ADJUSTABLE ACCURATE REFERENCE SOURCE

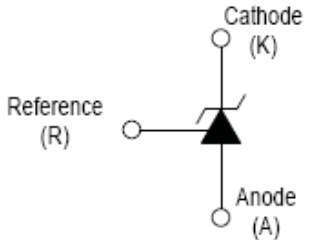
FEATURES

- 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

TO-92

APPLICATION

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



MECHANICAL DATA

- Case: TO - 92
- 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	200	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	417	°C/W
Operating Temperature	T_{opr}	-40~+105	°C
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-65 ~+150	°C

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

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Reference Input Voltage	V_{ref}	2.445	2.5	2.545	V	$V_{KA}=V_{REF}, I_{KA}=10mA$
Deviation of reference input voltage over temperature	$\Delta V_{ref}/\Delta T$		3	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	$\Delta V_{ref}/\Delta V_{KA}$	-0.4		-2.7	mV/V	$I_{KA}=10mA, \Delta V_{KA}=10V-V_{REF}$
		-0.4		-2.0	mV/V	$I_{KA}=10mA, \Delta V_{KA}=36V-10V$
Reference input current	I_{ref}		1.8	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	$I_{KA(OFF)}$		0.17	1.0	μA	$V_{KA}=36V, V_{REF}=0$
Dynamic Impedance	Z_{KA}		0.27	0.5	Ω	$V_{KA}=V_{REF}, I_{KA}=1\sim10mA, f\leq1.0kHz$

