



## PRODUCT DATA SHEET

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**Datasheet**



**Resources**



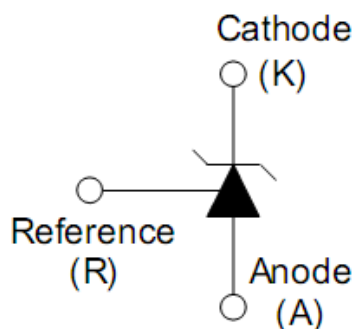
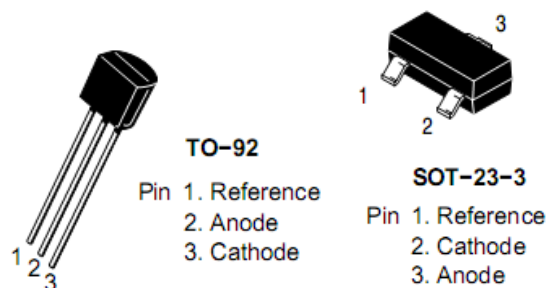
**Samples**

Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at [www.jg-semi.cn](http://www.jg-semi.cn). Please email any questions regarding the system integration to [JINGAO\\_questions@jgsemi.com](mailto:JINGAO_questions@jgsemi.com).

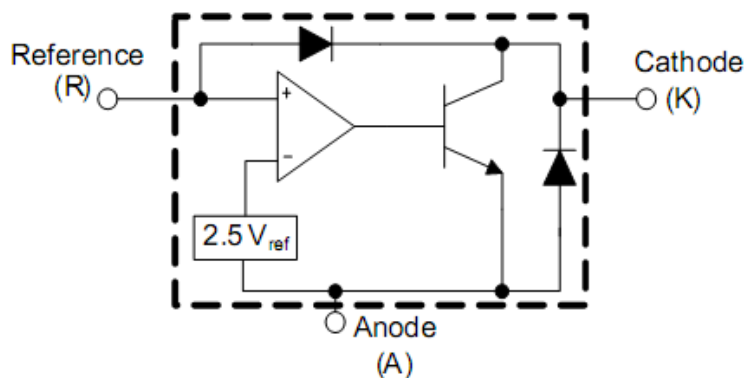
## FEATURES

- Programmable Output Voltage to 40V
- Low Dynamic Output Impedance  $0.27\Omega$  (Typ)
- Sink Current Capability of 0.1 mA to 100 mA
- Equivalent Full-Range Temperature Coefficient of 50 ppm/°C
- Temperature Compensated for Operation over Full Rated Operating Temperature Range
- Low Output Noise Voltage
- Fast Turn on Respons
- TO-92, SOP- 8, SOT-89 or SOT-23-3 packages

## PIN CONFIGURATION



Symbol



Representative Block diagram

## ABSOLUTE MAXIMUM RATINGS

(Operating temperature range applies unless otherwise specified)

Characteristic	Symbol	Value	Unit
Cathode Voltage	$V_{KA}$	40	V
Cathode Current Range (Continuous)	$I_K$	-100 ~ 150	mA
Reference Input Current Range	$I_{REF}$	-0.05 ~ +10	mA
Power Dissipation at 25°C: TO – 92 Package ( $R_{\theta JA} = 178^\circ\text{C/W}$ ) SOT – 23 – 3 Package ( $R_{\theta JA} = 625^\circ\text{C/W}$ )	$P_D$	0.7 0.2	W
Junction Temperature Range	$T_J$	-40 ~ 150	°C
Storage Temperature Range	$T_{stg}$	-65 ~ +150	°C

## RECOMMENDED OPERATING CONDITIONS

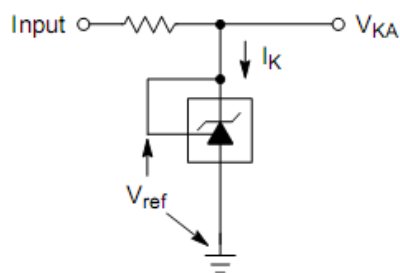
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Cathode Voltage	$V_{KA}$		$V_{REF}$		36	V
Cathode Current	$I_K$		0.5		100	mA

