

Surface Mount PAR[®] Transient Voltage Suppressors

Uni-directional 1500 W TVS in TO-277 (SMPC) Package

eSMP[®] Series

TO-277A (SMPC)

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE
FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 185\text{ }^\circ\text{C}$ capability suitable for high reliability and automotive requirement
- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Uni-direction only
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- Meets MSL level 1, per J-STD-020
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

MECHANICAL DATA
Case: TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating Base P/NHM3_X - halogen-free, 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

HM3 suffix meets JESD 201 class 2 whisker test

PRIMARY CHARACTERISTICS	
V_{WM}	5.8 V to 43.6 V
V_{BR}	6.8 V to 51 V
P_{PPM}	1500 W
T_J max.	185 $^\circ\text{C}$
Polarity	Uni-directional
Package	TO-277A (SMPC)

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 ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak 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 next table	A
Peak forward surge current 8.3 ms single half sine-wave ⁽²⁾	I_{FSM}	200	A
Maximum instantaneous forward voltage at 100 A ⁽³⁾	V_F	3.5	V
Operating junction and storage temperature range	T_J, T_{STG}	-65 to +185	$^\circ\text{C}$

Notes

- (1) Non-repetitive current pulse, per fig. 3 and derated above $T_A = 25\text{ }^\circ\text{C}$ per fig. 2
- (2) Measured on 8.3 ms single half sine-wave, or equivalent square wave, duty cycle = 4 pulses per minute maximum
- (3) Pulse test: 300 μs pulse width, 1 % duty cycle



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.						
TPC6.8A	DEP	6.45	7.14	10	5.80	1500	10 000	143	10.5
TPC7.5A	DGP	7.13	7.88	10	6.40	500	5000	133	11.3
TPC8.2A	DKP	7.79	8.61	10	7.02	200	2000	124	12.1
TPC9.1A	DMP	8.65	9.55	1.0	7.78	50	500	112	13.4
TPC10A	DPP	9.5	10.5	1.0	8.55	20	200	103	14.5
TPC11A	DRP	10.5	11.6	1.0	9.40	5.0	50	96.2	15.6
TPC12A	DTP	11.4	12.6	1.0	10.2	2.0	10	89.8	16.7
TPC13A	DVP	12.4	13.7	1.0	11.1	2.0	10	82.4	18.2
TPC15A	DXP	14.3	15.8	1.0	12.8	1.0	10	70.8	21.2
TPC16A	DZP	15.2	16.8	1.0	13.6	1.0	10	66.7	22.5
TPC18A	EEP	17.1	18.9	1.0	15.3	1.0	10	59.5	25.2
TPC20A	EGP	19.0	21.0	1.0	17.1	1.0	10	54.2	27.7
TPC22A	EKP	20.9	23.1	1.0	18.8	1.0	10	49.0	30.6
TPC24A	EMP	22.8	25.2	1.0	20.5	1.0	10	45.2	33.2
TPC27A	EPP	25.7	28.4	1.0	23.1	1.0	10	40.0	37.5
TPC30A	ERP	28.5	31.5	1.0	25.6	1.0	10	36.2	41.4
TPC33A	ETP	31.4	34.7	1.0	28.2	1.0	10	32.8	45.7
TPC36A	EVP	34.2	37.8	1.0	30.8	1.0	15	30.1	49.9
TPC39A	EXP	37.1	41.0	1.0	33.3	1.0	15	27.8	53.9
TPC43A	EZP	40.9	45.2	1.0	36.8	1.0	20	25.3	59.3
TPC47A	FEP	44.7	49.4	1.0	40.2	1.0	20	23.1	64.8
TPC51A	FGP	48.5	53.6	1.0	43.6	1.0	20	21.4	70.1

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
TPC10AHM3_A/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
TPC10AHM3_A/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note

- (1) Automotive grade



RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)