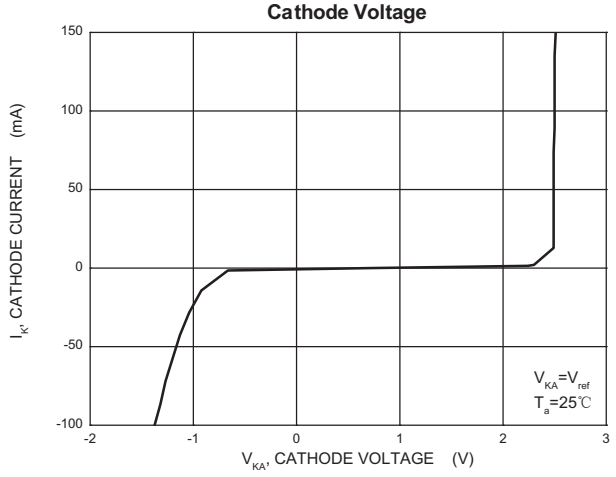
CLASSIFICATION OF V_{ref}

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

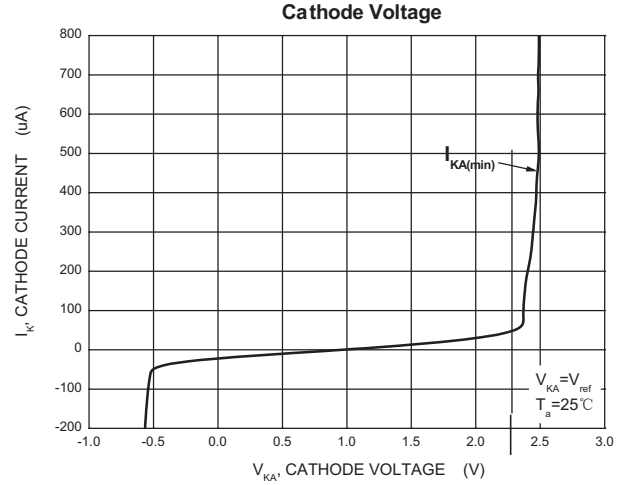
ADJUSTABLE ACCURATE REFERENCE SOURCE

Typical Characteristics

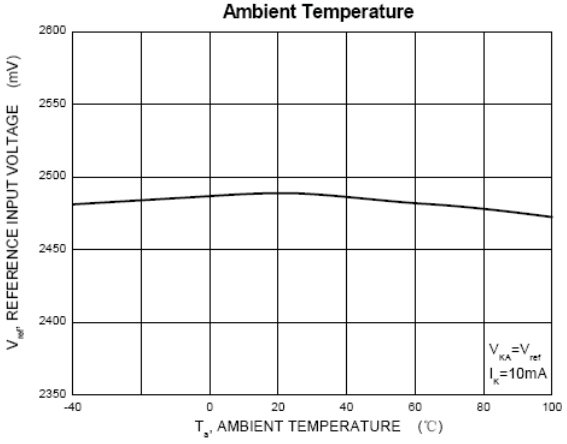
Cathode Voltage

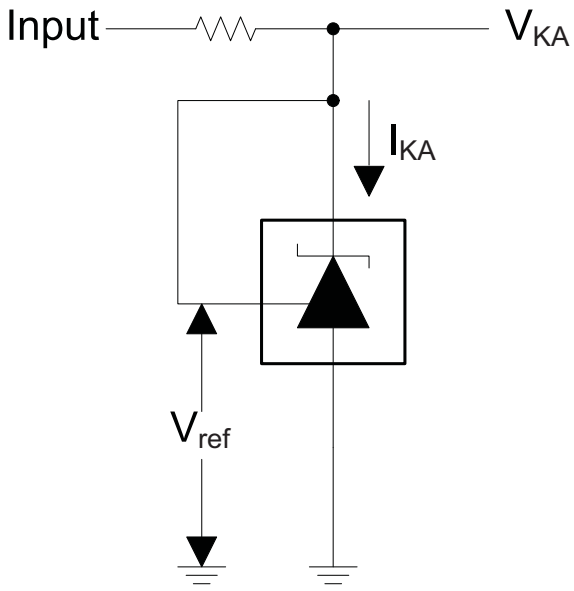


Cathode Current versus Cathode Voltage



Reference Input Voltage versus Ambient Temperature

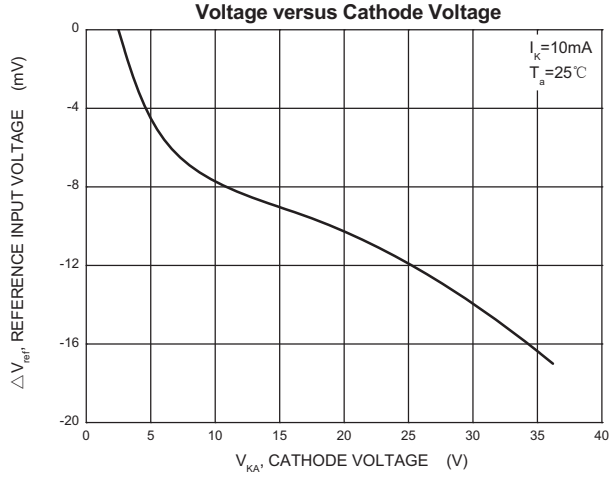


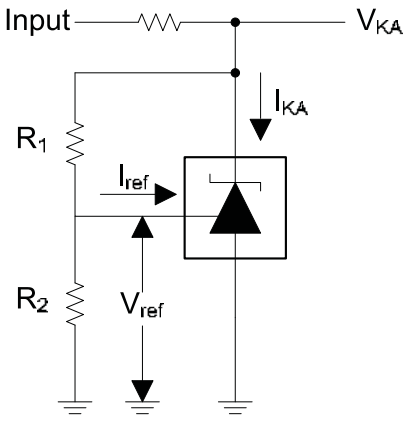


Test Circuit for $V_{KA}=V_{ref}$

ADJUSTABLE ACCURATE REFERENCE SOURCE

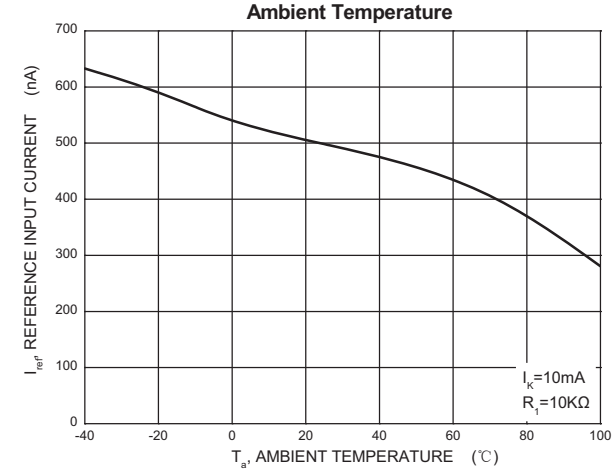
Change in Reference Input Voltage versus Cathode Voltage