## ELECTRICAL CHARACTERISTICS

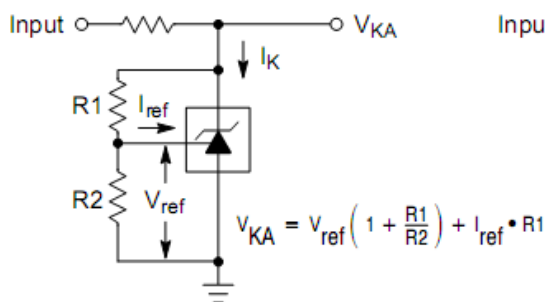
( $T_a = 25^\circ\text{C}$ ,  $V_{KA} = V_{REF}$ ,  $I_K = 10\text{mA}$  unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Reference Input Voltage	$V_{REF}$	$V_{KA} = V_{REF}$ , $I_K = 10\text{mA}$	2.483	2.495	2.507	V
Deviation of Reference Input Voltage Over Full Temperature Range	$V_{REF(dev)}$	$T_{min} \leq T_a \leq T_{max}$		3	17	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\Delta V_{REF}/\Delta V_{KA}$	$\Delta V_{KA} = 10\text{V} - V_{REF}$ $\Delta V_{KA} = 36\text{V} - 10\text{V}$	-0.4 -0.4	0.0 0.0	2.7 2.0	mV/V
Reference Input Current	$I_{REF}$	$R_1 = 10\text{K}\Omega$ , $R_2 = \infty$		1.8	4	$\mu\text{A}$
Deviation of Reference Input Current Over Full Temperature Range	$I_{REF(dev)}$	$R_1 = 10\text{K}\Omega$ , $R_2 = \infty$		0.4	1.2	$\mu\text{A}$
Minimum Cathode Current for Regulation	$I_{K(min)}$			0.25	0.5	mA
Off-State Cathode Current	$I_{K(off)}$	$V_{KA} = 40\text{V}$ , $V_{REF} = 0$		0.17	0.9	$\mu\text{A}$
Dynamic Impedance	$Z_{KA}$	$I_K = 1\text{mA}$ to $100\text{mA}$ , $f \leq 1.0\text{KHz}$		0.27	0.5	$\Omega$

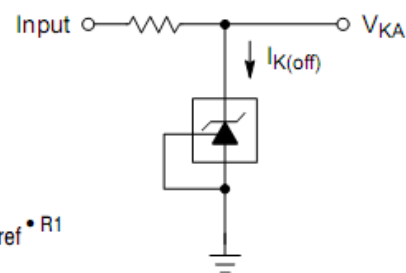
## TEST CIRCUITS



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

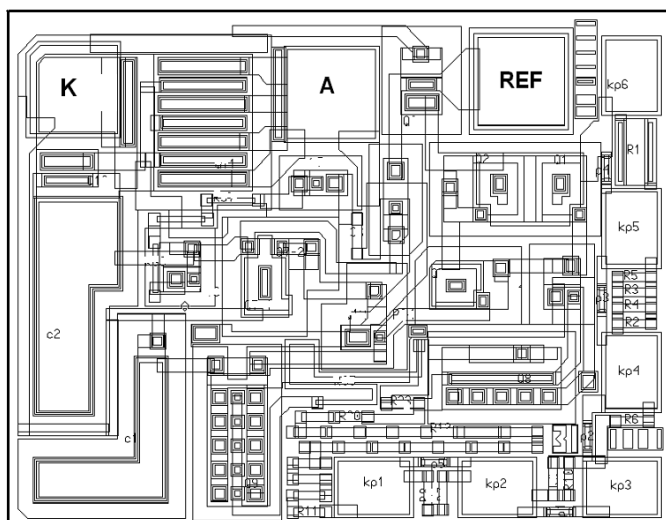


**Test Circuit  
for  $V_{KA} > V_{ref}$**



**Test Circuit  
for  $I_{K(off)}$**

## PAD LAYOUT



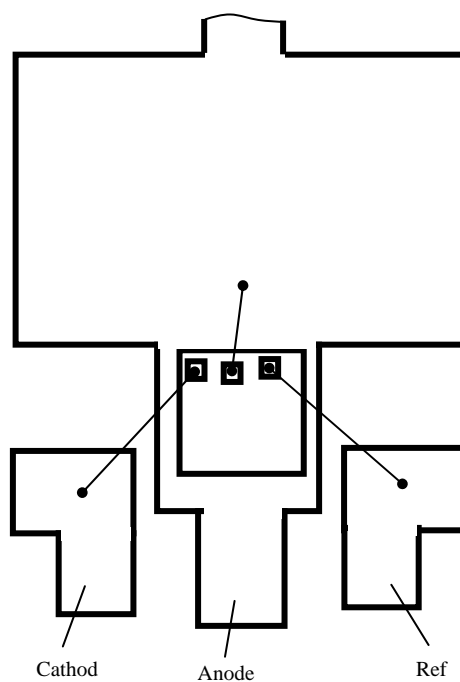
## PHISICAL CHARACTERISTICS:

