

Surface Mount Transient Voltage Suppressors

TPSMBJ Series 13 To 200V 600W

Description

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

Working Voltage: 13 to 200 V

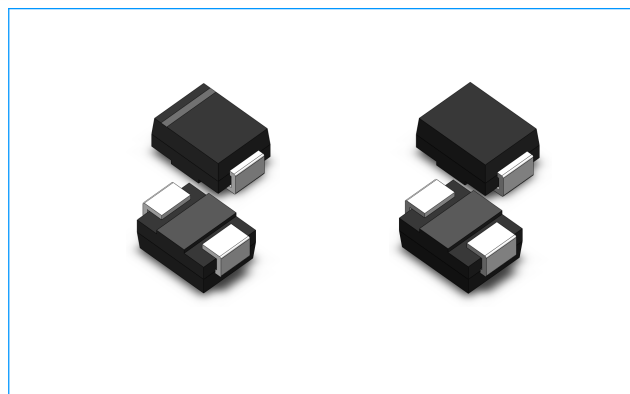
Peak Pulse Power: 600 W

Features

- ◆ Glass passivated chip
- ◆ 600W peak pulse power capability with a 10/1000 us waveform, repetitive rate (duty cycle):0.01 %
- ◆ High reliability application and automotive grade AEC Q101 qualified
- ◆ Low leakage
- ◆ Uni and Bidirectional unit
- ◆ Excellent clamping capability
- ◆ Very fast response time
- ◆ RoHS compliant

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.



Mechanical Data

- ◆ Case: Molded plastic
- ◆ Epoxy: UL 94V-0 rate flame retardant
- ◆ Lead: Solderable per MIL-STD-750, method 2026 guaranteed
- ◆ Polarity: Color band denotes TVS cathode end
- ◆ Mounting position: Any

Maximum Ratings and Thermal Characteristics ($T_A=25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾	P_{PPM}	600	W
Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	P_D	5.0	W
Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾	I_{PP}	See Next Table	A
Operating junction and storage temperature range ($V_{BR} \leq 47\text{V}$)	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$
Operating junction and storage temperature range ($V_{BR} > 47\text{V}$)		-55 to +150	$^\circ\text{C}$
Maximum Instantaneous Forward Voltage at 25A for Unidirectional	V_F	3.5	V
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽²⁾	I_{FSM}	100	A

Note:

(1)Non-repetitive current pulse per Fig.5 and derated above $T_A=25^\circ\text{C}$ per Fig.1

(2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

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Electrical Characteristics (@ 25°C Unless Otherwise Specified)

