



## Surface Mount TRANSZORB<sup>®</sup> Transient Voltage Suppressors



DO-214AB (SMC)

PRIMARY CHARACTERISTICS	
$V_{BR}$	6.8 V to 220 V
$P_{PPM}$	1500 W
$P_D$	6.5 W
$I_{FSM}$ (uni-directional only)	200 A
$T_J$ max.	150 °C

### MECHANICAL DATA

**Case:** DO-214AB (SMC)

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 JESD22-B102

M3 suffix meets JESD 201 class 1A whisker test

**Polarity:** For uni-directional types the band denotes cathode end, no marking on bi-directional types

### DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional devices use CA suffix (e.g. SM15T12CA).

Electrical characteristics apply in both directions.

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 1500 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Low inductance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**



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

### APPLICATION NOTES

A 1500 W (SMC) device is normally selected when the threat of transients is from lightning induced transients, conducted via external leads or I/O lines. It is also used to protect against switching transients induced by large coils or industrial motors. Source impedance at component level in a system is usually high enough to limit the current within the peak pulse current ( $I_{PP}$ ) rating of this series. In an overstress condition, the failure mode is a short circuit.

### 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 $\mu$ s waveform (fig. 1)	$P_{PPM}^{(1)(2)}$	1500	W
Peak power pulse current with a 10/1000 $\mu$ s waveform (fig. 3)	$I_{PPM}^{(1)}$	See next table	A
Power dissipation on infinite heatsink $T_A = 50$ °C	$P_D$	6.5	W
Peak forward surge current 10 ms single half sine-wave uni-directional only	$I_{FSM}^{(2)}$	200	A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 65 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 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pads to each terminal

## SM15T Series

Vishay General Semiconductor



ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)												
DEVICE TYPE <sup>(1)</sup>	DEVICE MARKING CODE		BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ (V) <sup>(2)</sup>		TEST CURRENT $I_T$ (mA)	STAND-OFF VOLTAGE $V_{RM}$ (V)	LEAKAGE CURRENT $I_{RM}$ AT $V_{RM}$ ( $\mu\text{A}$ ) <sup>(3)</sup>	CLAMPING VOLTAGE $V_C$ AT $I_{PP}$ 10/1000 $\mu\text{s}$		CLAMPING VOLTAGE $V_C$ AT $I_{PP}$ 8/20 $\mu\text{s}$		$\alpha_T$ MAX. $10^{-4}/^\circ\text{C}$
	UNI	BI	MIN.	MAX.				(V)	(A)	(V)	(A)	
SM15T6V8A	GDE7	GDE7	6.45	7.14	10	5.80	1000	10.5	143	13.4	746	5.7
SM15T7V5A	GDK7	BDK7	7.13	7.88	10	6.40	500	11.3	132	14.5	690	6.1
SM15T10A	GDT7	BDT7	9.50	10.5	1.0	8.55	10.0	14.5	103	18.6	538	7.3
SM15T12A	GDX7	BDX7	11.4	12.6	1.0	10.2	5.0	16.7	90.0	21.7	461	7.8
SM15T15A	GEG7	GEG7	14.3	15.8	1.0	12.8	1.0	21.2	71.0	27.2	368	8.4
SM15T18A	GEM7	BEM7	17.1	18.9	1.0	15.3	1.0	25.2	59.5	32.5	308	8.8
SM15T22A	GET7	BET7	20.9	23.1	1.0	18.8	1.0	30.6	49.0	39.3	254	9.2
SM15T24A	GEV7	GEV7	22.8	25.2	1.0	20.5	1.0	33.2	45.0	42.8	234	9.4
SM15T27A	GEX7	BEX7	25.7	28.4	1.0	23.1	1.0	37.5	40.0	48.3	207	9.6
SM15T30A	GFE7	BFE7	28.5	31.5	1.0	25.6	1.0	41.5	36.0	53.5	187	9.7
SM15T33A	GFG7	GFG7	31.4	34.7	1.0	28.2	1.0	45.7	33.0	59.0	169	9.8
SM15T36A	GFK7	BFK7	34.2	37.8	1.0	30.8	1.0	49.9	30.0	64.3	156	9.9
SM15T39A	GFM7	BFM7	37.1	41.0	1.0	33.3	1.0	53.9	28.0	69.7	143	10.0
SM15T68A	GGG7	GGG7	64.6	71.4	1.0	58.1	1.0	92.0	16.3	121	83	10.4
SM15T100A	GGV7	GGV7	95.0	105	1.0	85.5	1.0	137	11.0	178	56	10.6
SM15T150A	GHK7	GHK7	143	158	1.0	128	1.0	207	7.20	265	38	10.8
SM15T200A	GHR7	GHR7	190	210	1.0	171	1.0	274	5.50	353	28	10.8
SM15T220A	GHR8	GHR8	209	231	1.0	188	1.0	328	4.60	388	26	10.8

