2.0SMBJ Series

2000W Transient Voltage Suppressor

Description

The 2.0SMBJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

- Glass passivated or planar junction
- Excellent clamping capability
- Repetition rate (duty cycle): 0.01%
- Low profile package and low inductance
- 2000W Peak Pulse power capability at 10×1000μs waveform.
- Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- High temperature soldering: 260℃/10s at terminals.
- For surface mounted applications in order to optimize board space.

Mechanical Characteristics

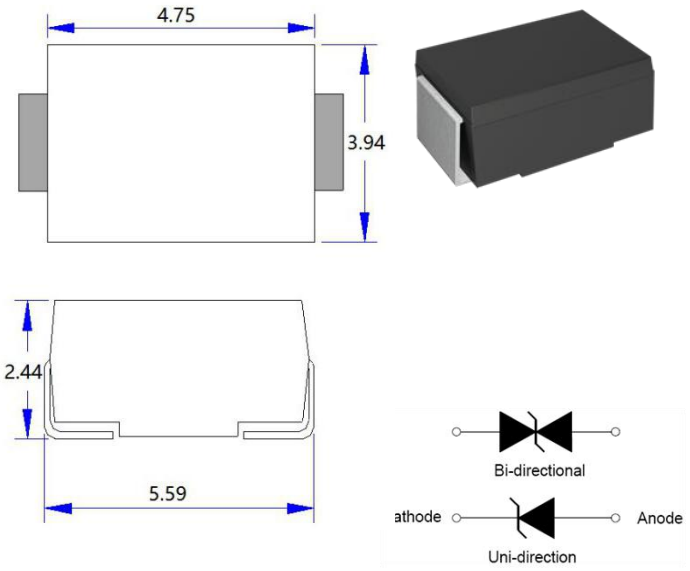
Package: SMB/DO-214AA

- Case Material: “Green” Molding Compound.
- Polarity: Color band denotes cathode except bi-directional models
- Standard Packaging: 12mm tape (EIA STD RS-481)
- Weight: 0.10g
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- I/O Interface.
- AC/DC Power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

Dimensions & Symbol（Unit: mm Max）



Ordering information

Out line	Reel (pcs)	Per carton (pcs)	Reel diameters (mm)
Taping	3K	48K	330

Electrical characteristics (T_A=25℃)

Part Number and Marking		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Bi-Polar	Uni-Polar	V	μA	min(V)	max(V)	mA	max(V)	A
2.0SMBJ5.0CA	2.0SMBJ5.0A	5.0	800	6.40	7.25	10	9.2	217.39
2.0SMBJ6.0CA	2.0SMBJ6.0A	6.0	800	6.67	7.67	10	10.3	194.17
2.0SMBJ 6.5CA	2.0SMBJ 6.5A	6.5	500	7.22	8.30	10	11.2	178.57
2.0SMBJ7.0 CA	2.0SMBJ7.0A	7.0	200	7.78	8.95	10	12.0	166.67
2.0SMBJ 7.5CA	2.0SMBJ 7.5A	7.5	100	8.33	9.58	1	12.9	155.04
2.0SMBJ 8.0CA	2.0SMBJ 8.0A	8.0	50	8.89	10.23	1	13.6	147.06
2.0SMBJ8.5 CA	2.0SMBJ8.5A	8.5	20	9.44	10.82	1	14.4	138.89
2.0SMBJ9.0 CA	2.0SMBJ9.0A	9.0	10	10.0	11.50	1	15.4	129.87
2.0SMBJ10CA	2.0SMBJ10A	10	10	11.10	12.30	1	17.0	117.65
2.0SMBJ11CA	2.0SMBJ11A	11	1	12.20	14.00	1	18.2	109.89
2.0SMBJ12CA	2.0SMBJ12A	12	1	13.30	14.70	1	19.9	100.50
2.0SMBJ13CA	2.0SMBJ13A	13	1	14.40	16.50	1	21.5	93.02
2.0SMBJ14CA	2.0SMBJ14A	14	1	15.60	17.20	1	23.2	86.21
2.0SMBJ15CA	2.0SMBJ15A	15	1	16.70	19.20	1	24.4	81.97
2.0SMBJ16CA	2.0SMBJ16A	16	1	17.80	19.70	1	26.0	76.92
2.0SMBJ17CA	2.0SMBJ17A	17	1	18.90	21.70	1	27.6	72.46
2.0SMBJ18CA	2.0SMBJ18A	18	1	20.00	23.30	1	29.2	68.49
2.0SMBJ20CA	2.0SMBJ20A	20	1	22.20	25.50	1	32.4	61.73
2.0SMBJ22CA	2.0SMBJ22A	22	1	24.40	28.0	1	35.5	56.34
2.0SMBJ24CA	2.0SMBJ24A	24	1	26.70	30.70	1	38.9	51.41
2.0SMBJ26CA	2.0SMBJ26A	26	1	28.90	33.20	1	42.1	47.51
2.0SMBJ28CA	2.0SMBJ28A	28	1	31.10	35.80	1	45.4	44.05
2.0SMBJ30CA	2.0SMBJ30	30	1	33.30	38.30	1	48.4	41.32
2.0SMBJ33CA	2.0SMBJ33A	33	1	36.70	42.20	1	53.3	37.52
2.0SMBJ36CA	2.0SMBJ36A	36	1	40.00	46.00	1	58.1	34.42
2.0SMBJ40CA	2.0SMBJ40A	40	1	44.40	51.10	1	64.5	31.01
2.0SMBJ43CA	2.0SMBJ43A	43	1	47.80	52.80	1	69.4	28.82
2.0SMBJ45CA	2.0SMBJ45A	45	1	50.00	57.50	1	72.7	27.51
2.0SMBJ48CA	2.0SMBJ48A	48	1	53.30	58.90	1	77.4	25.84

