

## Surface Mount Transient Voltage Suppressors

### TPSMDJ Series 10 To 78V 3000W

#### 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

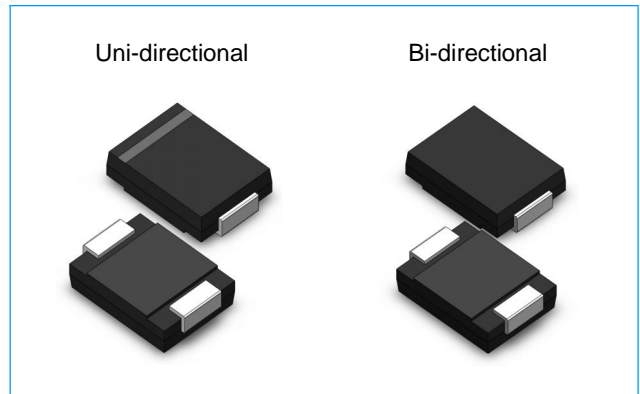
Peak Pulse Power: 3000 W

#### Features

- ◆ Glass passivated chip
- ◆ 3000W peak pulse power capability with a 10/1000  $\mu$  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

#### 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
- ◆ Polarity: Color band denotes cathode end except Bipolar
- ◆ Mounting position: Any

#### Maximum Ratings and Thermal Characteristics(TA=25°C Unless otherwise noted)

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	$P_{PPM}$	3000	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 $\mu$ s waveform <sup>(1)</sup>	$I_{PP}$	See Next Table	A
Junction and storage temperature range	$T_J, T_{STG}$	-55 to +175	$^\circ\text{C}$
Operating temperature range	$T_{OP}$	-55 to +150	$^\circ\text{C}$
Maximum Instantaneous Forward Voltage at 50A for Unidirectional <sup>(3)</sup>	$V_F$	3.5/5.0	V
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup>	$I_{FSM}$	300	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 (@25C 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 $I_R$ @ $V_{RWM}$ ( $\mu A$ )
Uni	Bi	Uni	Bi		MIN	MAX				
TPSMDJ10A	TPSMDJ10CA	PDXA	DDXA	10.0	11.10	12.30	5	17.0	176.47	15
TPSMDJ11A	TPSMDJ11CA	PDZA	DDZA	11.0	12.20	13.50	5	18.2	164.84	2
TPSMDJ12A	TPSMDJ12CA	PEEA	DEEA	12.0	13.30	14.70	5	19.9	150.75	2
TPSMDJ13A	TPSMDJ13CA	PEGA	DEGA	13.0	14.40	15.90	5	21.5	139.53	2
TPSMDJ14A	TPSMDJ14CA	PEKA	DEKA	14.0	15.60	17.20	5	23.2	129.31	2
