



**THE DATASHEET OF  
SMA6J6.5A-E3/5A**



# Surface-Mount TRANSZORB® Transient Voltage Suppressors


**SMA (DO-214AC)**

 Cathode  Anode

**LINKS TO ADDITIONAL RESOURCES**


PRIMARY CHARACTERISTICS	
$V_{BR}$	6.4 V to 34.4 V
$V_{WM}$	5.0 V to 28 V
$P_{PPM}$ (10 x 1000 $\mu$ s)	600 W
$P_{PPM}$ (8 x 20 $\mu$ s)	4000 W
$P_D$ at $T_A = 50^\circ\text{C}$	4 W
$I_{FSM}$	50 A
$T_J$ max.	150 $^\circ\text{C}$
Polarity	Unidirectional
Package	SMA (DO-214AC)

**FEATURES**

- Low profile package
- Ideal for automated placement
- Available in unidirectional polarity only
- Excellent clamping capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260  $^\circ\text{C}$
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


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

**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:** SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, and industrial grade

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

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

E3, M3 suffix meets JESD 201 class 2 whisker test

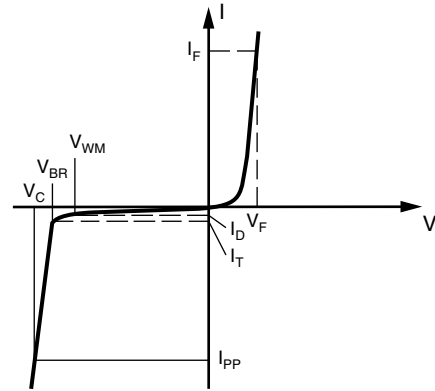
**Polarity:** color band denotes cathode end

MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)(2)</sup>	$P_{PPM}$	600	W
Peak pulse power dissipation with a 8/20 $\mu$ s waveform		4000	
Peak pulse current with a 10/1000 $\mu$ s waveform (1)(2)	$I_{PPM}$	See next table	A
Peak pulse current with a 8/20 $\mu$ s waveform			
Power dissipation on infinite heatsink, $T_A = 50^\circ\text{C}$	$P_D$	4.0	W
Peak forward surge current 8.3 ms single half sine-wave	$I_{FSM}$	50	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Notes**
<sup>(1)</sup> Non-repetitive current pulse, per fig. 1 and derated above  $T_A = 25^\circ\text{C}$  per fig. 2.

<sup>(2)</sup> Mounted on PCB with 5.0 mm x 5.0 mm copper pads to each terminal

INDEX OF SYMBOLS	
SYMBOL	PARAMETER
$V_{WM}$	Stand-off voltage
$V_{BR}$	Breakdown voltage
$V_C$	Clamping voltage
$I_D$	Leakage current at $V_{WM}$
$I_{PP}$	Peak pulse current
$\alpha T$	Voltage temperature coefficient
$V_F$	Forward voltage drop
$R_D$	Dynamic resistance



ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)															
DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ (1)			MAXIMUM REVERSE LEAKAGE $I_D$ AT $V_{WM}$		STAND-OFF VOLTAGE $V_{WM}$	$V_C$ AT $I_{PP}$			$R_D$ (2)	$V_C$ AT $I_{PP}$		$R_D$ (2)	$\alpha T$ (3)
		MIN.	MAX.		25 °C	85 °C		10/1000 $\mu\text{s}$				8/20 $\mu\text{s}$			
					V	mA	$\mu\text{A}$	V	V	A	$\Omega$	V	A	$\Omega$	
SMA6J5.0A	6AE	6.4	7.07	10	150	375	5.0	9.1	65.9	0.031	13.4	298	0.021	5.7	
SMA6J6.0A	6AG	6.7	7.41	10	600	1500	6.0	9.5	63.2	0.033	13.7	290	0.022	5.9	
SMA6J6.5A	6AK	7.2	7.96	10	100	250	6.5	10.2	58.8	0.038	14.5	276	0.024	6.1	
SMA6J7.5A	6AP	8.33	9.21	1	50	125	7.5	11.8	50.8	0.051	17.0	235	0.033	6.5	
SMA6J8.0A	6AR	8.89	9.83	1	20	50	8.0	12.5	48.0	0.056	18.2	220	0.038	7.0	
SMA6J8.5A	6AT	9.4	10.4	1	20	50	8.5	13.3	45.1	0.064	18.7	205	0.040	7.3	
SMA6J10A	6AX	11.1	12.3	1	1	5	10	15.7	38.2	0.089	19.6	184	0.040	7.8	
SMA6J11A	6AZ	12.2	13.5	1	1	5	11	17.2	34.8	0.107	21.5	172	0.047	8.1	
SMA6J12A	6BE	13.3	14.7	1	0.2	1	12	18.8	31.9	0.128	23.5	157	0.056	8.3	
SMA6J13A	6BG	14.4	15.9	1	0.2	1	13	20.4	29.4	0.153	23.9	147	0.054	8.4	
SMA6J15A	6BM	16.7	18.5	1	0.2	1	15	23.6	25.4	0.201	27.7	123	0.075	8.8	
SMA6J16A	6BP	17.8	19.7	1	0.2	1	16	25.2	23.8	0.229	29.5	119	0.083	8.8	
SMA6J17A	6BR	18.9	20.9	1	0.2	1	17	26.7	22.5	0.259	31.4	111	0.094	9.0	
SMA6J18A	6BT	20.0	22.1	1	0.2	1	18	28.3	21.2	0.292	33.2	102	0.109	9.2	
SMA6J20A	6BV	22.2	24.5	1	0.2	1	20	31.4	19.1	0.361	36.8	93	0.132	9.4	
SMA6J22A	6BX	24.4	26.9	1	0.2	1	22	34.5	17.4	0.437	40.4	89	0.152	9.5	
SMA6J24A	6BZ	26.7	29.5	1	0.2	1	24	37.8	15.9	0.523	44.3	80	0.185	9.6	
SMA6J26A	6CE	28.9	31.9	1	0.2	1	26	40.9	14.7	0.614	47.9	75	0.213	9.7	
SMA6J28A	6CG	31.1	34.4	1	0.2	1	28	44.0	13.6	0.704	51.6	68	0.253	9.8	

