

Surface Mount TRANSZORB® 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-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/automotive grade (AEC Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 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
- 1500 W peak pulse power capability with a 10/1000 μ s waveform
- Available in uni-directional and bi-directional
- Excellent clamping capability
- Low inductance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC


RoHS
COMPLIANT

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, automotive and telecommunication.

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Peak pulse power dissipation with a 10/1000 μ s waveform ⁽¹⁾⁽²⁾ (Fig. 1)	P_{PPM}	1500	W
Peak power pulse current with a 10/1000 μ s waveform ⁽¹⁾ (Fig. 3)	I_{PPM}	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 ⁽²⁾	I_{FSM}	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 x 8.0 mm) copper pads to each terminal

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)												
TYPE ⁽¹⁾	DEVICE MARKING CODE		STAND-OFF VOLTAGE V_{RM} (V)	LEAKAGE CURRENT ⁽³⁾ I_{RM} AT V_R	BREAKDOWN VOLTAGE V_{BR} AT I_T ⁽²⁾ (V)		TEST CURRENT I_T (mA)	CLAMPING VOLTAGE V_C AT I_{PP} (10/1000 μs)		CLAMPING VOLTAGE V_C AT I_{PP} (8/20 μs)		α_T Max. $10^{-4}/^\circ\text{C}$
	UNI	BI			MIN.	MAX.		(V)	(A)	(V)	(A)	
SM15T6V8A	GDE7	GDE7	5.80	1000	6.45	7.14	10	10.5	143	13.4	746	5.7
SM15T7V5A	GDK7	BDK7	6.40	500	7.13	7.88	10	11.3	132	14.5	690	6.1
SM15T10A	GDT7	BDT7	8.55	10.0	9.50	10.5	1.0	14.5	103	18.6	538	7.3
SM15T12A	GDX7	BDX7	10.2	5.0	11.4	12.6	1.0	16.7	90.0	21.7	461	7.8
SM15T15A	GEG7	GEG7	12.8	1.0	14.3	15.8	1.0	21.2	71.0	27.2	368	8.4
SM15T18A	GEM7	BEM7	15.3	1.0	17.1	18.9	1.0	25.2	59.5	32.5	308	8.8
SM15T22A	GET7	BET7	18.8	1.0	20.9	23.1	1.0	30.6	49.0	39.3	254	9.2
SM15T24A	GEV7	GEV7	20.5	1.0	22.8	25.2	1.0	33.2	45.0	42.8	234	9.4
SM15T27A	GEX7	BEX7	23.1	1.0	25.7	28.4	1.0	37.5	40.0	48.3	207	9.6
SM15T30A	GFE7	BFE7	25.6	1.0	28.5	31.5	1.0	41.5	36.0	53.5	187	9.7
SM15T33A	GFG7	GFG7	28.2	1.0	31.4	34.7	1.0	45.7	33.0	59.0	169	9.8
SM15T36A	GFK7	BFK7	30.8	1.0	34.2	37.8	1.0	49.9	30.0	64.3	156	9.9
SM15T39A	GFM7	BFM7	33.3	1.0	37.1	41.0	1.0	53.9	28.0	69.7	143	10.0
SM15T68A	GGG7	GGG7	58.1	1.0	64.6	71.4	1.0	92.0	16.3	121	83	10.4
SM15T100A	GGV7	GGV7	85.5	1.0	95.0	105	1.0	137	11.0	178	56	10.6
SM15T150A	GHK7	GHK7	128	1.0	143	158	1.0	207	7.20	265	38	10.8
SM15T200A	GHR7	GHR7	171	1.0	190	210	1.0	274	5.50	353	28	10.8
SM15T220A	GHR8	GHR8	188	1.0	209	231	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 μs 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 ⁽¹⁾	$R_{\theta JA}$	75	$^\circ\text{C/W}$
Typical thermal resistance, junction to leads	$R_{\theta JL}$	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-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
SM15T10A-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
SM15T10AHE3/57T ⁽¹⁾	0.211	57T	850	7" diameter plastic tape and reel
SM15T10AHE3/9AT ⁽¹⁾	0.211	9AT	3500	13" diameter plastic tape and reel

Note:

- (1) Automotive grade AEC Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

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

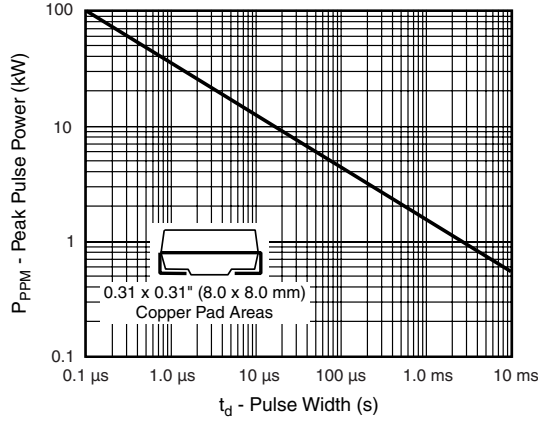


Figure 1. Peak Pulse Power Rating Curve

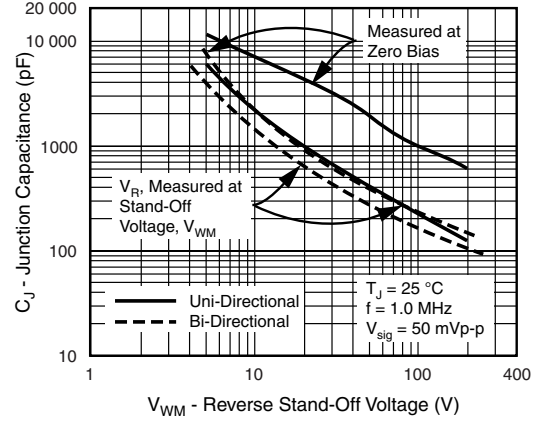


Figure 4. Typical Junction Capacitance Uni-Directional

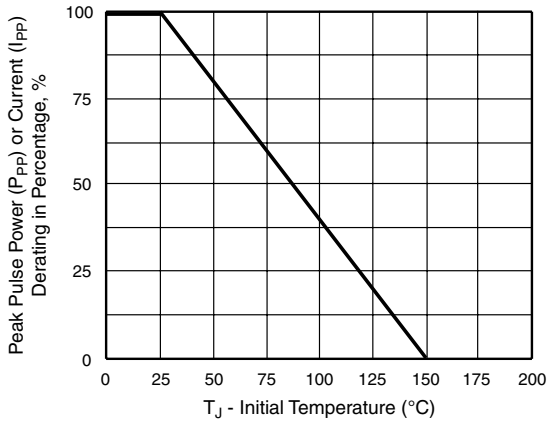


Figure 2. Pulse Power or Current vs. Initial Junction Temperature

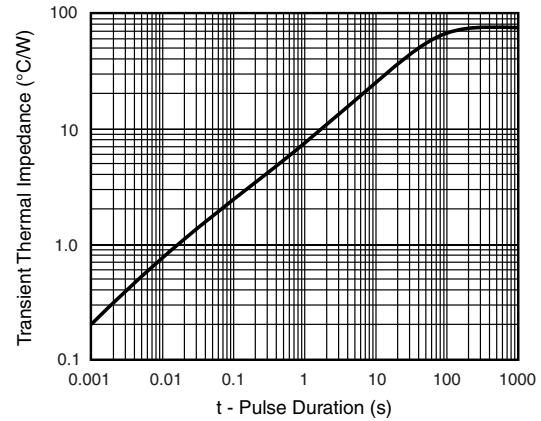


Figure 5. Typical Transient Thermal Impedance

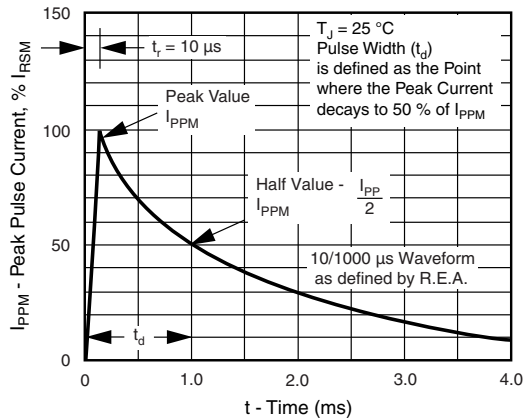


Figure 3. Pulse Waveform

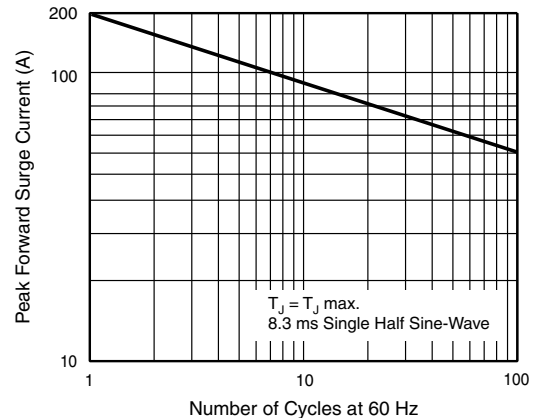
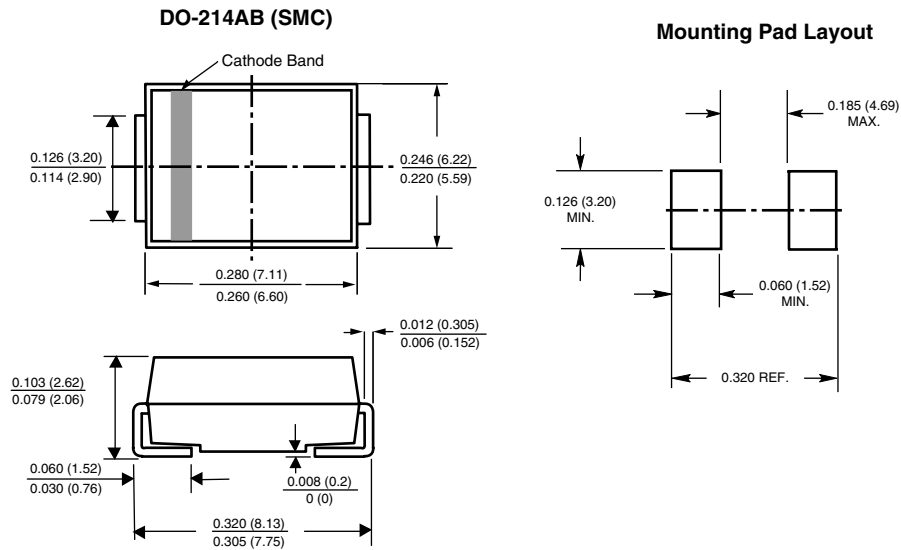


Figure 6. Maximum Non-Repetitive Forward Surge Current
Uni-Directional Use Only

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.

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.