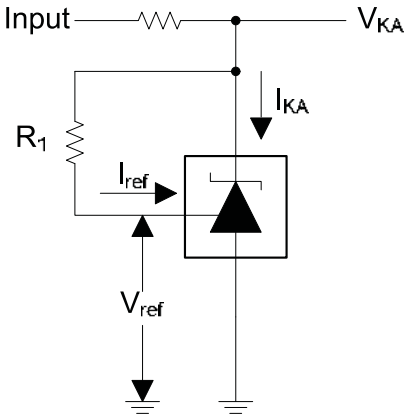




Test Circuit for $V_{KA}=V_{ref}(1+R1/R2)+R1*I_{ref}$

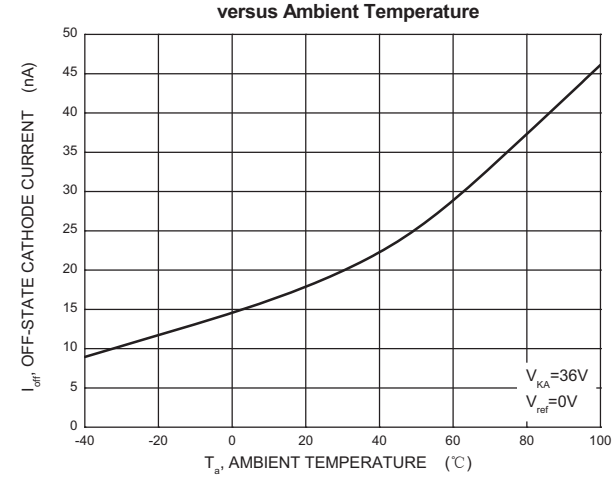
Reference Input Current versus Ambient Temperature

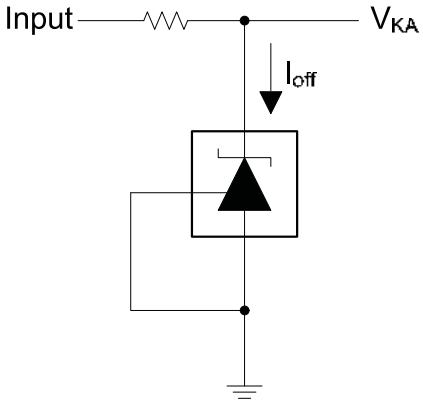




Test Circuit for I_{ref}

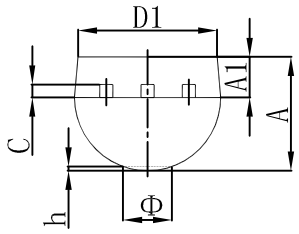
Off-State Cathode Current versus Ambient Temperature

