

# Surface Mount TRANSZORB<sup>®</sup> Transient Voltage Suppressors


**DO-214AB (SMC)**

**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**
**FEATURES**

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 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
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

PRIMARY CHARACTERISTICS	
$V_{WM}$	5.0 V to 188 V
$P_{PPM}$	1500 W
$I_{FSM}$ (uni-directional only)	200 A
$T_J$ max.	150 °C

**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:** DO-214AB (SMCJ)

Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade

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

M3 suffix meets JESD 201 class 1A whisker test

**Polarity:** Color band denotes cathode end

**DEVICES FOR BI-DIRECTION APPLICATIONS**

For bi-directional use CA suffix (e.g. SMCJ188CA).

Electrical characteristics apply in both directions.

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform (fig. 1)	$P_{PPM}^{(1)(2)}$	1500	W
Peak pulse current with a 10/1000 $\mu$ s waveform	$I_{PPM}^{(1)}$	See next table	A
Peak forward surge current 8.3 ms single half sine-wave uni-directional only	$I_{FSM}^{(2)}$	200	A
Power dissipation on infinite heatsink, $T_A = 50$ °C	$P_D$	6.5	W
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 150	°C

**Notes**

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

(2) Mounted on 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pads to each terminal



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)									
DEVICE TYPE MODIFIED "J" BEND LEAD	DEVICE MARKING CODE		BREAKDOWN VOLTAGE V <sub>BR</sub> AT I <sub>T</sub> (1) (V)		TEST CURRENT I <sub>T</sub> (mA)	STAND-OFF VOLTAGE V <sub>WM</sub> (V)	MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>D</sub> (μA) (3)	MAXIMUM PEAK PULSE SURGE CURRENT I <sub>PPM</sub> (A) (2)	MAXIMUM CLAMPING VOLTAGE AT I <sub>PPM</sub> V <sub>C</sub> (V)
	UNI	BI	MIN.	MAX.					
(+)SMCJ5.0A (5)	GDE	GDE	6.40	7.07	10	5.0	800	163.0	9.2
(+)SMCJ6.0A	GDG	GDG	6.67	7.37	10	6.0	800	145.6	10.3
(+)SMCJ6.5A	GDK	BDK	7.22	7.98	10	6.5	500	133.9	11.2
(+)SMCJ7.0A	GDM	GDM	7.78	8.60	10	7.0	200	125.0	12.0
(+)SMCJ7.5A	GDP	BDP	8.33	9.21	1.0	7.5	100	116.3	12.9
(+)SMCJ8.0A	GDR	BDR	8.89	9.83	1.0	8.0	50	110.3	13.6
(+)SMCJ8.5A	GDT	BDT	9.44	10.4	1.0	8.5	20	104.2	14.4
(+)SMCJ9.0A	GDV	BDV	10.0	11.1	1.0	9.0	10	97.4	15.4
(+)SMCJ10A	GDX	BDX	11.1	12.3	1.0	10	5.0	88.2	17.0
(+)SMCJ11A	GDZ	GDZ	12.2	13.5	1.0	11	5.0	82.4	18.2
(+)SMCJ12A	GEE	BEE	13.3	14.7	1.0	12	5.0	75.4	19.9
(+)SMCJ13A	GEG	GEG	14.4	15.9	1.0	13	1.0	69.8	21.5
(+)SMCJ14A	GEK	BEK	15.6	17.2	1.0	14	1.0	64.7	23.2
(+)SMCJ15A	GEM	BEM	16.7	18.5	1.0	15	1.0	61.5	24.4
(+)SMCJ16A	GEP	GEM	17.8	19.7	1.0	16	1.0	57.7	26.0
(+)SMCJ17A	GER	GER	18.9	20.9	1.0	17	1.0	54.3	27.6
(+)SMCJ18A	GET	BET	20.0	22.1	1.0	18	1.0	51.4	29.2
(+)SMCJ20A	GEV	BEV	22.2	24.5	1.0	20	1.0	46.3	32.4
(+)SMCJ22A	GEX	BEX	24.4	26.9	1.0	22	1.0	42.3	35.5
(+)SMCJ24A	GEZ	BEZ	26.7	29.5	1.0	24	1.0	38.6	38.9
(+)SMCJ26A	GFE	BFE	28.9	31.9	1.0	26	1.0	35.6	42.1
(+)SMCJ28A	GFG	GFG	31.1	34.4	1.0	28	1.0	33.0	45.4
(+)SMCJ30A	GFK	BFK	33.3	36.8	1.0	30	1.0	31.0	48.4
(+)SMCJ33A	GFM	BFM	36.7	40.6	1.0	33	1.0	28.1	53.3
(+)SMCJ36A	GFP	BFP	40.0	44.2	1.0	36	1.0	25.8	58.1
(+)SMCJ40A	GFR	BFR	44.4	49.1	1.0	40	1.0	23.3	64.5
(+)SMCJ43A	GFT	BFT	47.8	52.8	1.0	43	1.0	21.6	69.4
(+)SMCJ45A	GFV	BFV	50.0	55.3	1.0	45	1.0	20.6	72.7
(+)SMCJ48A	GFX	GFX	53.3	58.9	1.0	48	1.0	19.4	77.4
(+)SMCJ51A	GFZ	GFZ	56.7	62.7	1.0	51	1.0	18.2	82.4
(+)SMCJ54A	GGE	GGE	60.0	66.3	1.0	54	1.0	17.2	87.1
(+)SMCJ58A	GGG	GGG	64.4	71.2	1.0	58	1.0	16.0	93.6
(+)SMCJ60A	GGK	GGK	66.7	73.7	1.0	60	1.0	15.5	96.8
(+)SMCJ64A	GGM	GGM	71.1	78.6	1.0	64	1.0	14.6	103
(+)SMCJ70A	GGP	GGP	77.8	86.0	1.0	70	1.0	13.3	113
(+)SMCJ75A	GGR	GGR	83.3	92.1	1.0	75	1.0	12.4	121
(+)SMCJ78A	GGT	GGT	86.7	95.8	1.0	78	1.0	11.9	126
(+)SMCJ85A	GGV	GGV	94.4	104	1.0	85	1.0	10.9	137
(+)SMCJ90A	GGX	GGX	100	111	1.0	90	1.0	10.3	146
(+)SMCJ100A	GGZ	GGZ	111	123	1.0	100	1.0	9.3	162
(+)SMCJ110A	GHE	GHE	122	135	1.0	110	1.0	8.5	177
(+)SMCJ120A	GHG	GHG	133	147	1.0	120	1.0	7.8	193
(+)SMCJ130A	GHK	GHK	144	159	1.0	130	1.0	7.2	209
(+)SMCJ150A	GHM	GHM	167	185	1.0	150	1.0	6.2	243
(+)SMCJ160A	GHP	GHP	178	197	1.0	160	1.0	5.8	259
(+)SMCJ170A	GHR	GHR	189	209	1.0	170	1.0	5.5	275

