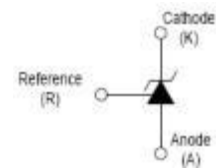


## Adjustable Accurate Reference Source

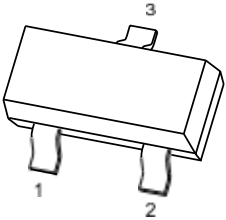

### FEATURES

- The output voltage can be adjusted to 36V
- Low dynamic output impedance ,its typical value is  $0.2\Omega$
- 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
- ESD protected up to 3KV

### Equivalent Circuit



### PIN CONNENCTIONS and MARKING

	<p><b>SOT -23</b></p> <p>1.REFERENCE 2.CATHODE 3. ANODE</p>
	<p><b>TO-92</b></p> <p>1.REFERENCE 2.ANODE 3.CATHODE</p>

### ORDERING INFORMATION

Part Number 规格编码	Packing Method 包装方式	Pack Quantity 包装数量	Part Number 规格编码
431	SOT-23	Reel	3000pcs/Reel
TL431	TO-92	Bulk	1000pcs/Bag

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

Parameter 测试项目	Symbol 符号	Value 典型值		单位
		SOT-23	TO-92	
Cathode Voltage 阴极电压	VKA	37		V
Cathode Current Range (Continuous) 阴极电流范围	IKA	-100~+150		mA
Reference Input Current Range 输入电流范围	Iref	0.05 +10		mA
Power Dissipation 功耗	PD	300	770	mW
Thermal Resistance from Junction to Ambient 温升	RθJA	417	162	°C/W
Operating Junction Temperature 操作结温	TJ	-40~ +125		°C
Storage Temperature Range 储存温度范围	Tstg	-65~+150		°C

