

# MSKSEMI

SEMICONDUCTOR



ESD



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PLED

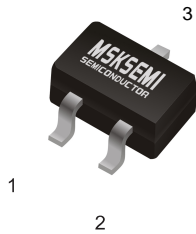
Product data sheet

**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 50 ppm/°C

**APPLICATION**

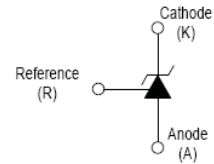
- Shunt Regulator
- High-Current Shunt Regulator
- Precision Current Limiter



**SOT -23**

- 1.REFERENCE
- 2.CATHODE
- 3. ANODE

**Equivalent Circuit**



**CLASSIFICATION cZV<sub>ref</sub>**

<b>Rank</b>	*** 0.5%	*****1%
<b>Range</b>	2.487-2.513	2.475-2.525

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

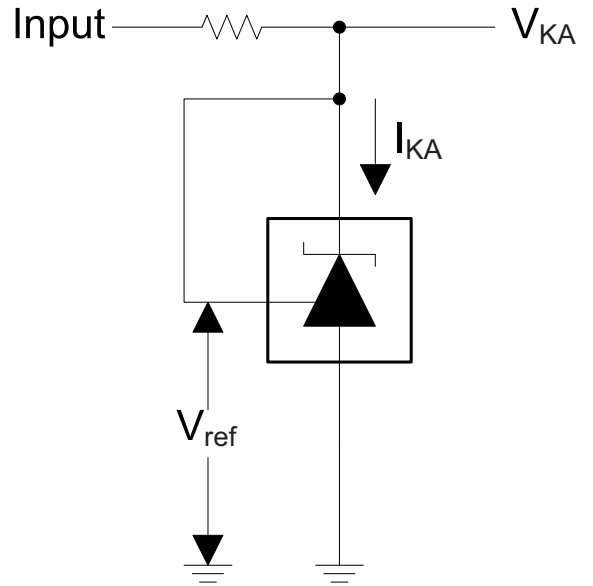
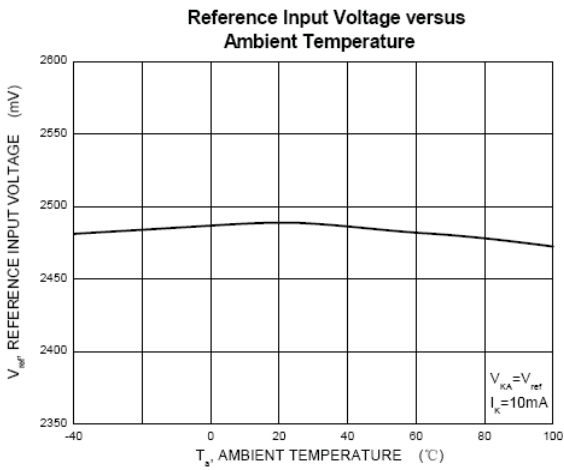
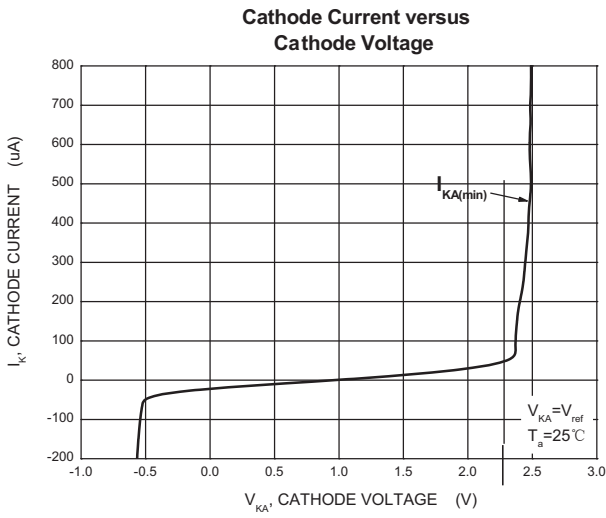
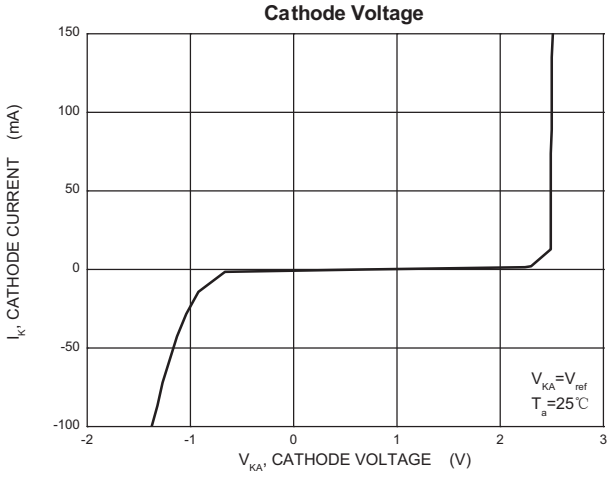
Parameter	Symbol	Value			Unit
		SOT-23			
Cathode Voltage	$V_{KA}$	36			V
Cathode Current Range (Continuous)	$I_{KA}$	-100~+150			mA
Reference Input Current Range	$I_{ref}$	0.05~+10			mA
Power Dissipation	$P_D$	300	500	770	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	417	250	162	°C/W
Operating Temperature	$T_{opr}$	-25~+85			°C
Junction Temperature	$T_J$	150			°C
Storage Temperature Range	$T_{STG}$	-65~+150			°C

**ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$  unless otherwise specified)**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Reference input voltage	$V_{ref}$	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$	2.475	2.5	2.525	V
Deviation of reference Input voltage over temperature (note)	$\Delta V_{ref}/\Delta T$	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$ $T_{MIN}\leq T_a\leq T_{MAX}$		4.5	17	mV
Ratio of change in reference Input voltage to the change in cathode voltage	$\Delta V_{ref}/\Delta V_{KA}$	$I_{KA}=10\text{mA}$	$\Delta V_{KA}=10\text{V}\sim V_{REF}$	-1.0	-2.7	mV/V
			$\Delta V_{KA}=36\text{V}\sim 10\text{V}$	-0.5	-2.0	mV/V
Reference input current	$I_{ref}$	$I_{KA}=10\text{mA}, R_1=10\text{k}\Omega$ $R_2=\infty$		1.5	4	$\mu\text{A}$
Deviation of reference input current over full temperature range	$\Delta I_{ref}/\Delta T$	$I_{KA}=10\text{mA}, R_1=10\text{k}\Omega$ $R_2=\infty$ $T_a=-25\text{ to }85^\circ\text{C}$		0.4	1.2	$\mu\text{A}$
Minimum cathode current for regulation	$I_{KA(\text{min})}$	$V_{KA}=V_{REF}$		0.45	1.0	mA
Off-state cathode current	$I_{KA(\text{OFF})}$	$V_{KA}=36\text{V}, V_{REF}=0$		0.05	1.0	$\mu\text{A}$
Dynamic impedance	$Z_{KA}$	$V_{KA}=V_{REF}, I_{KA}=1\text{ to }100\text{mA}$ $f\leq 1.0\text{kHz}$		0.15	0.5	$\Omega$

 Note:  $T_{MIN}=-25^\circ\text{C}$ ,  $T_{MAX}=+85^\circ\text{C}$

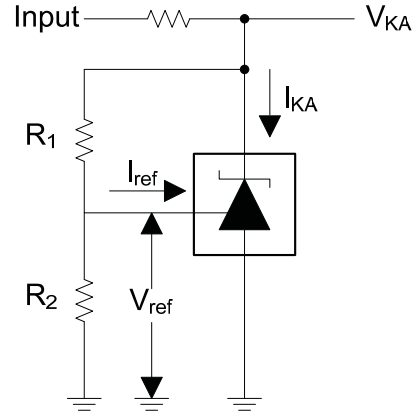
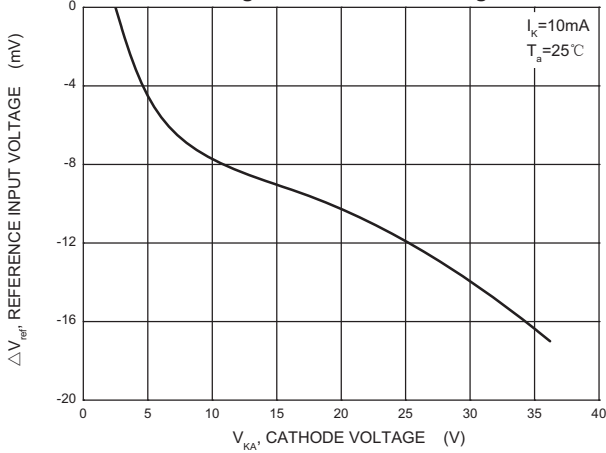
Typical Characteristics