Part Number		Marking		Reverse Stand-Off Voltage $V_{RWM}(V)$	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @ V_{RWM} (μA)
Uni	Bi	Uni	Bi		MIN	MAX				
TPSMBJ13A	TPSMBJ13CA	13AA	13CA	13	12.35	13.65	1	18.20	32.97	1
TPSMBJ15A	TPSMBJ15CA	15AA	15CA	15	14.25	15.75	1	21.20	28.30	1
TPSMBJ16A	TPSMBJ16CA	16AA	16CA	16	15.20	16.80	1	22.50	26.67	1
TPSMBJ18A	TPSMBJ18CA	18AA	18CA	18	17.10	18.90	1	25.20	23.81	1
TPSMBJ20A	TPSMBJ20CA	20AA	20CA	20	19.00	21.00	1	27.70	21.66	1
TPSMBJ22A	TPSMBJ22CA	22AA	22CA	22	20.90	23.10	1	30.60	19.61	1
TPSMBJ24A	TPSMBJ24CA	24AA	24CA	24	22.80	25.20	1	33.20	18.07	1
TPSMBJ27A	TPSMBJ27CA	27AA	27CA	27	25.65	28.35	1	37.50	16.00	1
TPSMBJ30A	TPSMBJ30CA	30AA	30CA	30	28.50	31.50	1	41.40	14.49	1
TPSMBJ33A	TPSMBJ33CA	33AA	33CA	33	31.35	34.65	1	45.70	13.13	1
TPSMBJ36A	TPSMBJ36CA	36AA	36CA	26	34.20	37.80	1	49.90	12.02	1
TPSMBJ39A	TPSMBJ39CA	39AA	39CA	39	37.05	40.95	1	53.90	11.13	1
TPSMBJ43A	TPSMBJ43CA	43AA	43CA	43	40.85	45.15	1	59.30	10.12	1
TPSMBJ47A	TPSMBJ47CA	47AA	47CA	47	44.65	49.35	1	64.80	9.26	1
TPSMBJ51A	TPSMBJ51CA	51AA	51CA	51	48.45	53.55	1	70.10	8.56	1
TPSMBJ56A	TPSMBJ56CA	56AA	56CA	56	53.20	58.80	1	77.00	7.79	1
TPSMBJ62A	TPSMBJ62CA	62AA	62CA	62	58.90	65.10	1	85.00	7.06	1
TPSMBJ68A	TPSMBJ68CA	68AA	68CA	68	64.60	71.40	1	92.00	6.52	1
TPSMBJ75A	TPSMBJ75CA	75AA	75CA	75	71.25	78.75	1	103.0	5.83	1
TPSMBJ82A	TPSMBJ82CA	82AA	82CA	82	77.90	86.10	1	113.0	5.31	1
TPSMBJ91A	TPSMBJ91CA	91AA	91CA	91	86.45	95.55	1	125.0	4.80	1
TPSMBJ100A	TPSMBJ100CA	100AA	100CA	100	95.00	105.0	1	137.0	4.38	1
TPSMBJ110A	TPSMBJ110CA	110AA	110CA	110	104.5	115.5	1	152.0	3.95	1
TPSMBJ120A	TPSMBJ120CA	120AA	120CA	120	114.0	126.0	1	165.0	3.64	1
TPSMBJ130A	TPSMBJ130CA	130AA	130CA	130	123.5	136.5	1	179.0	3.35	1
TPSMBJ150A	TPSMBJ150CA	150AA	150CA	150	142.5	157.5	1	207.0	2.90	1
TPSMBJ160A	TPSMBJ160CA	160AA	160CA	160	152.0	168.0	1	219.0	2.74	1
TPSMBJ170A	TPSMBJ170CA	170AA	170CA	170	161.5	178.5	1	234.0	2.56	1
TPSMBJ180A	TPSMBJ180CA	180AA	180CA	180	171.0	189.0	1	246.0	2.44	1
TPSMBJ200A	TPSMBJ200CA	200AA	200CA	200	190.0	210.0	1	274.0	2.19	1

Note:

(1) Add suffix 'C' or 'CA' after part number to specify Bi-directional devices

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Ratings and Characteristics Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1 - Pulse Waveform

