



## Surface Mount TRANSZORB® Transient Voltage Suppressors



SMA (DO-214AC)

## PRIMARY CHARACTERISTICS

$V_{BR}$	130 V to 220 V
$P_{PPM}$	200 W
$P_D$	0.5 W
$V_{WM}$	111 V to 185 V
$T_J$ max.	150 °C
Polarity	Uni-directional
Package	SMA (DO-214AC)

## 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

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Available in uni-directional 200 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
- 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:** SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial 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:** color band denotes the 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)	$P_{PPM}^{(1)(2)}$	200	W
Peak pulse current with a 10/1000 $\mu$ s waveform (fig. 3)	$I_{PPM}^{(1)}$	See next table	A
Power dissipation at $T_A = 25$ °C (fig. 6)	$P_D$	0.5	W
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150	°C

## Notes

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

(2) Mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal



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

DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ <sup>(1)</sup> (V)		TEST CURRENT $I_T$ (mA)	STAND-OFF VOLTAGE $V_{WM}$ (V)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ ) <sup>(1)</sup>	MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}$ (A) <sup>(2)</sup>	MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V)	MAXIMUM TEMPERATURE OF $V_{BR}$ (%/ $^{\circ}\text{C}$ )
		MIN.	MAX.						
P2SMA130A	2VK	124	137	1.0	111	1.0	1.11	179	0.140
P2SMA140A	2VL	133	147	1.0	119	1.0	1.04	192	0.140
P2SMA150A	2VM	143	158	1.0	128	1.0	0.97	207	0.140
P2SMA170A	2VN	162	179	1.0	145	1.0	0.85	234	0.150
P2SMA180A	2VP	171	189	1.0	154	1.0	0.81	246	0.150
P2SMA200A	2VQ	190	210	1.0	171	1.0	0.73	274	0.150
P2SMA220A	2VR	209	231	1.0	185	1.0	0.61	328	0.150

### Notes

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

(2) Surge current waveform per fig. 3 and derate per fig. 2

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

PARAMETER	SYMBOL	VALUE	UNIT
Thermal resistance, junction to ambient air	$R_{\theta JA}$ <sup>(1)</sup>	250	$^{\circ}\text{C/W}$
Thermal resistance, junction to mount	$R_{\theta JM}$ <sup>(1)</sup>	50	$^{\circ}\text{C/W}$

### Note

(1) Mounted on minimum recommended pad layout

## ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
P2SMA130A-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
P2SMA130A-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

