



# Surface Mount TRANSZORB® Transient Voltage Suppressors



DO-214AC (SMA)

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 400 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle): 0.01 % (300 W above 78 V)
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

PRIMARY CHARACTERISTICS	
V <sub>BR</sub> uni-directional	6.40 V to 231 V
V <sub>BR</sub> bi-directional	6.40 V to 231 V
V <sub>WM</sub>	5.0 V to 188 V
P <sub>PPM</sub>	400 W, 300 W
I <sub>FSM</sub>	40 A
T <sub>J</sub> max.	150 °C
Polarity	Uni-directional, bi-directional
Package	DO-214AC (SMA)

### DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional use CA suffix (e.g. SMAJ10CA).  
Electrical characteristics apply in both directions.

### MECHANICAL DATA

**Case:** DO-214AC (SMA)  
Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS compliant, commercial grade  
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102  
M3 suffix meets JESD 201 class 1A whisker test

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

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)(2)</sup> (fig. 1)	P <sub>PPM</sub>	400	W
Peak pulse current with a waveform <sup>(1)</sup>	I <sub>PPM</sub>	See next table	A
Peak forward surge current 8.3 ms single half sine-wave uni-directional only <sup>(2)</sup>	I <sub>FSM</sub>	40	A
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	- 55 to + 150	°C

### Notes

- <sup>(1)</sup> Non-repetitive current pulse, per fig. 3 and derated above T<sub>A</sub> = 25 °C per fig. 2. Rating is 300 W above 78 V
- <sup>(2)</sup> Mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal



ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C unless otherwise noted)

Table with 10 columns: DEVICE TYPE, DEVICE MARKING CODE (UNI, BI), BREAKDOWN VOLTAGE (MIN., MAX.), TEST CURRENT I\_T (mA), STAND-OFF VOLTAGE V\_WM (V), MAXIMUM REVERSE LEAKAGE AT V\_WM I\_D (µA), MAXIMUM PEAK PULSE SURGE CURRENT I\_PPM (A), MAXIMUM CLAMPING VOLTAGE AT I\_PPM V\_C (V). Rows list various diode types from SMAJ5.0A to SMAJ188A.

Notes

- (1) Pulse test: t\_p ≤ 50 ms
(2) Surge current waveform per fig. 3 and derate per fig. 2
(3) For bi-directional types having V\_WM of 10 V and less, the I\_D limit is doubled
(4) All terms and symbols are consistent with ANSI/IEEE C62.35
(5) For the bi-directional SMAJ5.0CA, the maximum V\_BR is 7.25 V
(6) V\_F = 3.5 V at I\_F = 25 A (uni-directional only)

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

PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to ambient <sup>(1)</sup>	$R_{\theta JA}$	120	$^\circ\text{C/W}$
Typical thermal resistance, junction to lead	$R_{\theta JL}$	30	$^\circ\text{C/W}$

**Note**

(1) Mounted on minimum recommended pad layout

## ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMAJ5.0A-E3/61	0.064	61	1800	7" diameter plastic tape and reel
SMAJ5.0A-E3/5A	0.064	5A	7500	13" diameter plastic tape and reel
SMAJ5.0AHE3/61 <sup>(1)</sup>	0.064	61	1800	7" diameter plastic tape and reel
SMAJ5.0AHE3/5A <sup>(1)</sup>	0.064	5A	7500	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

