

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


**SMC (DO-214AB)**

PRIMARY CHARACTERISTICS	
$V_{BR}$	11.1 V to 104 V
$V_{WM}$	10 V to 85 V
$P_{PPM}$	5000 W
$T_J$ max.	150 °C
Polarity	Uni-directional
Package	SMC (DO-214AB)

## 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.

## FEATURES

- Available in uni-directional polarity only
- 5000 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- 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
  - Automotive ordering code: base P/NHM3 for SMC5K10A to SMC5K20A
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

## MECHANICAL DATA

**Case:** SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating

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

Base P/NHM3\_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("\_X" denotes revision code e.g. A, B, ... and only available for SMC5K10A to 20A types)

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

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

### Note

- SMC5K22A to SMC5K85A for industrial grade only

**Polarity:** color band denotes cathode end

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)	$P_{PPM}^{(1)}$	5000	W
Peak pulse current with a 10/1000 $\mu$ s waveform (fig 3.)	$I_{PPM}^{(1)}$	See next table	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150	°C

### Note

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



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)								
DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V <sub>BR</sub> <sup>(1)</sup> (V) AT I <sub>T</sub>		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)	MAX. PEAK PULSE SURGE CURRENT I <sub>PPM</sub> <sup>(2)</sup> (A)	MAXIMUM CLAMPING VOLTAGE AT I <sub>PPM</sub> V <sub>C</sub> (V)
		MIN.	MAX.					
SMC5K10A	5GDY	11.1	12.3	1.0	10	10.0	294	17.0
SMC5K12A	5GEE	13.3	14.7	1.0	12	5.0	251	19.9
SMC5K13A	5GEG	14.4	15.9	1.0	13	2.0	233	21.5
SMC5K14A	5GEK	15.6	17.2	1.0	14	2.0	216	23.2
SMC5K15A	5GEM	16.7	18.5	1.0	15	2.0	205	24.4
SMC5K16A	5GEP	17.8	19.7	1.0	16	2.0	192	26.0
SMC5K17A	5GER	18.9	20.9	1.0	17	2.0	181	27.6
SMC5K18A	5GET	20.0	22.1	1.0	18	2.0	171	29.2
SMC5K20A	5GEV	22.2	24.5	1.0	20	2.0	154	32.4
SMC5K22A	5GEX	24.4	26.9	1.0	22	1.0	141	35.5
SMC5K24A	5GEZ	26.7	29.5	1.0	24	1.0	129	38.9
SMC5K26A	5GFE	28.9	31.9	1.0	26	1.0	119	42.1
SMC5K28A	5GFG	31.1	34.4	1.0	28	1.0	110	45.4
SMC5K30A	5GFK	33.3	36.8	1.0	30	1.0	103	48.4
SMC5K33A	5GFM	36.7	40.6	1.0	33	1.0	93.8	53.3
SMC5K36A	5GFP	40.0	44.2	1.0	36	1.0	86.1	58.1
SMC5K40A	5GFR	44.4	49.1	1.0	40	1.0	77.5	64.5
SMC5K43A	5GFT	47.8	52.8	1.0	43	1.0	72.0	69.4
SMC5K45A	5GFV	50.0	55.3	1.0	45	1.0	68.8	72.7
SMC5K48A	5GFX	53.3	58.9	1.0	48	1.0	64.6	77.4
SMC5K51A	5GFZ	56.7	62.7	1.0	51	1.0	60.7	82.4
SMC5K54A	5GGE	60.0	66.3	1.0	54	1.0	57.4	87.1
SMC5K58A	5GGG	64.4	71.2	1.0	58	1.0	53.4	93.6
SMC5K60A	5GGK	66.7	73.7	1.0	60	1.0	51.7	96.8
SMC5K64A	5GGM	71.1	78.6	1.0	64	1.0	48.5	103
SMC5K70A	5GGP	77.8	86.0	1.0	70	1.0	44.2	113
SMC5K75A	5GGR	83.3	92.1	1.0	75	1.0	41.3	121
SMC5K78A	5GGT	86.7	95.8	1.0	78	1.0	39.7	126
SMC5K85A	5GGV	94.4	104	1.0	85	1.0	36.5	137

**Notes**

- (1) Pulse test: t<sub>p</sub> ≤ 50 ms
- (2) Surge current waveform per fig. 3 and derated per fig.2
- (3) All terms and symbols are consistent with ANSI/IEEE C62.35

IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS (T <sub>A</sub> = 25 °C unless otherwise noted)					
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
IEC 61000-4-2	Human body model (contact mode)	C = 150 pF, R = 330 Ω	ESD	4	> 8 kV
	Human body model (air discharge mode)				> 15 kV

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMC5K10A-M3/H <sup>(1)</sup>	0.257	H	850	7" diameter plastic tape and reel
SMC5K10A-M3/I <sup>(1)</sup>	0.257	I	3500	13" diameter plastic tape and reel
SMC5K10AHM3_A/H <sup>(2)</sup>	0.257	H	850	7" diameter plastic tape and reel
SMC5K10AHM3_A/I <sup>(2)</sup>	0.257	I	3500	13" diameter plastic tape and reel

**Notes**

- (1) Available for SMC5K10A to SMC5K85A
- (2) AEC-Q101 qualified, available for SMC5K10A to SMC5K20A only

