

# Surface Mount TRANSZORB® Transient Voltage Suppressors


**SMC (DO-214AB)**


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

## FEATURES

- Bidirectional
- Peak pulse power
  - 3000 W (10/1000  $\mu$ s)
  - 30 kW (8/20  $\mu$ s)
- 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)

## LINKS TO ADDITIONAL RESOURCES



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)

## 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 $\mu$ s waveform (fig.1)	$P_{PPM}^{(1)}$	3000	W
Peak pulse current with a 10/1000 $\mu$ s waveform	$I_{PPM}^{(1)}$	See next table	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175	°C

### Note

<sup>(1)</sup> Non-repetitive current pulse and derated above  $T_A = 25$  °C



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)	MAXIMUM CLAMPING VOLTAGE V <sub>C</sub> (V) AT I <sub>PPM</sub>		MAXIMUM CLAMPING VOLTAGE V <sub>C</sub> (V) AT I <sub>PPM</sub>	
		MIN.	MAX.				10/1000 μs		8/20 μs	
							(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<sub>p</sub> ≤ 50 ms
- (2) 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	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



THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	TYP.	UNIT
Thermal resistance	R <sub>thJA</sub> <sup>(1)</sup>	90	°C/W
	R <sub>thJM</sub> <sup>(2)</sup>	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<sub>A</sub> = 25 °C unless otherwise noted)**

