

TO-92 Encapsulate Adjustable Reference Source

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
- The typical value of the equivalent temperature factor in the whole temperature scope is 50 ppm/°C
- The effective temperature compensation in the working range of full temperature
- Low output noise voltage
- Fast on -state response

TO- 92



Limiting Values (Absolute Maximum Rating)

Parameter	Symbol	Value	Unit
Cathode Voltage	V_{KA}	37	V
Cathode Current Range (Continuous)	I_{KA}	-100~+150	mA
Reference Input Current Range	I_{ref}	0.05~+10	mA
Power Dissipation	P_D	770	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	162	°C/W
Operating Ambient Temperature Range	T_{opr}	-25~+85	°C
Storage Temperature Range	T_{stg}	-65~+150	°C
Operating Junction Temperature	T_j	150	°C

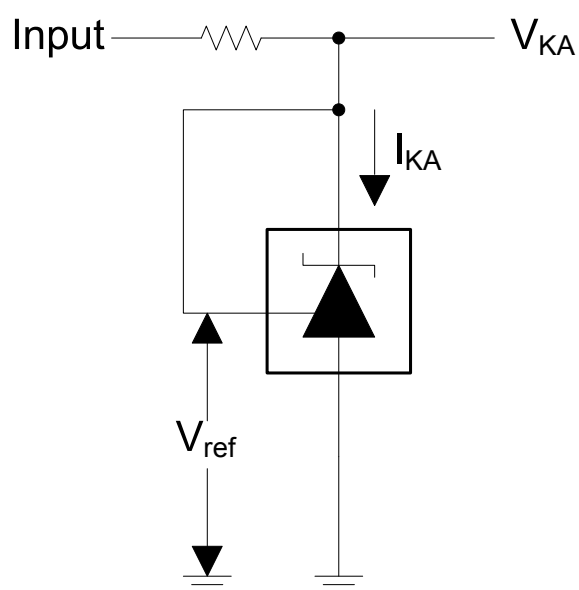
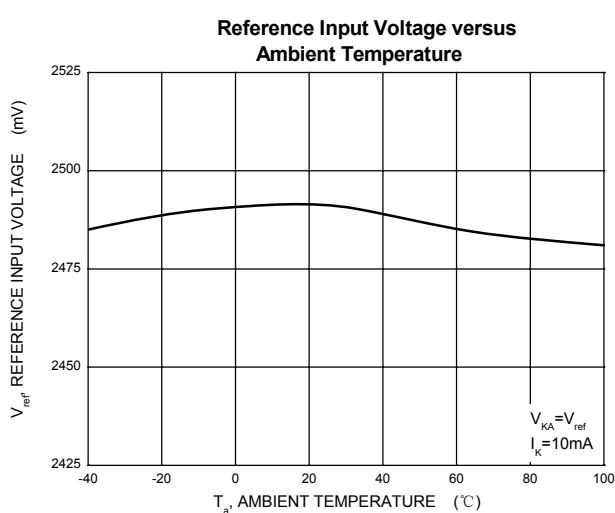
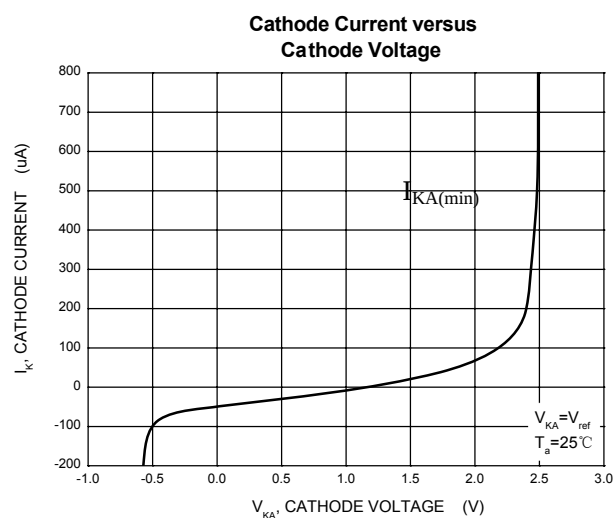
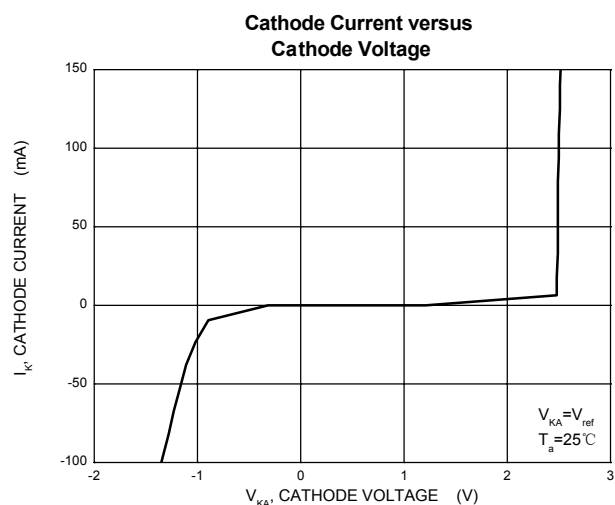
Electrical Characteristics ($T_a=25^\circ\text{C}$ Unless otherwise specified)

