

# TRANSZORB® Transient Voltage Suppressors



Case Style 1.5KE

PRIMARY CHARACTERISTICS	
$V_{WM}$	5.0 V to 18 V
$V_{BR}$ (uni-directional)	6.0 V to 21.2 V
$V_{BR}$ (bi-directional)	9.2 V to 21.2 V
$P_{PPM}$	1500 W
$P_D$	6.5 W
$I_{FSM}$	200 A
$T_J$ max.	175 °C
Polarity	Uni-directional, bi-directional
Package	1.5KE

## DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional types, use C suffix (e.g. ICTE18C). Electrical characteristics apply in both directions.

## FEATURES

- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 1500 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

## TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, and telecommunication.

## MECHANICAL DATA

**Case:** molded epoxy body over passivated junction Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant and commercial grade Base P/NHE3\_X - RoHS-compliant and AEC-Q101 qualified ("X" denotes revision code e.g. A, B, ...)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** for uni-directional types the color band denotes cathode end, no marking on bi-directional types

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (fig. 1)	$P_{PPM}$	1500	W
Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (fig. 3)	$I_{PPM}$	See next table	A
Power dissipation on infinite heatsink at $T_L = 75$ °C (fig. 8)	$P_D$	6.5	W
Peak forward surge current 8.3 ms single half sine-wave uni-directional only <sup>(2)</sup>	$I_{FSM}$	200	A
Maximum instantaneous forward voltage at 100 A for uni-directional only	$V_F$	3.5	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175	°C

### Notes

<sup>(1)</sup> Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25$  °C per fig. 2

<sup>(2)</sup> 8.3 ms single half sine-wave, duty cycle = 4 pulses per minute maximum



**ELECTRICAL CHARACTERISTICS (JEDEC® REGISTERED DATA)** (T<sub>A</sub> = 25 °C unless otherwise noted)

JEDEC® TYPE NUMBER	GENERAL SEMICONDUCTOR PART NUMBER	STAND-OFF VOLTAGE V <sub>WM</sub> (V)	BREAKDOWN VOLTAGE V <sub>BR</sub> AT 1.0 mA (V) MIN.	MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>D</sub> (µA)	MAXIMUM CLAMPING VOLTAGE AT I <sub>PP</sub> = 1.0 A V <sub>C</sub> (V)	MAXIMUM CLAMPING VOLTAGE AT I <sub>PP</sub> = 10 A V <sub>C</sub> (V)	MAXIMUM PEAK PULSE CURRENT I <sub>PP</sub> (A)
<b>UNI-DIRECTIONAL TYPES</b>							
1N6373 <sup>(2)</sup>	ICTE5 <sup>(2)</sup>	5.0	6.0	300	7.1	7.5	160
1N6374	ICTE8	8.0	9.4	25.0	11.3	11.5	100
1N6375	ICTE10	10.0	11.7	2.0	13.7	14.1	90
1N6376	ICTE12	12.0	14.1	2.0	16.1	16.5	70
1N6377	ICTE15	15.0	17.6	2.0	20.1	20.6	60
1N6378	ICTE18	18.0	21.2	2.0	24.2	25.2	50
<b>BI-DIRECTIONAL TYPES</b>							
1N6382	ICTE8C	8.0	9.4	50	11.4	11.6	100
1N6383	ICTE10C	10.0	11.7	2.0	14.1	14.5	90
1N6384	ICTE12C	12.0	14.1	2.0	16.7	17.1	70
1N6385	ICTE15C	15.0	17.6	2.0	20.8	21.4	60
1N6386	ICTE18C	18.0	21.2	2.0	24.8	25.5	50

**Notes**

- (1) "C" suffix indicates bi-directional
- (2) ICTE5 and 1N6373 are not available as bi-directional
- (3) Clamping factor: 1.33 at full rated power; 1.20 at 50 % rated power; clamping factor: the ratio of the actual V<sub>C</sub> (clamping voltage) to the V<sub>BR</sub> (breakdown voltage) as measured on a specific device

