

1.5SMB Series 1500W Transrariant Voltage Suppressor

Features:

- 1500W peak pulsepower capability at 10 x 1000 μ s waveform, repetition rate (duty cycle): 0.01%
- Glass Passivated chip junction
- For surface mounted applications to optimize board space
- Low profile package
- Built-in strain relief
- Low incremental surge resistance
- Excellent clamping capability
- Plastic package has UL flammability classification 94V-0
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- Typical IR less than 1uA above 12V
- High temperature soldering: 260°C/40 seconds at terminals
- IEC-61000-4-2 ESD 15KV(Air),8KV(Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2(IEC801-2)
- EFT protection of data lines in accordance with IEC61000-4-4(IEC801-4)

Description:

The 1.5SMB series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.



Applications:

TVS devices are ideal for the protection of I/O Interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Maximum Ratings and Electrical Characteristics

(TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at TA=25°C by 10x1000μs waveform (Fig.2)(Note 1) (Note 2)	P _{PPM}	1500	W
Power Dissipation on infinite heat sink at TA=50°C	P _D	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only(Note 3)	I _{FSM}	200	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional only	V _F	3.5V/5.0	V
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C
Typical Thermal Resistance Junction to Lead	R _{uJL}	10	°C/W
Typical Thermal Resistance Junction to Ambient	R _{uJA}	75	°C/W

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above TA=25°C per Fig. 2.
2. Mounted on copper pad area of 0.31x0.31" (8.0 x 8.0mm) to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Electrical Characteristics

PART NUMBER		REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE VBR(V)MAX. @IT		TEST CURRENT	REVERSE LEAKAGE @VRWM	PEAK PULSE CURRENT	MAXIMUM CLAMPING VOLTAGE @Ipp
BI- POLAR	UNI-POLAR	VRWM (V)	VBR MIN(V)	VBR MAX(V)	IT (mA)	IR (μA)	Ipp (A)	Vc (v)
1.5SMB5.0CA	1.5SMB5.0A	5.0	6.4	7.25	10	800	163.0	9.2
1.5SMB6.0CA	1.5SMB6.0A	6.0	6.67	7.67	10	800	145.6	10.3
1.5SMB 6.5CA	1.5SMB 6.5A	6.5	7.22	8.30	10	500	133.9	11.2
1.5SMB7.0 CA	1.5SMB7.0 A	7.0	7.78	8.95	10	200	125.0	12.0
1.5SMB 7.5CA	1.5SMB 7.5A	7.5	8.33	9.58	1	100	116.3	12.9
1.5SMB 8.0CA	1.5SMB 8.0A	8.0	8.89	10.23	1	50	110.3	13.6
1.5SMB8.5 CA	1.5SMB8.5 A	8.5	9.44	10.82	1	20	104.2	14.4
1.5SMB9.0 CA	1.5SMB9.0 A	9.0	10.00	11.50	1	10	97.4	15.4
1.5SMB10CA	1.5SMB10A	10.0	11.1	12.30	1	10	88.2	17.0
1.5SMB11CA	1.5SMB11A	11.0	12.20	14.00	1	1	82.4	18.2
1.5SMB12CA	1.5SMB12A	12.0	13.30	14.70	1	1	75.4	19.9
1.5SMB13CA	1.5SMB13A	13.0	14.40	16.50	1	1	69.8	21.5
1.5SMB14CA	1.5SMB14A	14.0	15.60	17.20	1	1	64.7	23.2
1.5SMB15CA	1.5SMB15A	15.0	16.70	19.20	1	1	61.5	24.4
1.5SMB16CA	1.5SMB16A	16.0	17.80	19.70	1	1	57.7	26.0
1.5SMB17CA	1.5SMB17A	17.0	18.90	21.70	1	1	54.3	27.6
1.5SMB18CA	1.5SMB18A	18.0	20.00	23.30	1	1	51.4	29.2
1.5SMB20CA	1.5SMB20A	20.0	22.20	25.50	1	1	46.3	32.4
1.5SMB22CA	1.5SMB22A	22.0	24.40	28.00	1	1	42.3	35.5
1.5SMB24CA	1.5SMB24A	24.0	26.70	30.70	1	1	38.6	38.9
1.5SMB26CA	1.5SMB26A	26.0	28.90	33.20	1	1	35.6	42.1
1.5SMB28CA	1.5SMB28A	28.0	31.10	35.80	1	1	33.0	45.4
1.5SMB30CA	1.5SMB30Adf	30.0	33.30	38.30	1	1	31.0	48.4
1.5SMB33CA	1.5SMB33A	33.0	36.70	42.20	1	1	28.1	53.3
1.5SMB36CA	1.5SMB36A	36.0	40.00	46.00	1	1	25.8	58.1
1.5SMB40CA	1.5SMB40A	40.0	44.40	51.10	1	1	23.3	64.5
1.5SMB43CA	1.5SMB43A	43.0	47.8	52.8	1	1	21.6	69.4
1.5SMB45CA	1.5SMB45A	45.0	50.00	57.50	1	1	20.6	72.7
1.5SMB48CA	1.5SMB48A	48.0	53.30	58.90	1	1	19.4	77.4
1.5SMB51CA	1.5SMB51A	51.0	56.70	65.20	1	1	18.2	82.4
1.5SMB54CA	1.5SMB54A	54.0	60.00	69.00	1	1	17.2	87.1