Electrical characteristics (T_A=25℃, continued)

Part Number and Marking		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	V	μA	min(V)	max(V)	mA	max(V)	A
2.0SMBJ51CA	2.0SMBJ51A	51	1	56.70	65.20	1	82.4	24.27
2.0SMBJ54CA	2.0SMBJ54A	54	1	60.00	69.00	1	87.1	22.96
2.0SMBJ58CA	2.0SMBJ58A	58	1	64.40	71.20	1	93.6	21.37
2.0SMBJ60CA	2.0SMBJ60A	60	1	66.70	73.70	1	96.8	20.66
2.0SMBJ64CA	2.0SMBJ64A	64	1	71.10	81.80	1	103.0	19.42
2.0SMBJ70CA	2.0SMBJ70A	70	1	77.80	95.10	1	113.0	17.70
2.0SMBJ75CA	2.0SMBJ75A	75	1	83.30	92.10	1	121.0	16.53
2.0SMBJ78CA	2.0SMBJ78A	78	1	86.70	99.70	1	126.0	15.87
2.0SMBJ85CA	2.0SMBJ85A	85	1	94.40	108.20	1	137.0	14.60
2.0SMBJ90CA	2.0SMBJ90A	90	1	100.00	111.00	1	146.0	13.70
2.0SMBJ100CA	2.0SMBJ100A	100	1	111.00	123.00	1	162.0	12.35
2.0SMBJ110CA	2.0SMBJ110A	110	1	122.00	135.00	1	177.0	11.30
2.0SMBJ120CA	2.0SMBJ120A	120	1	133.00	147.00	1	193.0	10.36
2.0SMBJ130CA	2.0SMBJ110A	130	1	144.00	159.00	1	209.0	9.57
2.0SMBJ150CA	2.0SMBJ150A	150	1	167.00	185.00	1	243.0	8.23
2.0SMBJ160CA	2.0SMBJ160A	160	1	178.00	197.00	1	259.0	7.72
2.0SMBJ170CA	2.0SMBJ170A	170	1	189.00	209.00	1	275.0	7.27
2.0SMBJ180CA	2.0SMBJ180A	180	1	201.00	222.00	1	292.0	6.85
2.0SMBJ190CA	2.0SMBJ190A	190	1	211.00	233.00	1	308.0	6.49

① Surge waveform: 10/1000μs

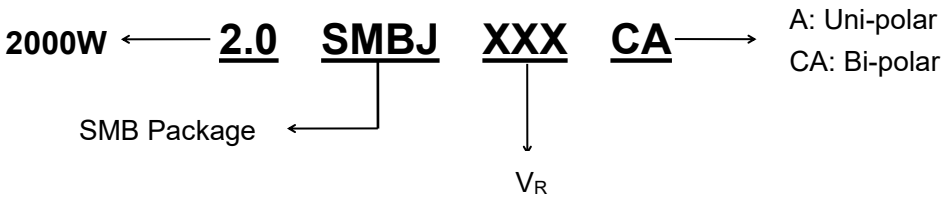
V_R ： Stand-off Voltage -- Maximum voltage that can be applied

V_{BR}： Breakdown Voltage

V_C：Clamping Voltage -- Peak voltage measured across the suppressor at a specified Ipp

