

Surface Mount PAR[®] Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-214AB (SMC)

PRIMARY CHARACTERISTICS	
V_{BR}	6.8 V to 47 V
V_{WM}	5.8 V to 40.2 V
P_{PPM}	1500 W
I_{FSM}	200 A
T_J max.	185 °C
Polarity	Uni-directional
Package	DO-214AB (SMC)

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

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 185$ °C capability suitable for high reliability and automotive requirement
- Available in uni-directional polarity only
- 1500 W peak pulse power capability with a 10/1000 μ 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
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

MECHANICAL DATA

Case: DO-214AB (SMC)

Molding compound meets UL 94 V-0 flammability rating
Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified
("X" denotes revision code e.g. A, B, ...)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HE3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 μ s waveform (fig. 3) ⁽¹⁾⁽²⁾	P_{PPM}	1500	W
Peak power pulse current with a 10/1000 μ s waveform (fig. 1) ⁽¹⁾	I_{PPM}	See table next page	A
Peak forward surge current 8.3 ms single half sine-wave ⁽²⁾⁽³⁾	I_{FSM}	200	A
Maximum instantaneous forward voltage at 100 A ⁽²⁾⁽³⁾	V_F	3.5	V
Operating junction and storage temperature range	T_J, T_{STG}	-65 to +185	°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 at each terminal

⁽³⁾ Measured on 8.3 ms single half sine-wave, or equivalent square wave, duty cycle = 4 pulses per minute maximum

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

DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE $V_{BR}^{(1)}$ AT I_T (V)		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_R (μA)	MAXIMUM REVERSE LEAKAGE AT V_{WM} $T_J = 150\text{ }^{\circ}\text{C}$ I_D (μA)	MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}^{(2)}$ (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)
		MIN.	MAX.						
TPSMC6.8A	DEP	6.45	7.14	10	5.80	1000	10 000	143	10.5
TPSMC7.5A	DGP	7.13	7.88	10	6.40	500	5000	133	11.3
TPSMC8.2A	DKP	7.79	8.61	10	7.02	200	2000	124	12.1
TPSMC9.1A	DMP	8.65	9.55	1	7.78	50	500	112	13.4
TPSMC10A	DPP	9.5	10.5	1	8.55	20	200	103	14.5
TPSMC11A	DRP	10.5	11.6	1	9.40	5.0	50	96.2	15.6
TPSMC12A	DTP	11.4	12.6	1	10.2	2.0	10	89.8	16.7
TPSMC13A	DVP	12.4	13.7	1	11.1	2.0	10	82.4	18.2
TPSMC15A	DXP	14.3	15.8	1	12.8	1.0	10	70.8	21.2
TPSMC16A	DZP	15.2	16.8	1	13.6	1.0	10	66.7	22.5
TPSMC18A	EEP	17.1	18.9	1	15.3	1.0	10	59.5	25.2
TPSMC20A	EGP	19.0	21.0	1	17.1	1.0	10	54.2	27.7
TPSMC22A	EKP	20.9	23.1	1	18.8	1.0	10	49.0	30.6
TPSMC24A	EMP	22.8	25.2	1	20.5	1.0	10	45.2	33.2
TPSMC27A	EPP	25.7	28.4	1	23.1	1.0	10	40.0	37.5
TPSMC30A	ERP	28.5	31.5	1	25.6	1.0	10	36.2	41.4
TPSMC33A	ETP	31.4	34.7	1	28.2	1.0	10	32.8	45.7
TPSMC36A	EVP	34.2	37.8	1	30.8	1.0	15	30.1	49.9
TPSMC39A	EXP	37.1	41.0	1	33.3	1.0	15	27.8	53.9
TPSMC43A	EZP	40.9	45.2	1	36.8	1.0	20	25.3	59.3
TPSMC47A	FEP	44.7	49.4	1	40.2	1.0	20	23.1	64.8

Notes

- (1) V_{BR} measured after I_T applied for 300 μs , I_T = square wave pulse or equivalent
(2) Surge current waveform per fig. 3 and derated per fig. 2
(3) All terms and symbols are consistent with ANSI/IEEE C62.35

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TPSMC6.8AHE3_B/H ⁽¹⁾	0.211	H	850	7" diameter plastic tape and reel
TPSMC6.8AHE3_B/I ⁽¹⁾	0.211	I	3500	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES

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

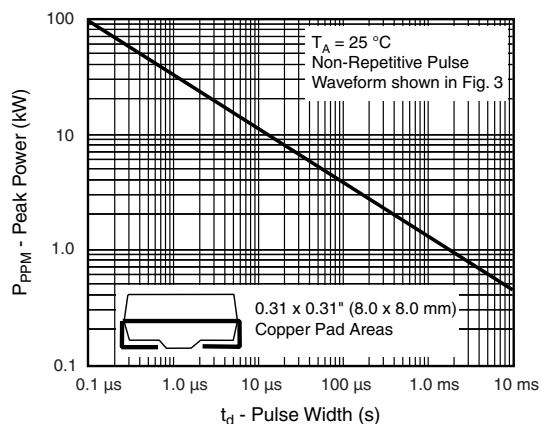


Fig. 1 - Peak Pulse Power Rating Curve

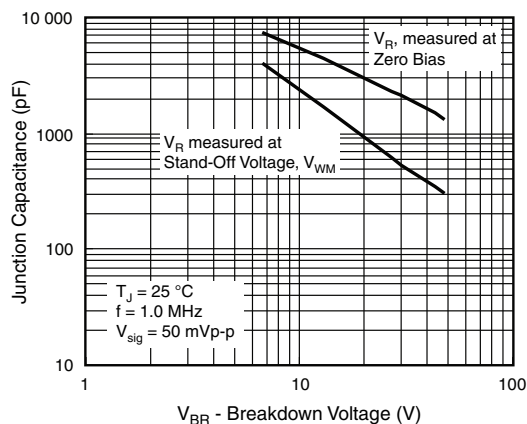


Fig. 4 - Typical Junction Capacitance

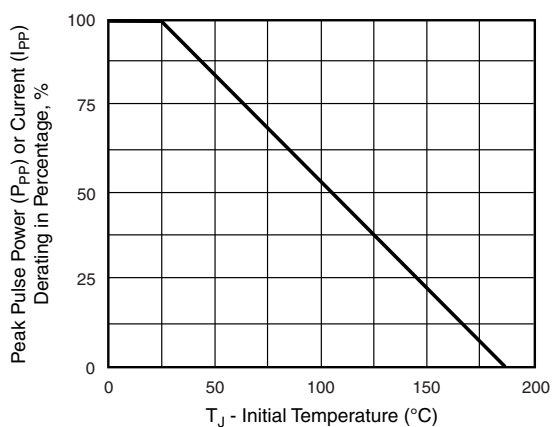


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

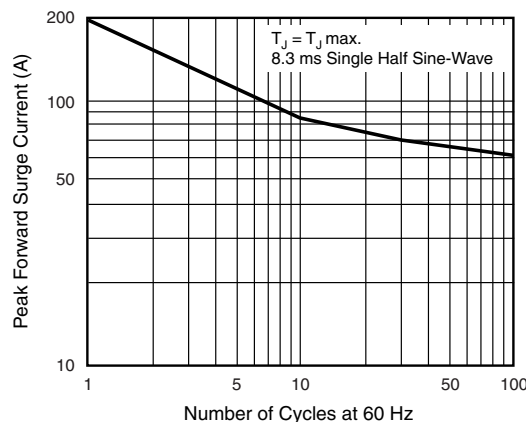


Fig. 5 - Maximum Non-Repetitive Peak Forward Surge Current

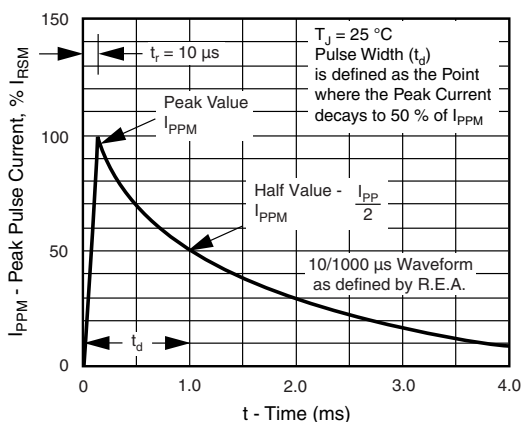
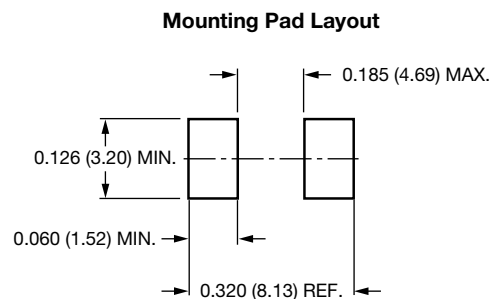
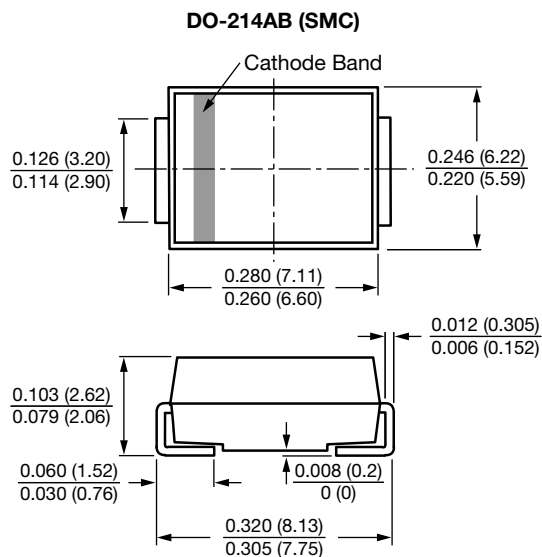


