

## TVS Diode – 1.0SMBJ Series

### Features

- Plastic package, excellent insulation strength
- Glass passivated chip junction in SMB package
- Excellent voltage clamping capability
- Low Zener impedance
- 1000W peak pulse power capability on 10/1000μs waveform.
- Typical leakage current less than 1μA above 13V
- Very fast response time, typically less than 1.0ps from 0 volt to V<sub>BR</sub> minimum
- High temperature soldering guaranteed: 265°C/10 sec
- MSL: JEDEC-J-STD-020, Level 1

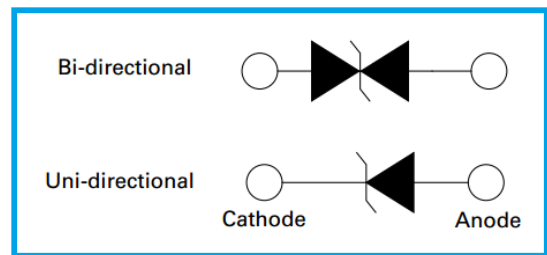


### Applications

- I/O interface, V<sub>CC</sub> bus
- Telecom
- Industrial and consumer electronic applications
- Relay and electromagnetic valve surge absorption

### Agency Approval

- UL file no.: E474915



### Mechanical and Physical Data

- Case: JEDEC SMB molded plastic
- Surface mount device, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional

### Maximum Ratings and Thermal Characteristics

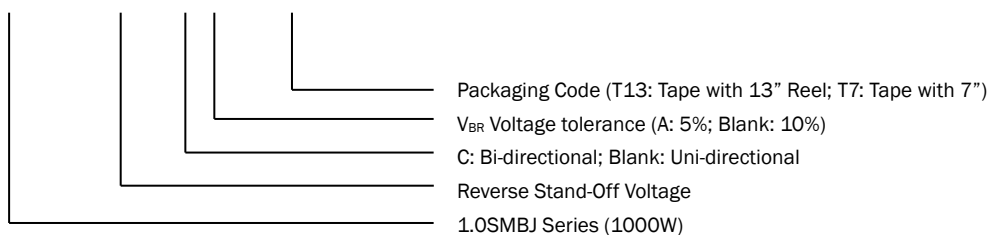
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, Fig.1).	P <sub>PPM</sub>	Min 1000	Watt
Peak Pulse Current of 10/1000μs waveform (Note 1, Fig.3).	I <sub>PPM</sub>	See Table	Amp
Steady State Power Dissipation at T <sub>L</sub> = 75°C (Fig.5).	P <sub>M(AV)</sub>	5.0	Watt
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I <sub>FSM</sub>	100	Amp
Operating Junction and Storage Temperature Range.	T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub> = 25°C per Fig.2.
2. 8.3ms single half sine wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

