

Surface Mount Transient Voltage Suppressors

TPSMCJ Series 10 To 78V 1500W

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: 10 to 78 V

Peak Pulse Power: 1500 W

Features

- ◆ Glass passivated chip
- ◆ 1500W peak pulse power capability with a 10/1000 μ s 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



Mechanical Data

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

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.

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

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾	P_{PPM}	1500	W
Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	P_D	6.5	W
Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾	I_{PP}	See Next Table	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$
Maximum Instantaneous Forward Voltage at 50A for Unidirectional ⁽³⁾	V_F	3.5/5.0	V
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽²⁾	I_{FSM}	200	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

(3) $V_F<3.5\text{V}$ for devices of $V_{BR}<200\text{V}$ and $V_F<5.0\text{V}$ for devices of $V_{BR}>201\text{V}$

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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				
TPSMCJ10A	TPSMCJ10CA	GDXA	BDXA	10.0	11.10	12.30	1	17.0	88.24	5
TPSMCJ11A	TPSMCJ11CA	GDZA	BDZA	11.0	12.20	13.50	1	18.2	82.42	1
TPSMCJ12A	TPSMCJ12CA	GEEA	BEEA	12.0	13.30	14.70	1	19.9	75.38	1
TPSMCJ13A	TPSMCJ13CA	GEGA	BEGA	13.0	14.40	15.90	1	21.5	69.77	1
TPSMCJ14A	TPSMCJ14CA	GEKA	BEKA	14.0	15.60	17.20	1	23.2	64.66	1
TPSMCJ15A	TPSMCJ15CA	GEMA	BEMA	15.0	16.70	18.50	1	24.4	61.48	1
TPSMCJ16A	TPSMCJ16CA	GEPA	BEPA	16.0	17.80	19.70	1	26.0	57.69	1
TPSMCJ17A	TPSMCJ17CA	GERA	BERA	17.0	18.90	20.90	1	27.6	54.35	1
TPSMCJ18A	TPSMCJ18CA	GETA	BETA	18.0	20.00	22.10	1	29.2	51.37	1
TPSMCJ19A	TPSMCJ19CA	GEBA	BEBA	19.0	21.10	23.30	1	29.2	48.73	1
TPSMCJ20A	TPSMCJ20CA	GEVA	BEVA	20.0	22.20	24.50	1	32.4	46.30	1
TPSMCJ22A	TPSMCJ22CA	GEXA	BEXA	22.0	24.40	26.90	1	35.5	42.25	1
TPSMCJ24A	TPSMCJ24CA	GEZA	BEZA	24.0	26.70	29.50	1	38.9	38.56	1
TPSMCJ26A	TPSMCJ26CA	GFEA	BFEA	26.0	28.90	31.90	1	42.1	35.63	1
TPSMCJ28A	TPSMCJ28CA	GFGA	BFGA	28.0	31.10	34.40	1	45.4	33.04	1
TPSMCJ30A	TPSMCJ30CA	GFKA	BFKA	30.0	33.30	36.80	1	48.4	30.99	1
TPSMCJ33A	TPSMCJ33CA	GFMA	BFMA	33.0	36.70	40.60	1	53.3	28.14	1
TPSMCJ36A	TPSMCJ36CA	GFPA	BFPA	36.0	40.00	44.20	1	58.1	25.82	1
TPSMCJ40A	TPSMCJ40CA	GFRA	BFRA	40.0	44.40	49.10	1	64.5	23.26	1
TPSMCJ43A	TPSMCJ43CA	GFTA	BFTA	43.0	47.80	52.80	1	69.4	21.61	1
TPSMCJ45A	TPSMCJ45CA	GFVA	BFVA	45.0	50.00	55.30	1	72.7	20.63	1
TPSMCJ48A	TPSMCJ48CA	GFXA	BFXA	48.0	53.30	58.90	1	77.4	19.38	1
TPSMCJ51A	TPSMCJ51CA	GFZA	BFZA	51.0	56.70	62.70	1	82.4	18.20	1
TPSMCJ54A	TPSMCJ54CA	GGEA	BGEA	54.0	60.00	66.30	1	87.1	17.22	1
TPSMCJ58A	TPSMCJ58CA	GGGA	BGGA	58.0	64.40	71.20	1	93.6	16.03	1
TPSMCJ60A	TPSMCJ60CA	GGKA	BGKA	60.0	66.70	73.70	1	96.8	15.50	1
TPSMCJ64A	TPSMCJ64CA	GGMA	BGMA	64.0	71.10	78.60	1	103.0	14.56	1
TPSMCJ70A	TPSMCJ70CA	GGPA	BGPA	70.0	77.80	86.00	1	113.0	13.27	1
TPSMCJ75A	TPSMCJ75CA	GGRA	BGRA	75.0	83.30	92.10	1	121.0	12.40	1
TPSMCJ78A	TPSMCJ78CA	GGTA	BGTA	78.0	86.70	95.80	1	126.0	11.90	1