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

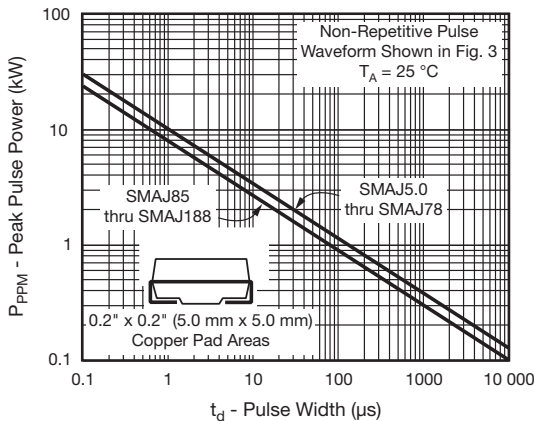


Fig. 1 - Peak Pulse Power Rating Curve

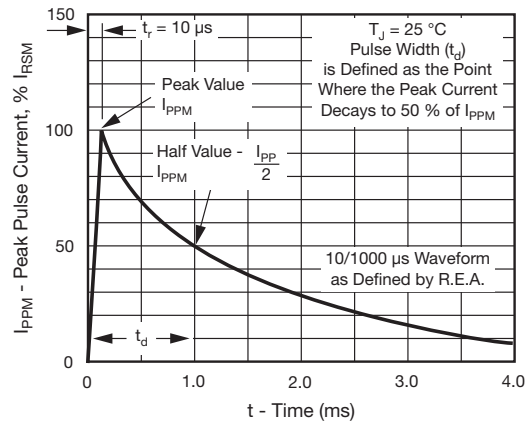


Fig. 3 - Pulse Waveform

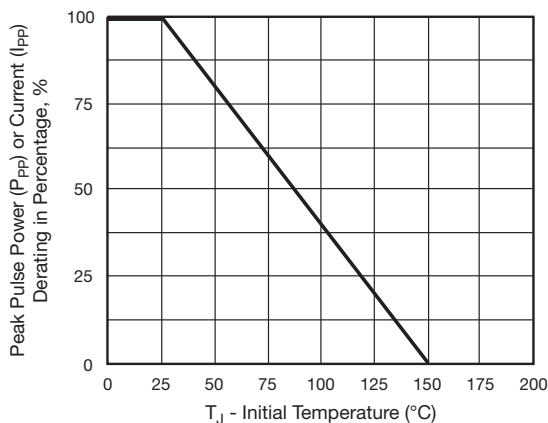


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

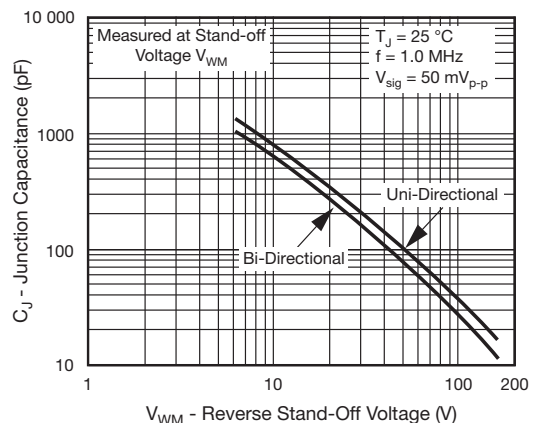


Fig. 4 - Typical Junction Capacitance

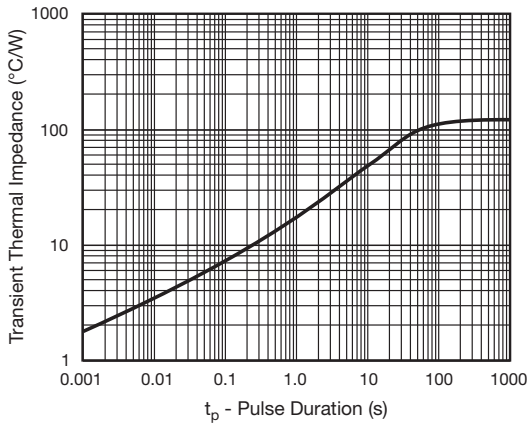


Fig. 5 - Typical Transient Thermal Impedance

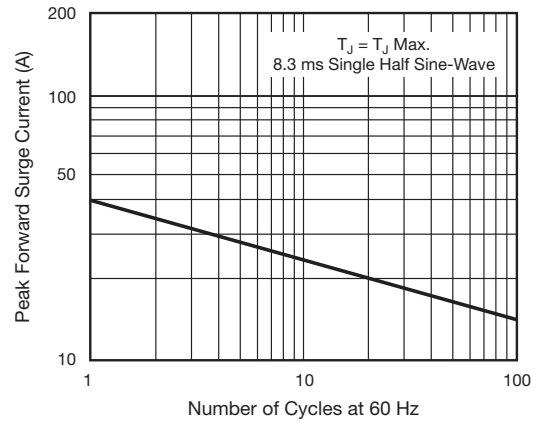
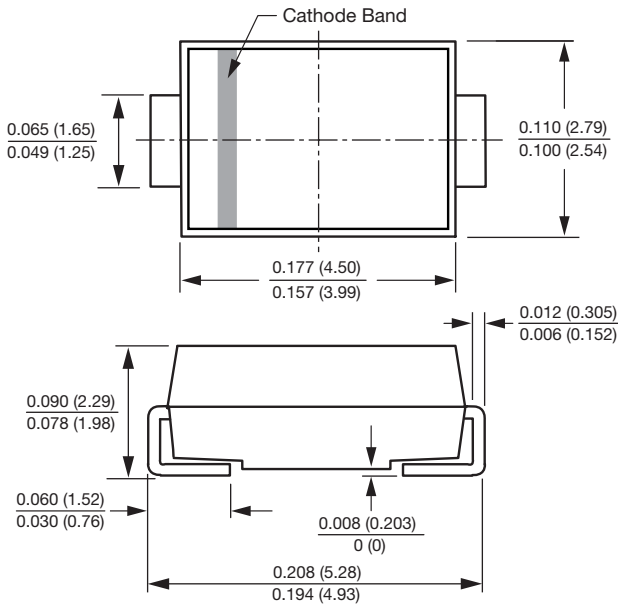


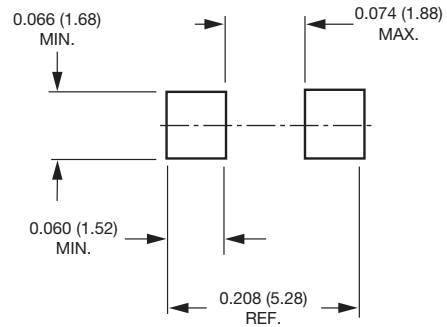
Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### DO-214AC (SMA)



#### Mounting Pad Layout





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