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ICTE5-E3/54	0.968	54	1400	13" diameter paper tape and reel
ICTE5HE3_A/C <sup>(1)</sup>	0.968	C	1400	13" diameter paper tape and reel

**Note**

- (1) AEC-Q101 qualified



### RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

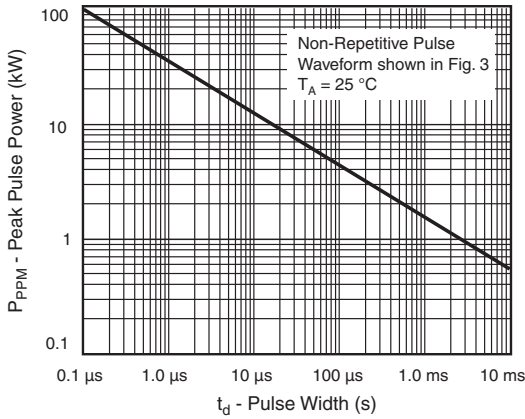


Fig. 1 - Peak Pulse Power Rating Curve

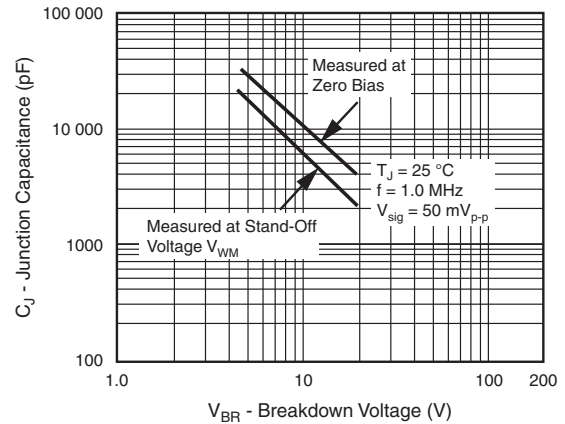


Fig. 4 - Typical Junction Capacitance Uni-Directional

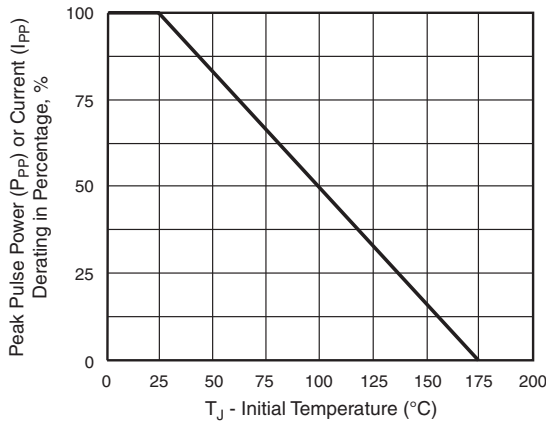


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