Wafer Diameter.....100 ± 0.5mm  
 Wafer Thickness..... 260 ±20 μm  
 Die size.....0.76 x 0.60 mm<sup>2</sup>  
 Scribe Width.....60 μm  
 Pad Size .....86 x 86 μm  
 Passivation.....PECVD  
 Backside metallization .....without metallization

## PAD LOCATION

Pad Name	Description	X	Y
K	Cathode	56	445
A	Anode	328	440
R	Reference	528	453

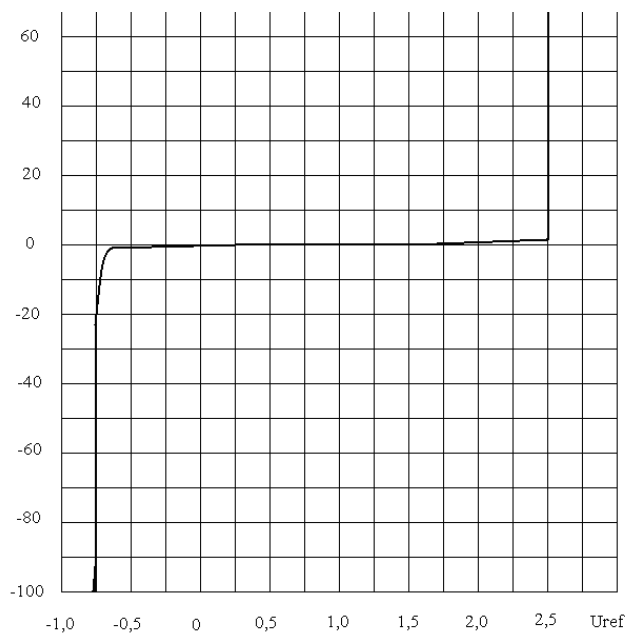
## BONDING DIAGRAM



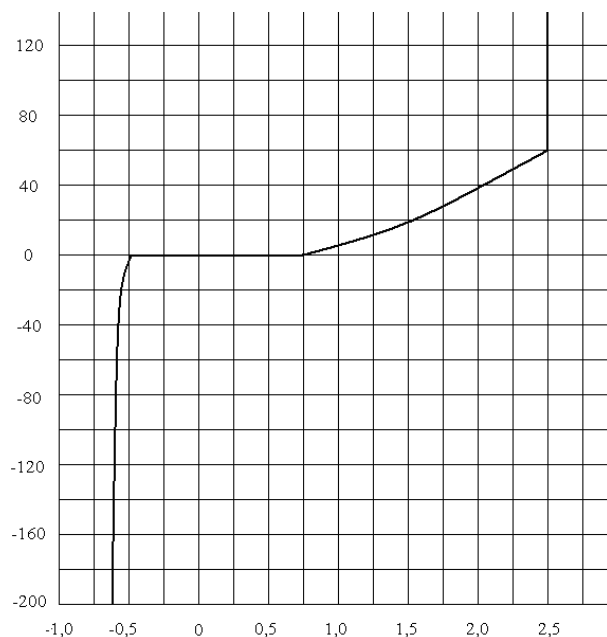
## PROGRAMMABLE PRECISION REFERENCES

### TYPICAL PERFORMANCE CHARACTERISTICS

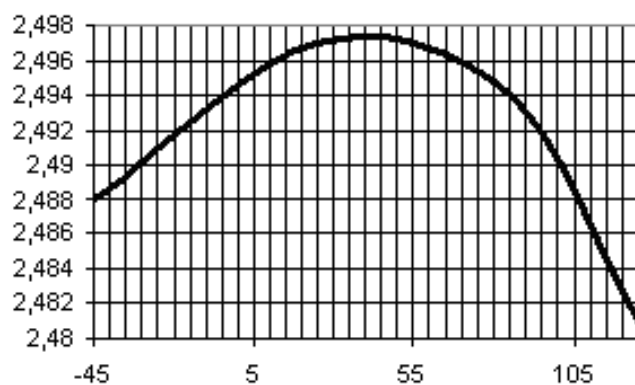
**Cathode Current  $I_k$  (mA)  
vs. Cathode Voltage  $U_k$  (V)**