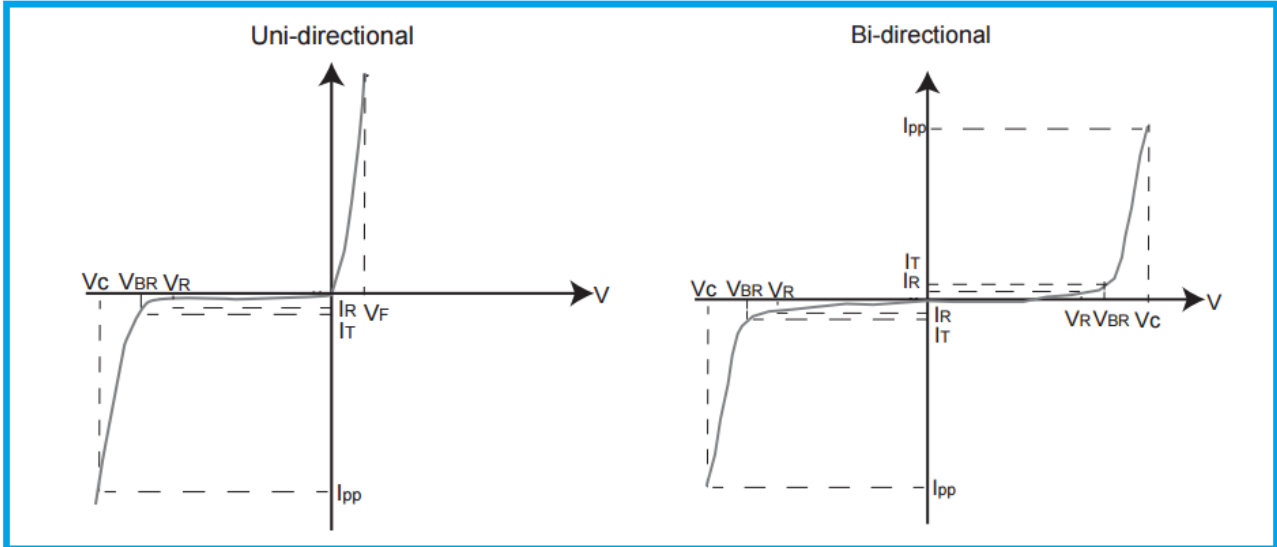
### Part Number Code

**1.0SMBJ** □□□ **CA** - □□□



## TVS Diode – 1.0SMBJ Series

### I-V Curve Characteristics



- $P_{PPM}$  Peak Pulse Power Dissipation – Maximum power dissipation
- $V_R$  Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation
- $V_{BR}$  Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current ( $I_T$ )
- $V_C$  Clamping Voltage – Peak voltage measured across the TVS at a specified  $I_{PPM}$  (Peak Impulse Current)
- $I_R$  Reverse Leakage Current – Current measured at  $V_R$
- $V_F$  Forward Voltage Drop for Uni-directional

### Electrical Characteristics

Part Number		Marking		Reverse Stand Off Voltage $V_R$ (V)	Breakdown Voltage $V_{BR}$ (V) @ $I_T$		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ (V) @ $I_{PP}$	Maximum Peak Pulse Current $I_{PP}$ (A)	Maximum Reverse Leakage $I_R$ ( $\mu$ A) @ $V_R$
Uni	Bi	Uni	Bi		Min.	Max.				
1.0SMBJ5.0A	1.0SMBJ5.0CA	AKE	AAE	5.0	6.40	7.00	10	9.2	108.7	800
1.0SMBJ6.0A	1.0SMBJ6.0CA	AKG	AAG	6.0	6.67	7.37	10	10.3	97.1	800
1.0SMBJ6.5A	1.0SMBJ6.5CA	AKK	AAK	6.5	7.22	7.98	10	11.2	89.3	500
1.0SMBJ7.0A	1.0SMBJ7.0CA	AKM	AAM	7.0	7.78	8.60	10	12.0	83.3	200
1.0SMBJ7.5A	1.0SMBJ7.5CA	AKP	AAP	7.5	8.33	9.21	1	12.9	77.5	100
1.0SMBJ8.0A	1.0SMBJ8.0CA	AKR	AAR	8.0	8.89	9.83	1	13.6	73.5	50
1.0SMBJ8.5A	1.0SMBJ8.5CA	AKT	AAT	8.5	9.44	10.4	1	14.4	69.4	10
1.0SMBJ9.0A	1.0SMBJ9.0CA	AKV	AAV	9.0	10.0	11.1	1	15.4	64.9	5
1.0SMBJ10A	1.0SMBJ10CA	AKX	AAX	10.0	11.1	12.3	1	17.0	58.8	5
1.0SMBJ11A	1.0SMBJ11CA	AKZ	AAZ	11.0	12.2	13.5	1	18.2	54.9	5
1.0SMBJ12A	1.0SMBJ12CA	ALE	ABE	12.0	13.3	14.7	1	19.9	50.2	5
1.0SMBJ13A	1.0SMBJ13CA	ALG	ABG	13.0	14.4	15.9	1	21.5	46.5	1
1.0SMBJ14A	1.0SMBJ14CA	ALK	ABK	14.0	15.6	17.2	1	23.2	43.1	1
1.0SMBJ15A	1.0SMBJ15CA	ALM	ABM	15.0	16.7	18.5	1	24.4	41.0	1
1.0SMBJ16A	1.0SMBJ16CA	ALP	ABP	16.0	17.8	19.7	1	26.0	38.4	1
1.0SMBJ17A	1.0SMBJ17CA	ALR	ABR	17.0	18.9	20.9	1	27.6	36.2	1
1.0SMBJ18A	1.0SMBJ18CA	ALT	ABT	18.0	20.0	22.1	1	29.2	34.2	1

