

TVS Diode – 1.0TPSMBJ 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_{BR} minimum
- High temperature soldering guaranteed: 265°C/10 sec
- MSL: JEDEC-J-STD-020, Level 1
- Automotive grade AEC-Q101 qualified

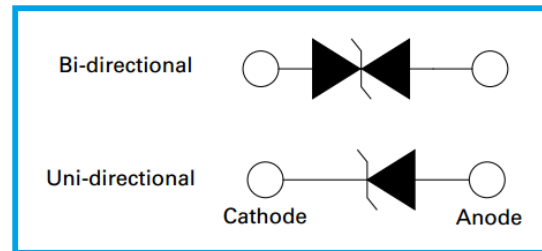


Applications

- I/O interface, V_{CC} bus
- Automotive/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
- Axial leaded, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional

Maximum Ratings and Thermal Characteristics

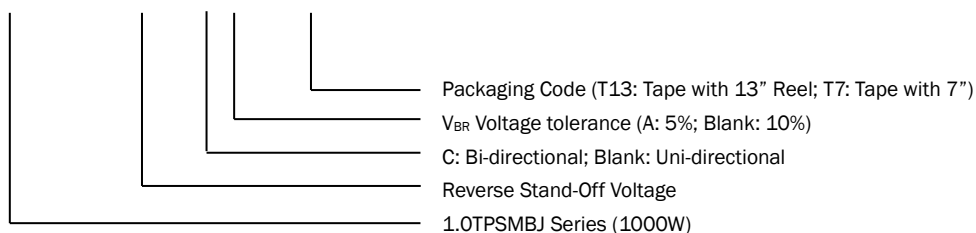
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000 μs waveform (Note 1, Fig.1).	P _{PPM}	Min 1000	Watt
Peak Pulse Current of 10/1000 μs waveform (Note 1, Fig.3).	I _{PPM}	See Table	Amp
Steady State Power Dissipation at TL = 75 °C (Fig.5).	P _{M(AV)}	5.0	Watt
Peak Forward Surge Current,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

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A = 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

1.0TPSMBJ □□□ **C A** - □□□



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I-V Curve Characteristics



- I_{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 (μ A) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
1.0TPSMBJ5.0A	1.0TPSMBJ5.0CA	AKET	AAET	5.0	6.40	7.00	10	9.2	108.7	800
1.0TPSMBJ6.0A	1.0TPSMBJ6.0CA	AKGT	AAGT	6.0	6.67	7.37	10	10.3	97.1	800
1.0TPSMBJ6.5A	1.0TPSMBJ6.5CA	AKKT	AAKT	6.5	7.22	7.98	10	11.2	89.3	500
1.0TPSMBJ7.0A	1.0TPSMBJ7.0CA	AKMT	AAMT	7.0	7.78	8.60	10	12.0	83.3	200
1.0TPSMBJ7.5A	1.0TPSMBJ7.5CA	AKPT	AAPT	7.5	8.33	9.21	1	12.9	77.5	100
1.0TPSMBJ8.0A	1.0TPSMBJ8.0CA	AKRT	AART	8.0	8.89	9.83	1	13.6	73.5	50
1.0TPSMBJ8.5A	1.0TPSMBJ8.5CA	AKTT	AATT	8.5	9.44	10.4	1	14.4	69.4	10
1.0TPSMBJ9.0A	1.0TPSMBJ9.0CA	AKVT	AAVT	9.0	10.0	11.1	1	15.4	64.9	5
1.0TPSMBJ10A	1.0TPSMBJ10CA	AKXT	AAXT	10.0	11.1	12.3	1	17.0	58.8	5
1.0TPSMBJ11A	1.0TPSMBJ11CA	AKZT	AAZT	11.0	12.2	13.5	1	18.2	54.9	5
1.0TPSMBJ12A	1.0TPSMBJ12CA	ALET	ABET	12.0	13.3	14.7	1	19.9	50.2	5
1.0TPSMBJ13A	1.0TPSMBJ13CA	ALGT	ABGT	13.0	14.4	15.9	1	21.5	46.5	1
1.0TPSMBJ14A	1.0TPSMBJ14CA	ALKT	ABKT	14.0	15.6	17.2	1	23.2	43.1	1
1.0TPSMBJ15A	1.0TPSMBJ15CA	ALMT	ABMT	15.0	16.7	18.5	1	24.4	41.0	1
1.0TPSMBJ16A	1.0TPSMBJ16CA	ALPT	ABPT	16.0	17.8	19.7	1	26.0	38.4	1
1.0TPSMBJ17A	1.0TPSMBJ17CA	ALRT	ABRT	17.0	18.9	20.9	1	27.6	36.2	1
1.0TPSMBJ18A	1.0TPSMBJ18CA	ALTT	ABTT	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 (μ A) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
1.0TPSMBJ20A	1.0TPSMBJ20CA	ALVT	ABVT	20.0	22.2	24.5	1	32.4	30.8	1
1.0TPSMBJ22A	1.0TPSMBJ22CA	ALXT	ABXT	22.0	24.4	26.9	1	35.5	28.1	1
1.0TPSMBJ24A	1.0TPSMBJ24CA	ALZT	ABZT	24.0	26.7	29.5	1	38.9	25.7	1
1.0TPSMBJ26A	1.0TPSMBJ26CA	AMET	ACET	26.0	28.9	31.9	1	42.1	23.7	1
1.0TPSMBJ28A	1.0TPSMBJ28CA	AMGT	ACGT	28.0	31.1	34.4	1	45.4	22.0	1
1.0TPSMBJ30A	1.0TPSMBJ30CA	AMKT	ACKT	30.0	33.3	36.8	1	48.4	20.6	1
1.0TPSMBJ33A	1.0TPSMBJ33CA	AMMT	ACMT	33.0	36.7	40.6	1	53.3	18.7	1
1.0TPSMBJ36A	1.0TPSMBJ36CA	AMPT	ACPT	36.0	40.0	44.2	1	58.1	17.2	1
1.0TPSMBJ40A	1.0TPSMBJ40CA	AMRT	ACRT	40.0	44.4	49.1	1	64.5	15.5	1
1.0TPSMBJ43A	1.0TPSMBJ43CA	AMTT	ACTT	43.0	47.8	52.8	1	69.4	14.4	1
1.0TPSMBJ45A	1.0TPSMBJ45CA	AMVT	ACVT	45.0	50.0	55.3	1	72.7	13.7	1
1.0TPSMBJ48A	1.0TPSMBJ48CA	AMXT	ACXT	48.0	53.3	58.9	1	77.4	12.9	1
1.0TPSMBJ51A	1.0TPSMBJ51CA	AMZT	ACZT	51.0	56.7	62.7	1	82.4	12.1	1
1.0TPSMBJ54A	1.0TPSMBJ54CA	ANET	ADET	54.0	60.0	66.3	1	87.1	11.4	1
1.0TPSMBJ58A	1.0TPSMBJ58CA	ANGT	ADGT	58.0	64.4	71.2	1	93.6	10.6	1