Electrical Characteristics

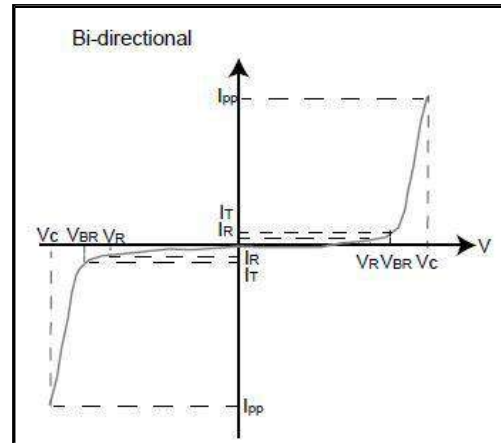
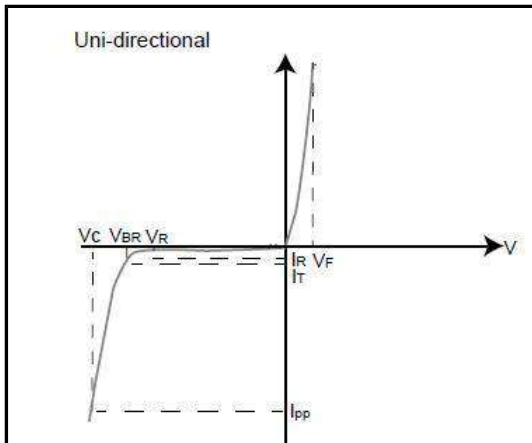
PART NUMBER		REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE VBR(V)MAX. @IT		TEST CURRENT	REVERSE LEAKAGE @VRWM	PEAK PULSE CURRENT	MAXIMUM CLAMPING VOLTAGE @Ipp
BI- POLAR	UNI-POLAR	VRWM (V)	VBR MIN(V)	VBR MAX(V)	IT (mA)	IR (μA)	Ipp (A)	Vc (v)
1.5SMB58CA	1.5SMB58A	58.0	64.4	71.2	1	1	16.0	93.6
1.5SMB60CA	1.5SMB60A	60.0	66.7	73.7	1	1	15.5	96.8
1.5SMB64CA	1.5SMB64A	64.0	71.10	81.80	1	1	14.6	103.0
1.5SMB70CA	1.5SMB70A	70.0	77.8	95.1	1	1	13.3	113.0
1.5SMB75CA	1.5SMB75A	75.0	83.3	92.1	1	1	12.4	121.0
1.5SMB78CA	1.5SMB78A	78.0	86.70	99.70	1	1	11.9	126.0
1.5SMB85CA	1.5SMB85A	85.0	94.40	108.20	1	1	10.9	137.0
1.5SMB90CA	1.5SMB90A	90.0	100.0	111.0	1	1	10.3	146.0
1.5SMB100CA	1.5SMB100A	100.0	111.00	123.00	1	1	9.3	162.0
1.5SMB110CA	1.5SMB110A	110.0	122.00	135.00	1	1	8.5	177.0
1.5SMB120CA	1.5SMB120A	110.0	133.00	147.00	1	1	7.8	193.0
1.5SMB130CA	1.5SMB110A	130.0	144.00	159.00	1	1	7.2	209.0
1.5SMB150CA	1.5SMB150A	150.0	167.00	185.00	1	1	6.2	243.0
1.5SMB160CA	1.5SMB160A	160.0	178.00	197.00	1	1	5.8	259.0
1.5SMB170CA	1.5SMB170A	170.0	189.00	209.00	1	1	5.5	275.0
1.5SMB180CA	1.5SMB180A	180.0	201.00	222.0	1	1	5.1	292.0
1.5SMB190CA	1.5SMB190A	190.0	211.00	233.00	1	1	4.9	308.0
1.5SMB200CA	1.5SMB200A	200.0	224.0	247.00	1	1	4.6	324.0
1.5SMB210CA	1.5SMB220A	210.0	237.00	263.00	1	1	4.2	356.0
1.5SMB220CA	1.5SMB220A	220.0	246.00	272.00	1	1	4.2	356.0
1.5SMB250CA	1.5SMB250A	250.0	279.00	309.00	1	1	3.7	405.0
1.5SMB300CA	1.5SMB300A	300.0	335.0	371.00	1	1	3.1	486.0
1.5SMB350CA	1.5SMB350A	350.0	391.00	432.00	1	1	2.6	567.0
1.5SMB400CA	1.5SMB400A	400.0	447.00	494.00	1	1	2.3	648.0
1.5SMB440CA	1.5SMB440A	440.0	492.00	543.00	1	1	2.1	713.0