TPSMDJ15A	TPSMDJ15CA	PEMA	DEMA	15.0	16.70	18.50	5	24.4	122.95	2
TPSMDJ16A	TPSMDJ16CA	PEPA	DEPA	16.0	17.80	19.70	5	26.0	115.38	2
TPSMDJ17A	TPSMDJ17CA	PERA	DERA	17.0	18.90	20.90	5	27.6	108.70	2
TPSMDJ18A	TPSMDJ18CA	PETA	DETA	18.0	20.00	22.10	5	29.2	102.74	2
TPSMDJ19A	TPSMDJ19CA	PEBA	DEBA	19.0	21.10	23.30	5	29.2	97.47	2
TPSMDJ20A	TPSMDJ20CA	PEVA	DEVA	20.0	22.20	24.50	5	32.4	92.59	2
TPSMDJ22A	TPSMDJ22CA	PEXA	DEXA	22.0	24.40	26.90	5	35.5	84.51	2
TPSMDJ24A	TPSMDJ24CA	PEZA	DEZA	24.0	26.70	29.50	5	38.9	77.12	2
TPSMDJ26A	TPSMDJ26CA	PFEA	DFEA	26.0	28.90	31.90	5	42.1	71.26	2
TPSMDJ28A	TPSMDJ28CA	PFGA	DFGA	28.0	31.10	34.40	5	45.4	66.08	2
TPSMDJ30A	TPSMDJ30CA	PFGA	DFGA	30.0	33.30	36.80	5	48.4	61.98	2
TPSMDJ33A	TPSMDJ33CA	PFMA	DFMA	33.0	36.70	40.60	5	53.3	56.29	2
TPSMDJ36A	TPSMDJ36CA	PFPA	DFPA	36.0	40.00	44.20	5	58.1	51.64	2
TPSMDJ40A	TPSMDJ40CA	PFRA	DFRA	40.0	44.40	49.10	5	64.5	46.51	2
TPSMDJ43A	TPSMDJ43CA	PFTA	DFTA	43.0	47.80	52.80	5	69.4	43.23	2
TPSMDJ45A	TPSMDJ45CA	PFVA	DFVA	45.0	50.00	55.30	5	72.7	41.27	2
TPSMDJ48A	TPSMDJ48CA	PFXA	DFXA	48.0	53.30	58.90	5	77.4	38.76	2
TPSMDJ51A	TPSMDJ51CA	PFZA	DFZA	51.0	56.70	62.70	5	82.4	36.41	2
TPSMDJ54A	TPSMDJ54CA	PGEA	DGEA	54.0	60.00	66.30	5	87.1	34.44	2
TPSMDJ58A	TPSMDJ58CA	PGGA	DGGA	58.0	64.40	71.20	5	93.6	32.05	2
TPSMDJ60A	TPSMDJ60CA	PGKA	DGKA	60.0	66.70	73.70	5	96.8	30.99	2
TPSMDJ64A	TPSMDJ64CA	PGMA	DGMA	64.0	71.10	78.60	5	103.0	29.13	2
TPSMDJ70A	TPSMDJ70CA	PGPA	DGPA	70.0	77.80	86.00	5	113.0	26.55	2
TPSMDJ75A	TPSMDJ75CA	PGRA	DGRA	75.0	83.30	92.10	5	121.0	24.79	2
TPSMDJ78A	TPSMDJ78CA	PGTA	DGTA	78.0	86.70	95.80	5	126.0	23.81	2