Note:

- 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

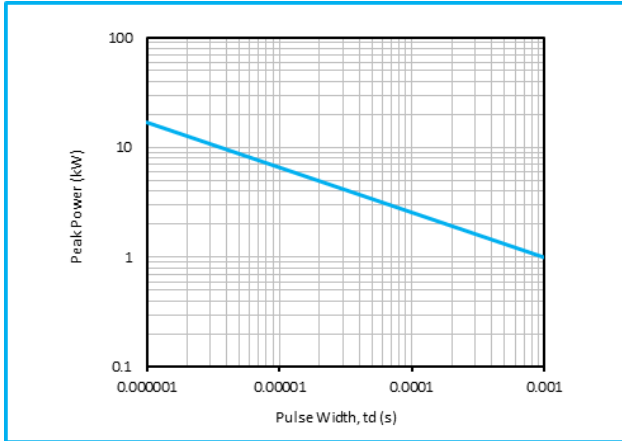


Fig 2 - Pulse Derating Curve

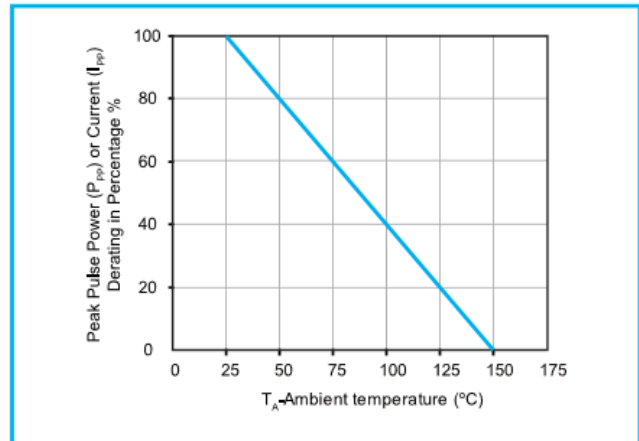


Fig 3 - Pulse Waveform

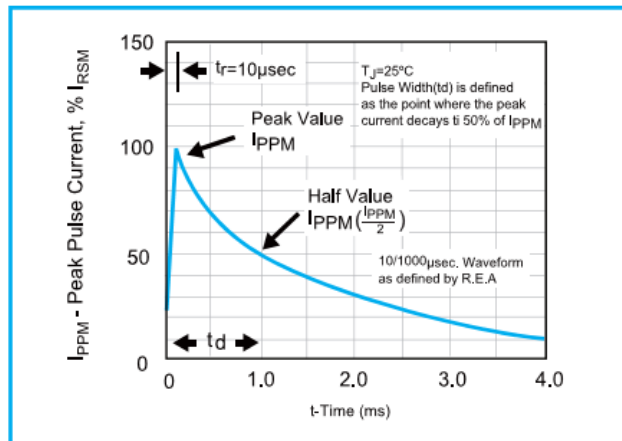


Fig 4 - Typical Junction Capacitance Uni-directional

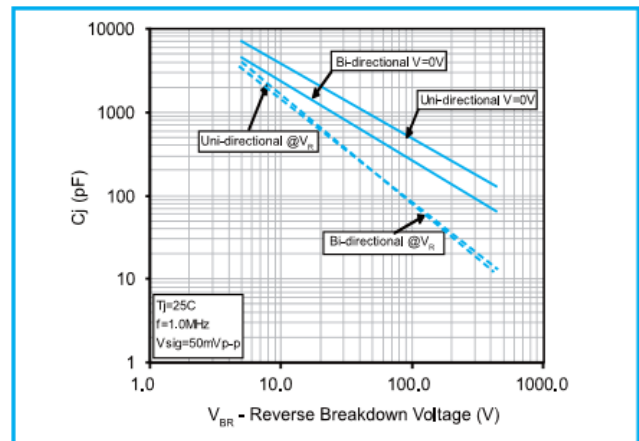


Fig 5 - Steady State Power Dissipation Derating Curve

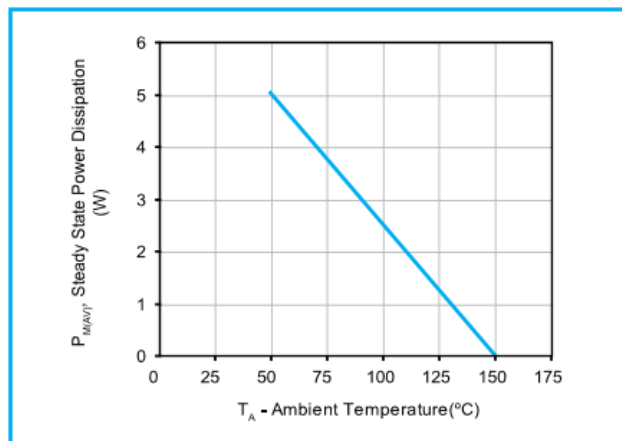
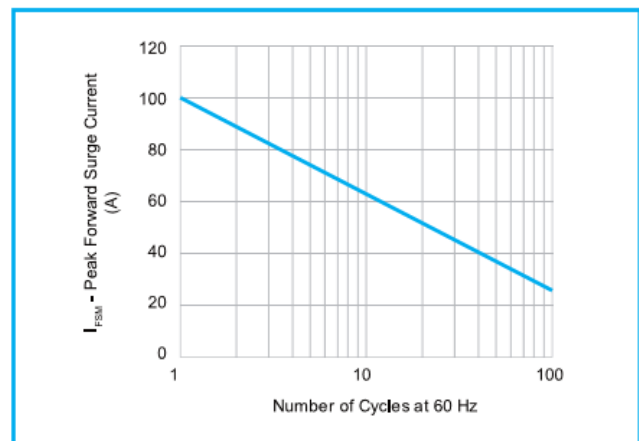
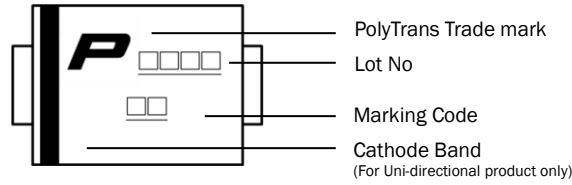


Fig 6 - Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

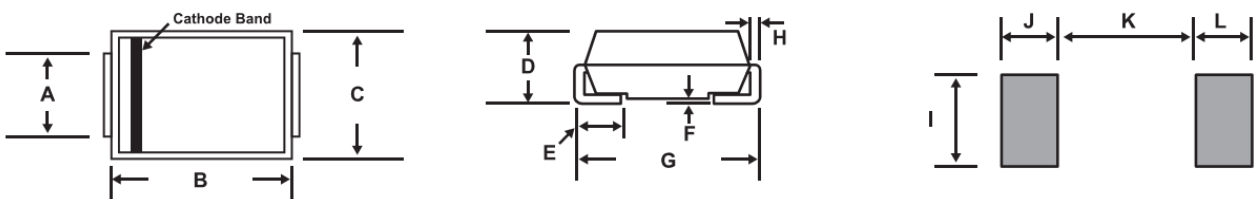


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Marking Definitions



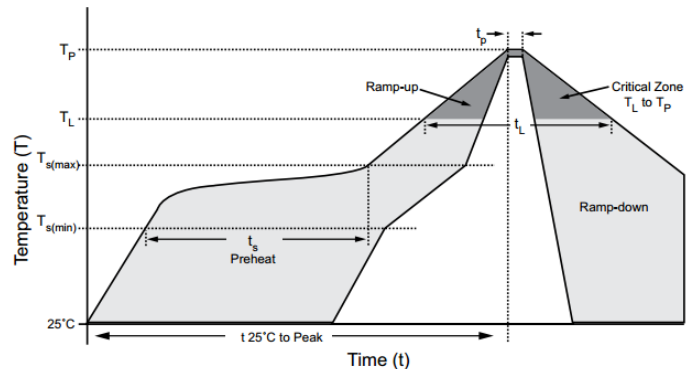
Physical Dimensions



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

Preheat	
- 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
Peak Temperature	260 °C max.
Time within 5°C of actual Peak Temperature (t_p)	40 seconds max.
Ramp-Down Rate	6 °C /second max.



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

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Packaging Information

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

Tape and Reel Specifications

