

Surface Mount TRANSZORB® Transient Voltage Suppressors


DO-214AA (SMBJ-Bend)

FEATURES

- Low profile package
- Ideal for automated placement
- $\pm 3.5\%$, very tight V_{BR} tolerance
- Available in uni-directional
- 600 W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle): 0.01 %
- 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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFETs, signal lines of sensor units for consumer, computer, industrial, and telecommunication.

MECHANICAL DATA

Case: DO-214AA (SMBJ)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and industrial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 suffix meets JESD 201 class 2 whisker test

Polarity: for uni-directional types the band denotes cathode end

PRIMARY CHARACTERISTICS	
V_{BR} (uni-directional)	6.5 V to 228 V
V_{WM}	5.0 V to 188 V
P_{PPM}	600 W
P_D at $T_M = 50\text{ }^\circ\text{C}$	5.0 W
P_D at $T_A = 25\text{ }^\circ\text{C}$	1.0 W
T_J max.	150 °C
Polarity	Uni-directional
Package	DO-214AA (SMBJ)

MAXIMUM RATINGS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation	P_{PPM} ⁽¹⁾	600	W
Peak pulse current	I_{PPM} ⁽¹⁾	See next table	A
Power dissipation	P_D ⁽²⁾	5.0	W
	P_D ⁽³⁾	1.0	
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C

Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above $T_A = 25\text{ }^\circ\text{C}$ per fig. 2

(2) Power dissipation mounted on infinite heatsink

(3) Power dissipation mounted on minimum recommended pad layout

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

DEVICE TYPE MODIFIED "J" BEND LEAD	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V_{BR} AT I_T ⁽¹⁾ (V)		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (μA) ⁽³⁾	MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (A) ⁽²⁾	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)
		UNI	MIN.					
SMBJ5.0D	6AA	6.50	6.97	10	5.0	800	65.9	9.1
SMBJ6.0D	6AB	6.77	7.27	10	6.0	800	58.9	10.2
SMBJ6.5D	6AC	7.33	7.87	10	6.5	500	54.5	11.0
SMBJ7.0D	6AD	7.90	8.48	10	7.0	200	50.8	11.8
SMBJ7.5D	6AE	8.46	9.08	1.0	7.5	100	47.2	12.7
SMBJ8.0D	6AF	9.03	9.69	1.0	8.0	50	44.8	13.4
SMBJ8.5D	6AG	9.57	10.3	1.0	8.5	20	42.2	14.3
SMBJ9.0D	6AH	10.2	10.9	1.0	9.0	10	39.7	15.1
SMBJ10D	6AK	11.3	12.1	1.0	10	5.0	35.9	16.7
SMBJ11D	6AL	12.4	13.3	1.0	11	5.0	33.5	17.9
SMBJ12D	6AM	13.5	14.5	1.0	12	5.0	30.6	19.6
SMBJ13D	6AN	14.6	15.7	1.0	13	1.0	28.3	21.2
SMBJ14D	6AP	15.8	17.0	1.0	14	1.0	26.2	22.9
SMBJ15D	6AQ	17.0	18.2	1.0	15	1.0	25.0	24.0
SMBJ16D	6AR	18.1	19.4	1.0	16	1.0	23.4	25.6
SMBJ17D	6AS	19.2	20.6	1.0	17	1.0	22.1	27.2
SMBJ18D	6AT	20.3	21.8	1.0	18	1.0	20.8	28.8
SMBJ20D	6AU	22.5	24.2	1.0	20	1.0	18.8	32.0
SMBJ22D	6AV	24.8	26.6	1.0	22	1.0	17.1	35.1
SMBJ24D	6AW	27.1	29.1	1.0	24	1.0	15.6	38.4
SMBJ26D	6AX	29.3	31.5	1.0	26	1.0	14.5	41.6
SMBJ28D	6AY	31.6	33.9	1.0	28	1.0	13.4	44.7
SMBJ30D	6AZ	33.8	36.3	1.0	30	1.0	12.6	47.7
SMBJ33D	6BA	37.3	40.0	1.0	33	1.0	11.5	52.5
SMBJ36D	6BB	40.6	43.6	1.0	36	1.0	10.5	57.3
SMBJ40D	6BC	45.1	48.4	1.0	40	1.0	9.43	63.6
SMBJ43D	6BD	48.5	52.1	1.0	43	1.0	8.76	68.5
SMBJ45D	6BE	50.8	54.5	1.0	45	1.0	8.40	71.6
SMBJ48D	6BF	54.1	58.1	1.0	48	1.0	7.90	76.3
SMBJ51D	6BG	57.6	61.8	1.0	51	1.0	7.40	81.2
SMBJ54D	6BH	60.9	65.4	1.0	54	1.0	7.00	85.9
SMBJ58D	6BK	65.4	70.2	1.0	58	1.0	6.50	92.3
SMBJ60D	6BL	67.7	72.7	1.0	60	1.0	6.28	95.5
SMBJ64D	6BM	72.2	77.5	1.0	64	1.0	5.88	102
SMBJ70D	6BN	79.0	84.8	1.0	70	1.0	5.40	111
SMBJ75D	6BP	84.6	90.8	1.0	75	1.0	5.06	119
SMBJ78D	6BQ	88.1	94.4	1.0	78	1.0	4.86	124
SMBJ85D	6BR	95.7	103	1.0	85	1.0	4.46	135
SMBJ90D	6BS	102	109	1.0	90	1.0	4.17	144
SMBJ100D	6BT	113	121	1.0	100	1.0	3.77	159
SMBJ110D	6BU	124	133	1.0	110	1.0	3.45	174
SMBJ120D	6BV	135	145	1.0	120	1.0	3.15	190
SMBJ130D	6BW	146	157	1.0	130	1.0	2.94	206
SMBJ150D	6BX	170	182	1.0	150	1.0	2.53	239
SMBJ160D	6BY	181	194	1.0	160	1.0	2.34	256
SMBJ170D	6BZ	192	206	1.0	170	1.0	2.23	270
SMBJ188D	6CA	212	228	1.0	188	1.0	2.03	301