Note:

- (1) Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
- (2) For Bi-Directional devices having VR of 10 volts and under, the IR limit is double

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

Figure 1 - Pulse Waveform

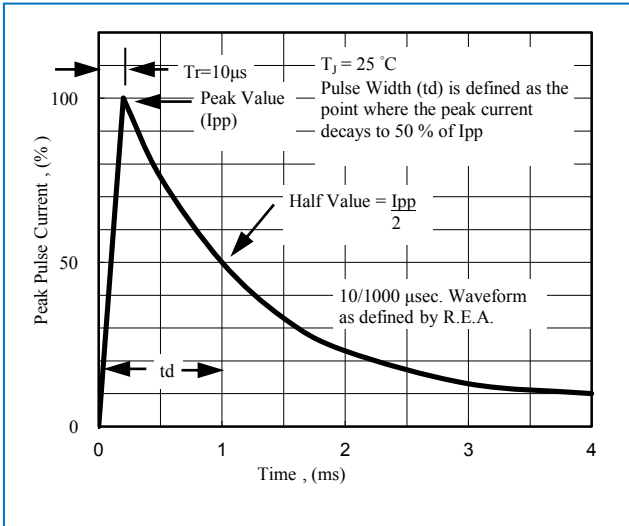


Figure 2 - Pulse Derating Curve

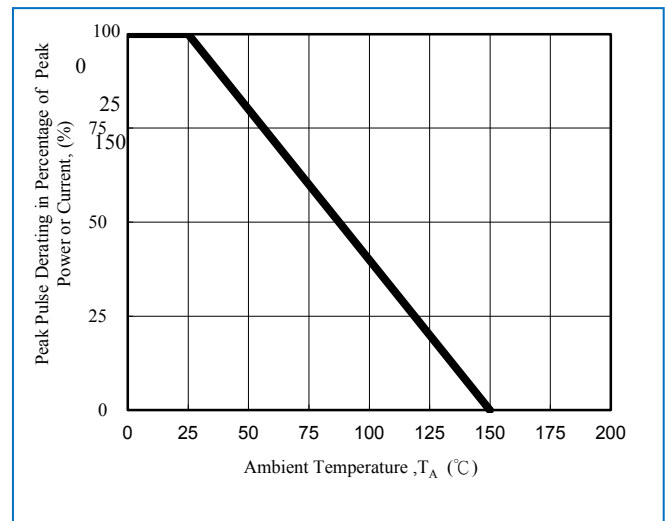


Figure 3 - Peak Pulse Power Rating Curve