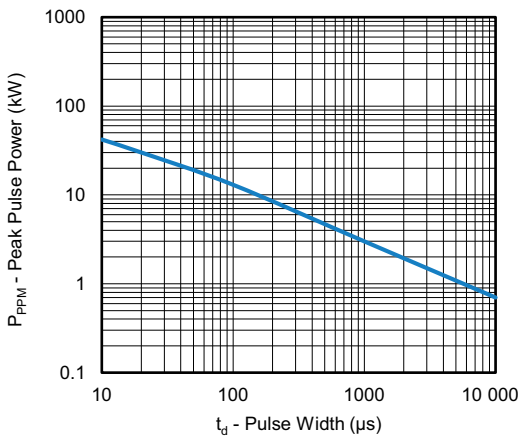


Fig. 1 - Peak Pulse Power Derating Curve

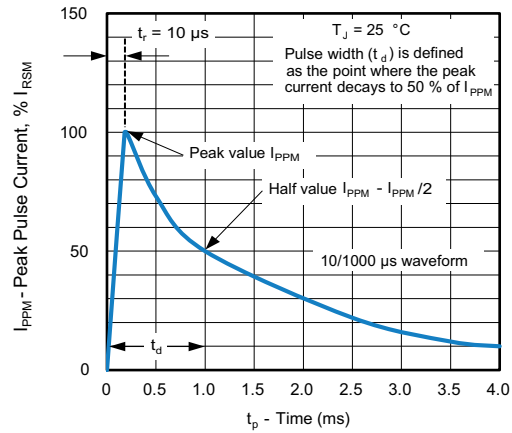


Fig. 3 - 10/1000 µs Pulse Waveform

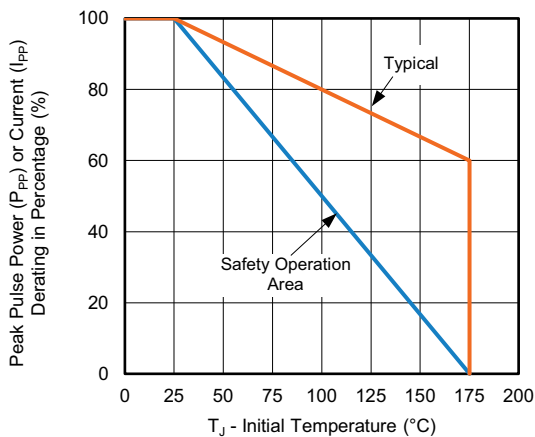


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

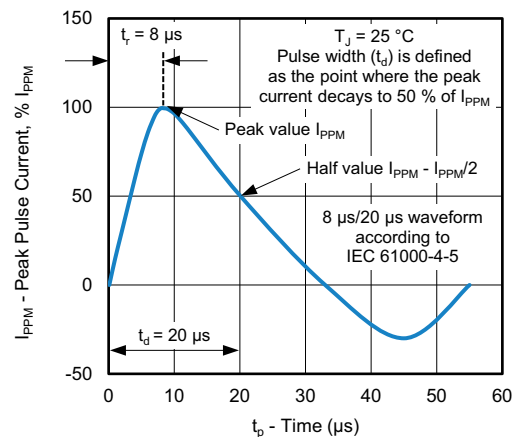


Fig. 4 - 8/20 µs Pulse Waveform

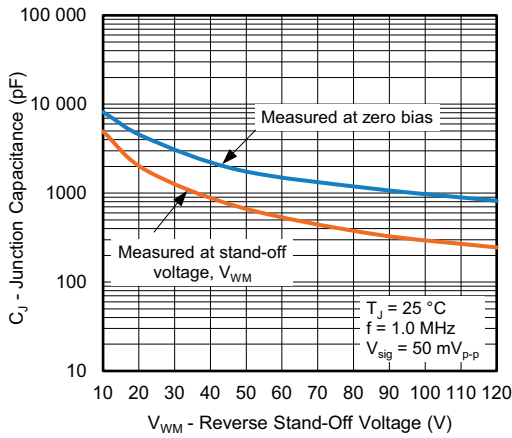


Fig. 5 - Typical Junction Capacitance

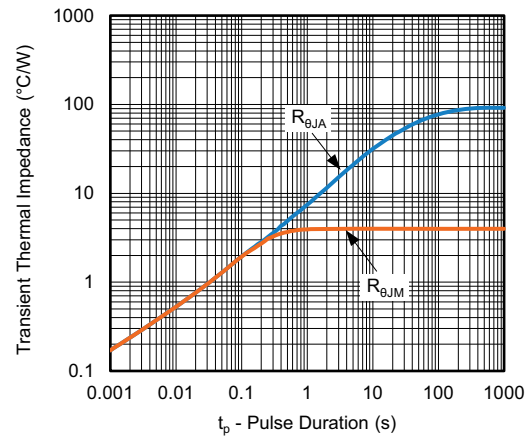
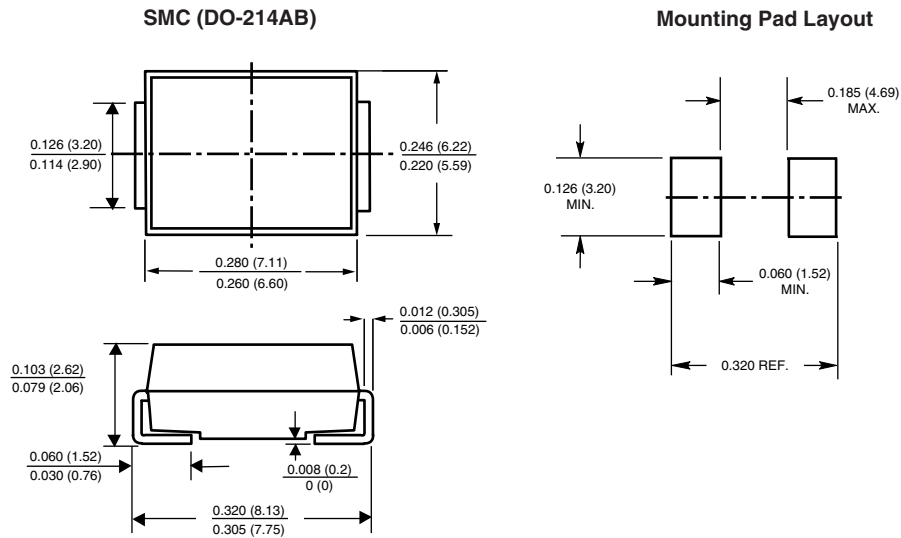


Fig. 6 - Typical Transient Thermal Impedance

**Notes**

- (1) Fig. 1 - Power calculation is based on  $I_{PPM}$  times defined maximum clamping voltage by pulse width
- (2) Fig. 1 - 10 000  $\mu s$   $P_{PPM}$  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)





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.