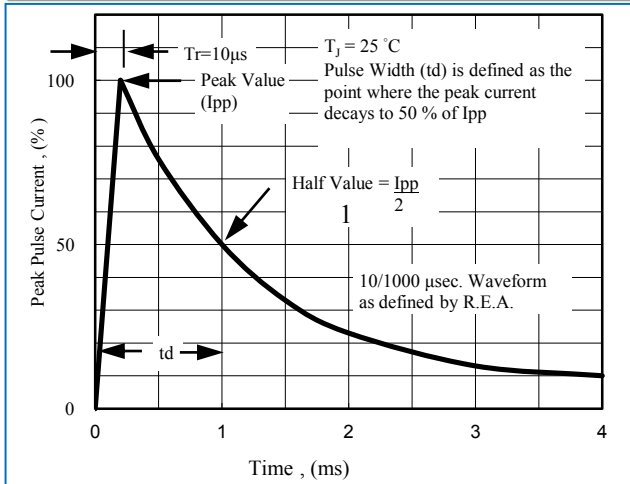


Figure 2 - Pulse Derating Curve

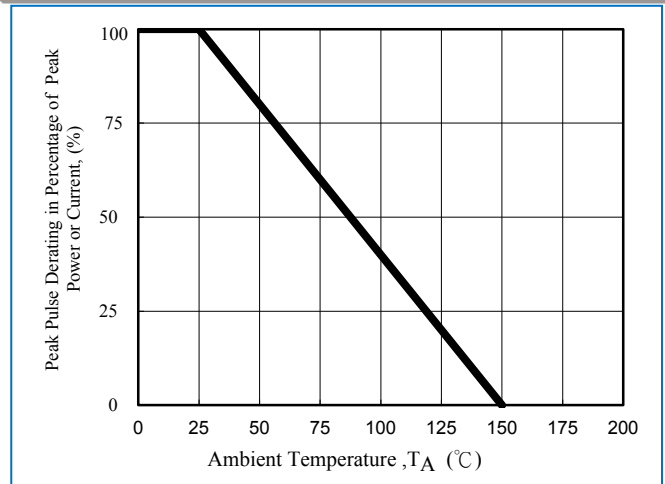


Figure 3 - Peak Pulse Power Rating Curve

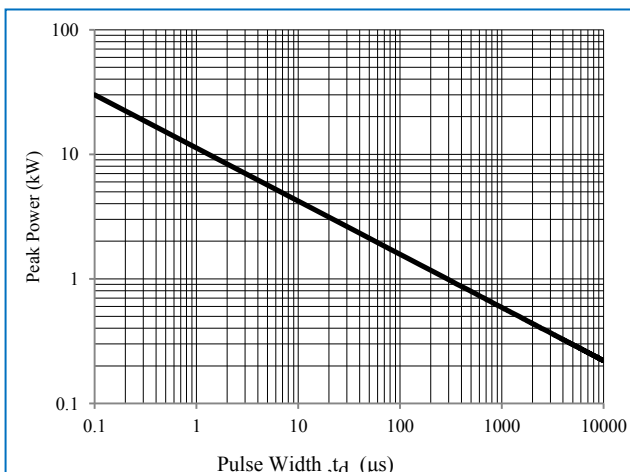


Figure 4 - Steady State Power Derating Curve

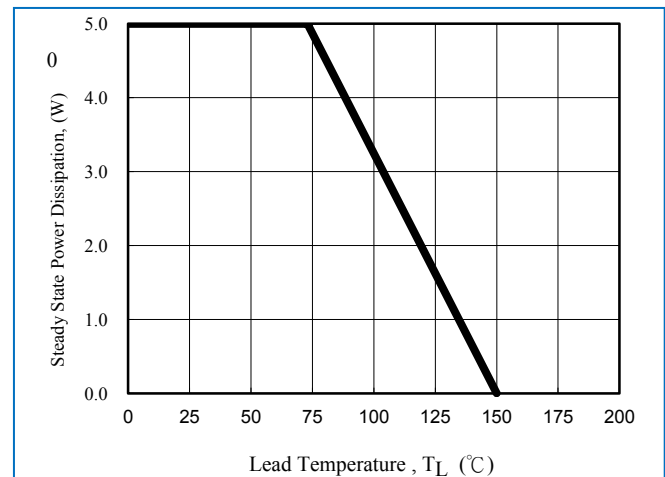


Figure 5 - Maximum Non-Repetitive Surge Current

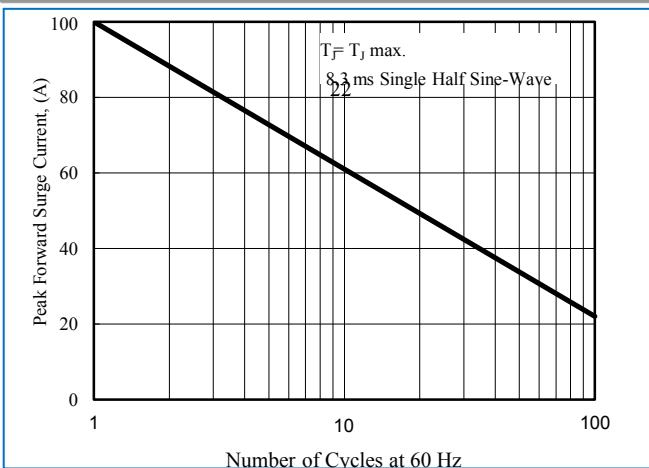
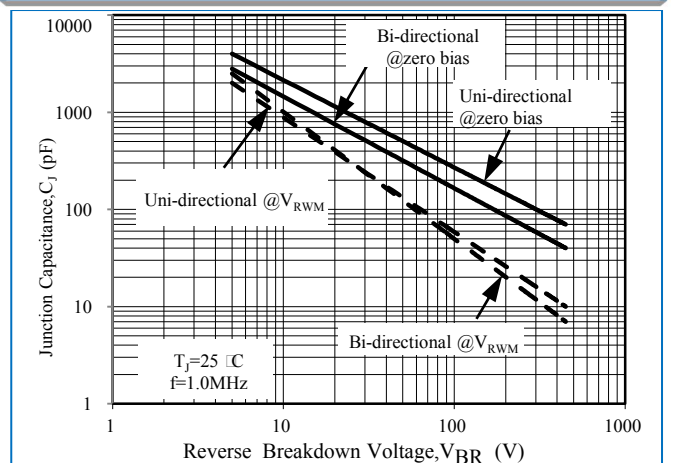