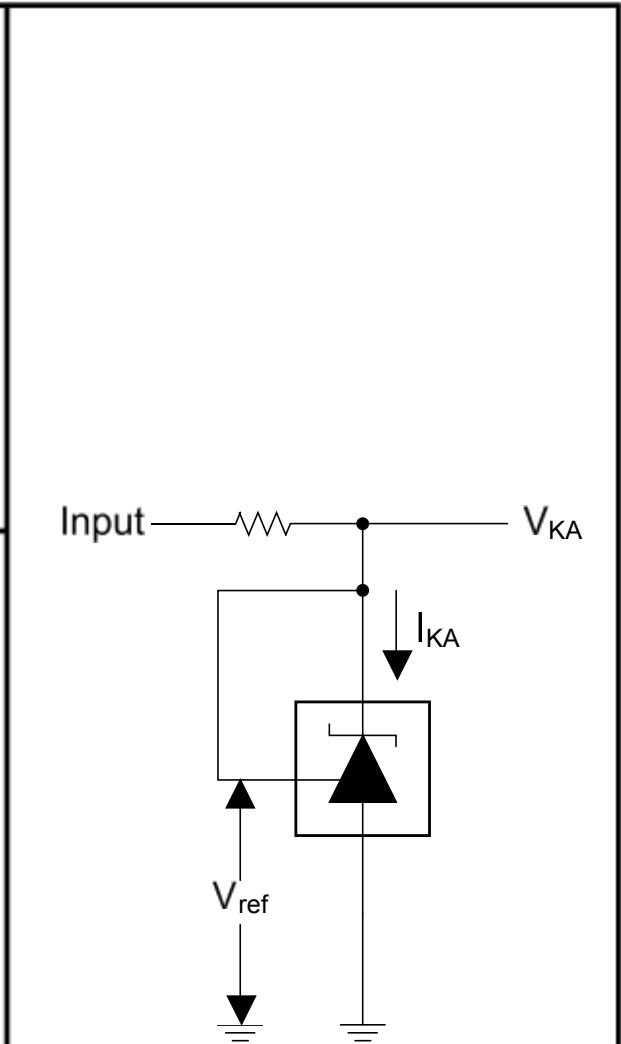
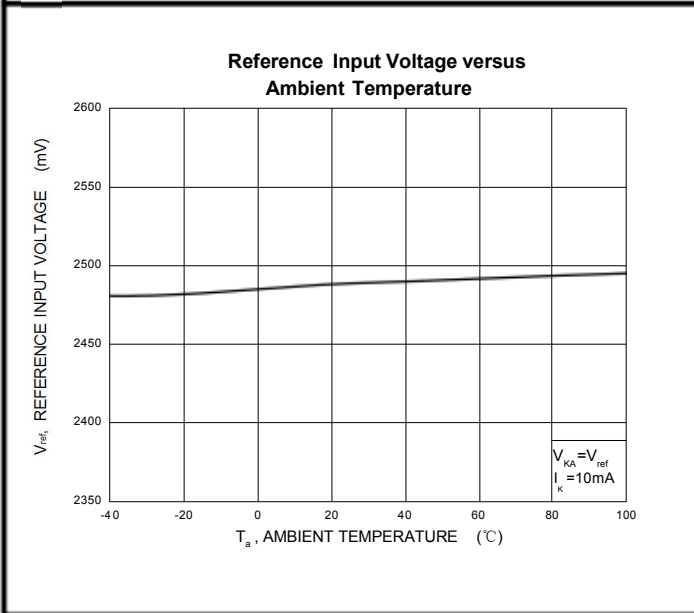
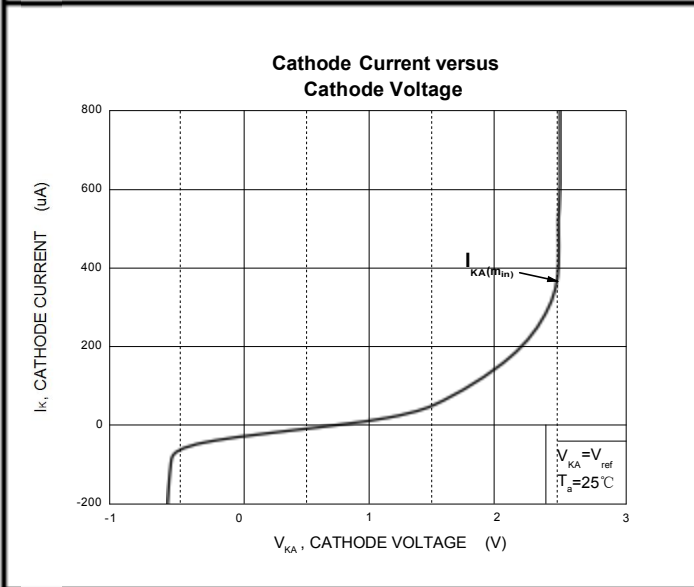
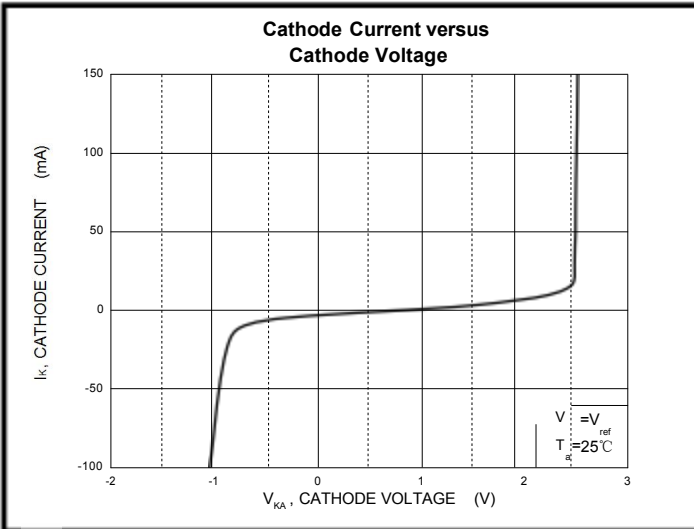
### ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter 测试项目	Symbol 符号	Test conditions 测试条件	小值	中间值	大值	单位
Reference input voltage 输入电压	Vref	VKA=VREF, IKA=10mA	2.470		2.520	V
Deviation of reference input voltage over temperature (note) 输入电压过温范围	$\Delta V_{ref} / \Delta T$	VKA = VREF, IKA = 10mA Tmin ≤ Ta ≤ Tmax		4.5	17	mV
Ratio of change in reference Input voltage to the change in cathode voltage 输入电压与阴极电压	$\Delta V_{ref} / \Delta V_{KA}$	IKA=10mA		-1.0	-2.7	mV/V
		$\Delta V_{KA} = 10V \sim V_{REF}$				
		$\Delta V_{KA} = 36V \sim 10V$		-0.5	-2.0	mV/V
Reference input current 输入电流	Iref	IKA= 10mA, R1=10kΩ R2=∞		1.5	4	μA
Deviation of reference input current over full temperature range 输入电流温度范围	$\Delta I_{ref} / \Delta T$	IKA=10mA, R1=10kΩ R2=∞ TA=-25 to 125°C		0.4	1.2	μA
Minimum cathode current for Regulation 最小阴极电流	IKA(min)	VKA=VREF		0.45	1.0	mA
Off-state cathode current 断开的阴极电流	IKA(OFF)	VKA=40V, VREF=0		0.05	0.5	μA
Dynamic impedance 动态阻抗	ZKA	VKA=VREF, IKA=1 to 100mA f ≤ 1.0kHz		0.15	0.5	Ω

