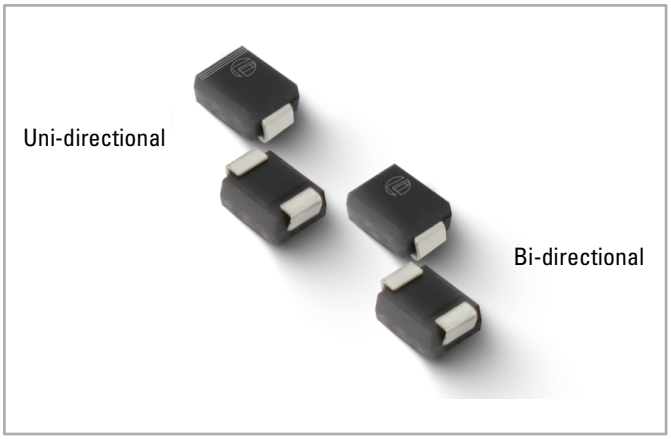
1.0SMB Series
Surface Mount – 1000W

HF RoHS Pb e3



Additional Information

Resources | Accessories | Samples

Maximum Ratings and Thermal Characteristics

(T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000μs Waveform(Fig.1)(Note 1)(Note 2) -Single Die Parts	P_{PPM}	1000	W
Power Dissipation on Infinite Heat Sink at T_L=50℃	P_D	5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	100	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V_F	3.5	V
Operating Temperature Range	T_J	-55 to 150	℃
Storage Temperature Range	T_{STG}	-55 to 150	℃
Typical Thermal Resistance Junction to Lead	$R_{\Theta JL}$	20	℃/W
Typical Thermal Resistance Junction to Ambient	$R_{\Theta JA}$	100	℃/W

Notes:

1. Non-repetitive current pulse , per Fig.3 and derated above T_J (initial) =25℃ per Fig. 2
2. Mounted on copper pad area of 0.2x0.2" (5.0 x 5.0mm) 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.

Description

The 1.0SMB series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

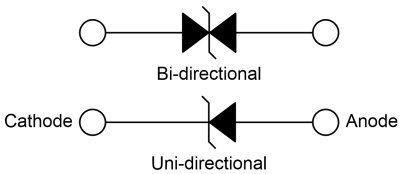
Features

- 1000W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Low incremental surge resistance
- Typical I_R less than 1μA when V_B min>12V
- Optimized surface mount footprint for minimal PCB space impact
- Low profile package
- Typical failure mode due to exceeding maximum ratings is a short circuit condition
- Whisker test conducted based on Table 4a and 4c of JEDEC JESD201A
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC61000-4-4
- Built-in strain relief
- Fast response time: typically less than 1.0psfrom 0V to V_B min
- High temperature to reflow soldering guaranteed: 260℃/20~40sec.
- V_B @ T_J= V_B@25℃x (1+ α T x (T_J - 25)) (α T:Temperature Coefficient, typical value is 0.1%)
- Meet MSL level1, per J-STD-020, LF maximum peak of 260℃
- Matte tin lead–free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD 609A.01)

