

## Common Cathode Zeners for ESD Protection

### DESCRIPTION

The dual monolithic silicon Zener diodes are designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. Their dual junction common cathode design protects two separate lines using only one package. These devices ideal for situations where board space is at a premium.

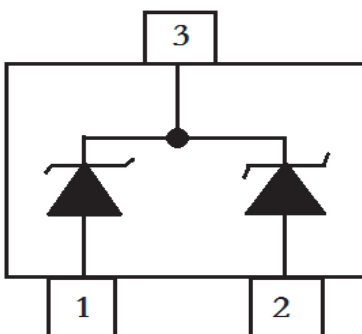
### ORDERING INFORMATION

- ✧ Device: TEPxxCL Series
- ✧ Package: SOT-23
- ✧ Material: RoHS Compliant
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

### MACHANICAL DATA

- ✧ SOT-23 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed: 260°C/10s
- ✧ Reel size: 7 inch

### PIN CONFIGURATION



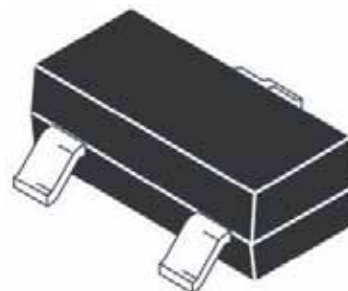
### FEATURES

- ✧ SOT-23 package allows either two separate unidirectional configurations or a single bidirectional configuration.
- ✧ Working peak reverse voltage 3V to 22V
- ✧ Standard Zener breakdown voltage 5.6V to 27V
- ✧ Peak power 24 or Watts @ 1.0ms (unidirectional) per Figure 6 Waveform
- ✧ ESD Rating:
  - Class 3B (>16kV) per the Human Body Model
  - Class C (>400V) per Machine Model
- ✧ ESD Rating of IEC61000-4-2 level 4,  $\pm 30$ kV contact Discharge
- ✧ Low leakage < 5.0 $\mu$ A
- ✧ P/N suffix V means AEC-Q101 qualified, e.g: TEP5V6CLV
- ✧ Halogen-free

### APPLICATIONS

- ✧ Computers
- ✧ Printers
- ✧ Business Machines
- ✧ Communication systems
- ✧ Medical equipment

### PACKAGE OUTLINE



**ABSOLUTE MAXIMUM RATING**

Symbol	Parameter	Value	Units
$P_{PK}$	Peak Power Dissipation @1.0ms TEP5V6CL -TEP6V8CL TEP12CL-TEP27CL	24 40	W
$P_D$	Total Power Dissipation	300	mW
$T_{OPT}$	Operating Temperature	-55/+150	°C
$T_{STG}$	Storage Temperature	-55/+150	°C

**24 WATTS****ELECTRICAL CHARACTERISTICS (Tamb=25°C)**

Part Number	Device Marking	$V_{RWM}$	$I_R$	$V_{BR}$			$Z_{ZT}$	$Z_{ZK}$		$V_C$		
		(V)	( $\mu$ A)	(V)			( $\Omega$ )	( $\Omega$ )	(mA)	(V)	(A)	
			@ $V_{RWM}$	Min	Nom	Max	@ $I_T$	Max @ $I_{ZT}$	Max	@ $I_{ZK}$	Max	@ $I_{PP}$
TEP5V6CL	5A6	3.0	5.0	5.32	5.6	5.88	20	11	1600	0.25	8.0	3.0
TEP6V2CL	6A2	3.0	0.5	5.89	6.2	6.51	1.0	--	--	--	8.7	2.76
TEP6V8CL	6A8	4.5	0.5	6.46	6.8	7.14	1.0	--	--	--	9.6	2.5

$V_F=0.9V$  Max @  $I_F=10mA$

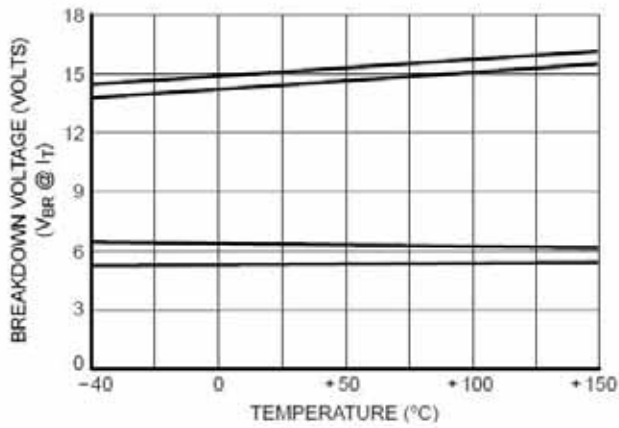
**40 WATTS****ELECTRICAL CHARACTERISTICS (Tamb=25°C)**

