

## Surface-Mount TRANSZORB® Transient Voltage Suppressors


**SMB (DO-214AA)**

### FEATURES

- Unidirectional polarity only
- Peak pulse power: 600 W (10/1000  $\mu$ s)
- Excellent clamping capability
- Very fast response time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**  
Available

### LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$V_{BR}$ (unidirectional)	4.1 V
$V_{WM}$	3.3 V
$P_{PPM}$	600 W
$P_D$	5 W
$I_{FSM}$ (unidirectional only)	60 A
$T_J$ max.	175 °C
Polarity	Unidirectional
Package	SMB (DO-214AA)

### 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 specifically for protecting 3.3 V supplied sensitive equipment against transient overvoltages.

### MECHANICAL DATA

**Case:** SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3\_X - RoHS-compliant and AEC-Q101 qualified

Base P/NHM3\_X - halogen-free, 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, M3, HE3, and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** color band denotes cathode end

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation <sup>(1)(2)</sup>	$P_{PPM}$	600	W
Peak pulse current with a 10/1000 $\mu$ s waveform (fig. 1)	$I_{PP}$	50	A
Peak pulse current with a 8/20 $\mu$ s waveform (fig. 1)	$I_{PPM}$	200	A
Peak forward surge current 8.3 ms single half sine-wave <sup>(2)</sup>	$I_{FSM}$	60	A
Power dissipation on infinite heatsink, $T_A = 75$ °C	$P_D$	5	W
Operating junction and storage temperature range	$T_J, T_{STG}$	-65 to +175	°C

### Notes

(1) Non-repetitive current pulse, per fig. 1

(2) Mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)										
DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$		MAXIMUM REVERSE LEAKAGE CURRENT $I_R$ AT $V_{WM}$	STAND-OFF VOLTAGE $V_{WM}$	MAXIMUM CLAMPING VOLTAGE $V_C$ AT $I_{PP}$		MAXIMUM CLAMPING VOLTAGE $V_C$ AT $I_{PPM}$	TYPICAL TEMPERATURE COEFFICIENT OF $V_{BR}$	TYPICAL JUNCTION CAPACITANCE $C_J$ AT 0 V 1 MHz
		MIN.	MA			$\mu\text{A}$	V	V	A	
		V	mA	200	3.3	7.3	50	10.3	200	-5.3
SMBJ3V3	KC	4.1	1.0							

THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to lead <sup>(1)</sup>	$R_{\theta JL}$	20	$^\circ\text{C}/\text{W}$
Typical thermal resistance, junction to ambient <sup>(2)</sup>	$R_{\theta JA}$	100	

**Notes**

(1) Thermal resistance from junction to lead - mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal  
(2) Thermal resistance from junction to ambient - mounted on the recommended PCB pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMBJ3V3-E3/52	0.096	52	750	7" diameter plastic tape and reel
SMBJ3V3-M3/52				
SMBJ3V3-E3/5B	0.096	5B	3200	13" diameter plastic tape and reel
SMBJ3V3-M3/5B				
SMBJ3V3HE3_A/H <sup>(1)</sup>	0.096	H	750	7" diameter plastic tape and reel
SMBJ3V3HM3_A/H <sup>(1)</sup>				
SMBJ3V3HE3_A/I <sup>(1)</sup>	0.096	I	3200	13" diameter plastic tape and reel
SMBJ3V3HM3_A/I <sup>(1)</sup>				

**Note**

<sup>(1)</sup> AEC-Q101 qualified

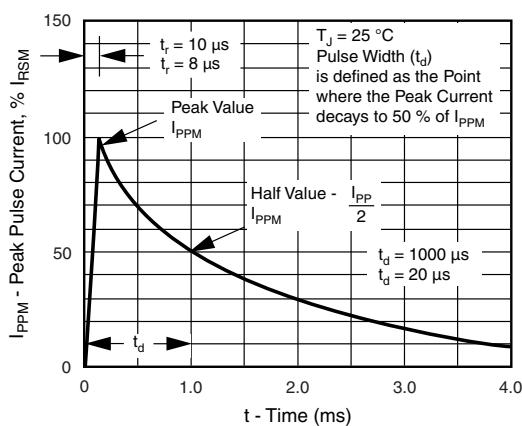
**RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25^\circ\text{C}$  unless otherwise noted)**