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

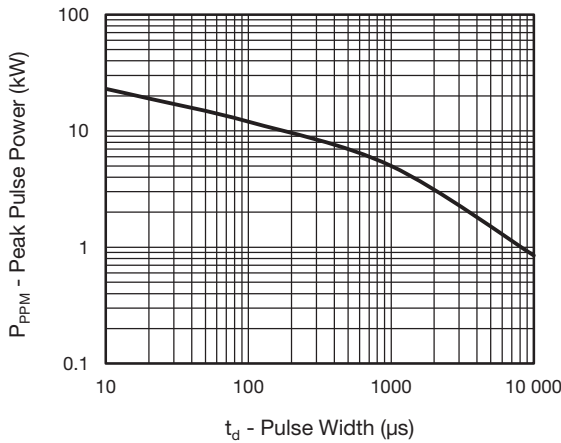


Fig. 1 - Peak Pulse Power Derating Curve

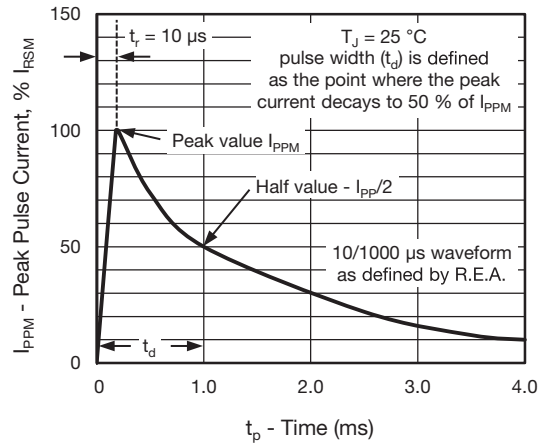


Fig. 3 - Pulse Waveform

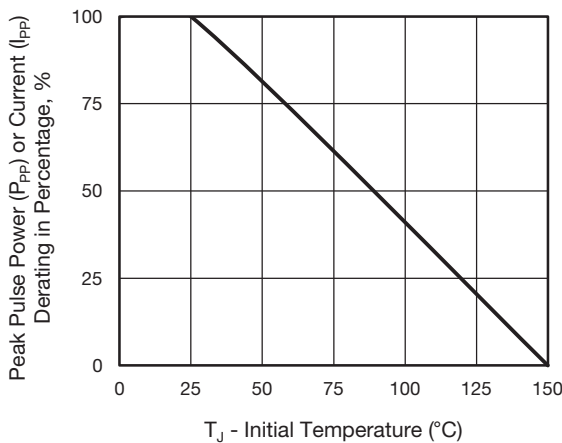


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

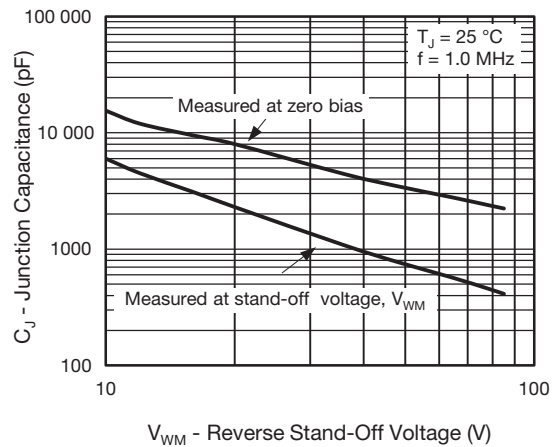


Fig. 4 - Typical Junction Capacitance

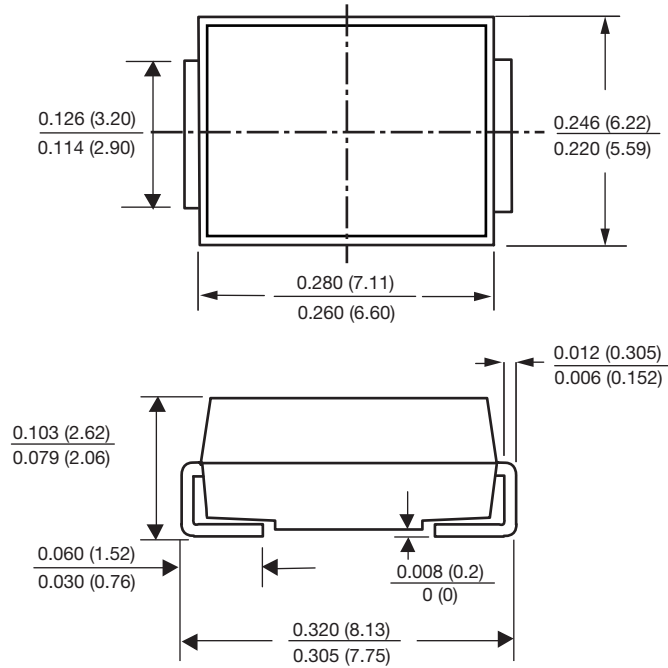
### Notes

- Fig.1 - Power calculations is based on  $I_{PPM}$  times defined maximum clamping voltage by pulse width
- Fig.1 - 10 000  $\mu\text{s}$   $P_{PPM}$  is actual test for  $V_{WM} \leq 60\text{ V}$  types, over 60 V types 10 000  $\mu\text{s}$   $P_{PPM}$  is curve extensional value

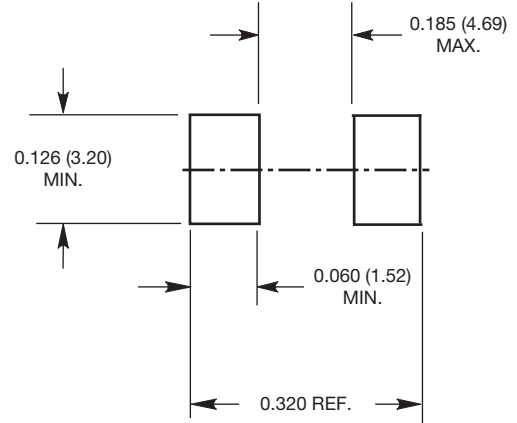


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMC (DO-214AB)



### Mounting Pad Layout





## Disclaimer

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