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	μA
Deviation Of Reference Input Current Over Full Temperature Range	$\Delta I_{ref}/\Delta T$	$I_{KA}=10\text{mA}$, $R_1=10\text{k}\Omega$ $R_2=\infty$ $T_A=-25$ to 85°C		0.4	1.2	μA
Minimum Cathode Current for Regulation	$I_{KA(min)}$	$V_{KA}=V_{REF}$		0.45	1.0	mA
Off-state Cathode Current	$I_{KA(OFF)}$	$V_{KA}=36\text{V}$, $V_{REF}=0$		0.05	1.0	μA
Dynamic Impedance	Z_{KA}	$V_{KA}=V_{REF}$, $I_{KA}=1$ to 100mA $f\leq 1.0\text{kHz}$		0.15	0.5	Ω

MIN=-25°C , T_{MAX}=+85°CCLASSIFICATION of V_{ref}

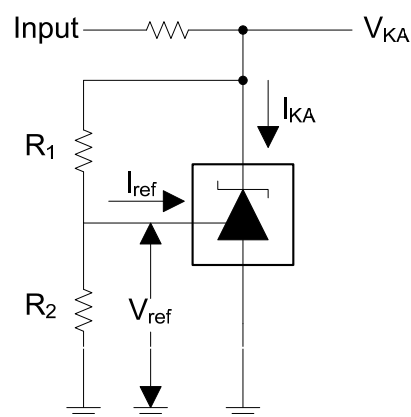
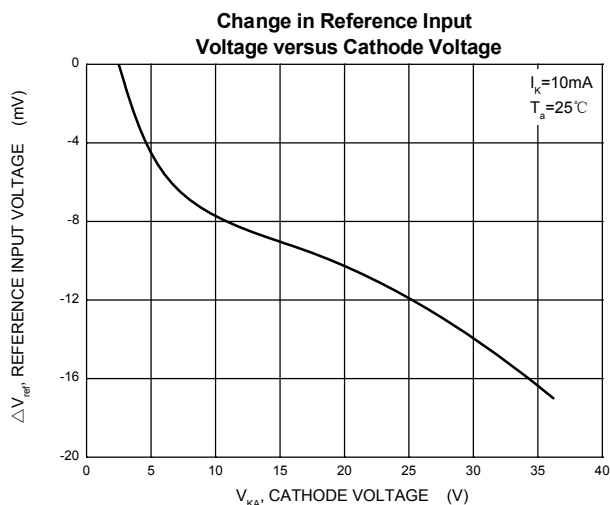
Rank	0.5%	1%
Range	2.487-2.513	2.475-2.525

Typical Characteristics

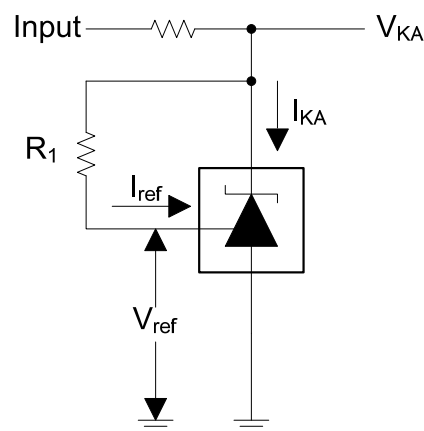
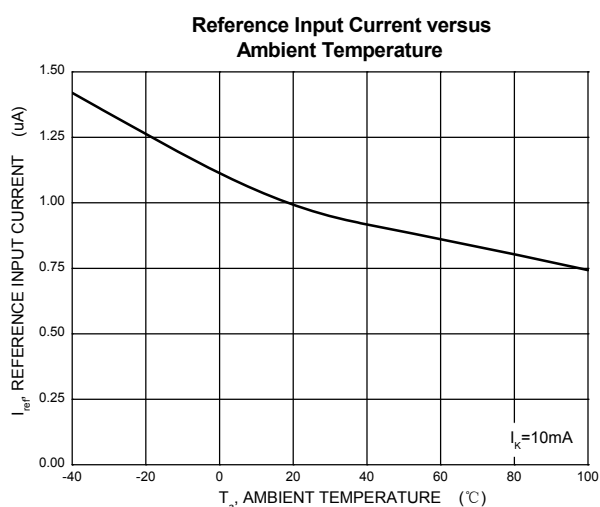