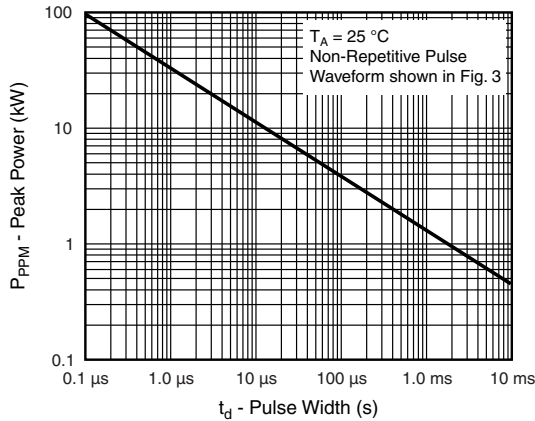


Fig. 1 - Peak Pulse Power Rating Curve

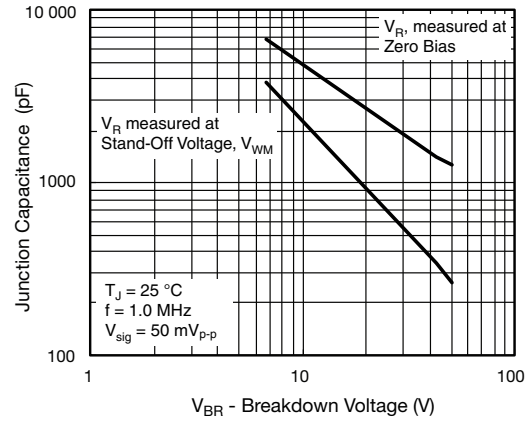


Fig. 4 - Typical Junction Capacitance

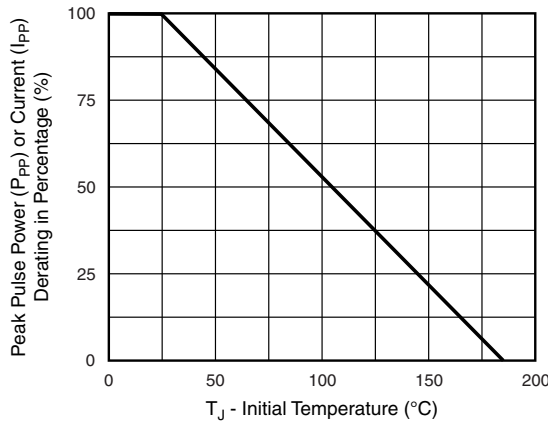


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

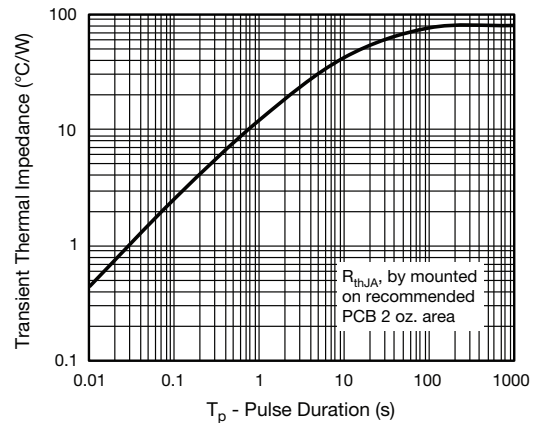


Fig. 5 - Typical Transient Thermal Impedance

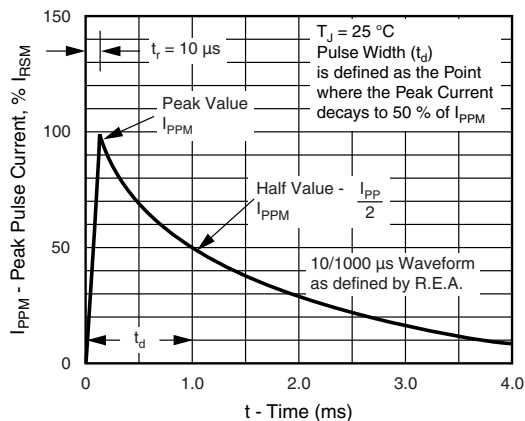
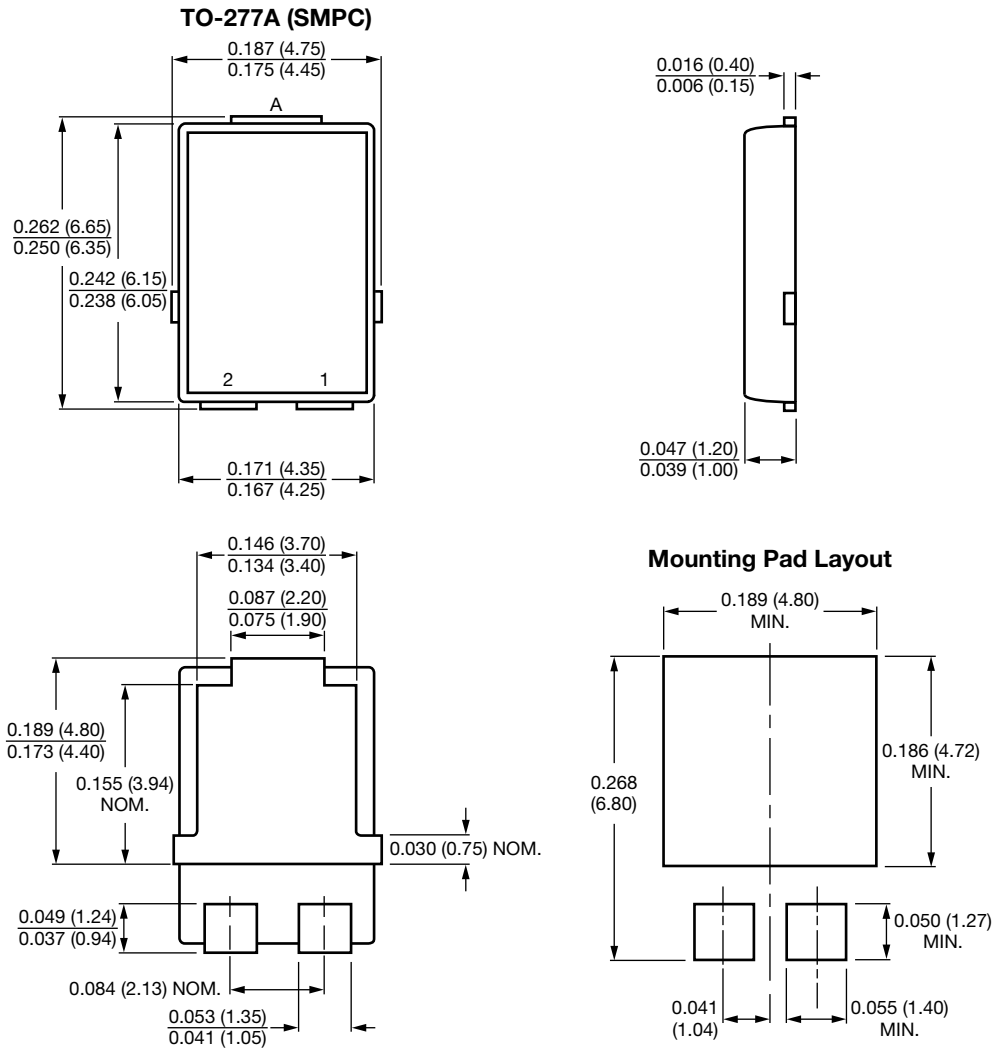


Fig. 3 - Pulse Waveform



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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