**Notes**

- (1) Pulse test:  $t_p \leq 50$  ms
- (2) To calculate maximum clamping voltage at other surge currents, use the following formula:  $V_{CLmax.} = R_D \times I_{PP} + V_{BRmax.}$
- (3) To calculate  $V_{BR}$  vs. junction temperature, use the following formula:  $V_{BR}$  at  $T_J = V_{BR}$  at  $25^\circ\text{C} \times (1 + \alpha T \times (T_J - 25))$
- (4)  $V_F = 3.5$  V at  $I_F = 25$  A, pulse test: 300  $\mu\text{s}$  pulse width



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	$R_{\theta JL}$	25	

**Note**

<sup>(1)</sup> Mounted on minimum recommended pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMA6J5.0A-E3/61	0.064	61	1800	7" diameter plastic tape and reel
SMA6J5.0A-M3/61	0.064	61	1800	7" diameter plastic tape and reel
SMA6J5.0A-E3/5A	0.064	5A	7500	13" diameter plastic tape and reel
SMA6J5.0A-M3/5A	0.064	5A	7500	13" diameter plastic tape and reel

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

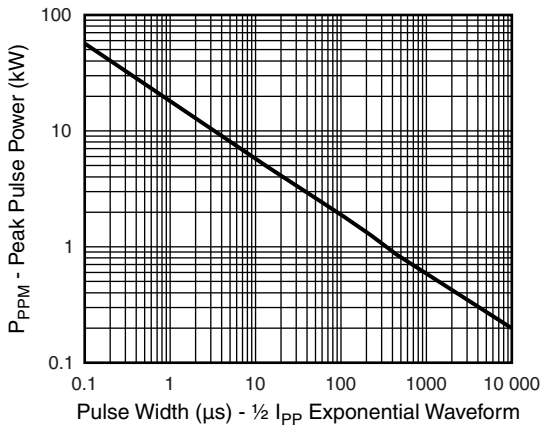


Fig. 1 - Peak Pulse Power Rating Curve

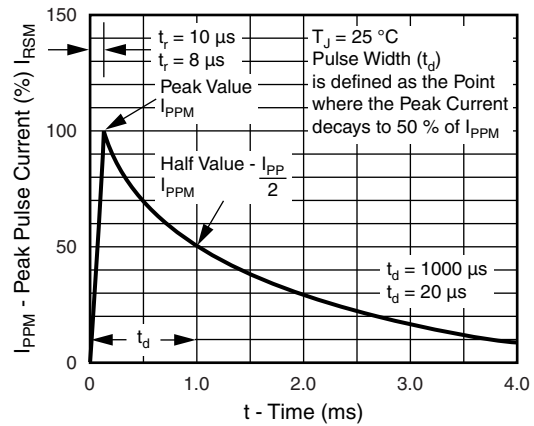


Fig. 3 - Pulse Waveform

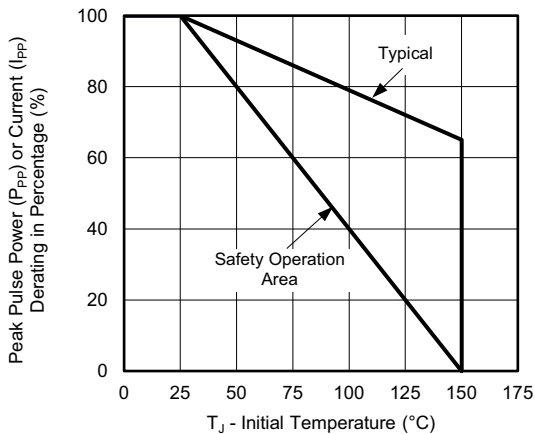


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

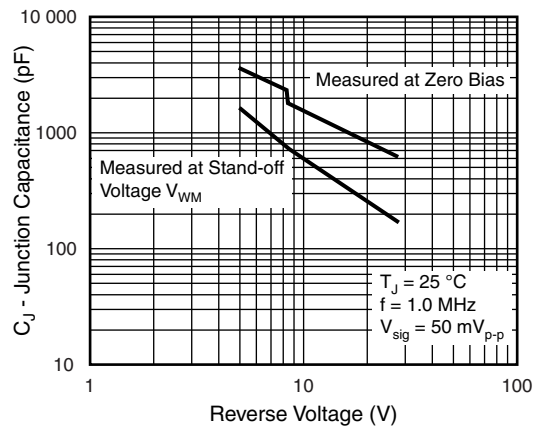


Fig. 4 - Typical Junction Capacitance

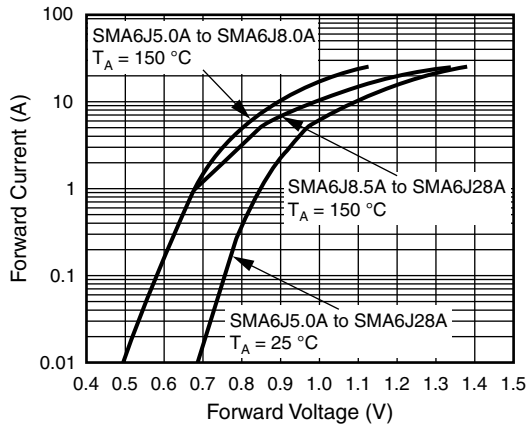


Fig. 5 - Typical Forward Characteristics

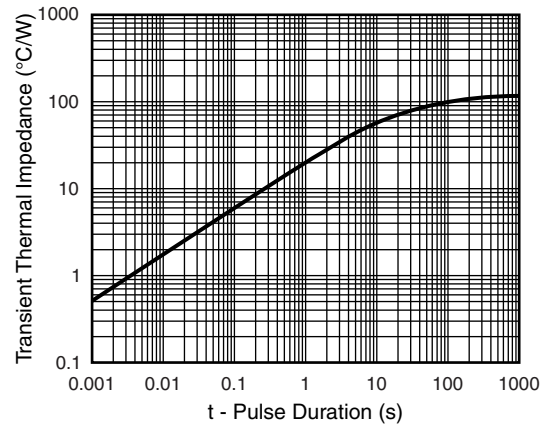
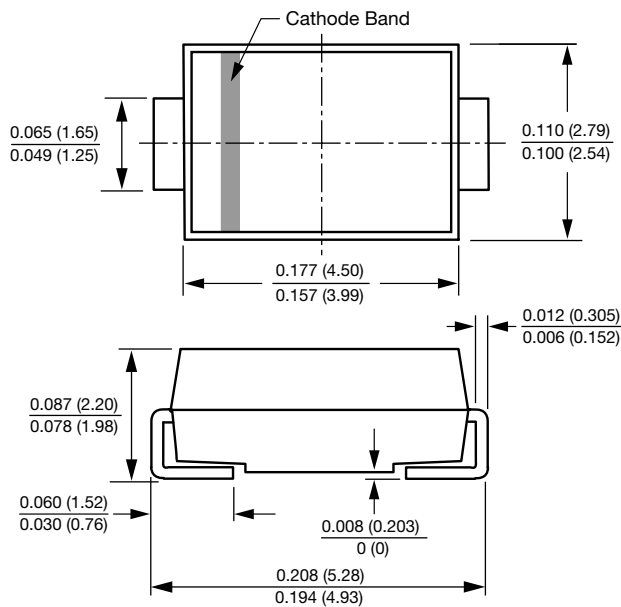


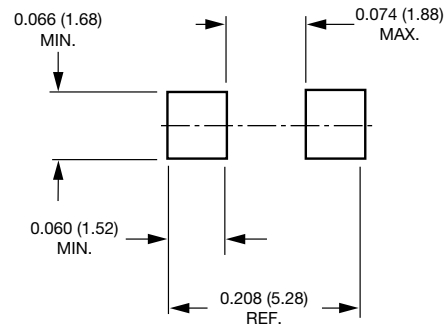
Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMA (DO-214AC)



### Mounting Pad Layout





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