Part Number	Device Marking	$V_{RWM}$	$I_R$	$V_{BR}$				$V_C$ (note1)	
		(V)	(nA)	(V)			(mA)	(V)	(A)
			@ $V_{RWM}$	Min	Nom	Max	@ $I_T$	Max	@ $I_{PP}$
TEP12CL	12A	8.5	200	11.40	12	12.60	1	17	2.35
TEP15CL	15A	12.0	50	14.25	15	15.75	1	21	1.90
TEP18CL	18A	14.5	50	17.10	18	18.90	1	25	1.60
TEP27CL	27A	22.0	50	25.65	27	28.35	1	40	1.0

$V_F=0.9V$  Max @  $I_F=10mA$

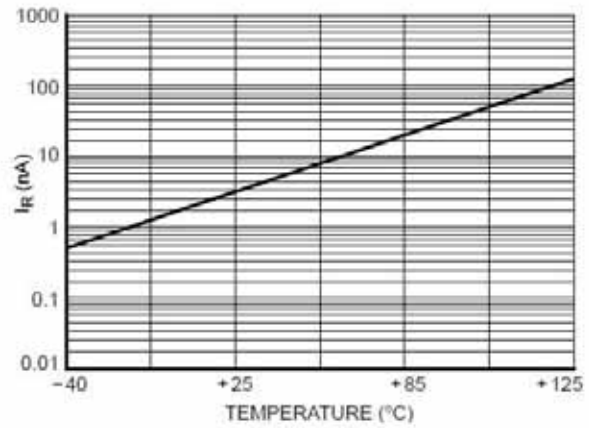
Note 1: Surge Current waveform per Figure 5

## RATING AND CHARACTERISTICS CURVES (TEPxxCL)

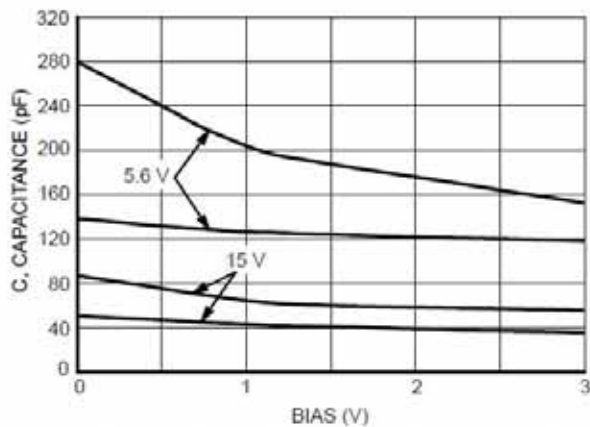


**Figure 1. Typical Breakdown Voltage versus Temperature**

(Upper curve for each voltage is bidirectional mode, lower curve is unidirectional mode)