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

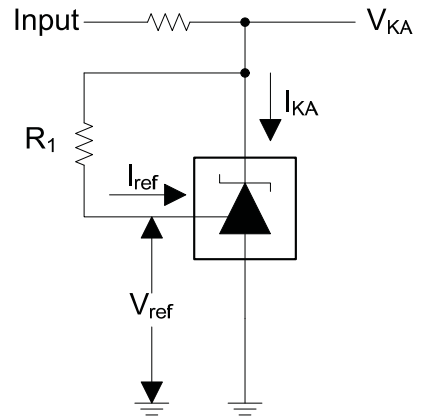
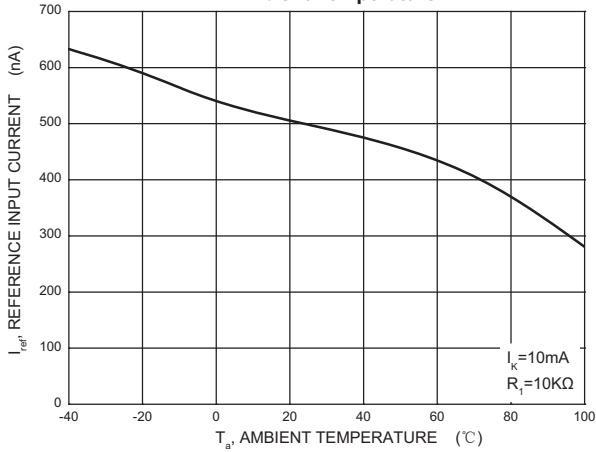
Typical Characteristics

Change in Reference Input Voltage versus Cathode Voltage



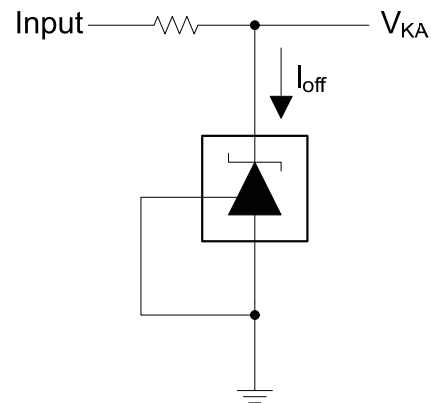
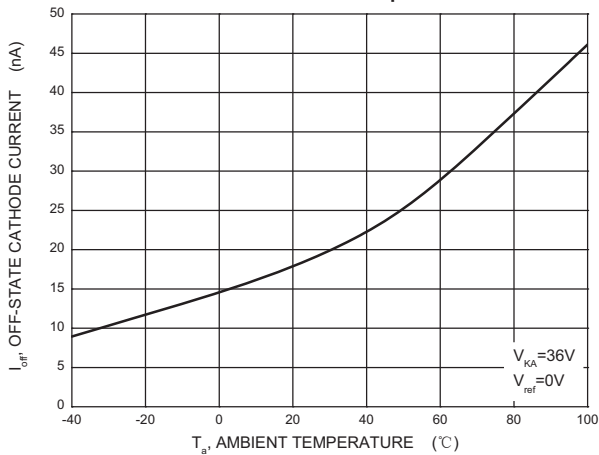
Test Circuit for  $V_{KA} = V_{ref}(1 + R_1/R_2) + R_1 * I_{ref}$

Reference Input Current versus Ambient Temperature



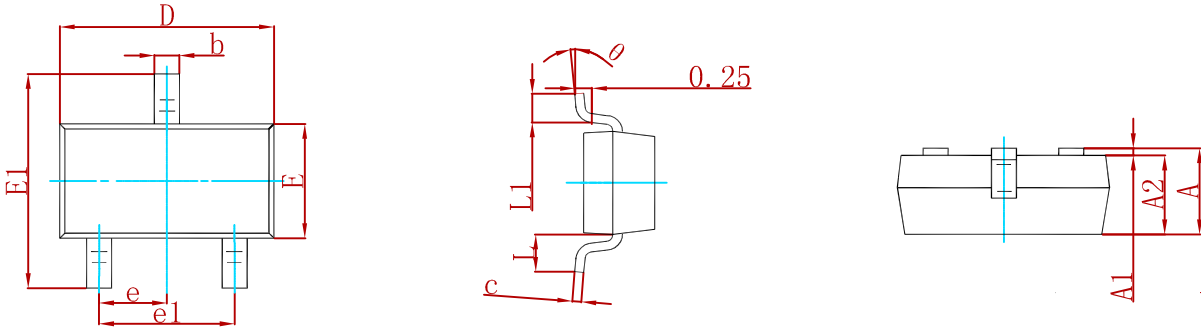
Test Circuit for  $I_{ref}$

Off-State Cathode Current versus Ambient Temperature



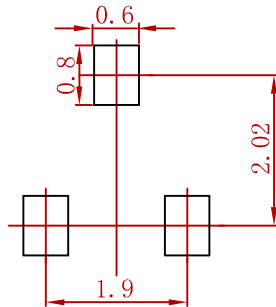
Test Circuit for  $I_{off}$

**PACKAGE MECHANICAL DATA**



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

**REEL SPECIFICATION**

P/N	PKG	QTY
AZ431AN-ATRG1-MS	SOT-23	3000

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