Surface Mount TRANSZORB® Transient Voltage Suppressors



SMC (DO-214AB)



LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
V_{BR}	11.1 V to 104 V
V_{WM}	10 V to 85 V
P_{PPM}	5000 W
T_J max.	175 °C
Polarity	Bidirectional
Package	SMC (DO-214AB)

FEATURES

- Bidirectional
- Peak pulse power:
  - 5000 W (10/1000 µs)
  - 40 kW (8/20 µs)
- 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

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, and industrial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 suffix meets JESD 201 class 2 whisker test

Polarity: no cathode band for bidirectional types

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.

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse power dissipation with a 10/1000 µs waveform (Fig.1)	P_{PPM} (1)	5000	W
Peak pulse current with a 10/1000 µs waveform (Fig.3)	I_{PPM} (1)	See next table	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	°C

Note

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

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V_{BR} (1) (V) AT I_T		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (µA)	MAXIMUM CLAMPING VOLTAGE V_C (V) AT I_{PPM}		MAXIMUM CLAMPING VOLTAGE V_C (V) AT I_{PPM}	
							10/1000 µs		8/20 µs	
		MIN.	MAX.				(V)	(A)	(V)	(A)
SMC5K10CA	5GDX	11.1	12.3	1.0	10	10.0	17.0	294	24.1	1660
SMC5K12CA	5GEE	13.3	14.7	1.0	12	5.0	19.9	251	25.3	1581
SMC5K13CA	5GEG	14.4	15.9	1.0	13	2.0	21.5	233	27.2	1471
SMC5K14CA	5GEK	15.6	17.2	1.0	14	2.0	23.2	216	30.0	1333
SMC5K15CA	5GEM	16.7	18.5	1.0	15	2.0	24.4	205	32.5	1231
SMC5K16CA	5GEP	17.8	19.7	1.0	16	2.0	26.0	192	34.4	1163
SMC5K17CA	5GER	18.9	20.9	1.0	17	2.0	27.6	181	37.0	1081
SMC5K18CA	5GET	20.0	22.1	1.0	18	2.0	29.2	171	39.3	1018
SMC5K20CA	5GEV	22.2	24.5	1.0	20	2.0	32.4	154	42.8	935
SMC5K22CA	5GEX	24.4	26.9	1.0	22	1.0	35.5	141	48.2	830
SMC5K24CA	5GEZ	26.7	29.5	1.0	24	1.0	38.9	129	51.6	775
SMC5K26CA	5GFE	28.9	31.9	1.0	26	1.0	42.1	119	55.8	717
SMC5K28CA	5GFG	31.1	34.4	1.0	28	1.0	45.4	110	60.2	664
SMC5K30CA	5GFK	33.3	36.8	1.0	30	1.0	48.4	103	64.0	625
SMC5K33CA	5GFM	36.7	40.6	1.0	33	1.0	53.3	93.8	69.8	573
SMC5K36CA	5GFP	40.0	44.2	1.0	36	1.0	58.1	86.1	76.0	526
SMC5K40CA	5GFR	44.4	49.1	1.0	40	1.0	64.5	77.5	84.0	476
SMC5K43CA	5GFT	47.8	52.8	1.0	43	1.0	69.4	72.0	90.3	443
SMC5K45CA	5GFV	50.0	55.3	1.0	45	1.0	72.7	68.8	94.6	423
SMC5K48CA	5GFX	53.3	58.9	1.0	48	1.0	77.4	64.6	100	400
SMC5K51CA	5GFZ	56.7	62.7	1.0	51	1.0	82.4	60.7	107	374
SMC5K54CA	5GGE	60.0	66.3	1.0	54	1.0	87.1	57.4	113	354
SMC5K58CA	5GGG	64.4	71.2	1.0	58	1.0	93.6	53.4	121	331
SMC5K60CA	5GGK	66.7	73.7	1.0	60	1.0	96.8	51.7	125	320
SMC5K64CA	5GGM	71.1	78.6	1.0	64	1.0	103	48.5	134	299
SMC5K70CA	5GGP	77.8	86.0	1.0	70	1.0	113	44.2	146	274
SMC5K75CA	5GGR	83.3	92.1	1.0	75	1.0	121	41.3	157	255
SMC5K78CA	5GGT	86.7	95.8	1.0	78	1.0	126	39.7	163	245
SMC5K85CA	5GGV	94.4	104	1.0	85	1.0	137	36.5	177	226

