Surface Mount PAR® Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-214AB (SMC)

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 µs 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

PRIMARY CHARACTERISTICS	
V_{BR}	6.8 V to 47 V
V_{WM}	5.50 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.

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, ..., revision code only applicable for part number with ± 5 % tolerance)

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 µs waveform (fig. 3) (1)(2)	P_{PPM}	1500	W
Peak power pulse current with a 10/1000 µs 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

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ELECTRICAL CHARACTERISTICS (T_A = 25 °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 °C I_D (µA)	MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (2) (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)
		MIN.	MAX.						
TPSMC6.8	DDP	6.12	7.48	10	5.5	1000	10000	139	10.8
TPSMC6.8A	DEP	6.45	7.14	10	5.8	1000	10000	143	10.5
TPSMC7.5	DFP	6.75	8.25	10	6.05	500	5000	128	11.7
TPSMC7.5A	DGP	7.13	7.88	10	6.4	500	5000	133	11.3
TPSMC8.2	DHP	7.38	9.02	10	6.63	200	2000	120	12.5
TPSMC8.2A	DKP	7.79	8.61	10	7.02	200	2000	124	12.1
TPSMC9.1	DLP	8.19	10	1	7.37	50	500	109	13.8
TPSMC9.1A	DMP	8.65	9.55	1	7.78	50	500	112	13.4
TPSMC10	DNP	9	11	1	8.1	20	200	100	15
TPSMC10A	DPP	9.5	10.5	1	8.55	20	200	103	14.5
TPSMC11	DQP	9.9	12.1	1	8.92	5	50	92.6	16.2
TPSMC11A	DRP	10.5	11.6	1	9.4	5	50	96.2	15.6
TPSMC12	DSP	10.8	13.2	1	9.72	2	10	86.7	17.3
TPSMC12A	DTP	11.4	12.6	1	10.2	2	10	89.8	16.7
TPSMC13	DUP	11.7	14.3	1	10.5	2	10	78.9	19
TPSMC13A	DVP	12.4	13.7	1	11.1	2	10	82.4	18.2
TPSMC15	DWP	13.5	16.5	1	12.1	1	10	68.2	22
TPSMC15A	DXP	14.3	15.8	1	12.8	1	10	70.8	21.2
TPSMC16	DYP	14.4	17.6	1	12.9	1	10	63.8	23.5
TPSMC16A	DZP	15.2	16.8	1	13.6	1	10	66.7	22.5
TPSMC18	EDP	16.2	19.8	1	14.5	1	10	56.6	26.5
TPSMC18A	EEP	17.1	18.9	1	15.3	1	10	59.5	25.2
TPSMC20	EFP	18	22	1	16.2	1	10	51.5	29.1
TPSMC20A	EGP	19	21	1	17.1	1	10	54.2	27.7
TPSMC22	EHP	19.8	24.2	1	17.8	1	10	47	31.9
TPSMC22A	EKP	20.9	23.1	1	18.8	1	10	49	30.6
TPSMC24	ELP	21.6	26.4	1	19.4	1	10	43.2	34.7
TPSMC24A	EMP	22.8	25.2	1	20.5	1	10	45.2	33.2
TPSMC27	ENP	24.3	29.7	1	21.8	1	10	38.4	39.1
TPSMC27A	EPP	25.7	28.4	1	23.1	1	10	40	37.5
TPSMC30	EQP	27	33	1	24.3	1	10	34.5	43.5
TPSMC30A	ERP	28.5	31.5	1	25.6	1	10	36.2	41.4
TPSMC33	ESP	29.7	36.3	1	26.8	1	10	31.4	47.7
TPSMC33A	ETP	31.4	34.7	1	28.2	1	10	32.8	45.7
TPSMC36	EUP	32.4	39.6	1	29.1	1	15	28.8	52
TPSMC36A	EVP	34.2	37.8	1	30.8	1	15	30.1	49.9
TPSMC39	EWP	35.1	42.9	1	31.6	1	15	26.6	56.4
TPSMC39A	EXP	37.1	41	1	33.3	1	15	27.8	53.9
TPSMC43	EYP	38.7	47.3	1	34.8	1	20	24.2	61.9
TPSMC43A	EZP	40.9	45.2	1	36.8	1	20	25.3	59.3
TPSMC47	FDP	42.3	51.7	1	38.1	1	20	22.1	67.8
TPSMC47A	FEP	44.7	49.4	1	40.2	1	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

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ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TPSMC6.8AHE3_A/H (1)	0.211	H	850	7" diameter plastic tape and reel
TPSMC6.8AHE3_A/I (1)	0.211	I	3500	13" diameter plastic tape and reel
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 °C unless otherwise noted)

