Surface Mount TRANSZORB® Transient Voltage Suppressors



SMC (DO-214AB)

Cathode ○—|◀|—○ Anode

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.	150 °C
Polarity	Unidirectional
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

RoHS COMPLIANT HALOGEN FREE

- Unidirectional
- 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
- AEC-Q101 qualified
- Automotive ordering code: base P/NHM3 for SMC5K10A to SMC5K20A
- UL recognition for safety 497B with file number E136766
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

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 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 +150	°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} AT I_T (1) (V)		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 AT I_{PPM} 10/1000 µs		MAXIMUM CLAMPING VOLTAGE V_C AT I_{PPM} 8/20 µs	
		MIN.	MAX.				(V)	(A)	(V)	(A)
SMC5K10A	5GDX	11.1	12.3	1.0	10	10.0	17.0	294	24.1	1660
SMC5K12A	5GEE	13.3	14.7	1.0	12	5.0	19.9	251	25.3	1581
SMC5K13A	5GEG	14.4	15.9	1.0	13	2.0	21.5	233	27.2	1471
SMC5K14A	5GEK	15.6	17.2	1.0	14	2.0	23.2	216	30.0	1333
SMC5K15A	5GEM	16.7	18.5	1.0	15	2.0	24.4	205	32.5	1231
SMC5K16A	5GEP	17.8	19.7	1.0	16	2.0	26.0	192	34.4	1163
SMC5K17A	5GER	18.9	20.9	1.0	17	2.0	27.6	181	37.0	1081
SMC5K18A	5GET	20.0	22.1	1.0	18	2.0	29.2	171	39.3	1018
SMC5K20A	5GEV	22.2	24.5	1.0	20	2.0	32.4	154	42.8	935
SMC5K22A	5GEX	24.4	26.9	1.0	22	1.0	35.5	141	48.2	830
SMC5K24A	5GEZ	26.7	29.5	1.0	24	1.0	38.9	129	51.6	775
SMC5K26A	5GFE	28.9	31.9	1.0	26	1.0	42.1	119	55.8	717
SMC5K28A	5GFG	31.1	34.4	1.0	28	1.0	45.4	110	60.2	664
SMC5K30A	5GFK	33.3	36.8	1.0	30	1.0	48.4	103	64.0	625
SMC5K33A	5GFM	36.7	40.6	1.0	33	1.0	53.3	93.8	69.8	573
SMC5K36A	5GFP	40.0	44.2	1.0	36	1.0	58.1	86.1	76.0	526
SMC5K40A	5GFR	44.4	49.1	1.0	40	1.0	64.5	77.5	84.0	476
SMC5K43A	5GFT	47.8	52.8	1.0	43	1.0	69.4	72.0	90.3	443
SMC5K45A	5GFV	50.0	55.3	1.0	45	1.0	72.7	68.8	94.6	423
SMC5K48A	5GFX	53.3	58.9	1.0	48	1.0	77.4	64.6	100	400
SMC5K51A	5GFZ	56.7	62.7	1.0	51	1.0	82.4	60.7	107	374
SMC5K54A	5GGE	60.0	66.3	1.0	54	1.0	87.1	57.4	113	354
SMC5K58A	5GGG	64.4	71.2	1.0	58	1.0	93.6	53.4	121	331
SMC5K60A	5GGK	66.7	73.7	1.0	60	1.0	96.8	51.7	125	320
SMC5K64A	5GGM	71.1	78.6	1.0	64	1.0	103	48.5	134	299
SMC5K70A	5GGP	77.8	86.0	1.0	70	1.0	113	44.2	146	274
SMC5K75A	5GGR	83.3	92.1	1.0	75	1.0	121	41.3	157	255
SMC5K78A	5GGT	86.7	95.8	1.0	78	1.0	126	39.7	163	245
SMC5K85A	5GGV	94.4	104	1.0	85	1.0	137	36.5	177	226

Notes

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

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)