Test Circuit for $V_{KA} = V_{ref}$

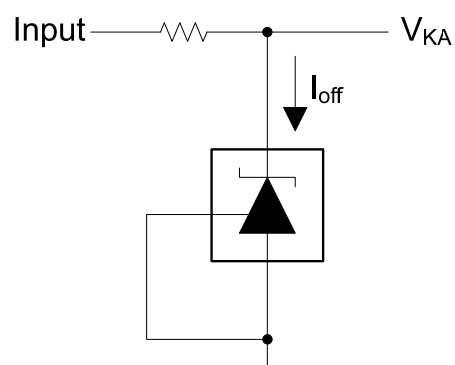
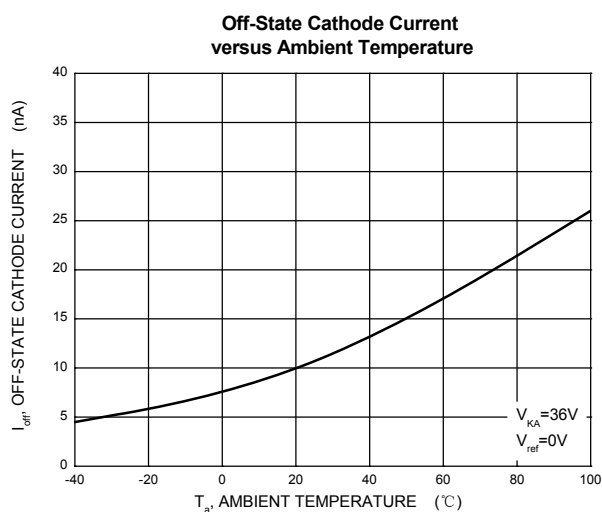
Typical Characteristics



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

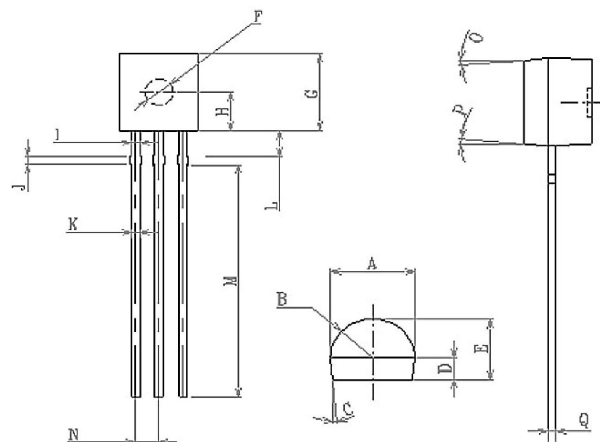


Test Circuit for I_{ref}



Test Circuit for I_{off}

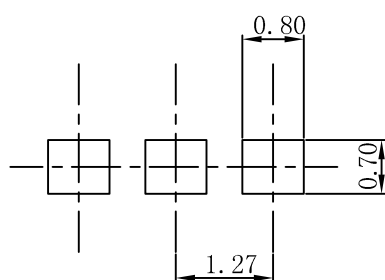
TO- 92 Package Outline Dimensions



SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	4.1	4.3	K	0.36	0.56
B	R2.0	R2.2	L	1.35	1.45
C	4.1		M	12.00	12.5
D	1.1	1.2	N	1.24	1.3
E	3.13	3.33	O	5°	
F	Φ 1.48	Φ 1.52	P	5°	
G	4.4	4.6	Q	0.37	0.39
H	2.2	2.3			
I	0.36	0.56			
J	0.5	0.6			