Notes:

For bidirectional type having VRWM of 10 volts and less, the IR limit is double.

For parts without A (VBR is $\pm 10\%$ and VC is 5% higher than A parts)

I-V Curve Characteristics



RATINGS AND CHARACTERISTIC CURVES (TA=25°C unless otherwise noted)

Figure 1 - Peak Pulse Power Rating Curve

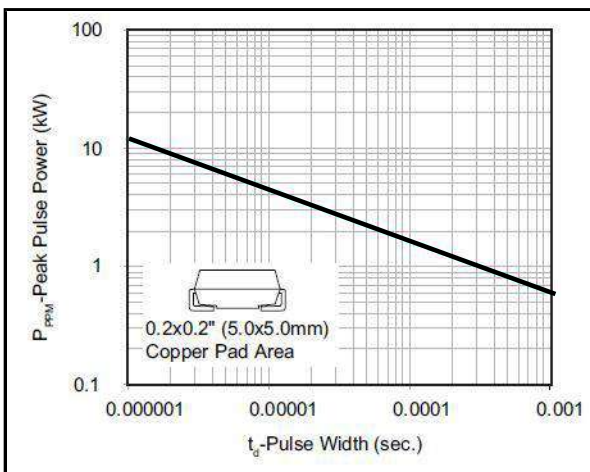