Notes

(1) Pulse test: $t_p \leq 50$ ms

(2) All terms and symbols are consistent with ANSI/IEEE C62.35

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	TYP.	UNIT
Thermal resistance	R_{thJA} (1)	90	°C/W
	R_{thJM} (2)	4.0	°C/W

Notes

(1) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz. standard footprint

(2) Thermal resistance junction-to-mount to follow JEDEC® 51-14 using Transient Dual Interface Test Method (TDIM)

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IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C unless otherwise noted)				
STANDARD	**TEST TYPE**	**TEST CONDITIONS**	**SYMBOL**	**VALUE**
IEC 61000-4-2	Human body model (contact mode)	C = 150 pF, R = 330 Ω	ESD	30 kV
	Human body model (air discharge mode)			30 kV

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SMC5K10CA-M3/H	0.257	H	850	7" diameter plastic tape and reel
SMC5K10CA-M3/I	0.257	I	3500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

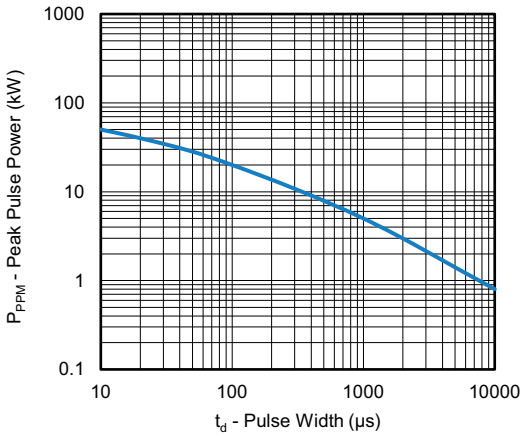