I_R： Reverse Leakage Current

Part number code



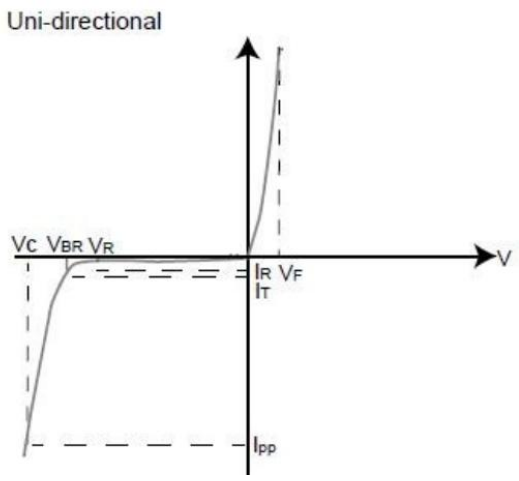
Absolute maximum ratings (T_A=25ºC, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage temperature range	T_{stg}	-55 to +150	℃
Operating junction temperature range	T_j	-55 to +150	℃
Power Dissipation on infinite heat sink at TA=50℃	P_D	6.5	W
Peak Pulse Power Dissipation at TA=25℃ by 10x1000μs waveform(Fig.3)(Note 1) (Note 2)	P_{PP}	2000	W
Maximum Instantaneous Forward Voltage at 50A for Unidirectional	V_F	5.0	V
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only(Note 3)	I_{FSM}	300	A

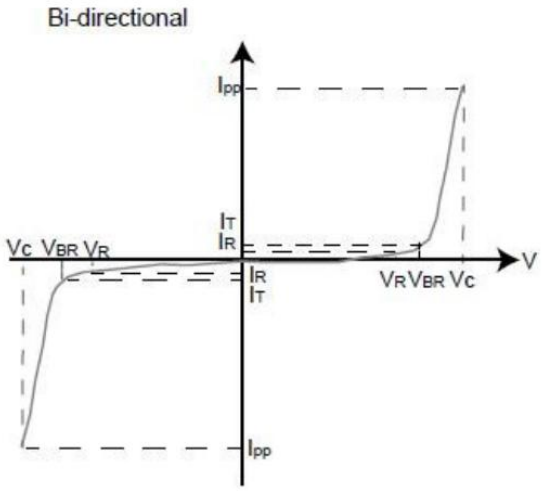
Notes:

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

Ratings and V-I characteristics curves (T_A=25ºC, unless otherwise noted)