**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(TA=25C unless otherwise noted)

Figure 1-Pulse Waveform

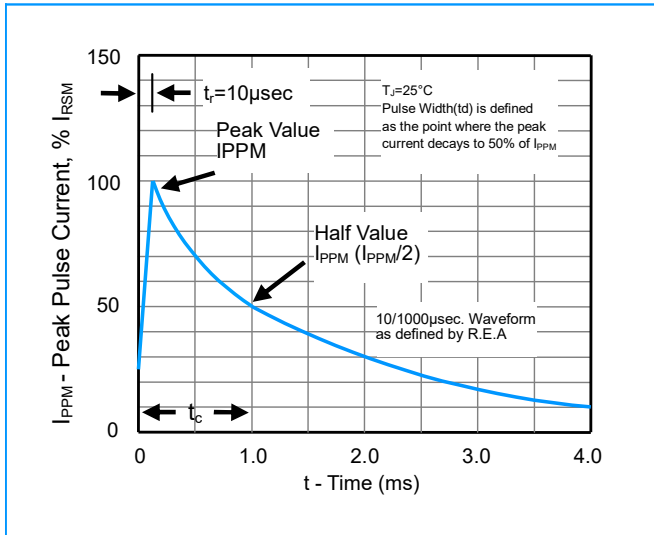


Figure 2-Pulse Derating Curve

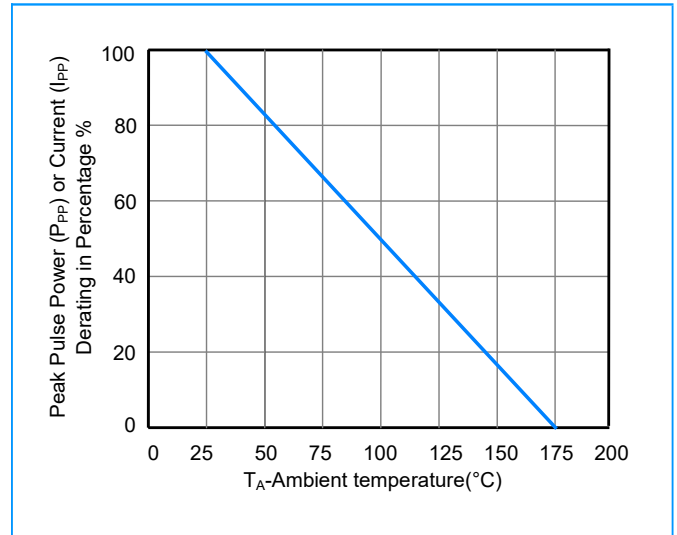


Figure 3-Peak Power Rating Curve

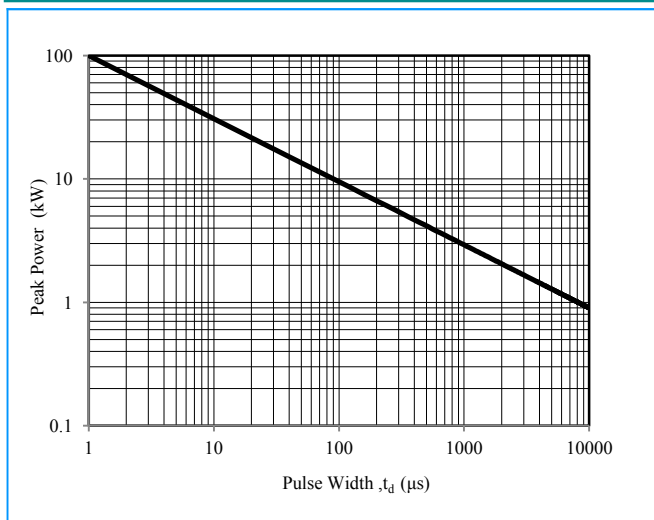
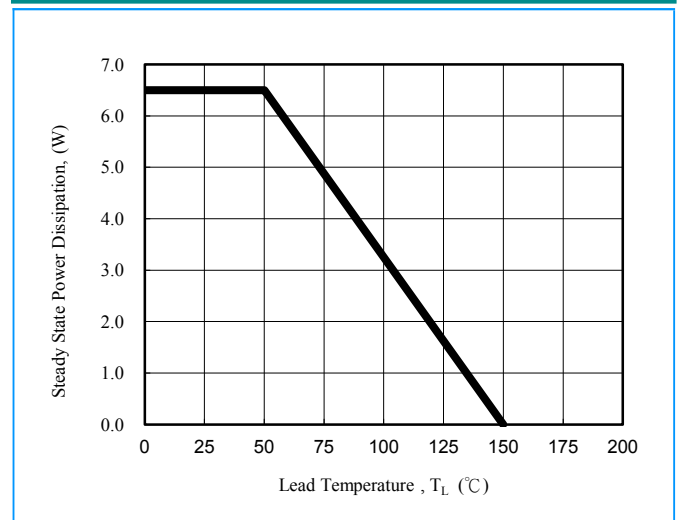


Figure 4-Steady State Power Derating Curve



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Figure 5-Maximum Non-Repetitive Surge Current