## RATINGS AND CHARACTERISTICS CURVES

( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

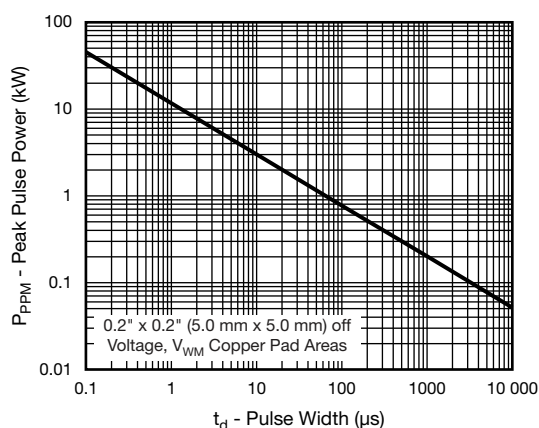


Fig. 1 - Peak Pulse Power Rating Curve

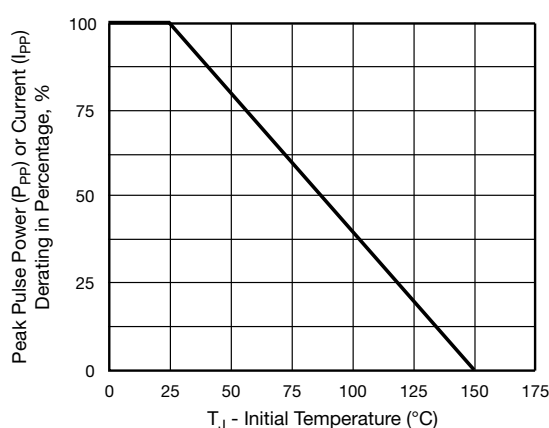


Fig. 2 - Pulse Derating Curve

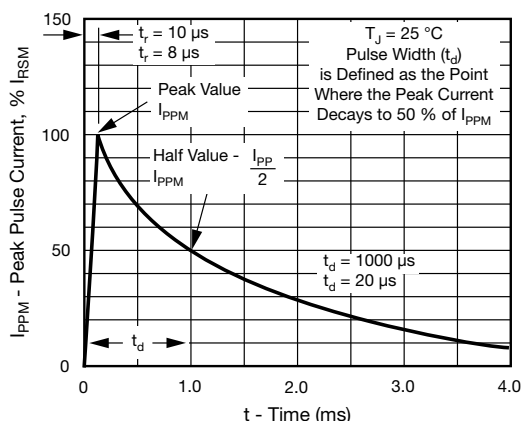


Fig. 3 - Pulse Waveform

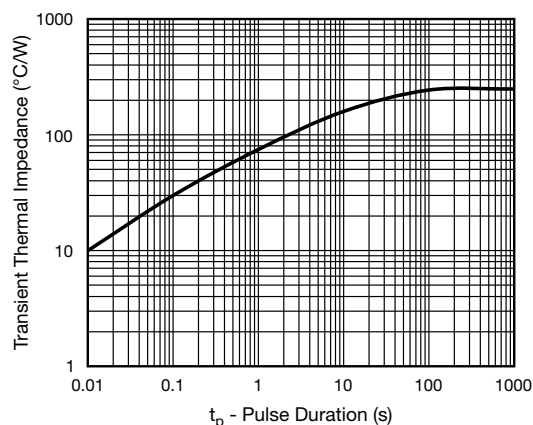


Fig. 5 - Typical Transient Thermal Impedance

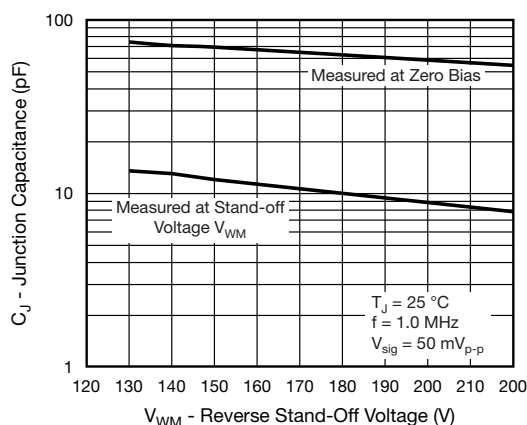


Fig. 4 - Typical Junction Capacitance

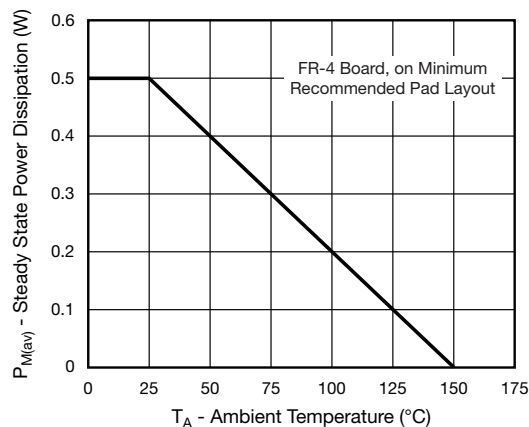
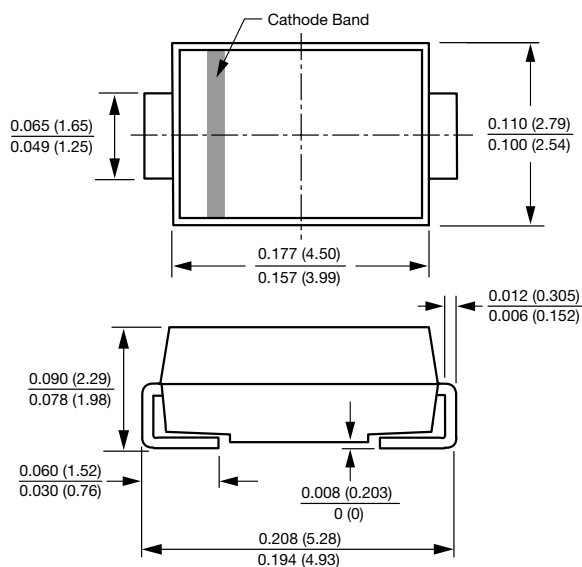


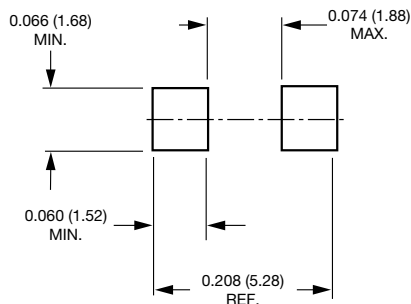
Fig. 6 - Power Derating Curve

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### SMA (DO-214AC)



#### Mounting Pad Layout





## 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.

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.