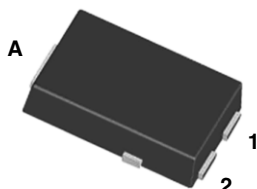


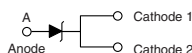
Surface Mount Automotive Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

eSMP™ Series



TO-277A (SMPC)



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

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 μ s waveform ⁽¹⁾⁽²⁾ (Fig. 3)	P_{PPM}	1500	W
Peak power pulse current with a 10/1000 μ s 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 μ s 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)	$T_J = 150\text{ }^{\circ}\text{C}$ 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

**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

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

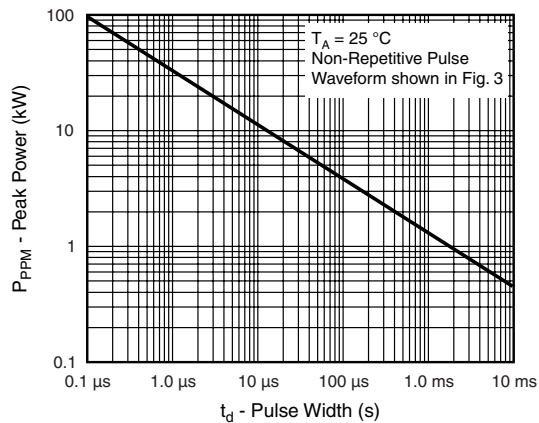


Figure 1. Peak Pulse Power Rating Curve

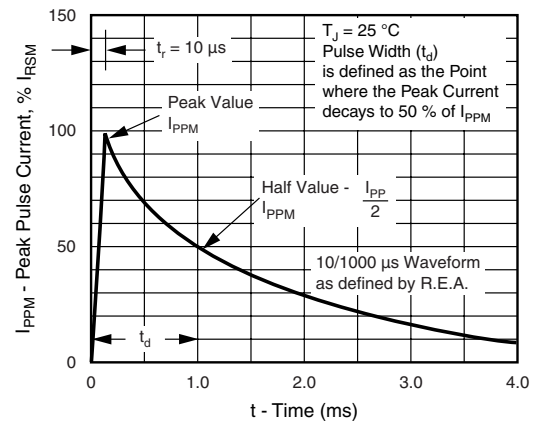


Figure 3. Pulse Waveform

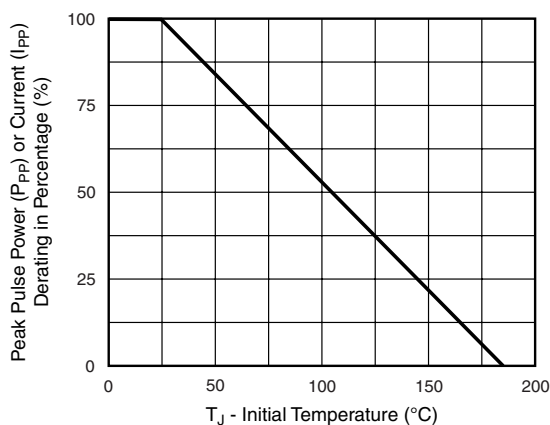


Figure 2. Pulse Power or Current vs. Initial Junction Temperature

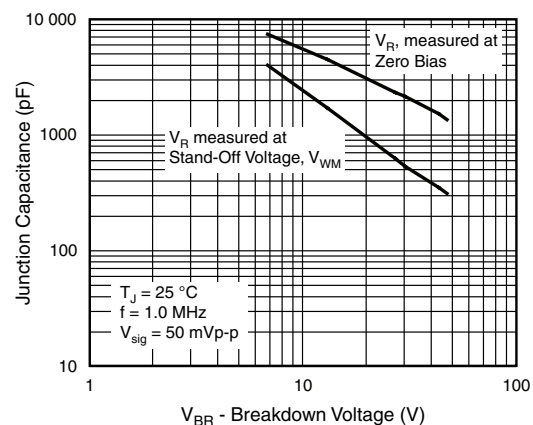
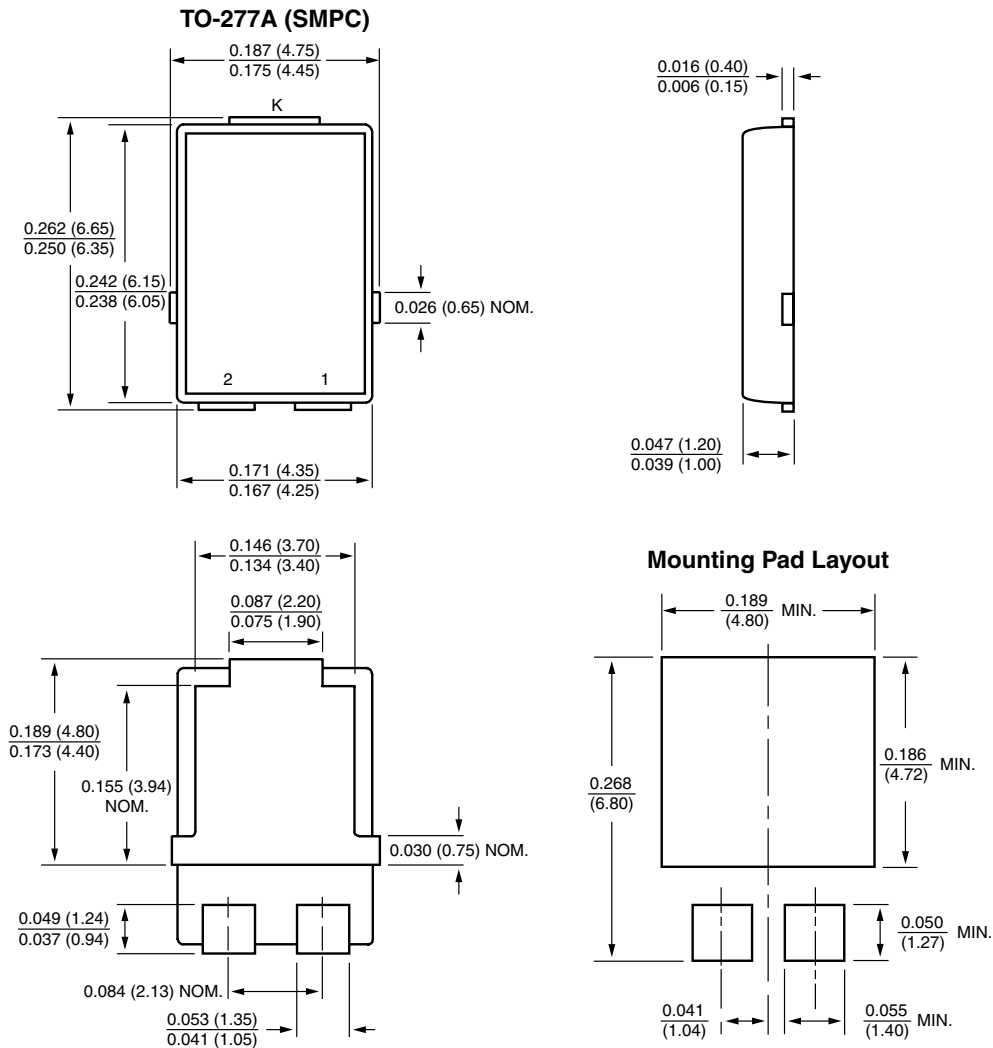


Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Conform to JEDEC TO-277A



Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.