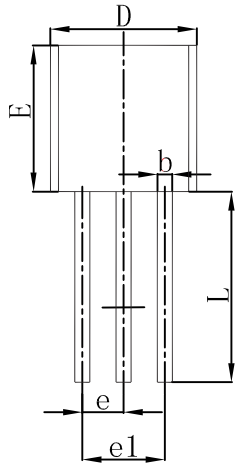




Test Circuit for I_{off}

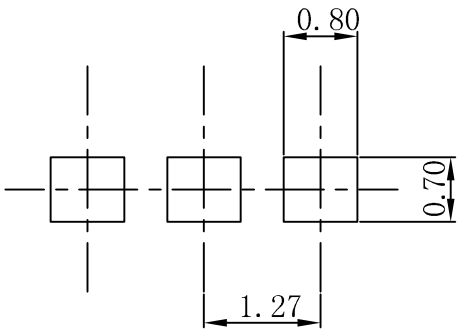
TO-92 Package Outline Dimensions





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92 Suggested Pad Layout



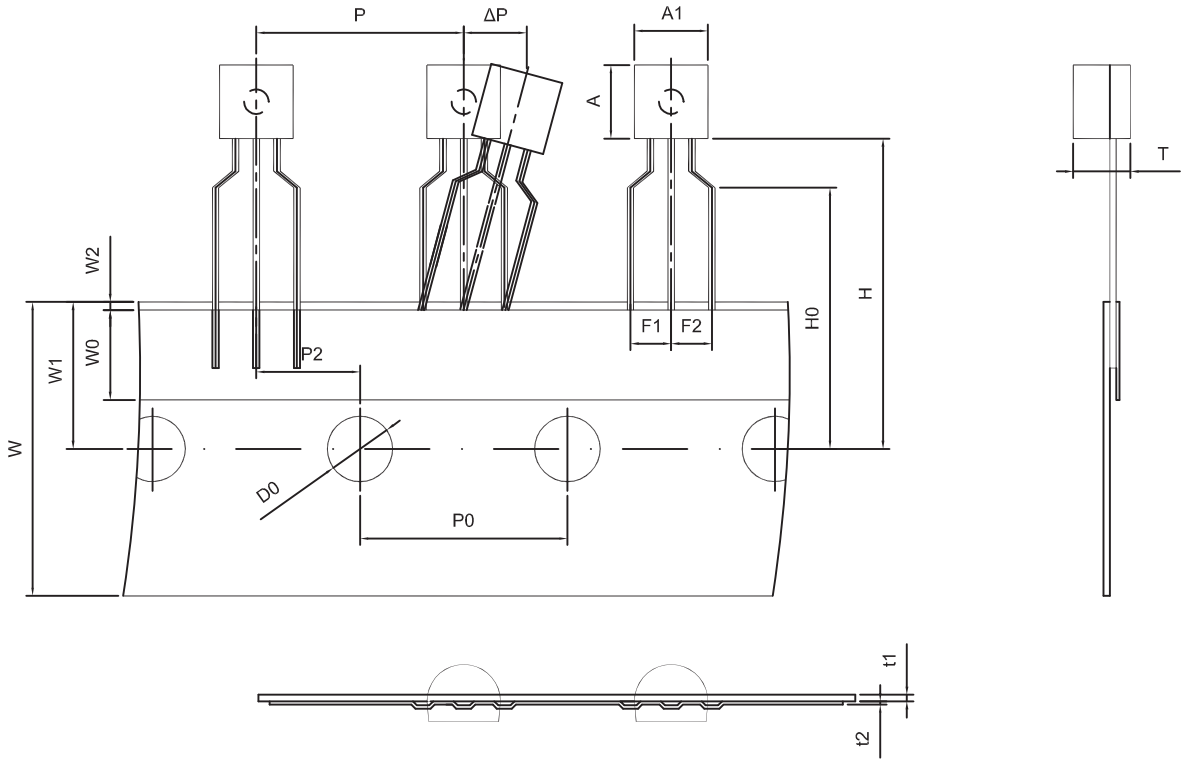
Note:

1.Controlling dimension: in millimeters

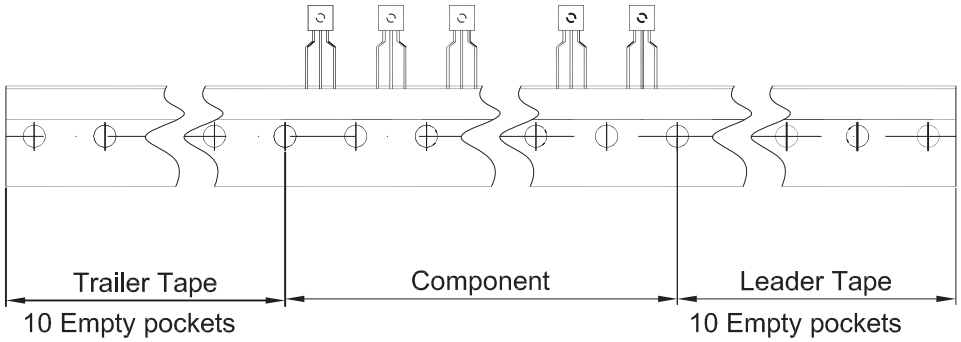
2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

TO-92 Package Tapeing Dimensions



Dimiensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX.	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250