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

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

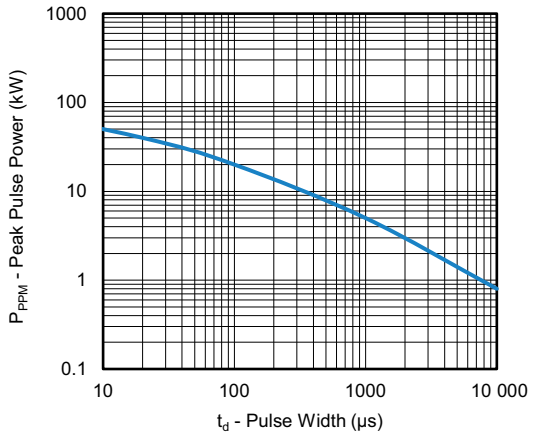


Fig. 1 - Peak Pulse Power Derating Curve

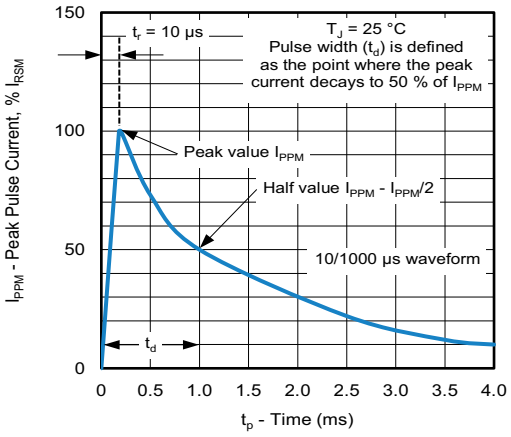


Fig. 3 - Pulse Waveform

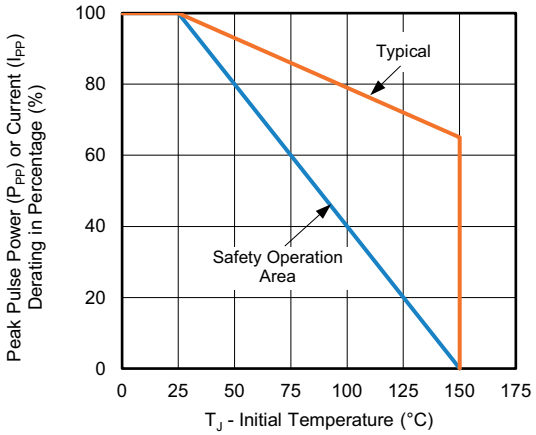


Fig. 2 - Peak Pulse Power or Current vs. Initial Junction Temperature

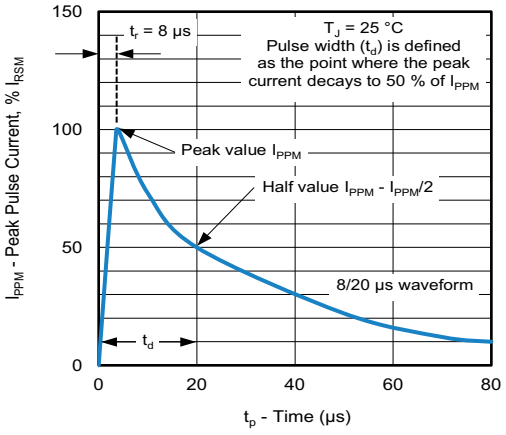


Fig. 4 - Pulse Waveform

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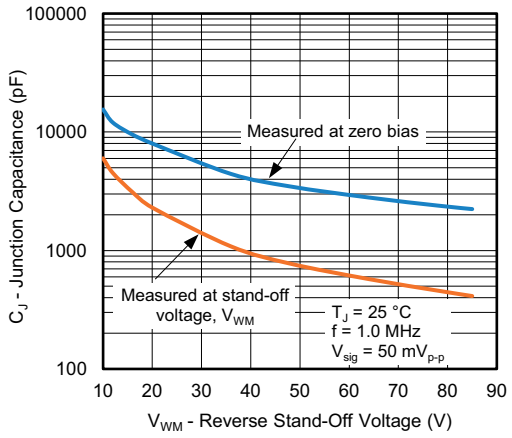


Fig. 5 - Typical Junction Capacitance

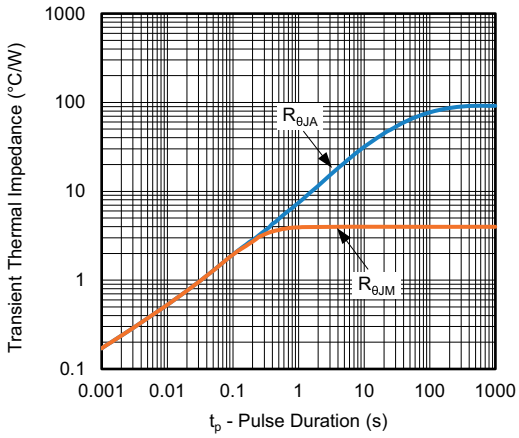


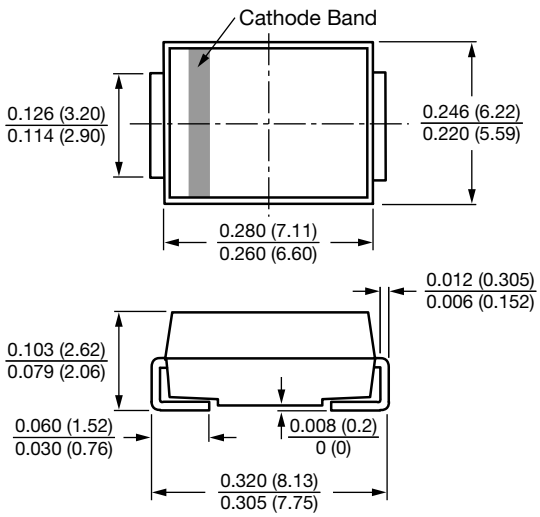
Fig. 6 - Typical Transient thermal Impedance

Notes

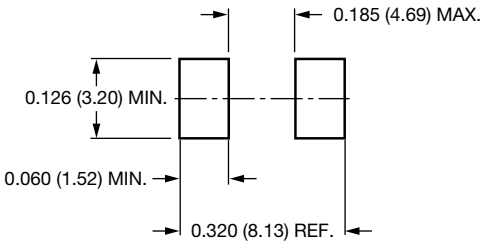
- Fig.1 - Power calculations is based on I_{PPM} times defined maximum clamping voltage by pulse width
- Fig.1 - 10 000 µs P_{PPM} is actual test for $V_{WM} \leq 60$ V types, over 60 V types 10 000 µs P_{PPM} is curve extensional value

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMC (DO-214AB)



Mounting Pad Layout



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