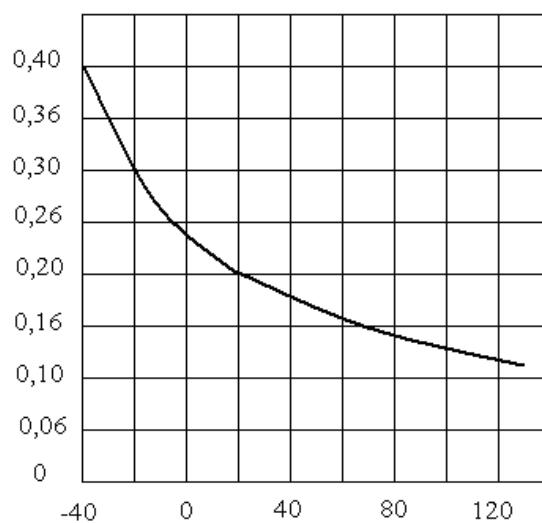
**Cathode Current  $I_k$  (uA)  
vs. Cathode Voltage  $U_k$  (V)**



**Reference Voltage  $U_{ref}$  (V)  
vs. Junction Temperature  $T_j$  (°C)  
 $I_k=10mA$**

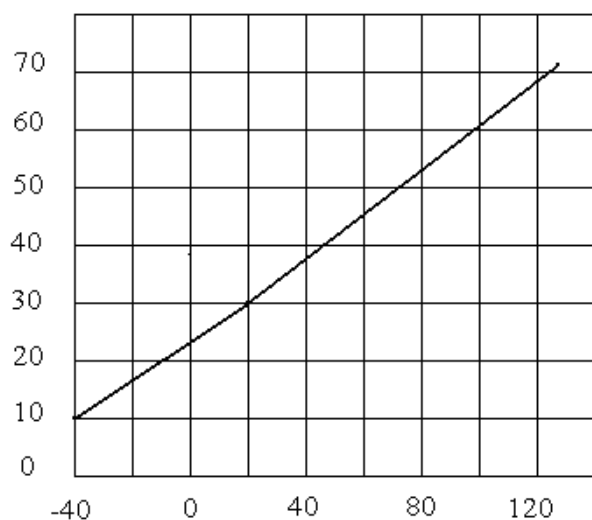


**Reference Input Current  $I_{ref}$  (uA)  
vs. Junction Temperature  $T_j$  (°C)  
 $I_k=10mA$**

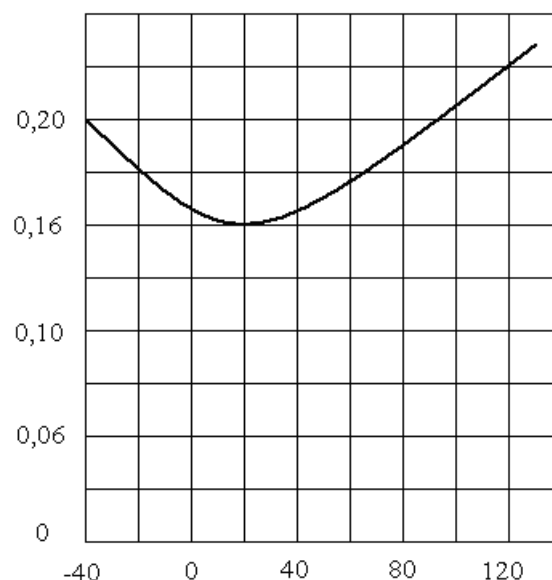


## PROGRAMMABLE PRECISION REFERENCES

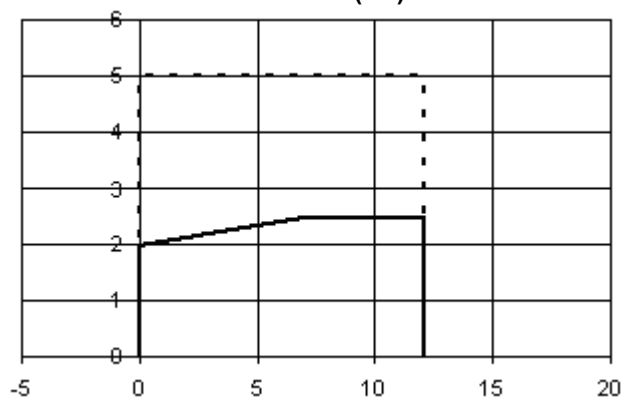
**Off-State Cathode Current  $I_{koff}$  ( $\mu A$ )  
vs. Junction Temperature  $T_j$  ( $^{\circ}C$ )  
 $U_{ka}=36V$**



**Dynamic Impedance  $Z_{ka}$  (Ohm)  
vs. Junction Temperature  $T_j$  ( $^{\circ}C$ )  
 $I_K = 1 \div 100$  mA**



**Pulse Response Input and Output Voltage (V)  
vs. Time  $t$  ( $\mu S$ )**



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