## Notes

- (1) For bi-directional devices add suffix "CA" instead of "A"  
 (2)  $V_{BR}$  measured after  $I_T$  applied for 300  $\mu\text{s}$  square wave pulse  
 (3) For bipolar devices with  $V_R = 10\text{ V}$  or under, the  $I_T$  limit is doubled

THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to ambient air	$R_{\theta JA}$ <sup>(1)</sup>	75	$^\circ\text{C/W}$
Typical thermal resistance, junction to lead	$R_{\theta JL}$	15	$^\circ\text{C/W}$

## Note

- (1) Mounted on minimum recommended pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SM15T10A-M3/57T	0.211	57T	850	7" diameter plastic tape and reel
SM15T10A-M3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel



**RATINGS AND CHARACTERISTICS CURVES**

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

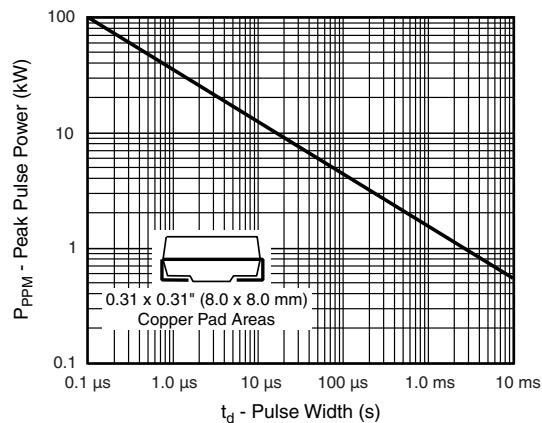


Fig. 1 - Peak Pulse Power Rating Curve

