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3.0C10CA-M3 thru 3.0C120CA-M3

Vishay General Semiconductor

Surface Mount TRANSZORB® Transient Voltage Suppressors



SMC (DO-214AB)



LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
V_{BR}	11.1 V to 147 V
V_{WM}	10 V to 120 V
P_{PPM}	3000 W
T_J max.	175 °C
Polarity	Bidirectional
Package	SMC (DO-214AB)

FEATURES

- Bidirectional
- Peak pulse power
  - 3000 W (10/1000 µs)
  - 30 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 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: 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 marking on bidirectional types

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)	3000	W
Peak pulse current with a 10/1000 µs waveform	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 and derated above T_A = 25 °C

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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)
3.0C10CA-M3	BDX3	11.1	12.3	1.0	10	10.0	17.0	176	24.1	1245
3.0C12CA-M3	BEE3	13.3	14.7	1.0	12	5.0	19.9	151	25.3	1186
3.0C13CA-M3	GEG3	14.4	15.9	1.0	13	2.0	21.5	140	27.2	1103
3.0C14CA-M3	BEK3	15.6	17.2	1.0	14	2.0	23.2	129	30.0	1000
3.0C15CA-M3	BEM3	16.7	18.5	1.0	15	2.0	24.4	123	32.5	923
3.0C16CA-M3	GEP3	17.8	19.7	1.0	16	2.0	26.0	115	34.4	872
3.0C17CA-M3	GER3	18.9	20.9	1.0	17	2.0	27.6	109	37.0	811
3.0C18CA-M3	BET3	20.0	22.1	1.0	18	2.0	29.2	103	39.3	763
3.0C20CA-M3	EEV3	22.2	24.5	1.0	20	2.0	32.4	92.6	42.8	701
3.0C22CA-M3	BEX3	24.4	26.9	1.0	22	1.0	35.5	84.5	48.2	622
3.0C24CA-M3	BEZ3	26.7	29.5	1.0	24	1.0	38.9	77.1	51.6	581
3.0C26CA-M3	BFE3	28.9	31.9	1.0	26	1.0	42.1	71.3	55.8	538
3.0C28CA-M3	BFG3	31.1	34.4	1.0	28	1.0	45.4	66.1	60.2	498
3.0C30CA-M3	BFK3	33.3	36.8	1.0	30	1.0	48.4	62.0	64.0	469
3.0C33CA-M3	BFM3	36.7	40.6	1.0	33	1.0	53.3	56.3	69.8	430
3.0C36CA-M3	BFP3	40.0	44.2	1.0	36	1.0	58.1	51.6	76.0	395
3.0C40CA-M3	BFR3	44.4	49.1	1.0	40	1.0	64.5	46.5	84.0	357
3.0C43CA-M3	BFT3	47.8	52.8	1.0	43	1.0	69.4	43.2	90.3	332
3.0C45CA-M3	GFV3	50.0	55.3	1.0	45	1.0	72.7	41.3	94.6	317
3.0C48CA-M3	GFX3	53.3	58.9	1.0	48	1.0	77.4	38.8	100	300
3.0C51CA-M3	GFZ3	56.7	62.7	1.0	51	1.0	82.4	36.4	107	280
3.0C54CA-M3	GGE3	60.0	66.3	1.0	54	1.0	87.1	34.4	113	265
3.0C58CA-M3	GGG3	64.4	71.2	1.0	58	1.0	93.6	32.1	121	248
3.0C60CA-M3	GGK3	66.7	73.7	1.0	60	1.0	96.8	31.0	125	240
3.0C64CA-M3	GGM3	71.1	78.6	1.0	64	1.0	103	29.1	134	224
3.0C70CA-M3	GGP3	77.8	86.0	1.0	70	1.0	113	26.5	146	205
3.0C75CA-M3	GGR3	83.3	92.1	1.0	75	1.0	121	24.8	157	191
3.0C78CA-M3	GGT3	86.7	95.8	1.0	78	1.0	126	23.8	163	184
3.0C85CA-M3	GGV3	94.4	104	1.0	85	1.0	137	21.9	177	169
3.0C90CA-M3	GGX3	100	111	1.0	90	1.0	146	20.5	189	159
3.0C100CA-M3	GGZ3	111	123	1.0	100	1.0	162	18.5	209	144
3.0C110CA-M3	GHE3	122	135	1.0	110	1.0	177	16.9	230	130
3.0C120CA-M3	GHG3	133	147	1.0	120	1.0	193	15.5	250	120

Notes

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

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

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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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)

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
3.0C10CA-M3/H	0.257	H	850	7" diameter plastic tape and reel
3.0C10CA-M3/I	0.257	I	3500	13" diameter plastic tape and reel