Figure 2 - Pulse Derating Curve

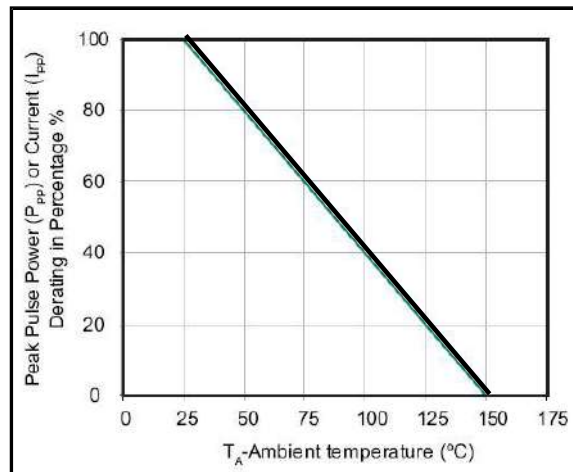


Figure 3 - Pulse Waveform

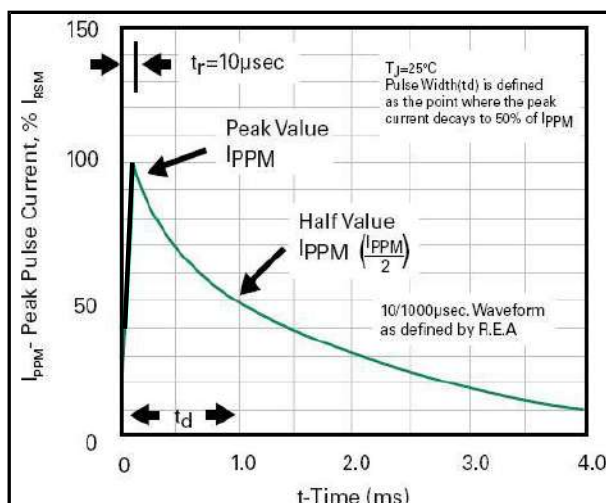


Figure 4 - Typical Junction Capacitance

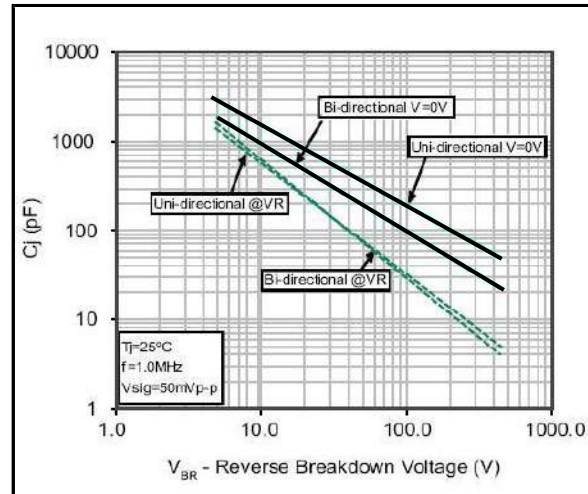


Figure 5 - Steady State Power Dissipation Derating Curve

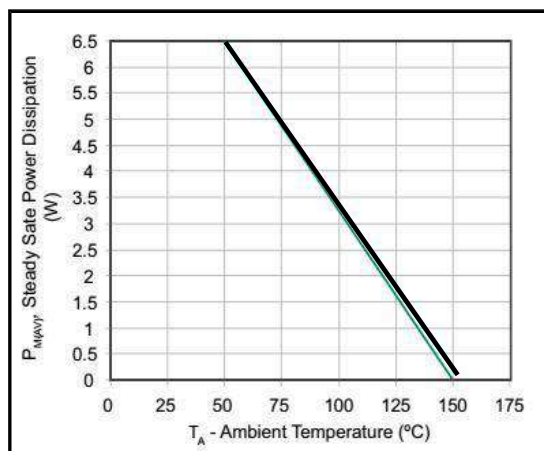
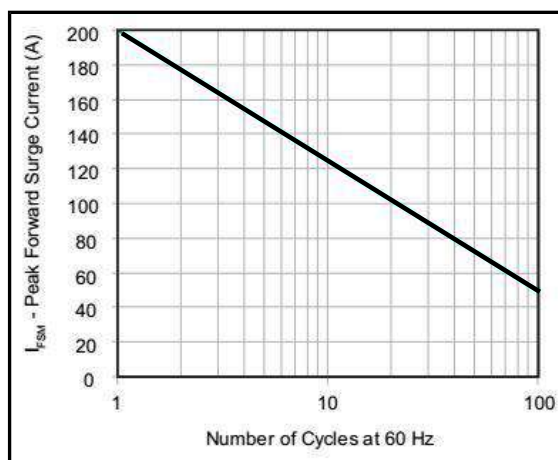