Applications

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

Functional Diagram



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Surface Mount – 1000W

Electrical Characteristics (T_A=25℃ unless otherwise noted)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I_T		Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_R
Uni.	Bi.	Uni.	Bi.	V_R(V)	$V_{B\ Min.}$(V)	$V_{B\ Max.}$(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
1.0SMB6.8A	1.0SMB6.8CA	6V8A•	6V8C•	5.80	6.45	7.14	10	10.5	96.8	1000
1.0SMB7.5A	1.0SMB7.5CA	7V5A•	7V5C•	6.40	7.13	7.88	10	11.3	90.0	500
1.0SMB8.2A	1.0SMB8.2CA	8V2A•	8V2C•	7.02	7.79	8.61	10	12.1	84.0	200
1.0SMB9.1A	1.0SMB9.1CA	9V1A•	9V1C•	7.78	8.65	9.55	1	13.4	75.8	50
1.0SMB10A	1.0SMB10CA	10A•	10C•	8.55	9.50	10.50	1	14.5	70.2	10
1.0SMB11A	1.0SMB11CA	11A•	11C•	9.40	10.50	11.60	1	15.6	65.2	5
1.0SMB12A	1.0SMB12CA	12A•	12C•	10.20	11.40	12.60	1	16.7	60.8	5
1.0SMB13A	1.0SMB13CA	13A•	13C•	11.10	12.40	13.70	1	18.2	55.8	1
1.0SMB15A	1.0SMB15CA	15A•	15C•	12.80	14.30	15.80	1	21.2	48.0	1
1.0SMB16A	1.0SMB16CA	16A•	16C•	13.60	15.20	16.80	1	22.5	45.2	1
1.0SMB18A	1.0SMB18CA	18A•	18C•	15.30	17.10	18.90	1	25.2	40.3	1
1.0SMB20A	1.0SMB20CA	20A•	20C•	17.10	19.00	21.00	1	27.7	36.7	1
1.0SMB22A	1.0SMB22CA	22A•	22C•	18.80	20.90	23.10	1	30.6	33.2	1
1.0SMB24A	1.0SMB24CA	24A•	24C•	20.50	22.80	25.20	1	33.2	30.7	1
1.0SMB27A	1.0SMB27CA	27A•	27C•	23.10	25.70	28.40	1	37.5	27.2	1
1.0SMB30A	1.0SMB30CA	30A•	30C•	25.60	28.50	31.50	1	41.4	24.5	1
1.0SMB33A	1.0SMB33CA	33A•	33C•	28.20	31.40	34.70	1	45.7	22.2	1
1.0SMB36A	1.0SMB36CA	36A•	36C•	30.80	34.20	37.80	1	49.9	20.3	1
1.0SMB39A	1.0SMB39CA	39A•	39C•	33.30	37.10	41.00	1	53.9	18.8	1
1.0SMB43A	1.0SMB43CA	43A•	43C•	36.80	40.90	45.20	1	59.3	17.2	1
1.0SMB47A	1.0SMB47CA	47A•	47C•	40.20	44.70	49.40	1	64.8	15.7	1
1.0SMB51A	1.0SMB51CA	51A•	51C•	43.60	48.50	53.60	1	70.1	14.5	1
1.0SMB56A	1.0SMB56CA	56A•	56C•	47.80	53.20	58.80	1	77.0	13.2	1
1.0SMB62A	1.0SMB62CA	62A•	62C•	53.00	58.90	65.10	1	85.0	12.0	1
1.0SMB68A	1.0SMB68CA	68A•	68C•	58.10	64.60	71.40	1	92.0	11.0	1

Notes:
For bidirectional type having V_R of 10 volts and less, the I_R limit is double.

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Ratings and Characteristic Curves (T_A=25℃ unless otherwise noted)