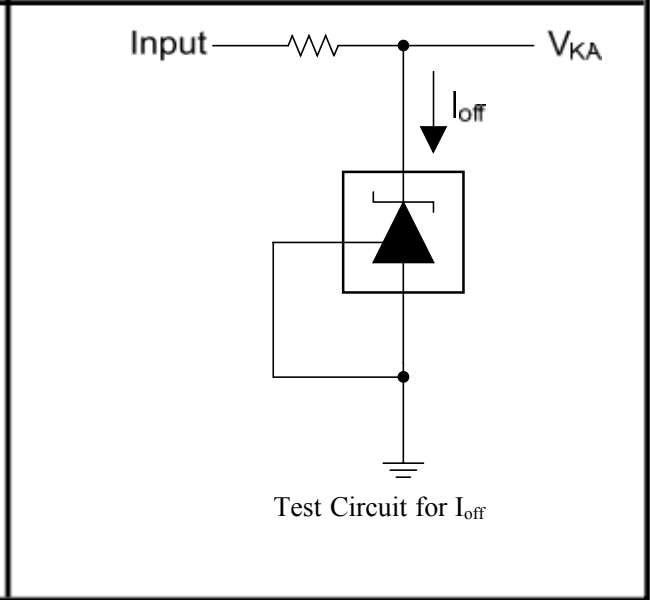
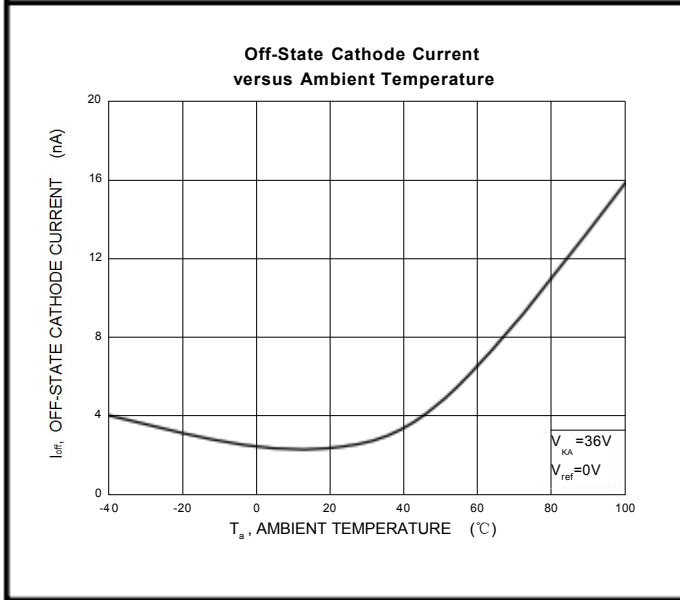
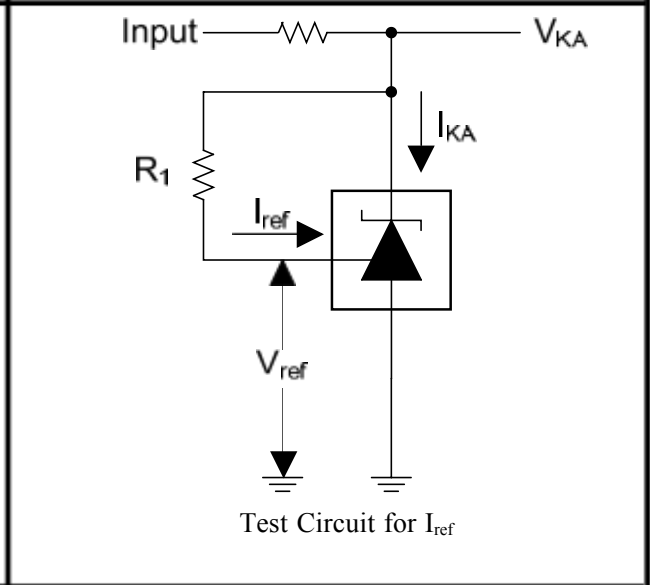