Figure 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



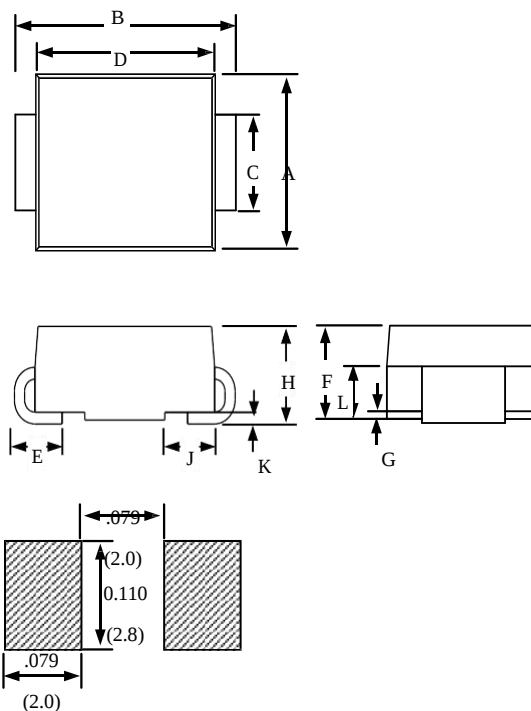
PART NUMBERING SYSTEM

1.5SMB XXX C A
 (1) (2) (3) (4)

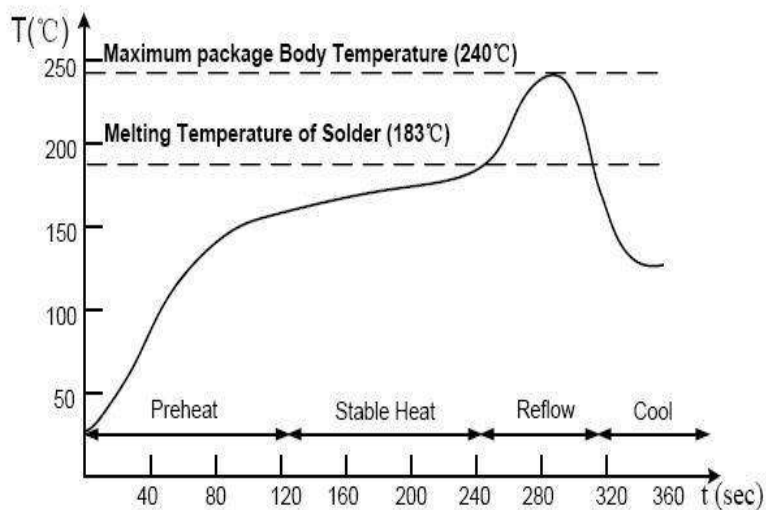
- (1) SERIES.
- (2) VR VOLTAGE.
- (3) BI-DIRECTIONAL AND UNI-DIRECTIONAL.
- (4) 5% VOLTAGE TOLERANCE.

PRODUCT DIMENSIONS

Dimension	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.134	0.155	3.40	3.94
B	0.205	0.22	5.21	5.59
C	0.075	0.083	1.90	2.11
D	0.166	0.185	4.22	4.70
E	0.036	0.056	0.91	1.42
F	0.073	0.087	1.85	2.2
G	0.002	0.008	0.05	0.20
H	0.077	0.094	1.95	2.45
J	0.043	0.053	1.09	1.35
K	0.008	0.014	0.20	0.35
L	0.039	0.049	0.99	1.24



SOLDER REFLOW RECOMMENDATIONS



- Recommended reflow methods: IR, vapor phase oven, hot air oven, wave solder.
- The device can be exposed to a maximum temperature of 265°C for 10 seconds.
- Devices can be cleaned using standard industry methods and solvents.

Notes: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

SUMMARY OF PACKING OPTIONS

Package Type	Description	Packing Quantity	Industry Standard
DO-214AA(SMB) 	Embossed Carrier Reel Pack	3000PCS	EIA-481-D