Notes

(1) Pulse test: $t_p \leq 50$ ms

(2) Surge current waveform per fig. 3 and derate per fig. 2

(3) All terms and symbols are consistent with ANSI/IEEE C62.35

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

PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to ambient	$R_{\theta JA}^{(1)}$	125	$^\circ\text{C}/\text{W}$
	$R_{\theta JA}^{(2)}$	100	
Typical thermal resistance, junction to mount	$R_{\theta JM}$	20	

Notes

(1) Mounted on minimum recommended pad layout
 (2) Mounted on 5.0 mm x 5.0 mm copper pad area

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMBJ5.0D-M3/H	0.096	H	750	7" diameter plastic tape and reel
SMBJ5.0D-M3/I	0.096	I	3200	13" diameter plastic tape and reel

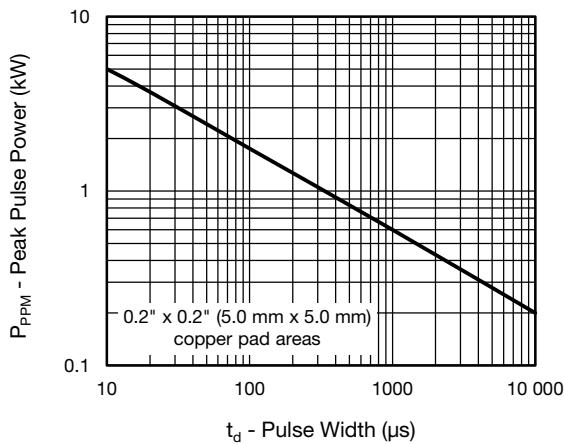
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Peak Pulse Power Rating Curve