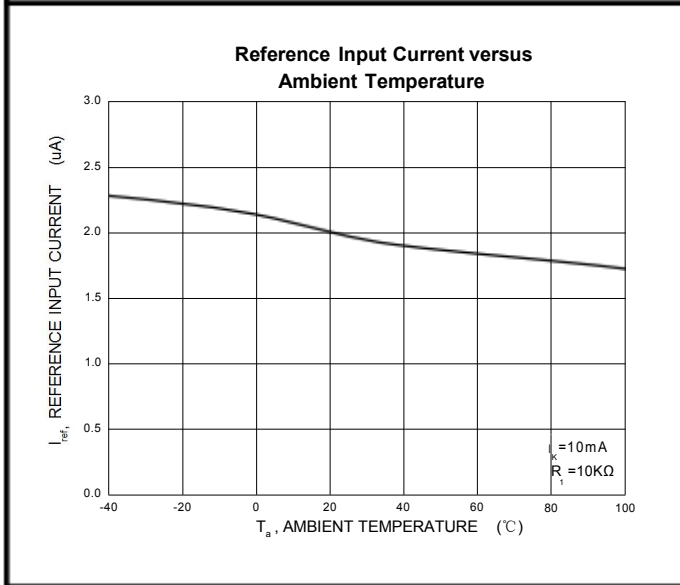
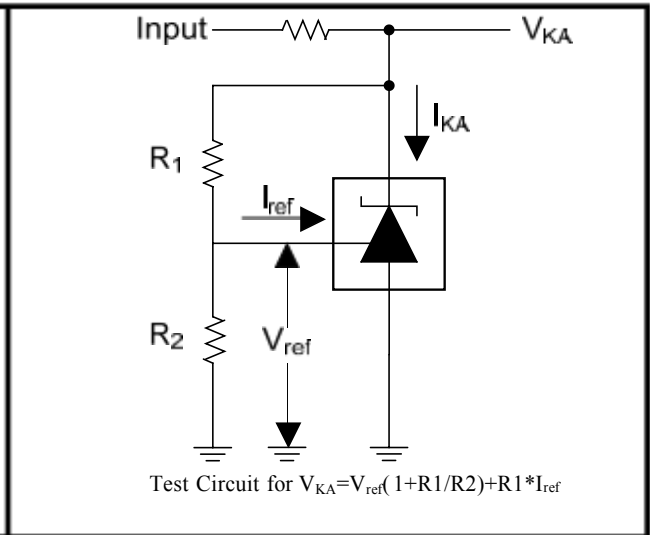
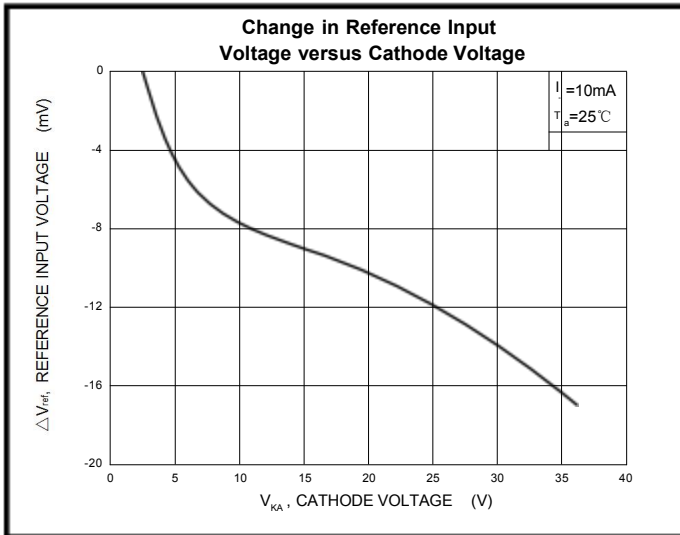
Note: TMIN=-25 °C, TMAX=+85 °C

