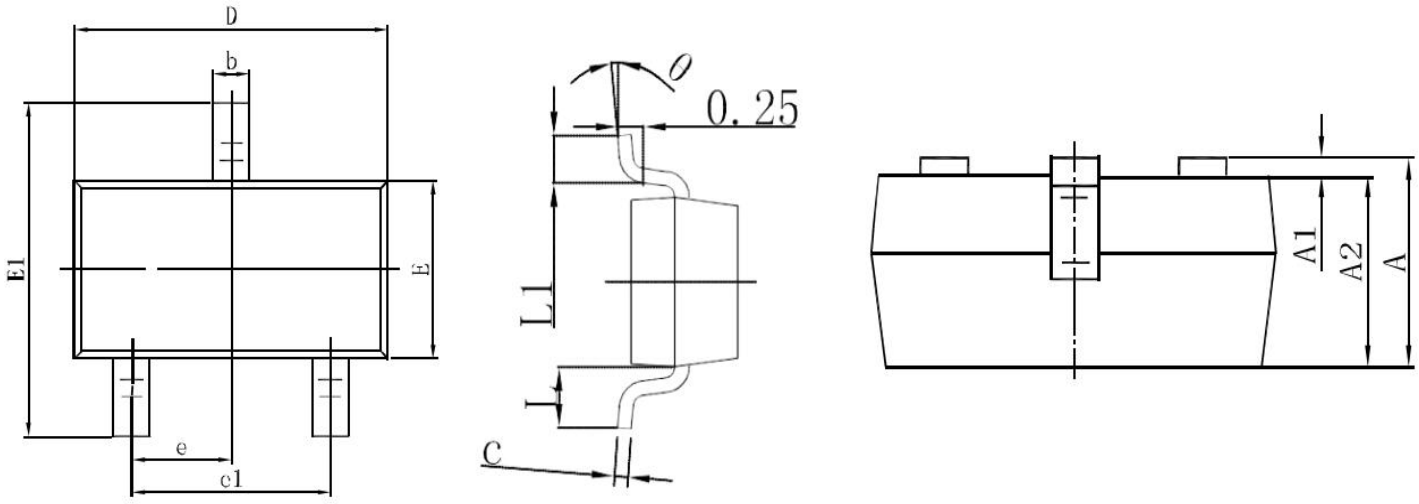




Test Circuit for I_{off}

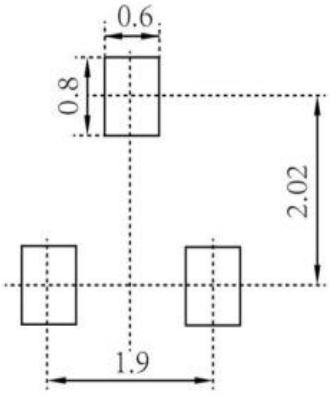
ADJUSTABLE ACCURATE REFERENCE SOURCE

SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.354	0.453
A1	0.000	0.100	0.000	0.039
A2	0.900	1.050	0.354	0.413
b	0.300	0.500	0.118	0.197
c	0.080	1.150	0.031	0.453
D	2.900	3.100	1.142	1.220
E	1.200	1.400	0.472	0.551
E1	2.250	2.550	0.886	1.004
e	0.95REF		0.374REF	
e1	1.800	2.000	0.709	0.787
L	0.55REF		0.215REF	
L1	0.300	0.500	0.118	0.197

SOT-23 Suggested Pad Layout

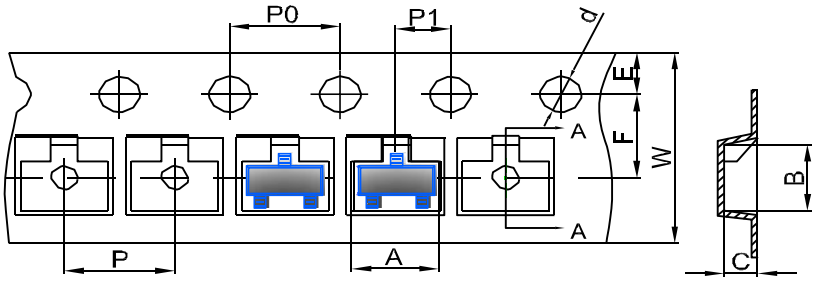


Note:

1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference purposes only

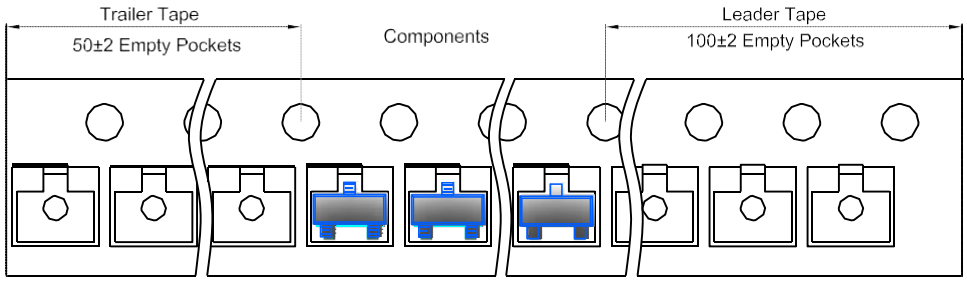
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

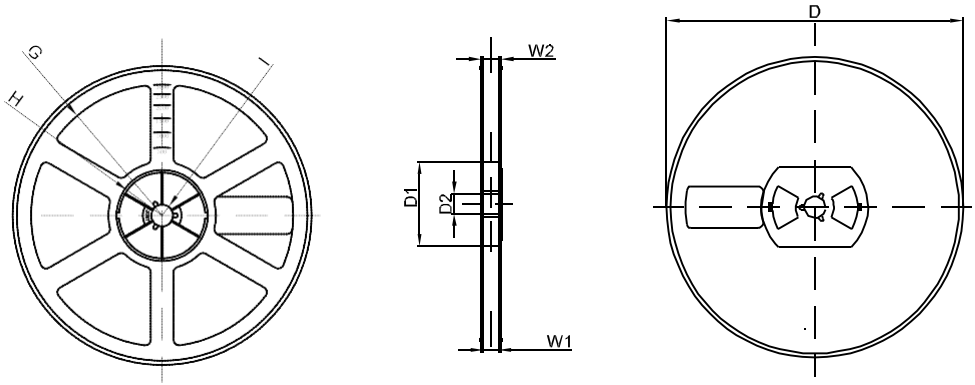


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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	54.40	13.00	R78	R25.60	R6.50	9.50	12.30
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1