Figure 1:
Peak Pulse Power Rating Curve

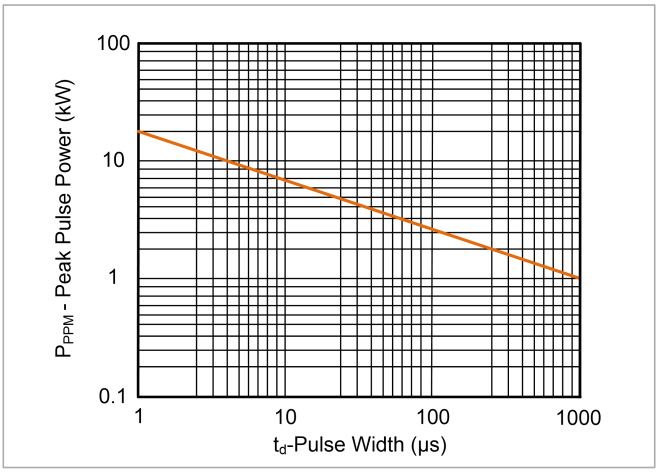


Figure 2:
Pulse Derating Curve

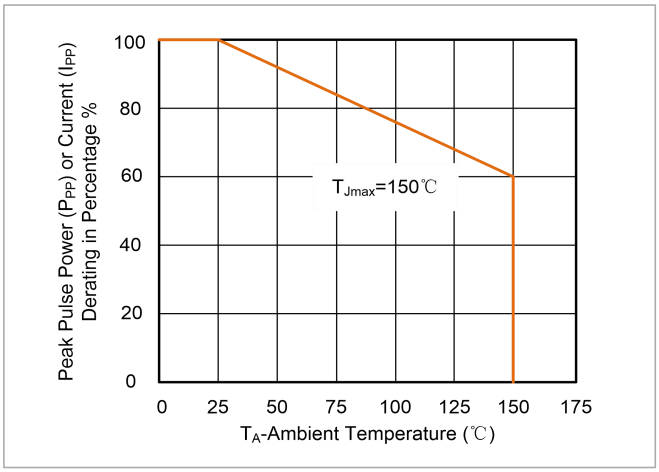


Figure 3:
Pulse Waveform

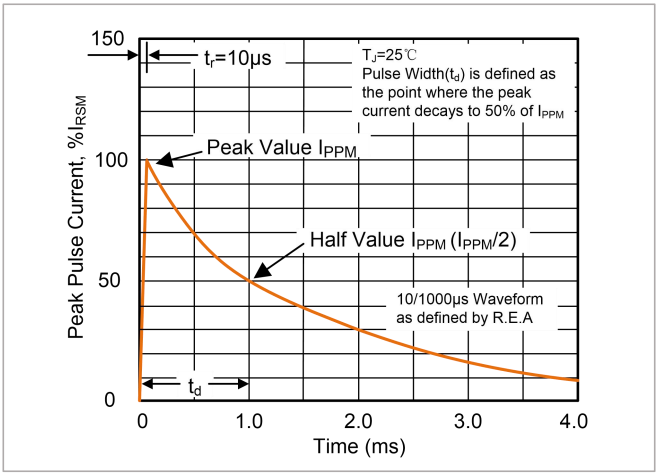


Figure 4:
Typical Junction Capacitance

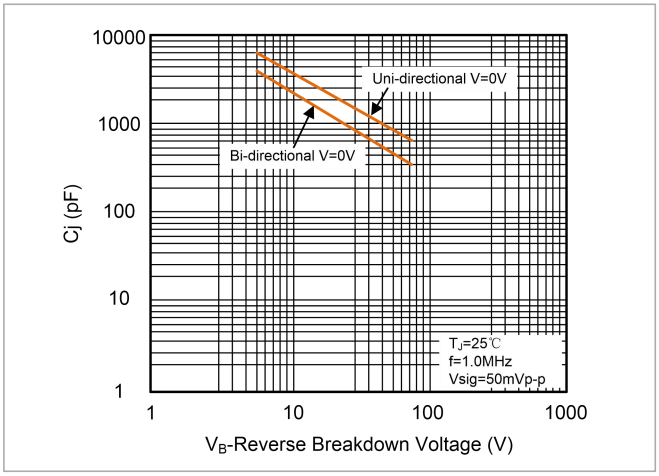


Figure 5:
Steady State Power Dissipation Derating Curve

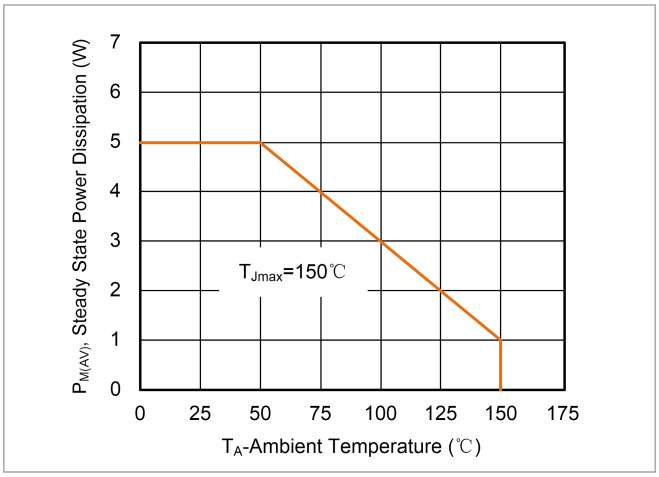
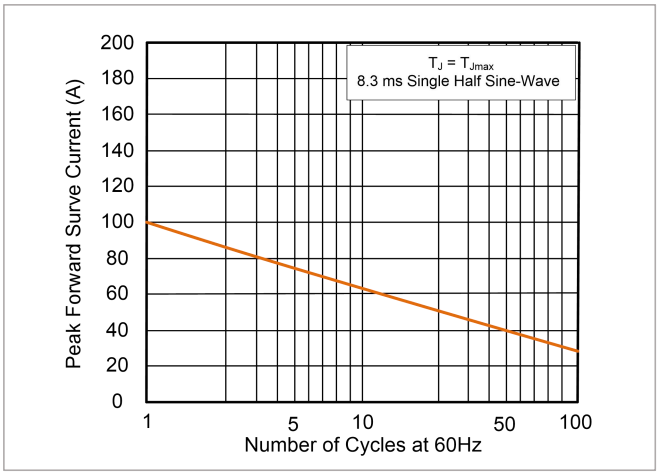