### CLASSIFICATION OF Vref

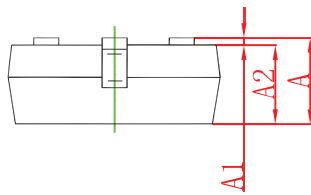
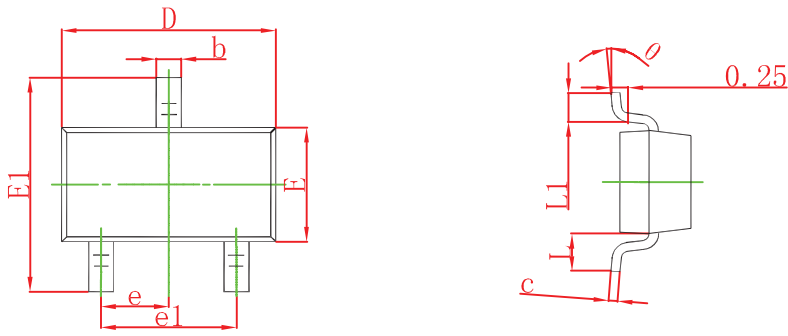
Rank	0.5%	1%
Range	2.482-2.508	2.47-2.52



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

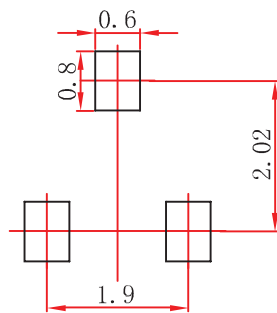


## SOT-23 Package Outline Dimensions



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
v	0°	8°	0°	8°

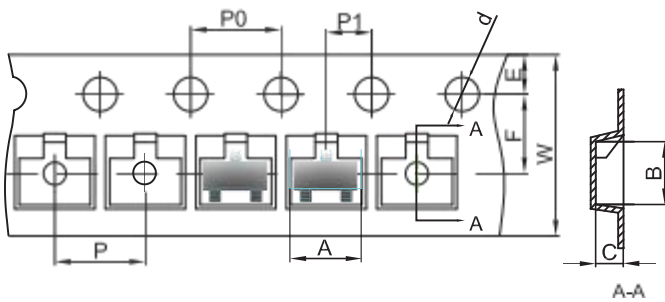
## SOT-23 Suggested Pad Layout



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

## SOT-23 Tape and Reel

### SOT-23 Embossed Carrier Tape



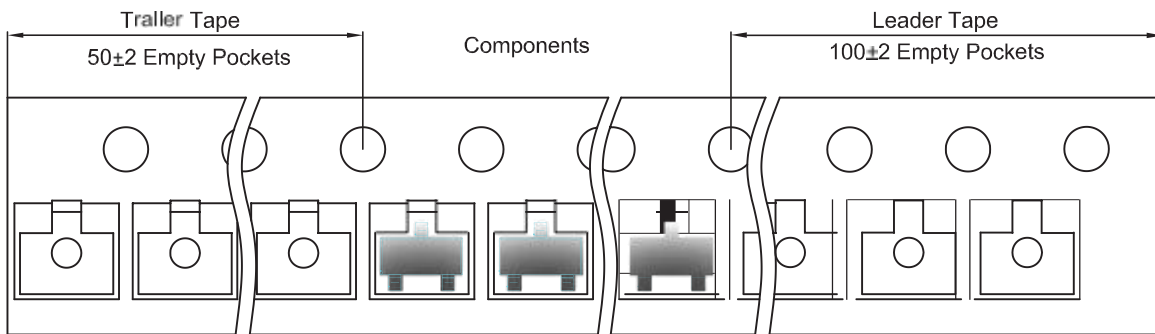
#### Packaging Description:

SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17,8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

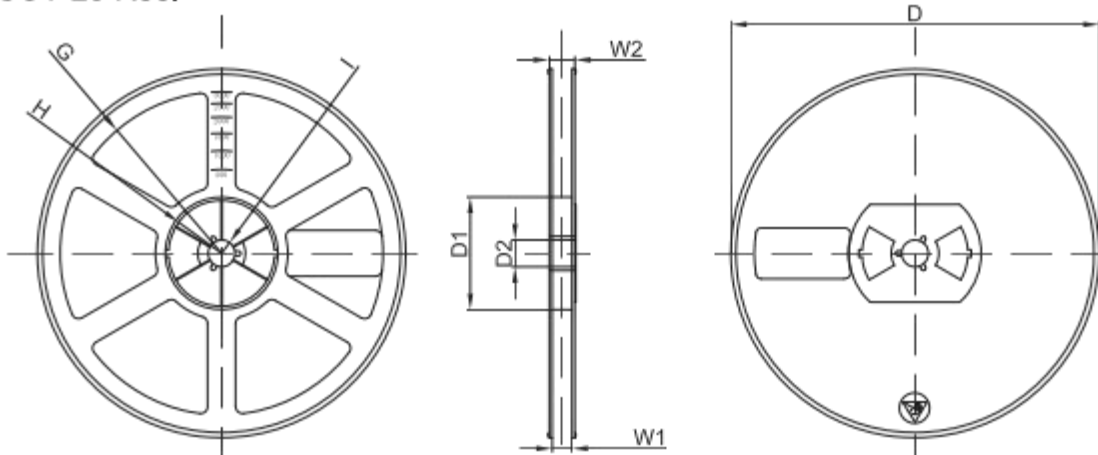
Dimensions are in millimeter

Pkg 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

### SOT-23 Tape Leader and Trailer



### SOT-23 Reel

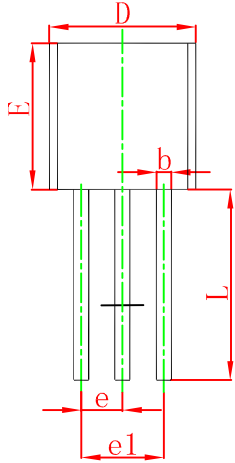
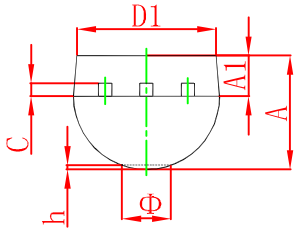


Dimensions are in millimeter

Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

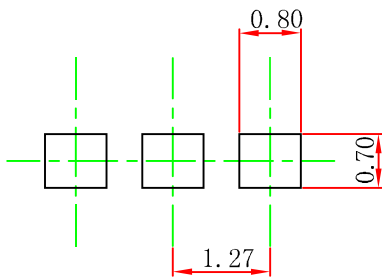
REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	

**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.