Figure 6 - Typical Junction Capacitance

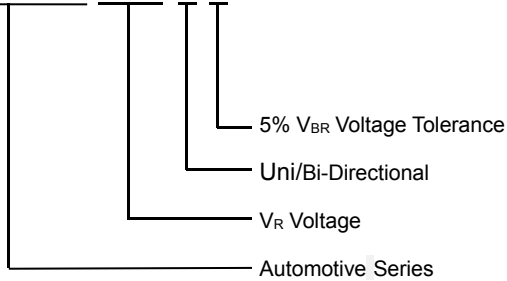


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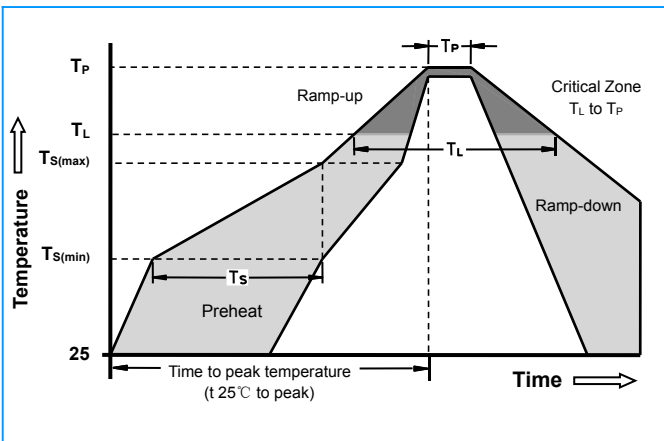
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Part Numbering

TPSMBxxxCA



Soldering Parameters

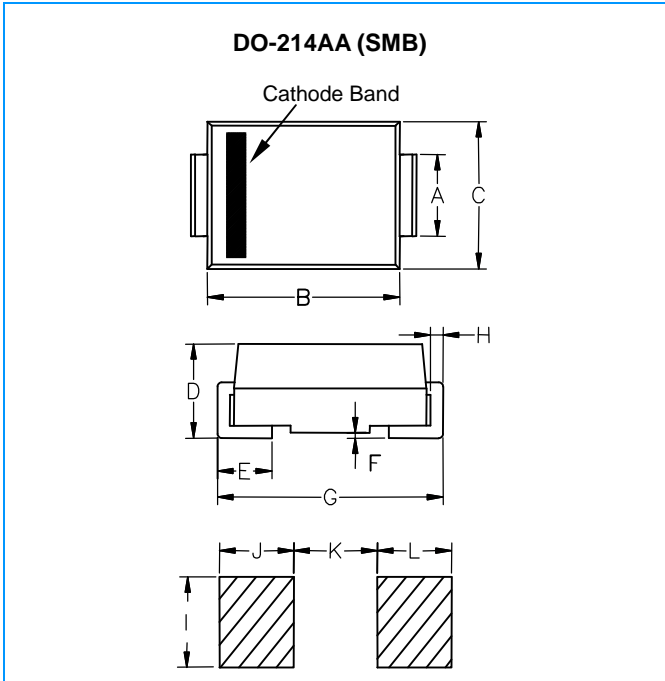


Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min ($T_{S(min)}$)	150°C
	-Temperature Max ($T_{S(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquidus Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		20 -40 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		280°C

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Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.087	1.960	2.200
B	0.171	0.191	4.350	4.850
C	0.130	0.155	3.300	3.940
D	0.084	0.096	2.130	2.440
E	0.030	0.060	0.750	1.520
F	-	0.008	-	0.203
G	0.201	0.216	5.100	5.500
H	0.006	0.012	0.152	0.305
I	0.089	-	2.260	-
J	0.085	-	2.160	-
K	-	0.107	-	2.740
L	0.085	-	2.160	-