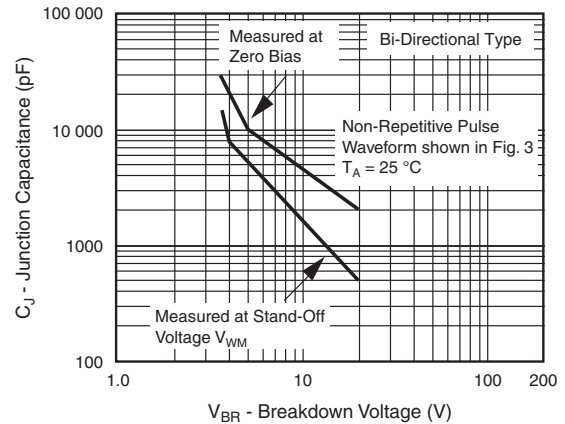


Fig. 5 - Typical Junction Capacitance

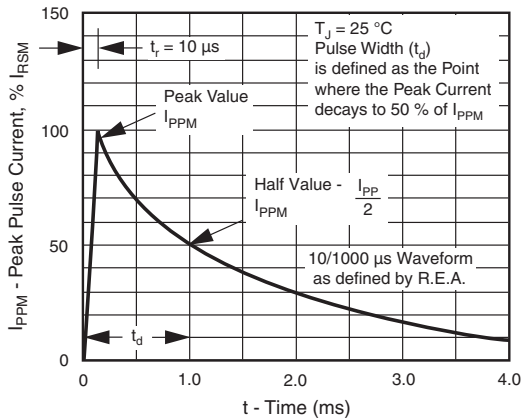


Fig. 3 - Pulse Waveform

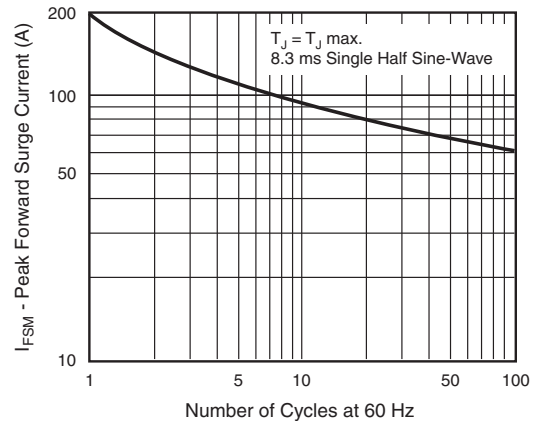


Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

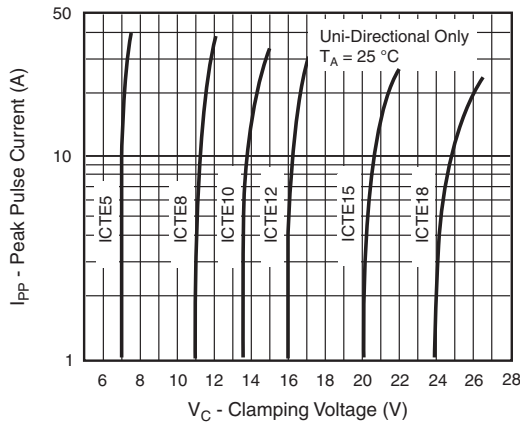


Fig. 7 - Typical Characteristics Clamping Voltage

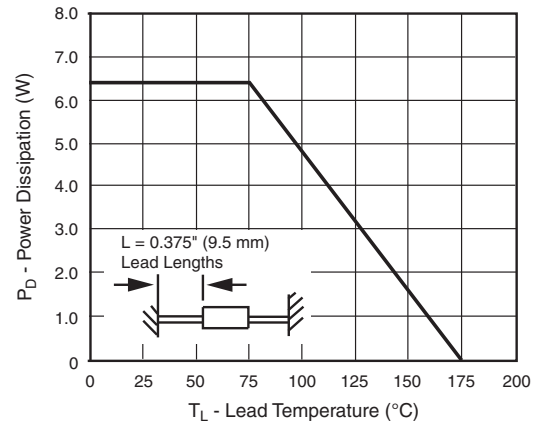
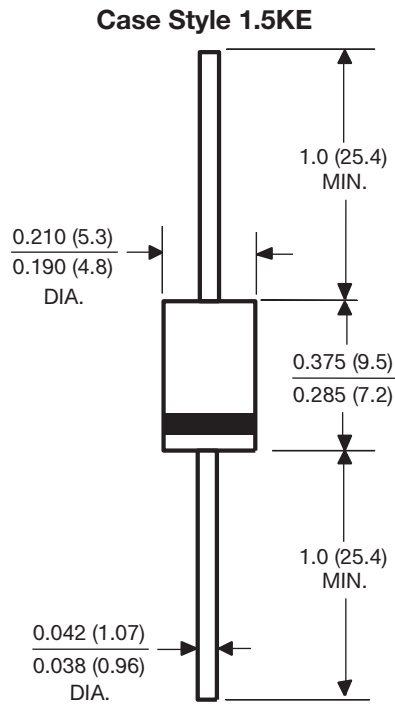


Fig. 8 - Power Derating Curve

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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