I-V Curve Characteristics uni-polar



I-V Curve Characteristics bi-polar

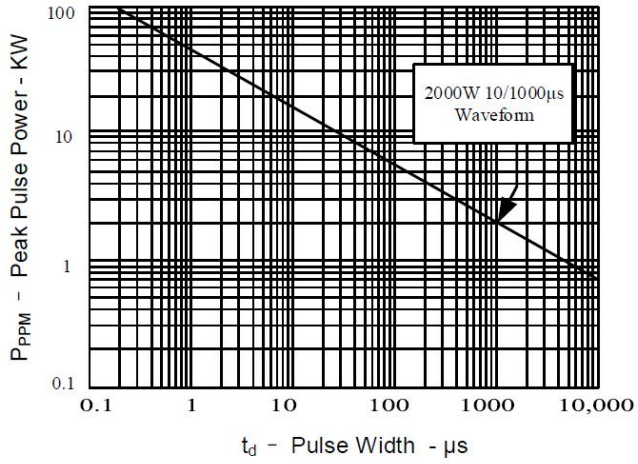


Figure 1 - Peak Pulse Power Rating Curve

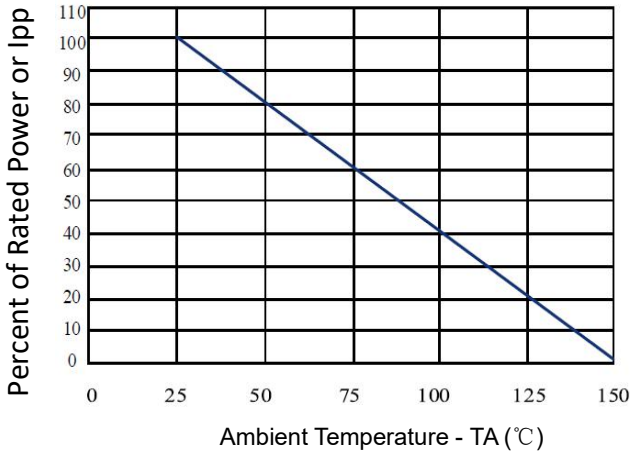


Figure 2: Pulse Derating Curve

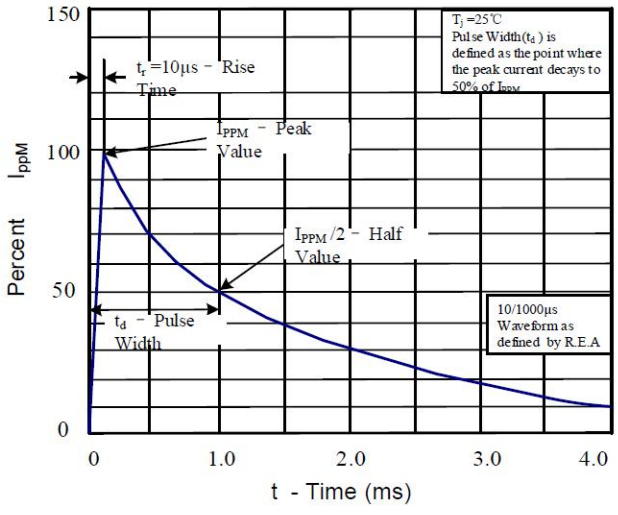


Figure 3: Pulse waveform

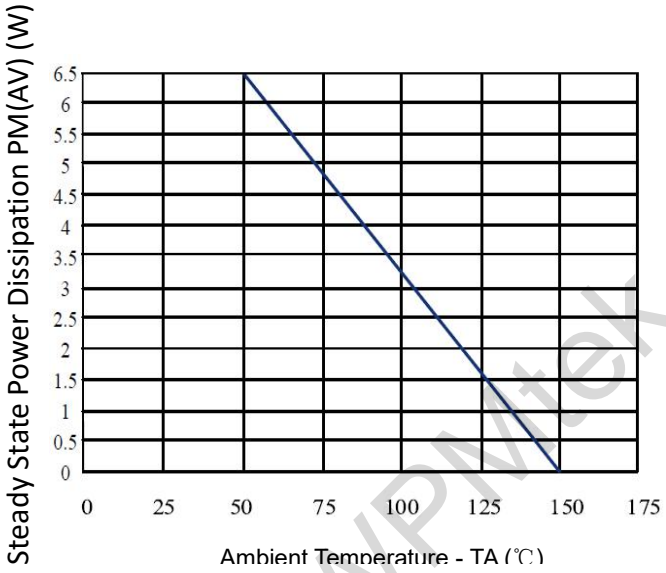
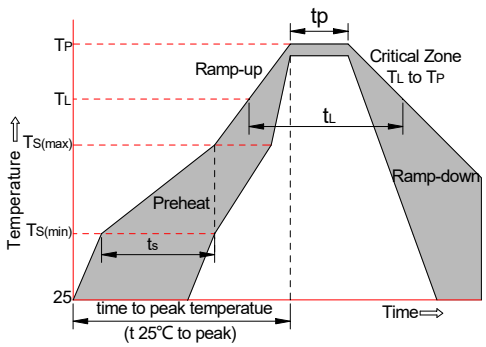


Figure 4: Steady State Power Dissipation Derating Curve

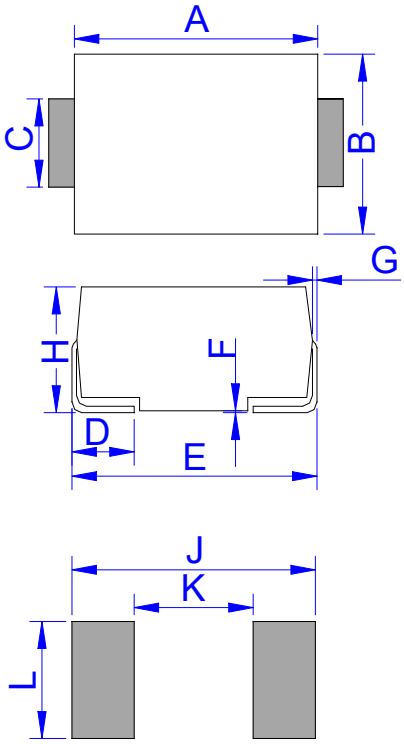
Soldering parameters

Reflow Condition		Pb-Free assembly (see FIG.5)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG.5: Reflow condition



Package mechanical data



DO-214AA (SMB)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.22	4.75	0.166	0.187
B	3.30	3.94	0.130	0.155
C	1.85	2.21	0.073	0.087
D	0.76	1.52	0.030	0.060
E	5.08	5.59	0.200	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	1.95	2.44	0.077	0.096
J	6.80		0.270	
K		2.60		0.100
L	2.40		0.090	

Tape & reel specification - SMB

Ref.	Dimensions	
	Millimeters	Inches
A	3.76 ± 0.2	0.144 ± 0.012
B	5.69 ± 0.2	0.244 ± 0.012
d	1.5 ± 0.25	0.059 ± 0.004
D	330.0	13.0
D2	13 ± 1	0.512 ± 0.039
E	1.75 ± 0.2	0.059 ± 0.008
F	5.5 ± 0.1	0.222 ± 0.008
P	8.0 ± 0.2	0.315 ± 0.008
P0	4.0 ± 0.2	0.157 ± 0.008
P1	2.0 ± 0.2	0.079 ± 0.008
W	12.0 ± 0.3	0.472 ± 0.008
W1	16.8 ± 2.0	0.661 ± 0.079