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Part Number		Marking		Reverse Stand Off Voltage $V_R$ (V)	Breakdown Voltage $V_{BR}$ (V) @ $I_T$		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ (V) @ $I_{PP}$	Maximum Peak Pulse Current $I_{PP}$ (A)	Maximum Reverse Leakage $I_R$ ( $\mu$ A) @ $V_R$
Uni	Bi	Uni	Bi		Min.	Max.				
1.0SMBJ20A	1.0SMBJ20CA	ALV	ABV	20.0	22.2	24.5	1	32.4	30.8	1
1.0SMBJ22A	1.0SMBJ22CA	ALX	ABX	22.0	24.4	26.9	1	35.5	28.1	1
1.0SMBJ24A	1.0SMBJ24CA	ALZ	ABZ	24.0	26.7	29.5	1	38.9	25.7	1
1.0SMBJ26A	1.0SMBJ26CA	AME	ACE	26.0	28.9	31.9	1	42.1	23.7	1
1.0SMBJ28A	1.0SMBJ28CA	AMG	ACG	28.0	31.1	34.4	1	45.4	22.0	1
1.0SMBJ30A	1.0SMBJ30CA	AMK	ACK	30.0	33.3	36.8	1	48.4	20.6	1
1.0SMBJ33A	1.0SMBJ33CA	AMM	ACM	33.0	36.7	40.6	1	53.3	18.7	1
1.0SMBJ36A	1.0SMBJ36CA	AMP	ACP	36.0	40.0	44.2	1	58.1	17.2	1
1.0SMBJ40A	1.0SMBJ40CA	AMR	ACR	40.0	44.4	49.1	1	64.5	15.5	1
1.0SMBJ43A	1.0SMBJ43CA	AMT	ACT	43.0	47.8	52.8	1	69.4	14.4	1
1.0SMBJ45A	1.0SMBJ45CA	AMV	ACV	45.0	50.0	55.3	1	72.7	13.7	1
1.0SMBJ48A	1.0SMBJ48CA	AMX	ACX	48.0	53.3	58.9	1	77.4	12.9	1
1.0SMBJ51A	1.0SMBJ51CA	AMZ	ACZ	51.0	56.7	62.7	1	82.4	12.1	1
1.0SMBJ54A	1.0SMBJ54CA	ANE	ADE	54.0	60.0	66.3	1	87.1	11.4	1
1.0SMBJ58A	1.0SMBJ58CA	ANG	ADG	58.0	64.4	71.2	1	93.6	10.6	1

Note:

1. For bi-directional type having  $V_R$  of 10 volts and less, the  $I_R$  limit is double.

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### Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