Figure 6:
Maximum Non-Repetitive Forward Surge Current Uni-Directional



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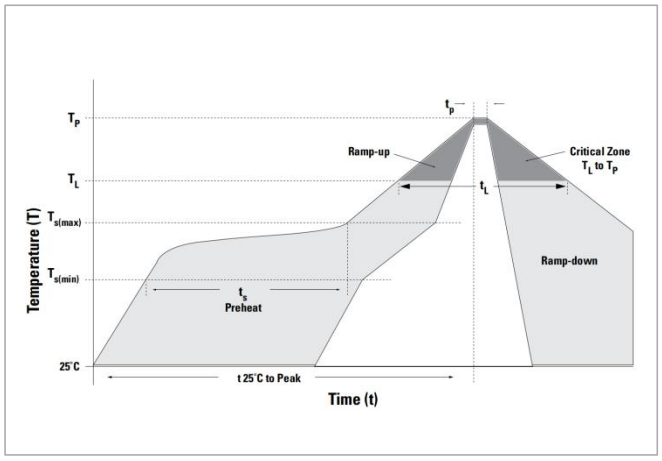
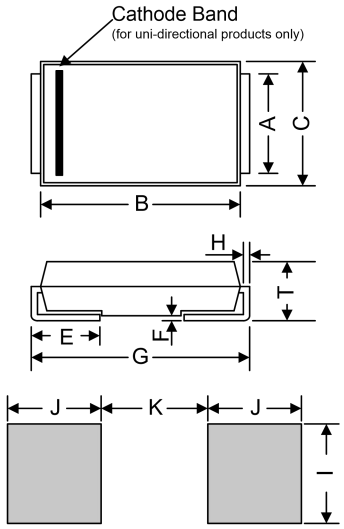
Soldering Parameters

Reflow Condition		Lead–free assembly
Pre Heat	**-Temperature Min ($T_{S\ min}$)**	150℃
	-Temperature Max ($T_{S\ max}$)	200℃
	-Time (min to max) (t_S)	60 – 180 secs
Average ramp-up rate(Liquidus Temp (T_L) to peak		3℃/second max.
$T_{S\ (max)}$ to T_L-Ramp-up Rate		3℃/second max.
Reflow	**-Temperature (T_L) (Liquidus)**	217℃
	-Time (min to max) (t_L)	60-150 seconds
Peak Temperature (T_P)		260℃
Time within 5℃ of actual Peak Temperature (t_P)		20-40 seconds
Ramp-down Rate		6℃/second max.
Time 25℃ to Peak Temperature		8 minutes max.
Do not exceed		260℃



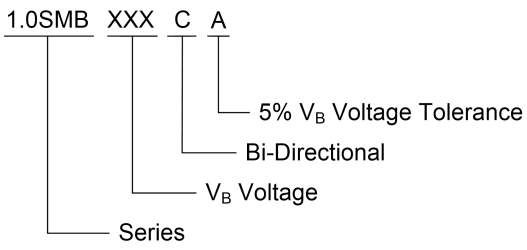
Dimensions

DO-214AA (SMB)

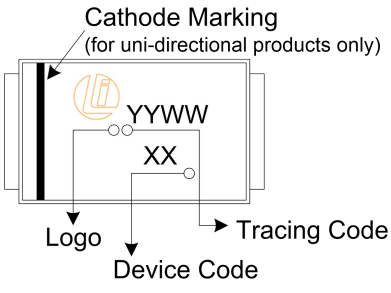


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.930	2.200	0.076	0.086
B	4.060	4.570	0.160	0.180
C	3.300	3.940	0.130	0.155
E	0.760	1.520	0.030	0.060
F	-	0.203	-	0.008
G	5.100	5.480	0.201	0.216
H	0.152	0.305	0.006	0.012
T	2.160	2.440	0.085	0.096
I	2.260	-	0.089	-
J	2.160	-	0.085	-
K	-	2.740	-	0.107

Part Numbering System



Part Marking System

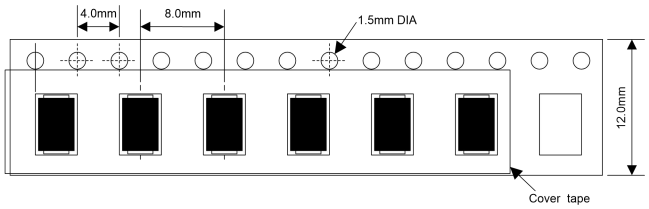


Packaging

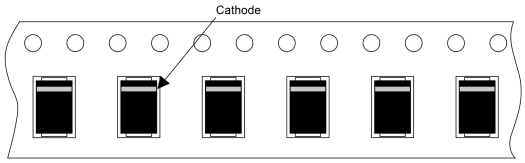
Part number	Component Package	Quantity	Packaging Option	Packaging Specification
1.0SMBxxxXX	DO-214AA	3000	Tape & Reel - 12mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification

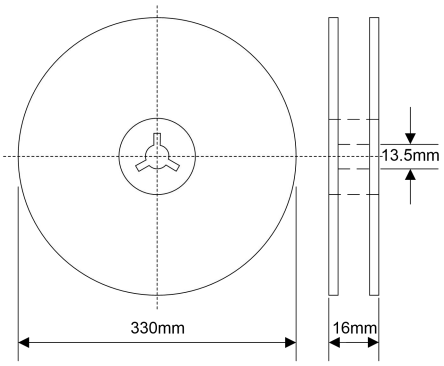
Tape



For Uni-Devices



13 Inches Reel



Quantity：3000pcs/reel