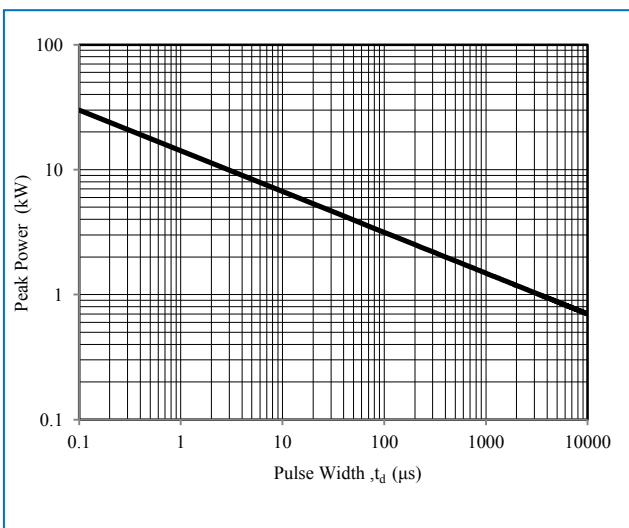
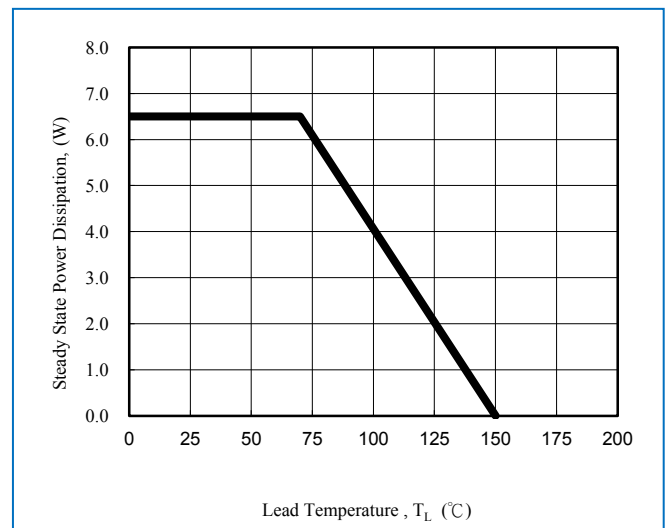


Figure 4 - Steady State Power Derating Curve



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Figure 5 - Maximum Non-Repetitive Surge Current

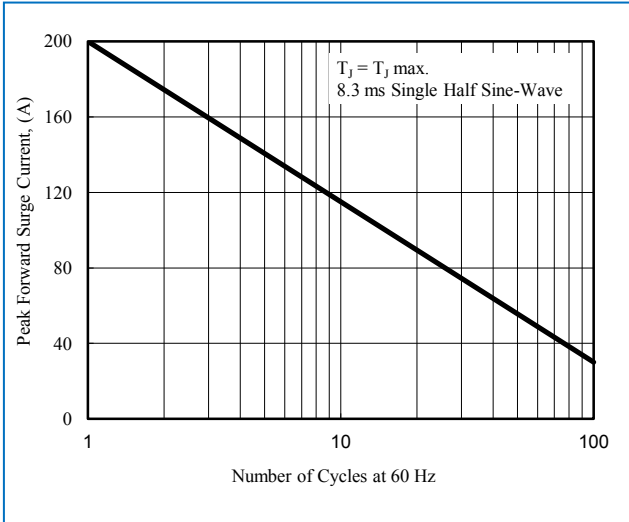
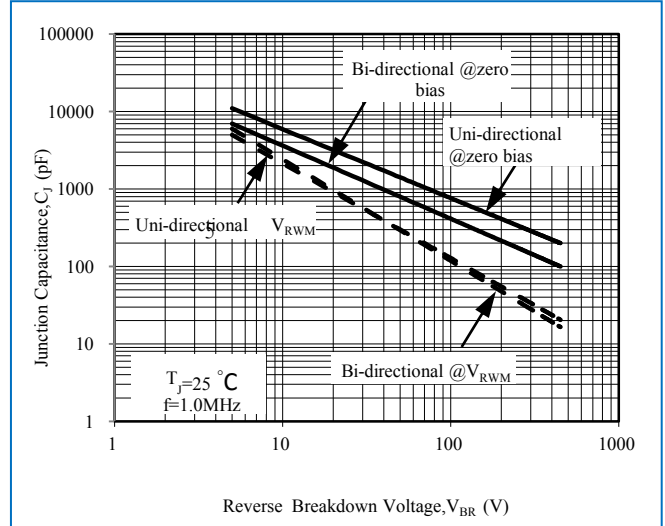
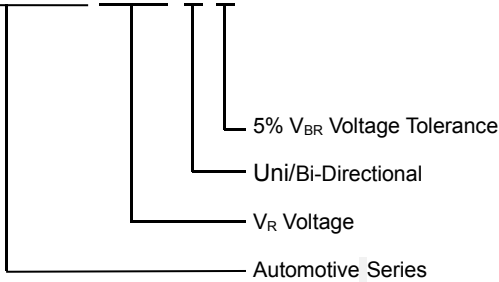