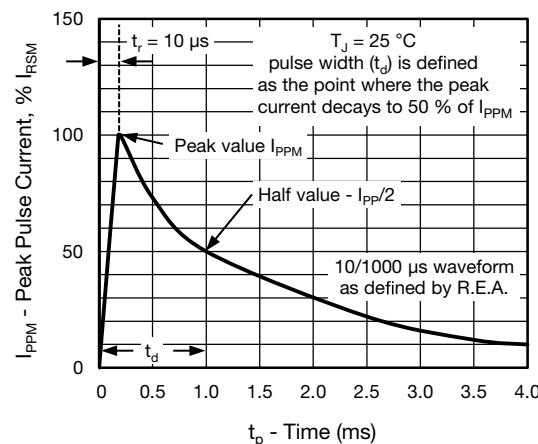


Fig. 3 - Pulse Waveform

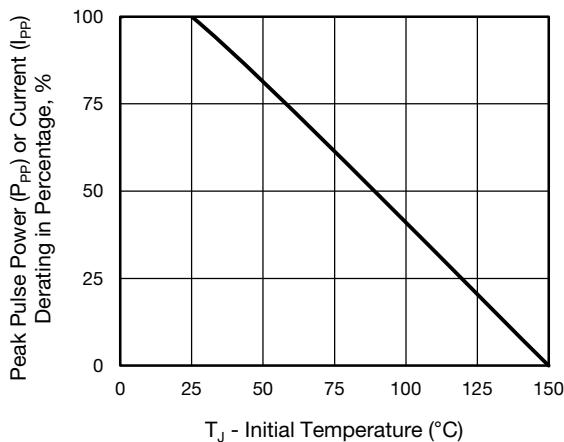


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

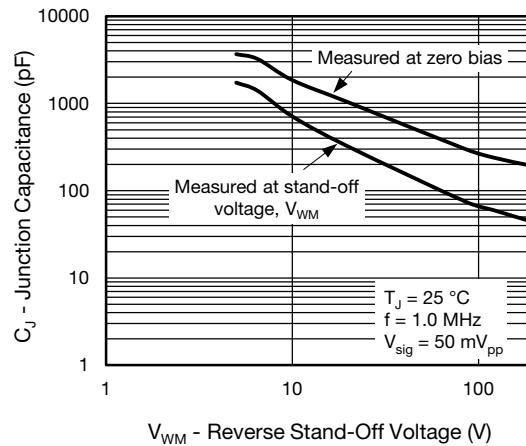


Fig. 4 - Typical Junction Capacitance

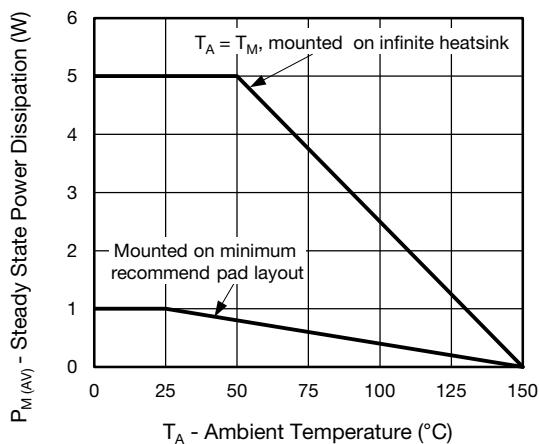


Fig. 5 - Power Dissipation Derating Curve

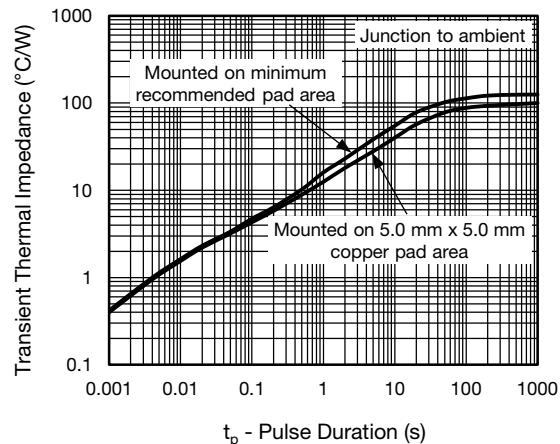


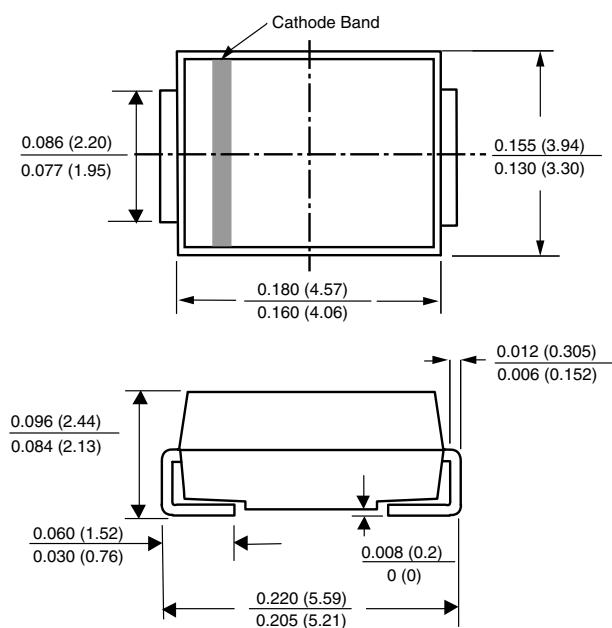
Fig. 6 - Typical Transient Thermal Impedance

Note

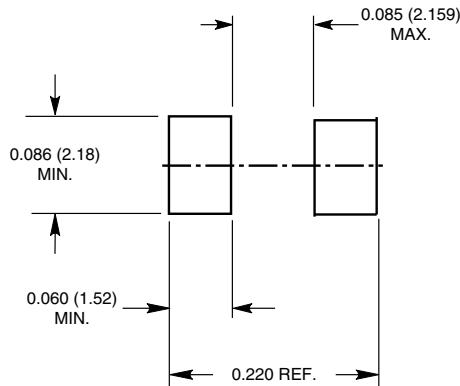
⁽¹⁾ Fig.1, 10 000 µs P_{ppm} is actual test for V_{WM} ≤ 60 V types, over 60 V types 10 000 µs P_{ppm} is curve extensional value as reference only

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB-J-Bend)



Mounting Pad Layout



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