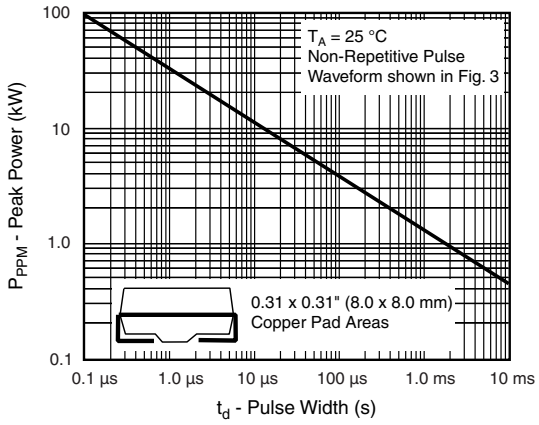


Fig. 1 - Peak Pulse Power Rating Curve

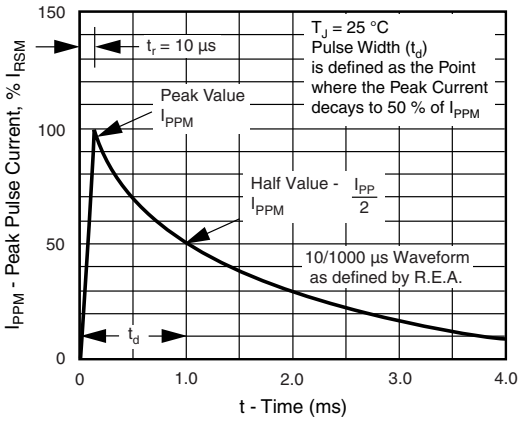


Fig. 3 - Pulse Waveform

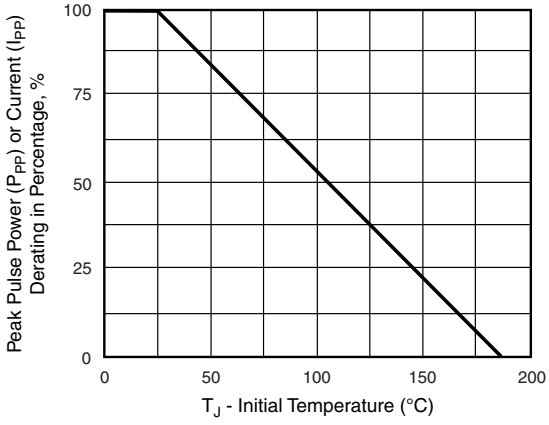


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

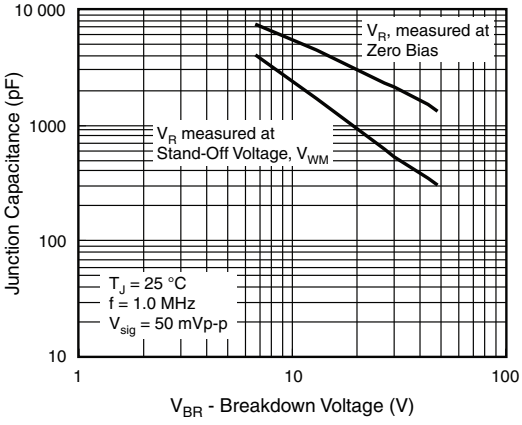


Fig. 4 - Typical Junction Capacitance

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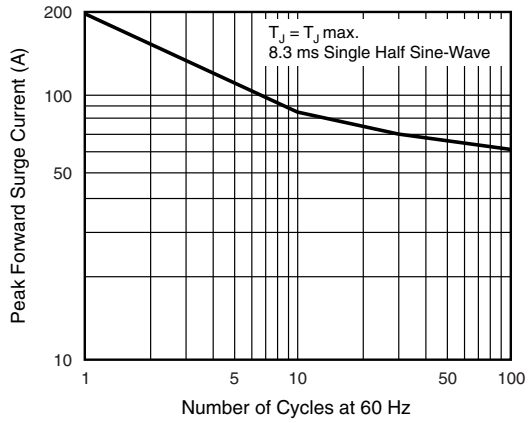
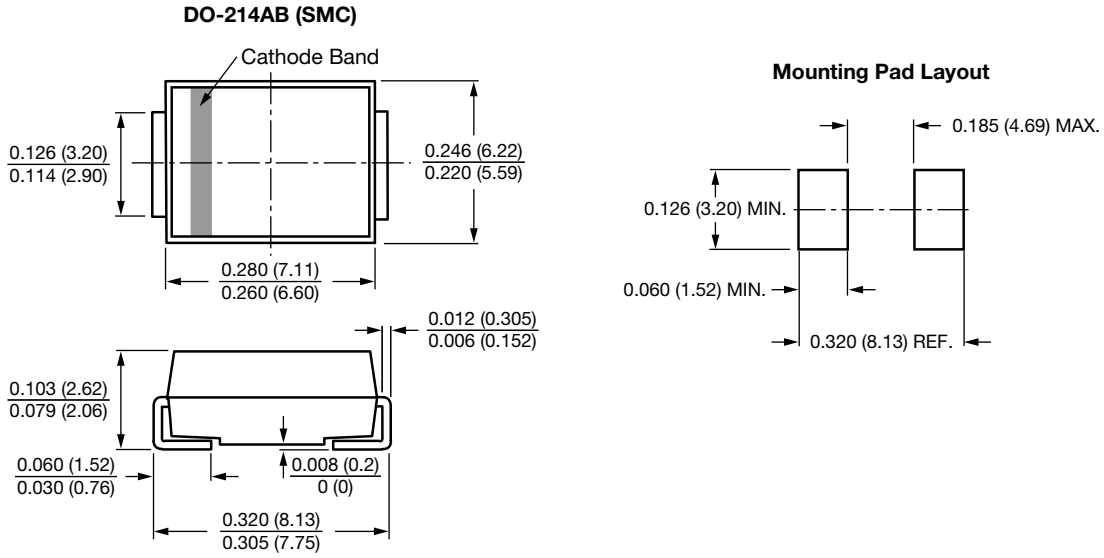


Fig. 5 - Maximum Non-Repetitive Peak Forward Surge Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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