单位: mm

TO- 92 Suggested Pad Layout



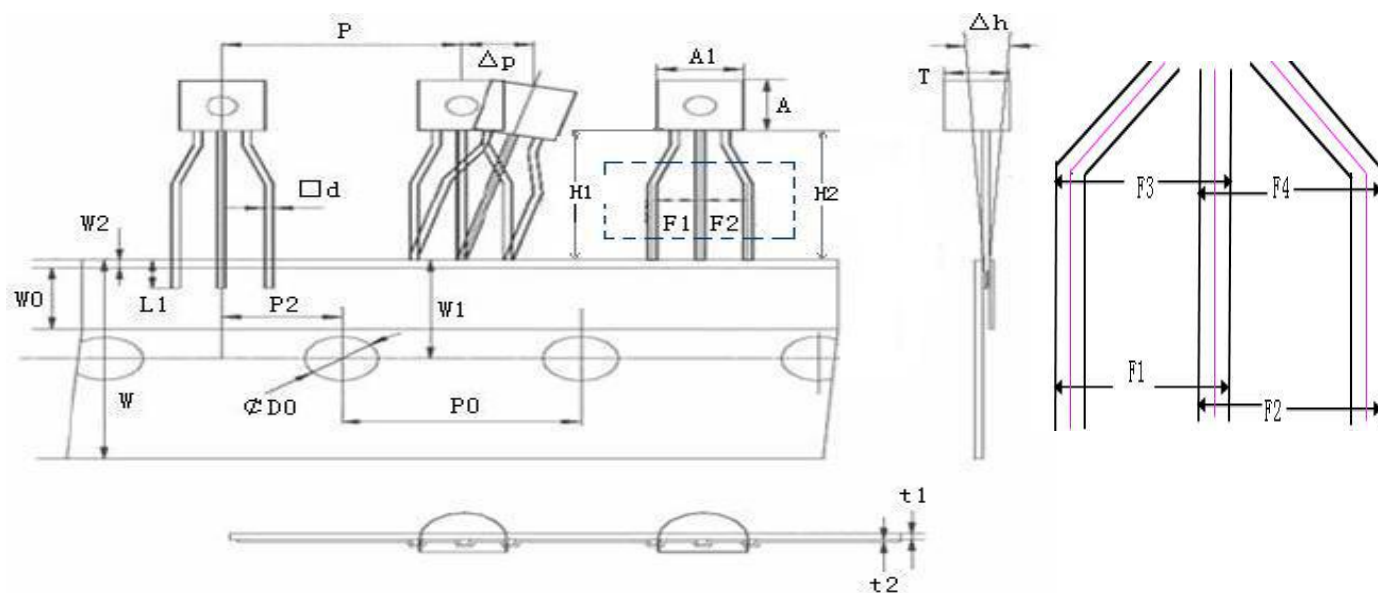
Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

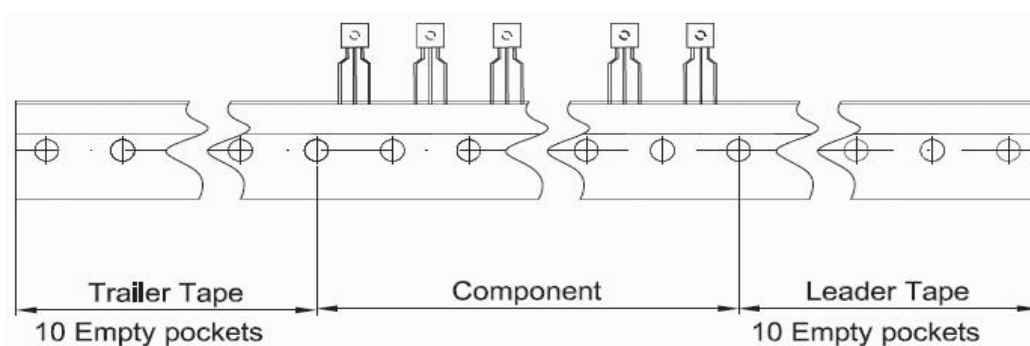
NOTICE

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TO-92 Tape and Reel



Symbol	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A1	4.1	4.2	4.3	0.171	0.176	0.180
A	4.4	4.5	4.6	0.184	0.188	0.192
T	3.13	3.23	3.33	0.131	0.134	0.139
$\square d$	0.36	0.45	0.56	0.015	0.018	0.022
L1	2.5	—	—	0.098	—	—
P	12.4	—	13	0.488	—	0.512
P0	12.5	12.7	12.9	0.492	0.5	0.508
P2	6.05	6.35	6.65	0.238	0.25	0.262
F1,F2	2.75	3.00	3.25			
F3,F4	2.75	3.00	3.25			
F1-F2	—	—	0.4			



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000PCS	343×158×42	20000PCS	470×358×180