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

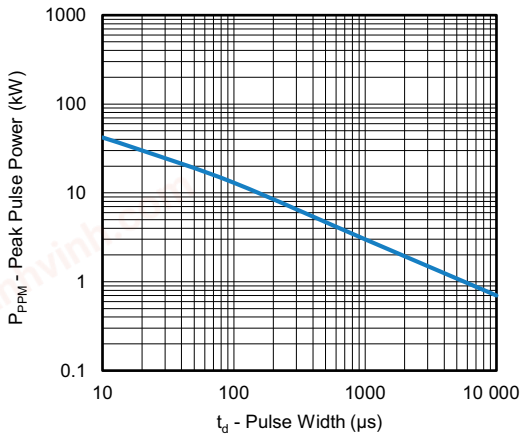


Fig. 1 - Peak Pulse Power Derating Curve

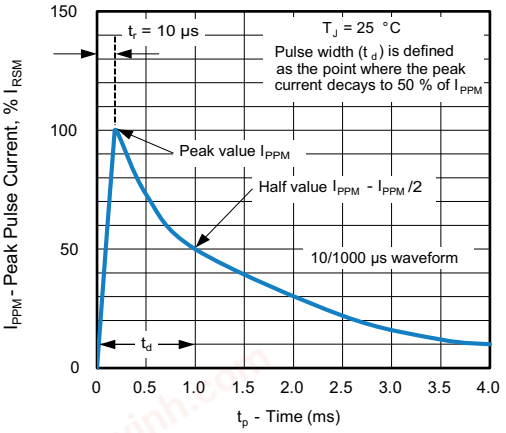


Fig. 3 - 10/1000 µs Pulse Waveform

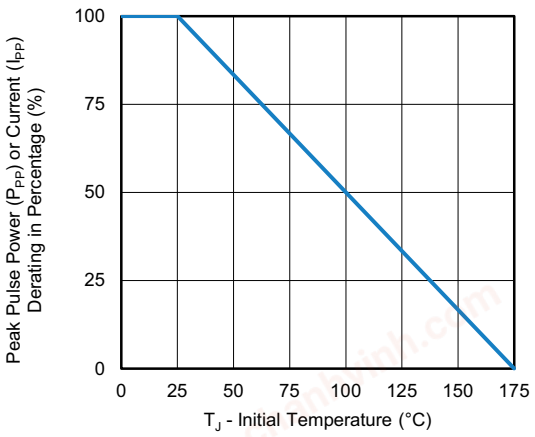


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

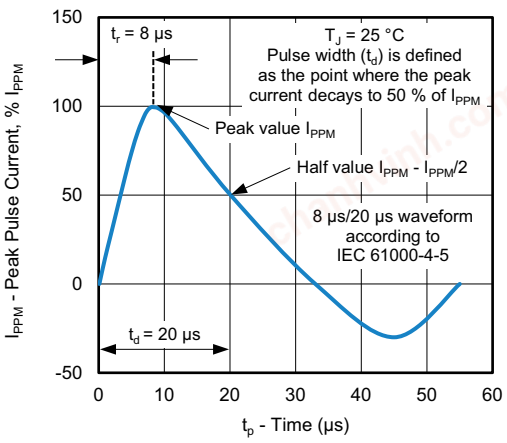


Fig. 4 - 8/20 µs Pulse Waveform

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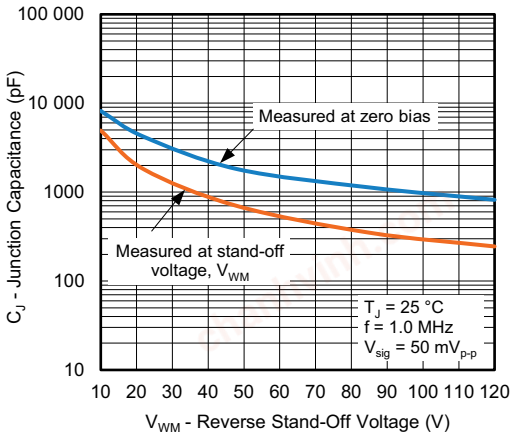


Fig. 5 - Typical Junction Capacitance

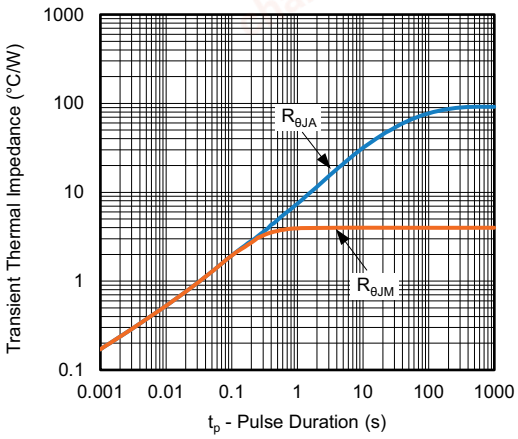


Fig. 6 - Typical Transient Thermal Impedance

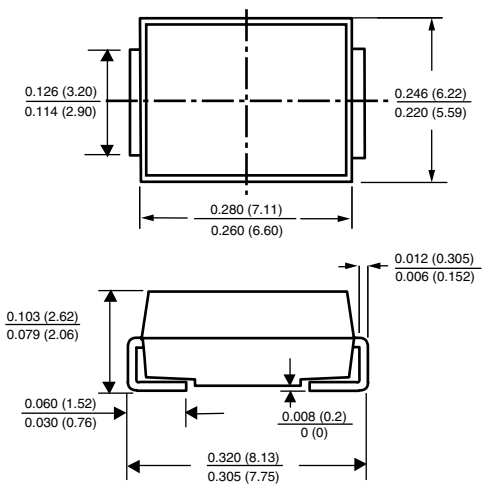
Notes

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

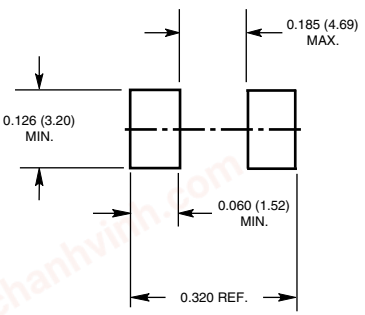
(2) Fig. 1 - 10 000 µs P_{PPM} is actual test for $V_{WM} \leq 60$ V types, over 60 V types 10 000 P_{PPM} is curve extensional value

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

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Mounting Pad Layout



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