Fig. 3 - Pulse Waveform



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. 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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Vishay:

[TPSMC10-E3/51T](#) [TPSMC10-E3/57T](#) [TPSMC10-E3/9AT](#) [TPSMC13A-E3/51T](#) [TPSMC13A-E3/57T](#) [TPSMC13A-E3/59T](#) [TPSMC13A-E3/9AT](#) [TPSMC15A-E3/51T](#) [TPSMC15A-E3/59T](#) [TPSMC15A-E3/9AT](#) [TPSMC16A-E3/51T](#) [TPSMC16A-E3/57T](#) [TPSMC16A-E3/59T](#) [TPSMC16A-E3/9AT](#) [TPSMC18A-E3/51T](#) [TPSMC18A-E3/57T](#) [TPSMC18A-E3/59T](#) [TPSMC18A-E3/9AT](#) [TPSMC20A-E3/1T](#) [TPSMC20A-E3/51T](#) [TPSMC20A-E3/57T](#) [TPSMC20A-E3/59T](#) [TPSMC20A-E3/9AT](#) [TPSMC20-E3/51T](#) [TPSMC20-E3/57T](#) [TPSMC20-E3/59T](#) [TPSMC20-E3/9AT](#) [TPSMC22A-E3/51T](#) [TPSMC22A-E3/57T](#) [TPSMC22A-E3/59T](#) [TPSMC22A-E3/9AT](#) [TPSMC22-E3/51T](#) [TPSMC22-E3/57T](#) [TPSMC22-E3/59T](#) [TPSMC22-E3/9AT](#) [TPSMC24A-E3/1T](#) [TPSMC24A-E3/51T](#) [TPSMC24A-E3/59T](#) [TPSMC27A-E3/1T](#) [TPSMC27A-E3/51T](#) [TPSMC27A-E3/9AT](#) [TPSMC27-E3/51T](#) [TPSMC27-E3/59T](#) [TPSMC27-E3/9AT](#) [TPSMC30A-E3/51T](#) [TPSMC30A-E3/9AT](#) [TPSMC30-E3/51T](#) [TPSMC30-E3/57T](#) [TPSMC30-E3/59T](#) [TPSMC30-E3/9AT](#) [TPSMC33A-E3/51T](#) [TPSMC33A-E3/9AT](#) [TPSMC33-E3/51T](#) [TPSMC33-E3/57T](#) [TPSMC33-E3/59T](#) [TPSMC33-E3/9AT](#) [TPSMC36A-E3/1T](#) [TPSMC36A-E3/51T](#) [TPSMC36A-E3/59T](#) [TPSMC36A-E3/9AT](#) [TPSMC36A-E3/9CT](#) [TPSMC36-E3/51T](#) [TPSMC36-E3/57T](#) [TPSMC36-E3/59T](#) [TPSMC36-E3/9AT](#) [TPSMC39A/1T](#) [TPSMC39A-E3/1T](#) [TPSMC39A-E3/51T](#) [TPSMC39A-E3/59T](#) [TPSMC39A-E3/9AT](#) [TPSMC39A-E3/9CT](#) [TPSMC39-E3/57T](#) [TPSMC39-E3/9AT](#) [TPSMC43A-E3/1T](#) [TPSMC43A-E3/51T](#) [TPSMC43A-E3/57T](#) [TPSMC43A-E3/59T](#) [TPSMC43A-E3/9AT](#) [TPSMC43-E3/51T](#) [TPSMC43-E3/57T](#) [TPSMC43-E3/59T](#) [TPSMC43-E3/9AT](#) [TPSMC47A-E3/59T](#) [TPSMC47A-E3/9AT](#) [TPSMC6.8A/9T](#) [TPSMC6.8A-E3/51T](#) [TPSMC6.8A-E3/57T](#) [TPSMC6.8A-E3/59T](#) [TPSMC6.8A-E3/9AT](#) [TPSMC7.5A-E3/51T](#) [TPSMC7.5A-E3/57T](#) [TPSMC7.5A-E3/59T](#) [TPSMC7.5A-E3/9AT](#) [TPSMC8.2A-E3/51T](#) [TPSMC8.2A-E3/57T](#) [TPSMC8.2A-E3/59T](#) [TPSMC8.2A-E3/9AT](#) [TPSMC9.1A/7T](#) [TPSMC9.1A-E3/51T](#) [TPSMC9.1A-E3/57T](#)