Figure 6 - Typical Junction Capacitance



Part Numbering

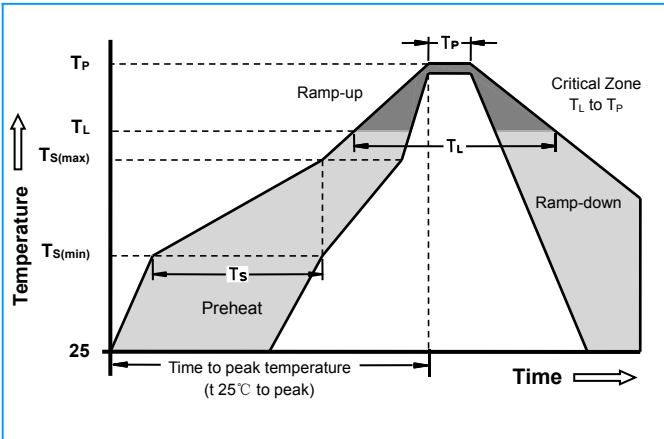
TPSMCJ × × × CA



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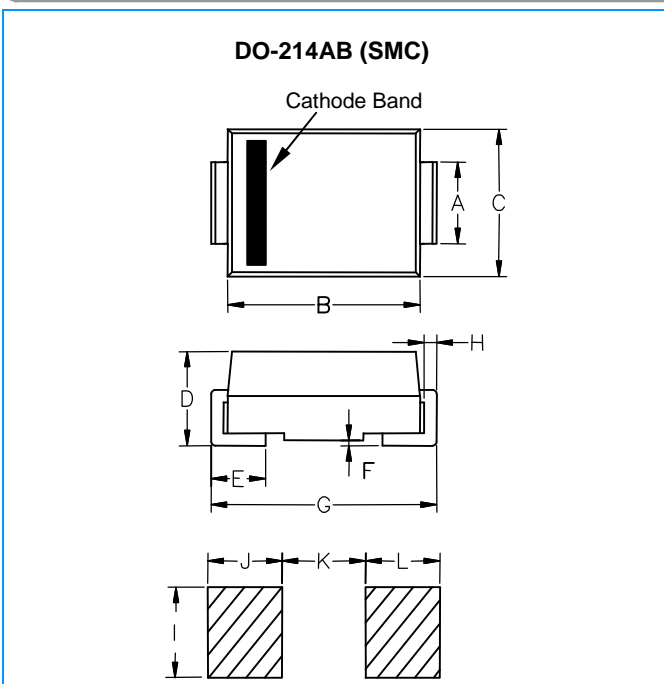
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Soldering Parameters



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

Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.86	3.160
B	0.260	0.280	6.520	7.020
C	0.220	0.245	5.520	6.150
D	0.079	0.103	1.980	2.590
E	0.030	0.060	0.750	1.510
F	-	0.008	-	0.203
G	0.305	0.320	7.640	8.020
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200
L	0.094	-	2.400	-