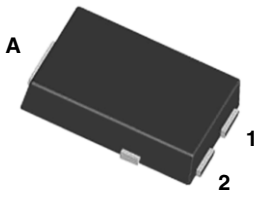
Surface Mount Automotive Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

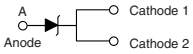
eSMP™ Series



Patented*

*Patent #'s
4,980,315
5,166,769
5,278,094

TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
V_{BR}	6.8 V to 43 V
P_{PPM}	1500 W
I_{FSM}	200 A
T_J max.	185 °C

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

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Uni-direction only
- Patented PAR® construction
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- Meets MSL level 1, per J-STD-020C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

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

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

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

HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse power dissipation with a 10/1000 µs waveform (1)(2) (Fig. 3)	P_{PPM}	1500	W
Peak power pulse current with a 10/1000 µs waveform (1) (Fig. 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	°C

Notes

(1) Non-repetitive current pulse, per Fig. 3 and derated above T_A = 25 °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 °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)**	**T_J = 150 °C MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (µA)**	**MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} [2] (A)**	**MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)**
		MIN.	**MAX.**						
TPC6.8	DDP	6.12	7.48	10.0	5.50	1500	10 000	139.0	10.8
TPC6.8A	DEP	6.45	7.14	10.0	5.80	1500	10 000	143.0	10.5
TPC7.5	DFP	6.75	8.25	10.0	6.05	500	5000	128.0	11.7
TPC7.5A	DGP	7.13	7.88	10.0	6.40	500	5000	133.0	11.3
TPC8.2	DHP	7.38	9.02	10.0	6.63	200	2000	120.0	12.5
TPC8.2A	DKP	7.79	8.61	10.0	7.02	200	2000	124.0	12.1
TPC9.1	DLP	8.19	10.0	1.0	7.37	50	500	109.0	13.8
TPC9.1A	DMP	8.65	9.55	1.0	7.78	50	500	112.0	13.4
TPC10	DNP	9.00	11.0	1.0	8.10	20	200	100.0	15.0
TPC10A	DPP	9.50	10.5	1.0	8.55	20	200	103.0	14.5
TPC11	DQP	9.90	12.1	1.0	8.92	5.0	50	92.6	16.2
TPC11A	DRP	10.5	11.6	1.0	9.40	5.0	50	96.2	15.6
TPC12	DSP	10.8	13.2	1.0	9.72	2.0	10	86.7	17.3
TPC12A	DTP	11.4	12.6	1.0	10.2	2.0	10	89.8	16.7
TPC13	DUP	11.7	14.3	1.0	10.5	2.0	10	78.9	19.0
TPC13A	DVP	12.4	13.7	1.0	11.1	2.0	10	82.4	18.2
TPC15	DWP	13.5	16.5	1.0	12.1	1.0	10	68.2	22.0
TPC15A	DXP	14.3	15.8	1.0	12.8	1.0	10	70.8	21.2
TPC16	DYP	14.4	17.6	1.0	12.9	1.0	10	63.8	23.5
TPC16A	DZP	15.2	16.8	1.0	13.6	1.0	10	66.7	22.5
TPC18	EDP	16.2	19.8	1.0	14.5	1.0	10	56.6	26.5
TPC18A	EEP	17.1	18.9	1.0	15.3	1.0	10	59.5	25.2
TPC20	EFP	18.0	22.0	1.0	16.2	1.0	10	51.5	29.1
TPC20A	EGP	19.0	21.0	1.0	17.1	1.0	10	54.2	27.7
TPC22	EHP	19.8	24.2	1.0	17.8	1.0	10	47.0	31.9
TPC22A	EKP	20.9	23.1	1.0	18.8	1.0	10	49.0	30.6
TPC24	ELP	21.6	26.4	1.0	19.4	1.0	10	43.2	34.7
TPC24A	EMP	22.8	25.2	1.0	20.5	1.0	10	45.2	33.2
TPC27	ENP	24.3	29.7	1.0	21.8	1.0	10	38.4	39.1
TPC27A	EPP	25.7	28.4	1.0	23.1	1.0	10	40.0	37.5
TPC30	EQP	27.0	33.0	1.0	24.3	1.0	10	34.5	43.5
TPC30A	ERP	28.5	31.5	1.0	25.6	1.0	10	36.2	41.4
TPC33	ESP	29.7	36.3	1.0	26.8	1.0	10	31.4	47.7
TPC33A	ETP	31.4	34.7	1.0	28.2	1.0	10	32.8	45.7
TPC36	EUP	32.4	39.6	1.0	29.1	1.0	15	28.8	52.0
TPC36A	EVP	34.2	37.8	1.0	30.8	1.0	15	30.1	49.9
TPC39	EWP	35.1	42.9	1.0	31.6	1.0	15	26.6	56.4
TPC39A	EXP	37.1	41.0	1.0	33.3	1.0	15	27.8	53.9
TPC43	EYP	38.7	47.3	1.0	34.8	1.0	20	24.2	61.9
TPC43A	EZP	40.9	45.2	1.0	36.8	1.0	20	25.3	59.3