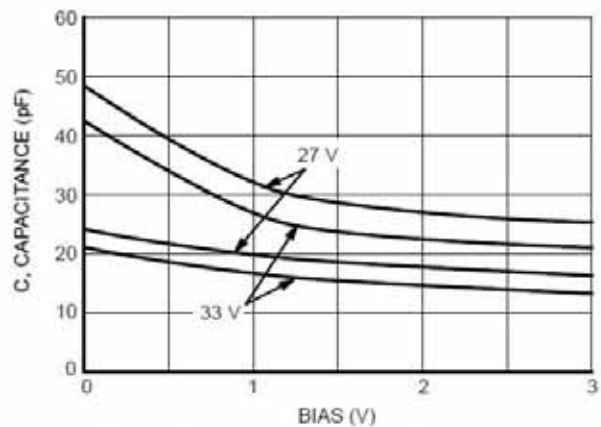


**Figure 2. Typical Leakage Current versus Temperature**



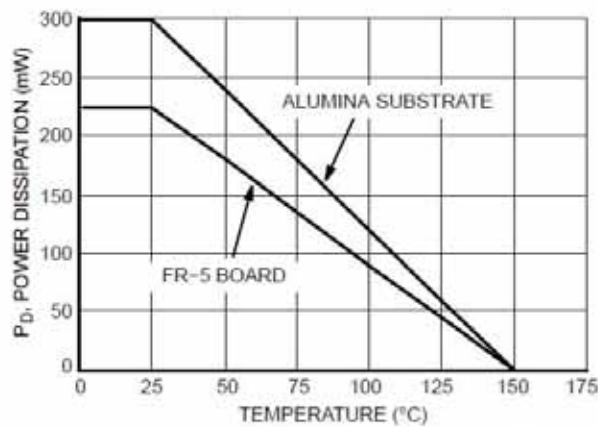
**Figure 3. Typical Capacitance versus Bias Voltage**

(Upper curve for each voltage is unidirectional mode, lower curve is bidirectional mode)



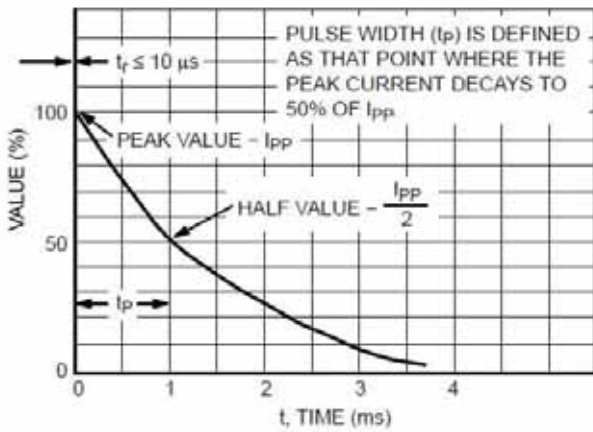
**Figure 4. Typical Capacitance versus Bias Voltage**

(Upper curve for each voltage is unidirectional mode, lower curve is bidirectional mode)

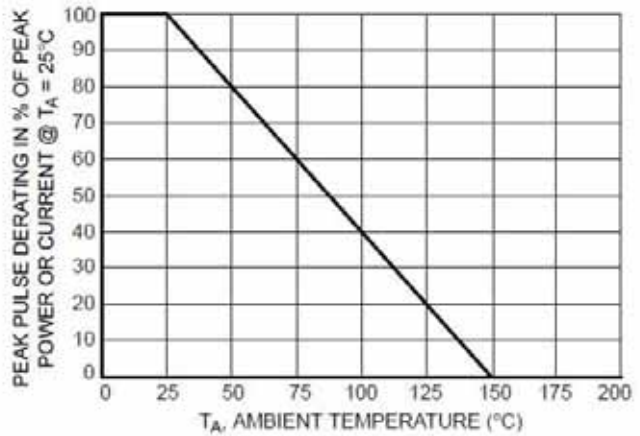


**Figure 5. Steady State Power Derating Curve**

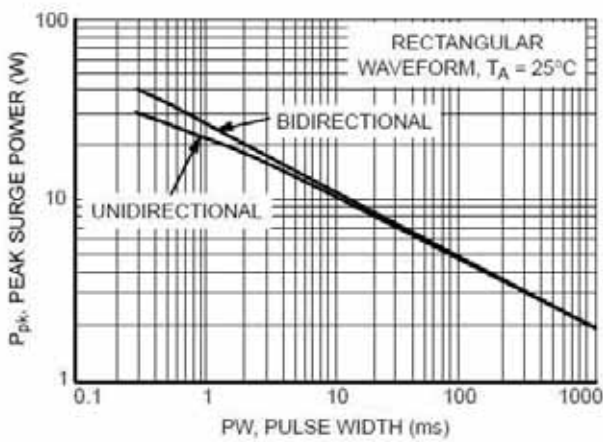
## RATING AND CHARACTERISTICS CURVES (TEPxxCL)