Fig. 1 - Pulse Wave Form

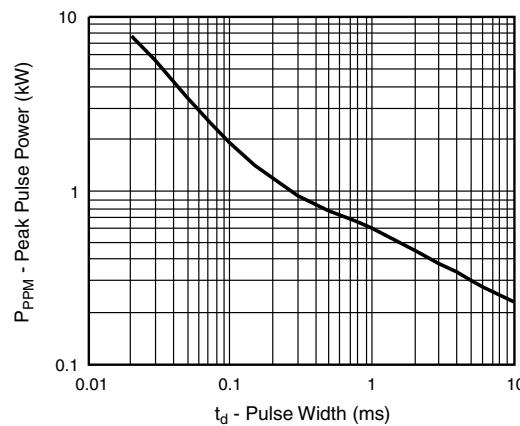


Fig. 2 - Peak Pulse Power Rating Curve

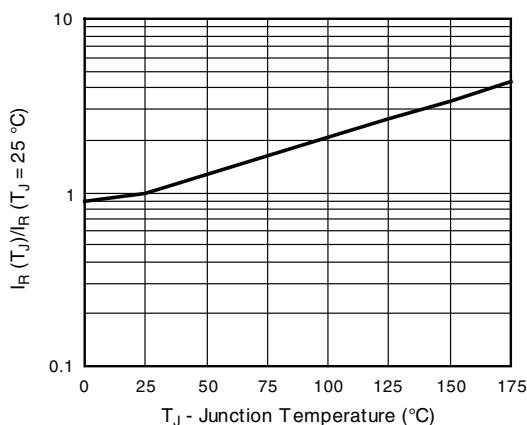


Fig. 3 - Relative Variation of Leakage Current vs. Junction Temperature

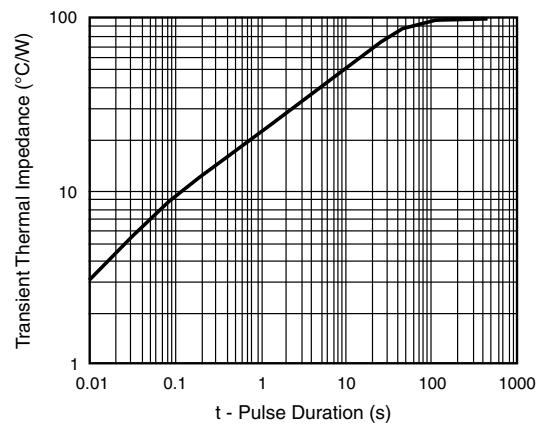


Fig. 6 - Typical Transient Thermal Impedance

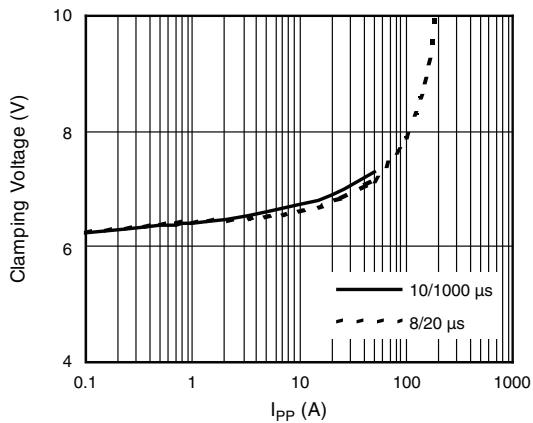


Fig. 4 - Clamping Voltage vs. Peak Pulse Current ( $T_J$  initial = 25 °C)

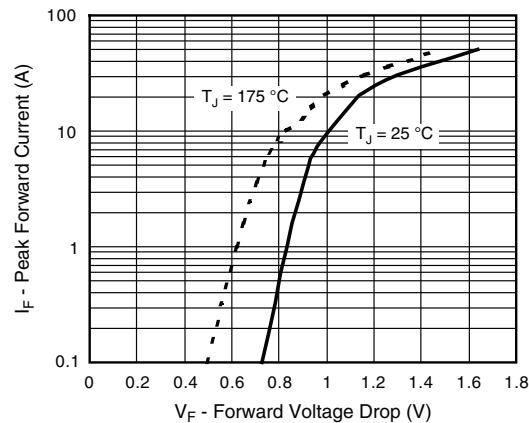


Fig. 7 - Typical Peak Forward Voltage Drop vs. Peak Forward Current

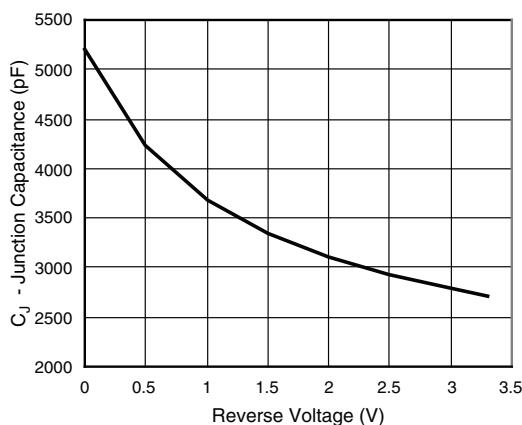
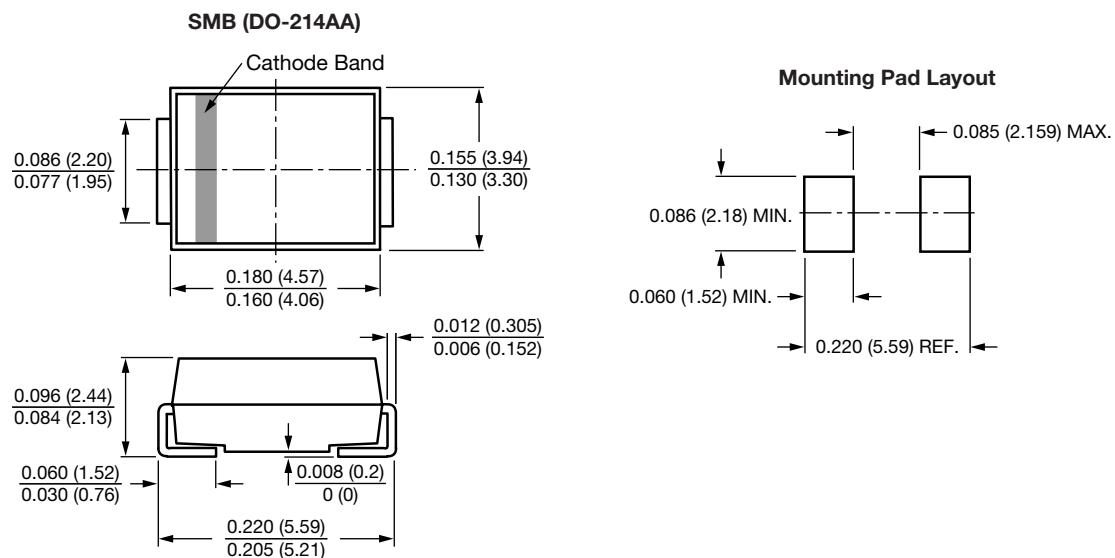


Fig. 5 - Typical Junction Capacitance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)


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