**Notes**

- (1) Pulse test: t<sub>p</sub> ≤ 50 ms
  - (2) Surge current waveform per fig. 3 and derate per fig. 2
  - (3) For bi-directional types having V<sub>WM</sub> of 10 V and less, the I<sub>D</sub> limit is doubled
  - (4) All terms and symbols are consistent with ANSI/IEEE C62.35
  - (5) For the bi-directional SMCJ5.0CA, the maximum V<sub>BR</sub> is 7.25 V
  - (6) V<sub>F</sub> = 3.5 V at I<sub>F</sub> = 25 A (uni-directional only)
- (+) Underwriters laboratory recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to ambient	$R_{\theta JA}^{(1)}$	75	$^\circ\text{C/W}$
Typical thermal resistance, junction to lead	$R_{\theta JL}$	15	$^\circ\text{C/W}$

**Note**

(1) Mounted on minimum recommended pad layout

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMCJ5.0A-M3/57T	0.211	57T	850	7" diameter plastic tape and reel
SMCJ5.0A-M3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel

**RATINGS AND CHARACTERISTICS CURVES**

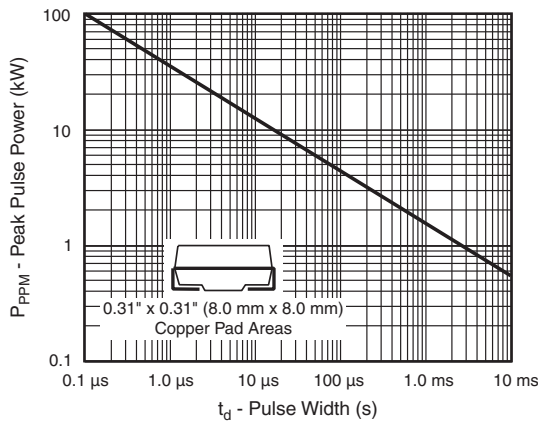
 ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Peak Pulse Power Rating Curve

