

**TRANSZORB® Transient Voltage Suppressors****Case Style 1.5KE****PRIMARY CHARACTERISTICS**

V_{BR} uni-directional	6.8 V to 540 V
V_{BR} bi-directional	6.8 V to 440 V
P_{PPM}	1500 W
P_D	6.5 W
I_{FSM} (uni-directional only)	200 A
T_J max.	175 °C

DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional types, use C or CA suffix (e.g. 1.5KE440CA).

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 μ s waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

**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, automotive 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, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/
automotive grade (AEC Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

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

Note:

- 1.5KE250 ~ 1.5KE540A and 1.5KE250C ~ 1.5KE440CA for commercial grade only

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 μ s waveform ⁽¹⁾ (Fig. 1)	P_{PPM}	1500	W
Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾	I_{PPM}	See next table	A
Power dissipation on infinite heatsink at $T_L = 75$ °C (Fig. 5)	P_D	6.5	W
Peak forward surge current 8.3 ms single half sine-wave uni-directional only ⁽²⁾	I_{FSM}	200	A
Maximum instantaneous forward voltage at 100 A for uni-directional only ⁽³⁾	V_F	3.5/5.0	V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175	°C

Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25$ °C per Fig. 2

(2) Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

(3) $V_F = 3.5$ V for 1.5KE220 (A) and below; $V_F = 5.0$ V for 1.5KE250(A) and above

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to ambient	$R_{\theta JA}$	75	$^{\circ}\text{C/W}$
Typical thermal resistance, junction to lead	$R_{\theta JL}$	15.4	

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1.5KE6.8A-E3/54	0.968	54	1400	13" diameter paper tape and reel
1.5KE6.8AHE3/54 ⁽¹⁾	0.968	54	1400	13" diameter paper tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

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

Figure 1. Peak Pulse Power Rating Curve



Figure 3. Pulse Waveform



Figure 2. Pulse Power or Current vs. Initial Junction Temperature



Figure 4. Typical Junction Capacitance



Figure 5. Power Derating Curve



Figure 8. Incremental Clamping Voltage Curve (Uni-Directional)



Figure 6. Maximum Non-Repetitive Forward Surge Current
Uni-Directional only



Figure 9. Incremental Clamping Voltage Curve (Bi-directional)



Figure 7. Incremental Clamping Voltage Curve (Uni-Directional)



Figure 10. Incremental Clamping Voltage Curve (Bi-Directional)



Figure 11. Instantaneous Forward Voltage Characteristics Curve

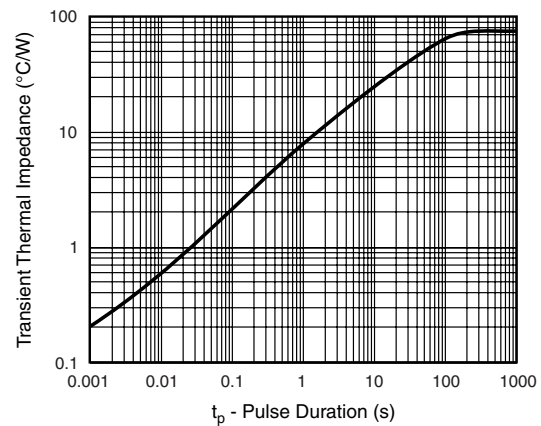
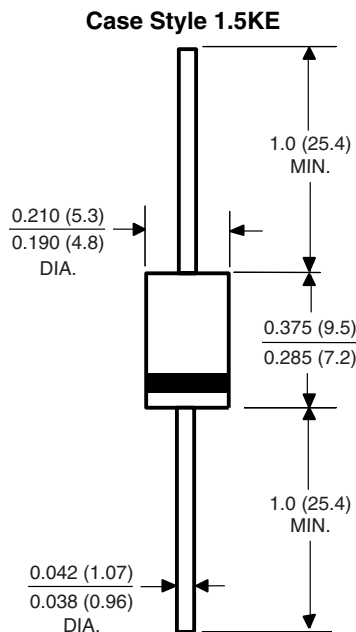


Figure 12. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



APPLICATION NOTES

- This series of Silicon Transient Suppressors is used in applications where large voltage transients can permanently damage voltage-sensitive components.
- The TVS diode can be used in applications where induced lightning on rural or remote transmission lines presents a hazard to electronic circuitry (ref: R.E.A. specification P.E. 60).
- This Transient Voltage Suppressor diode has a pulse power rating of 1500 W for 1 ms. The response time of TVS diode clamping action is effectively instantaneous (1×10^{-9} s bi-directional); therefore, they can protect integrated circuits, MOS devices, hybrids, and other voltage sensitive semiconductors and components. TVS diodes can also be used in series or parallel to increase the peak power ratings.



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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9