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

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

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ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TPC10AHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
TPC10AHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
TPC10AHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
TPC10AHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

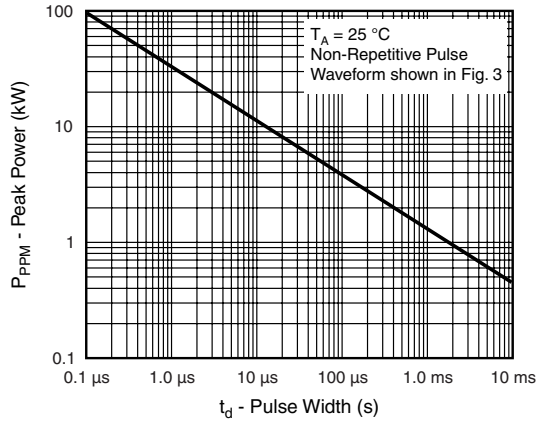


Figure 1. Peak Pulse Power Rating Curve

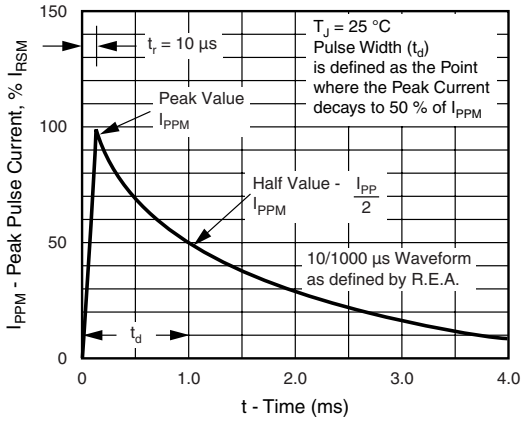


Figure 3. Pulse Waveform

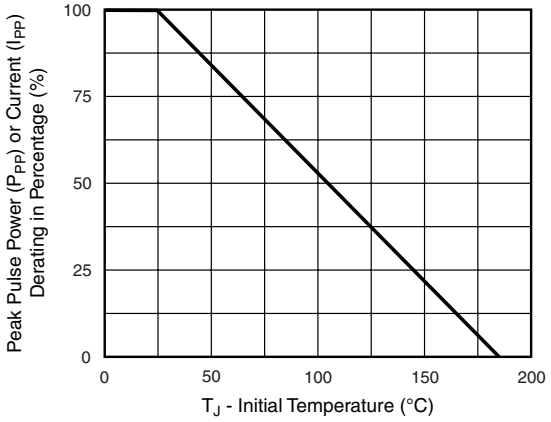


Figure 2. Pulse Power or Current vs. Initial Junction Temperature

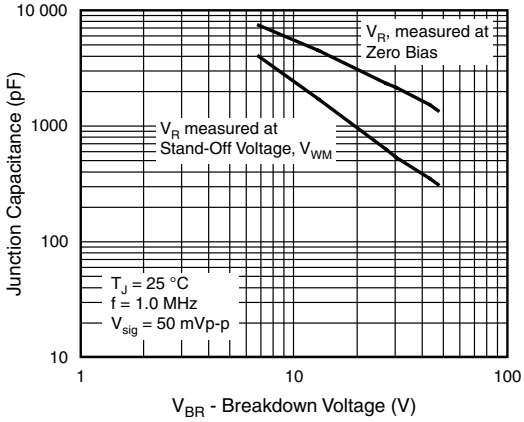
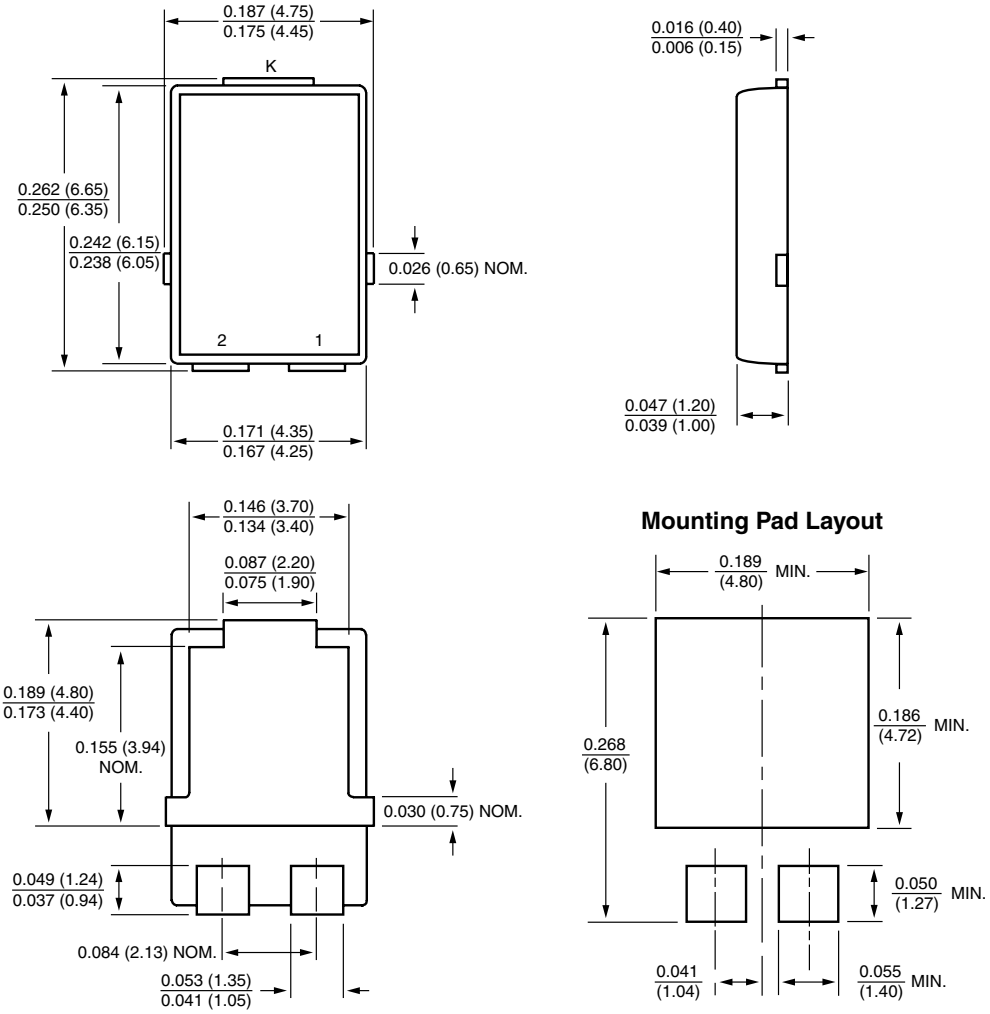


Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

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