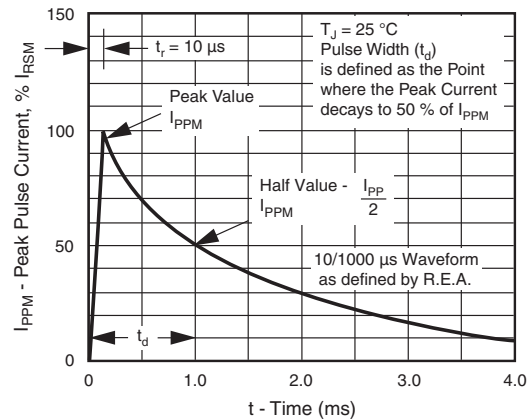


Fig. 3 - Pulse Waveform

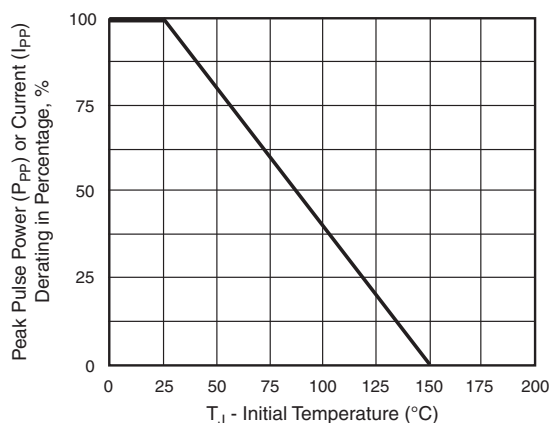


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

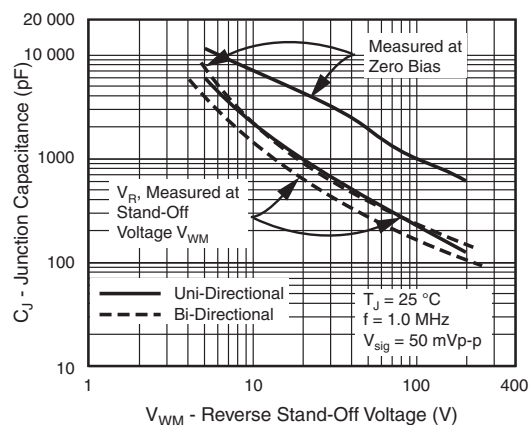


Fig. 4 - Typical Junction Capacitance

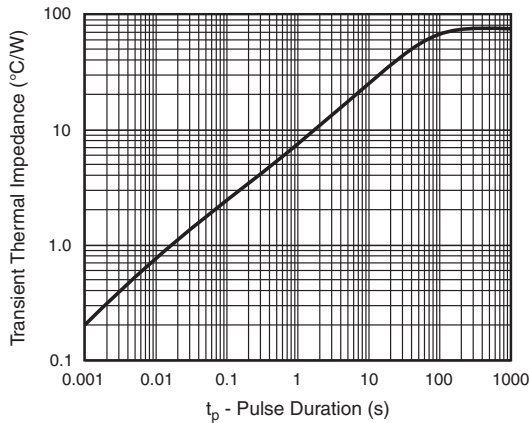


Fig. 5 - Typical Transient Thermal Impedance

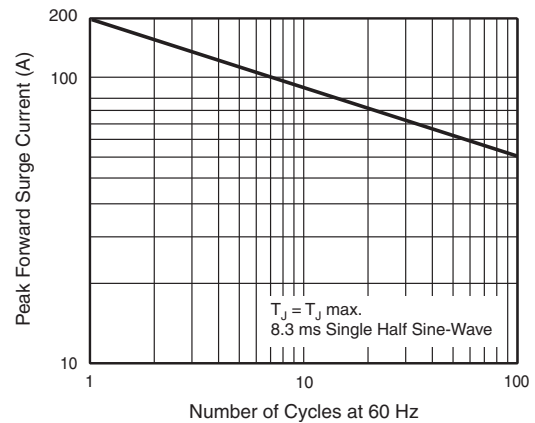
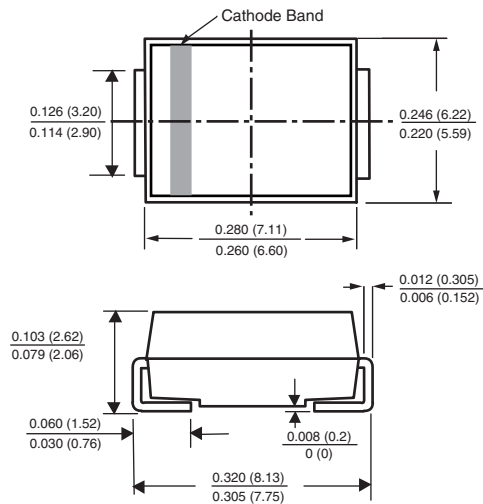


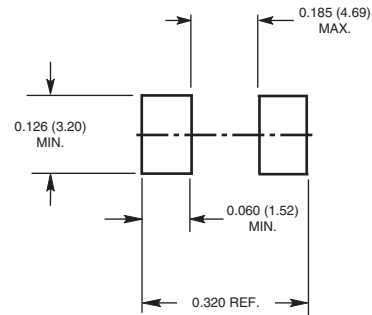
Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-214AB (SMC J-Bend)



### Mounting Pad Layout





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