Fig. 1 - Peak Pulse Power Derating Curve

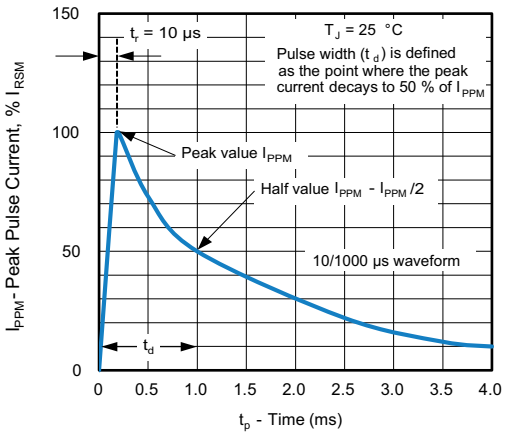


Fig. 3 - Pulse Waveform

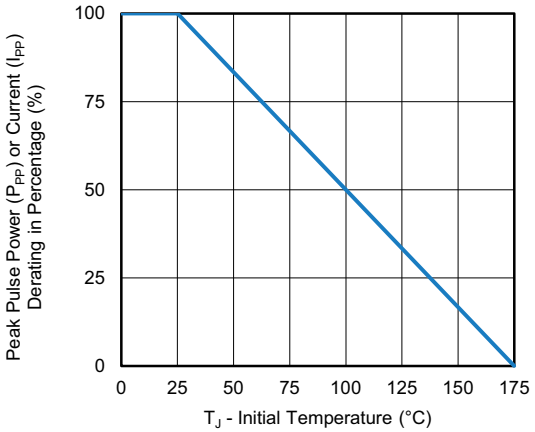


Fig. 2 - Peak Pulse Power or Current vs. Initial Temperature

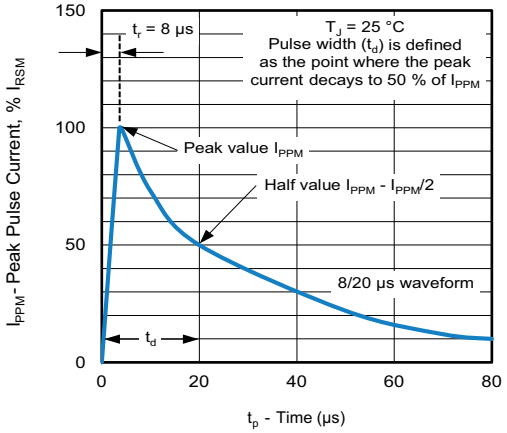


Fig. 4 - Pulse Waveform

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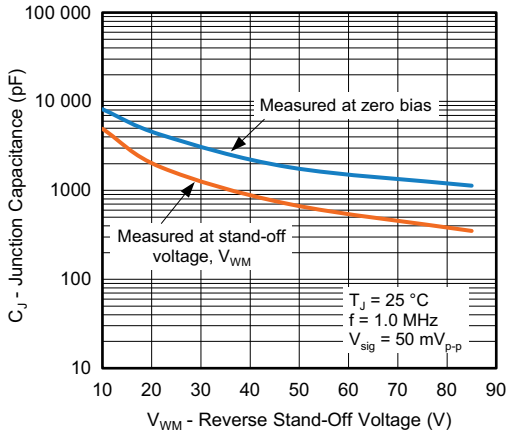


Fig. 5 - Typical Junction Capacitance

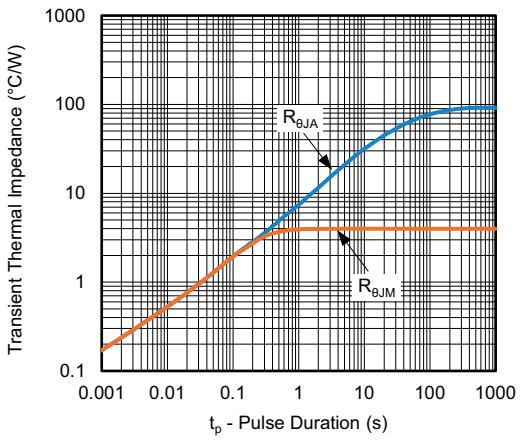


Fig. 6 - Typical Transient Thermal Impedance

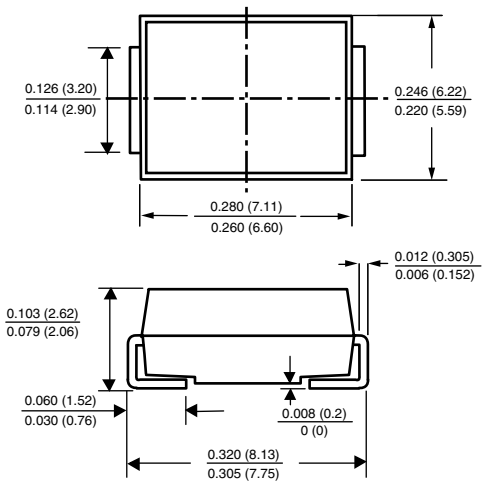
Notes

(1) Fig. 1- Power calculation is based on I_{PPM} times defined maximum clamping voltage by pulse width

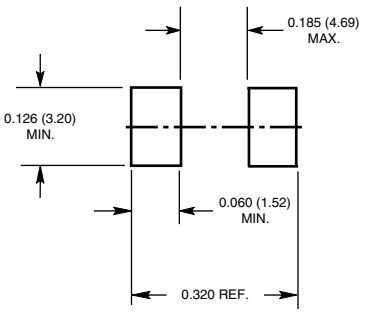
(2) Fig. 1 - 10 000 µs P_{PPM} is actual test for $V_{WM} \leq 60$ V types, over 60 V types 10 000 P_{PPM} is curve extensional value

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

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Mounting Pad Layout



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