**Figure 6. Pulse Waveform**

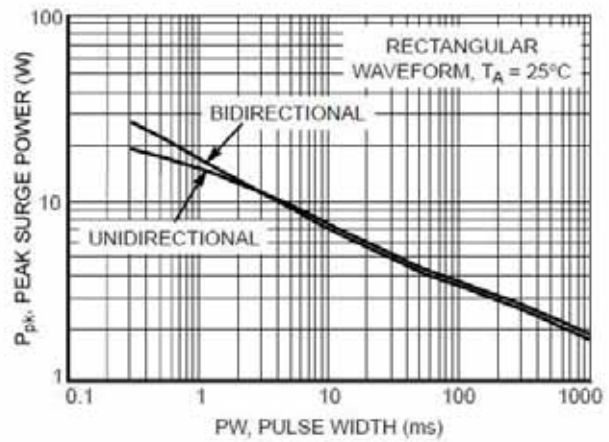


**Figure 7. Pulse Derating Curve**



**Figure 8. Maximum Non-repetitive Surge Power,  $P_{pk}$  versus PW**

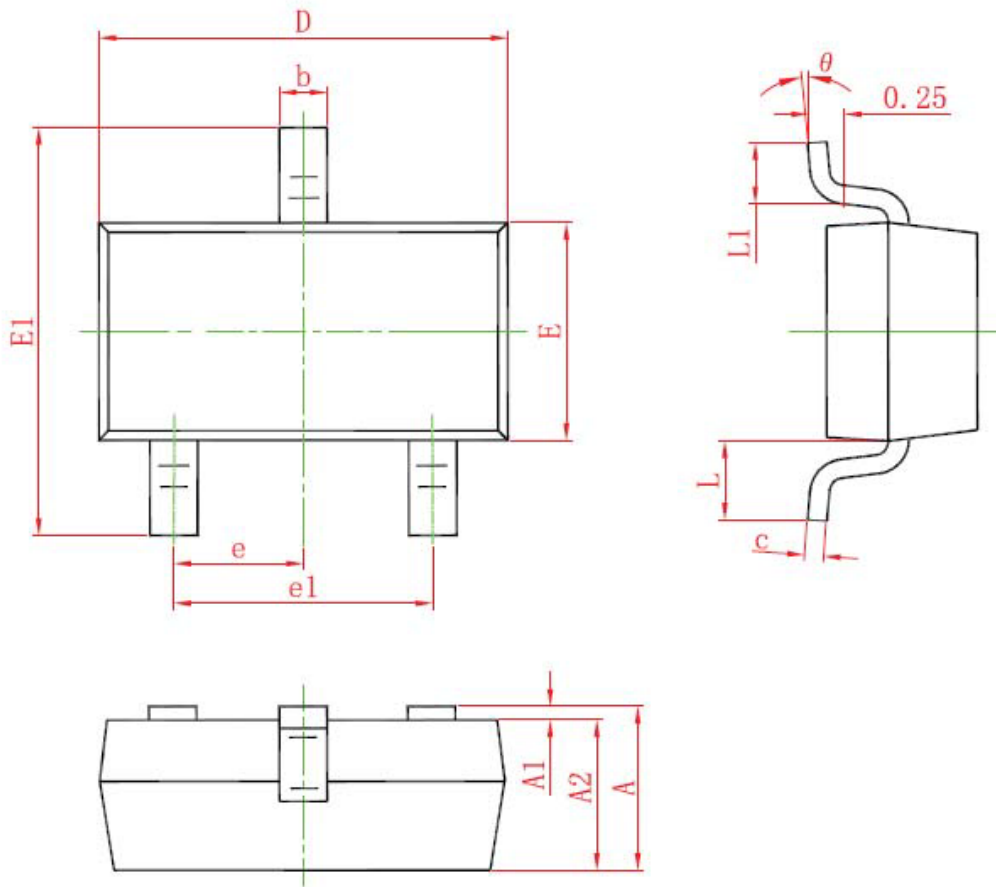
Power is defined as  $V_{RSM} \times I_Z(pk)$  where  $V_{RSM}$  is the clamping voltage at  $I_Z(pk)$ .



**Figure 9. Maximum Non-repetitive Surge Power,  $P_{pk(NOM)}$  versus PW**

Power is defined as  $V_Z(NOM) \times I_Z(pk)$  where  $V_Z(NOM)$  is the nominal Zener voltage measured at the low test current used for voltage classification.

## 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
$\theta$	0°	8°	0°	8°

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