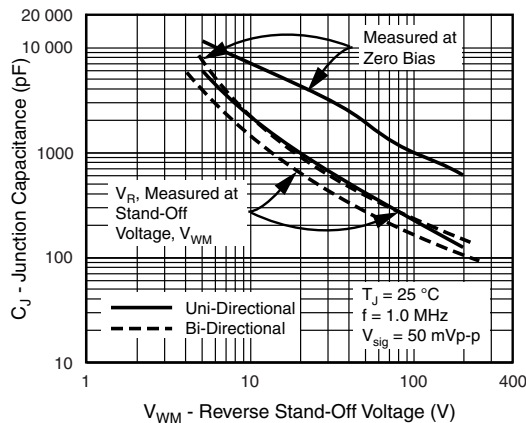


Fig. 4 - Typical Junction Capacitance Uni-Directional

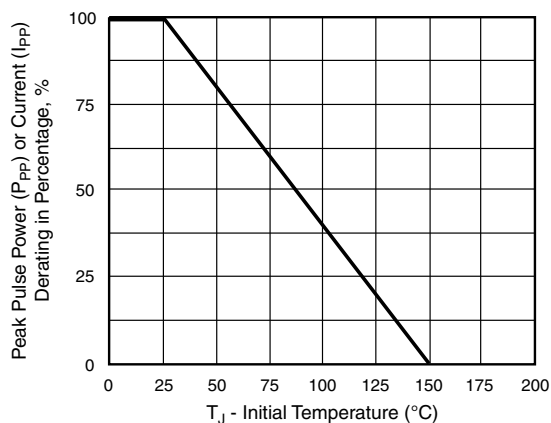


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

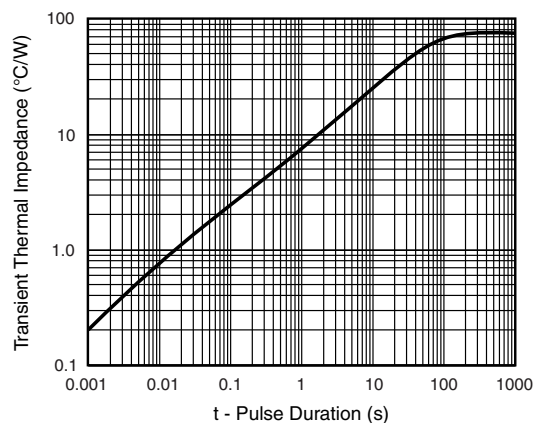


Fig. 5 - Typical Transient Thermal Impedance

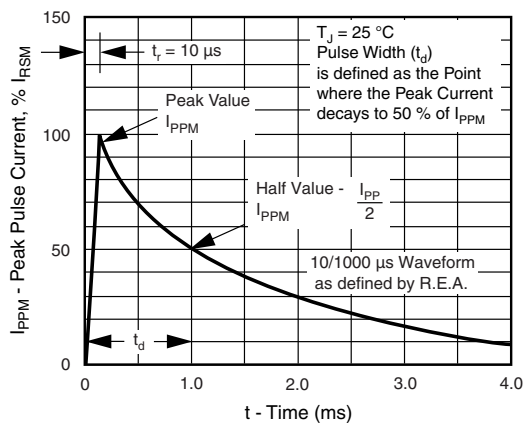


Fig. 3 - Pulse Waveform

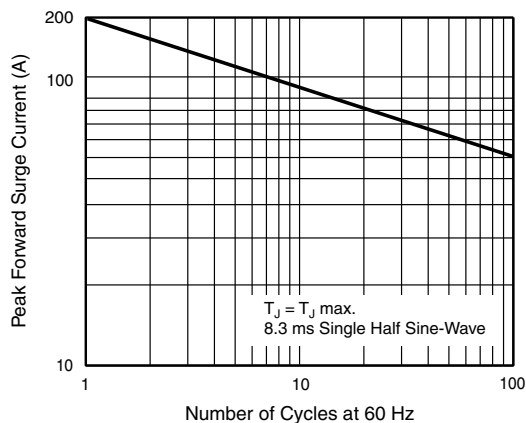


Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Use Only

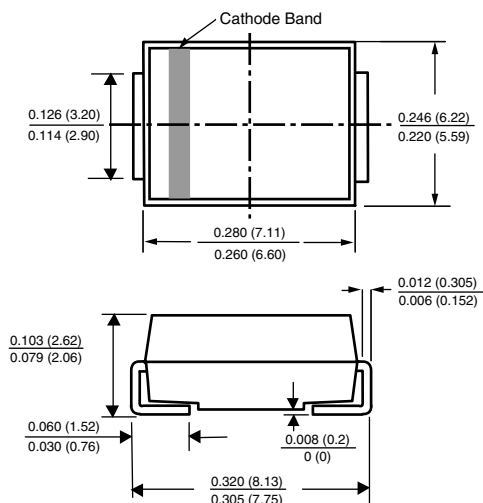
# SM15T Series

Vishay General Semiconductor

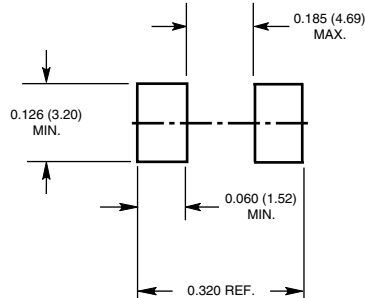


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AB (SMC)



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 and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. 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.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**