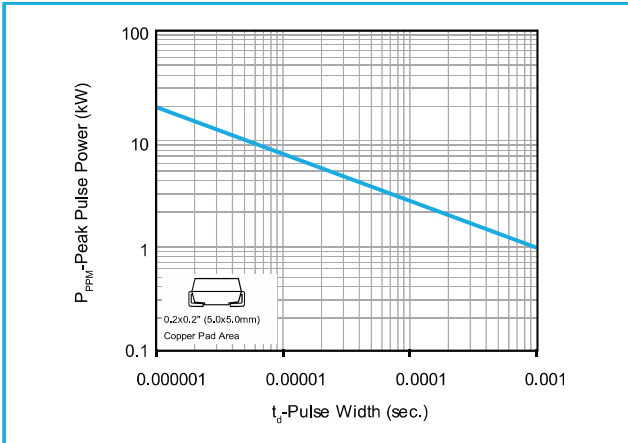


Fig 2 - Pulse Derating Curve

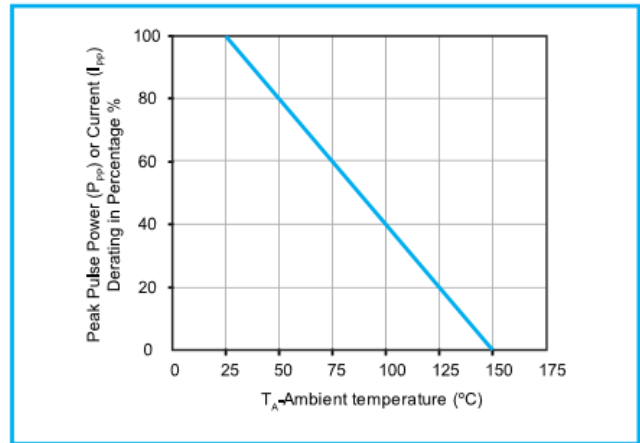


Fig 3 - Pulse Waveform

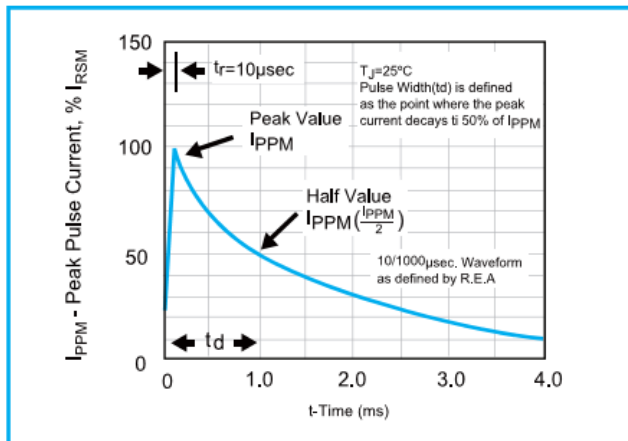


Fig 4 - Typical Junction Capacitance Uni-directional

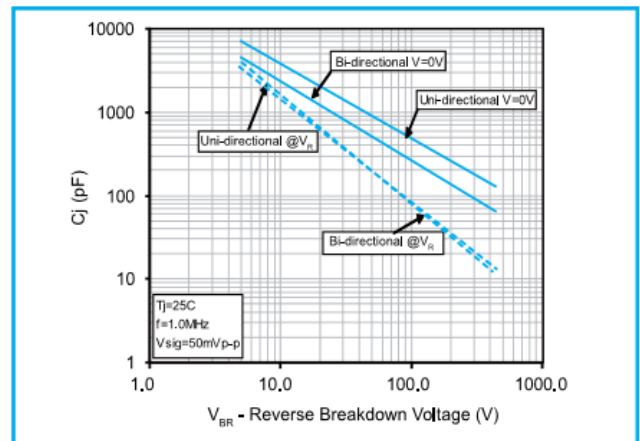


Fig 5 - Steady State Power Dissipation Derating Curve

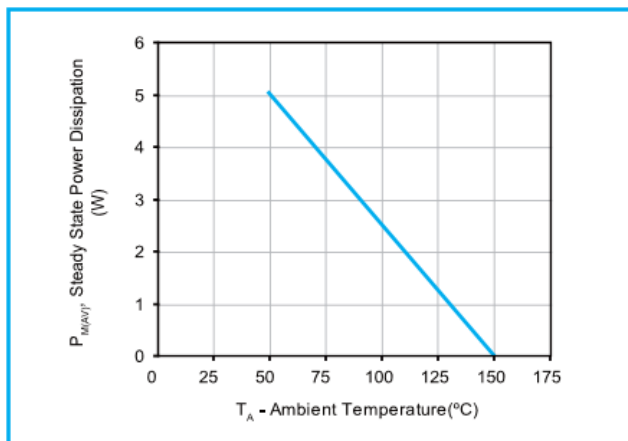
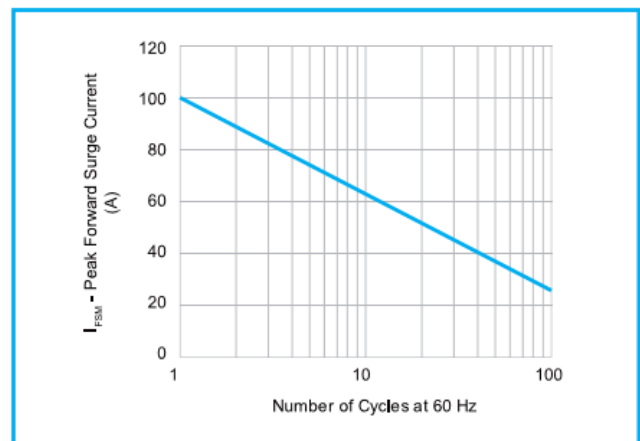
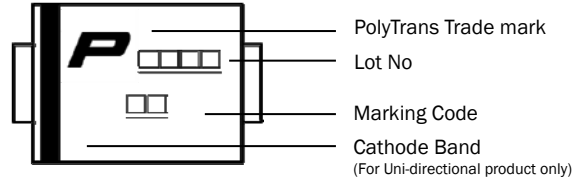


Fig 6 - Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

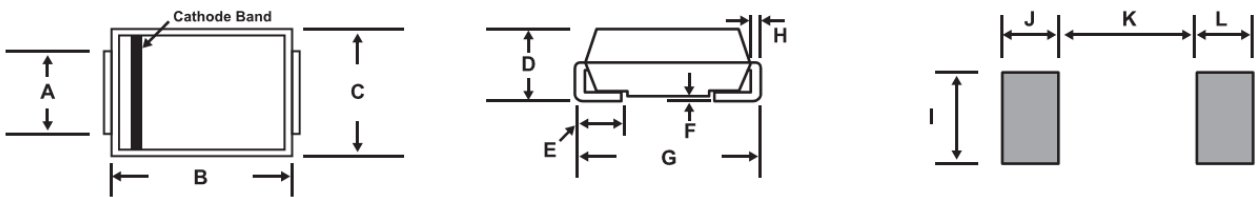


## TVS Diode - 1.0SMBJ Series

### Marking Definitions



### Physical Dimensions



Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	1.90	2.20	0.077	0.086
B	4.06	4.85	0.160	0.191
C	3.30	3.94	0.130	0.155
D	1.95	2.44	0.084	0.096
E	0.76	1.52	0.030	0.060
F	-	0.20	-	0.008
G	5.21	5.59	0.205	0.220
H	0.15	0.31	0.006	0.012
I	2.26	-	0.089	-
J	2.16	-	0.085	-
K	-	2.74	-	0.107
L	2.16	-	0.085	-

### Lead Free Reflow Soldering Recommendations

<b>Preheat</b>	
- Temperature Min ( $T_{s\_min}$ )	150°C
- Temperature Max ( $T_{s\_max}$ )	200°C
- Time ( $T_{s\_min}$ to $T_{s\_max}$ )	60-180 seconds
- Average Ramp-Up Rate	1~3°C/second
<b>Peak Temperature</b>	260°C max.
<b>Time within 5°C of actual Peak Temperature (<math>t_p</math>)</b>	40 seconds max.
<b>Ramp-Down Rate</b>	6 °C /second max.



**Note:** If the soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

## TVS Diode – 1.0SMBJ Series

### Packaging Information

Part Number	Packaging Code	Component Package	Quantity	Packaging Option	Packaging Specification
1.0SMBJ Series	T13	DO-214AA	3000	Tape & Reel - 12mm tape/13" reel	EIA STD RS-481
1.0SMBJ Series	T7	DO-214AA	500	Tape & Reel - 12mm tape/7" reel	EIA STD RS-481

### Tape and Reel Specifications