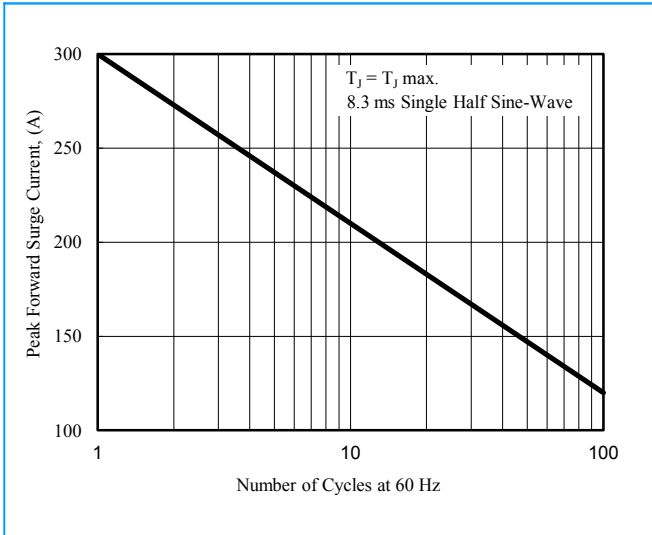
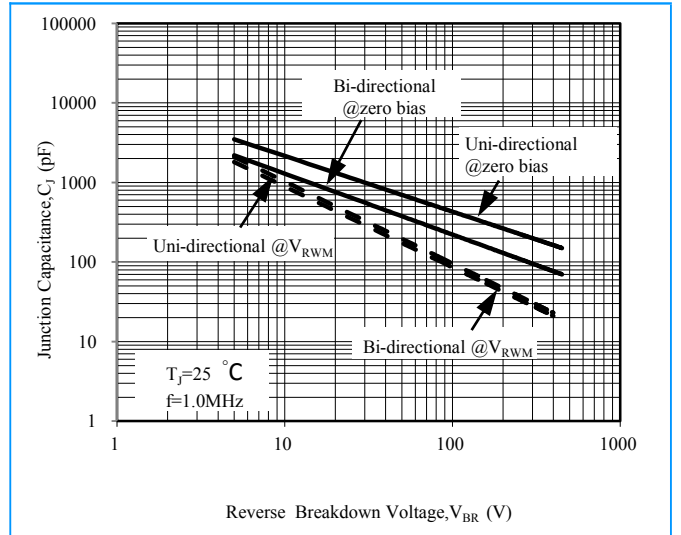
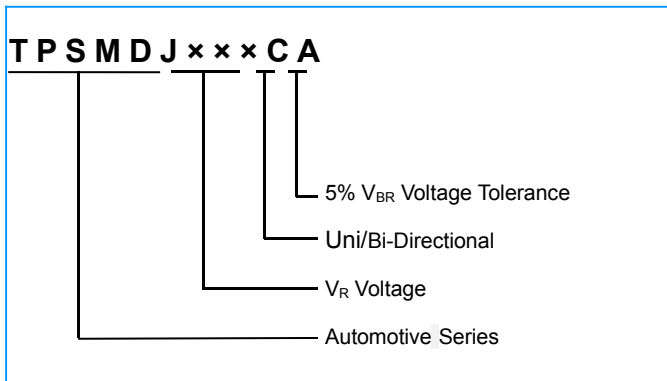


Figure 6-Typical Junction Capacitance



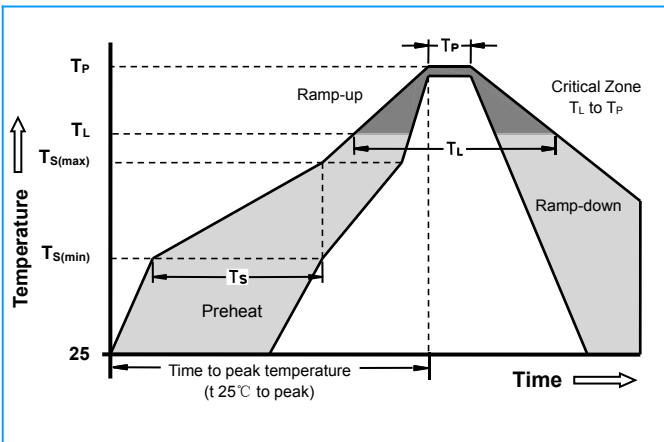
### Part Numbering



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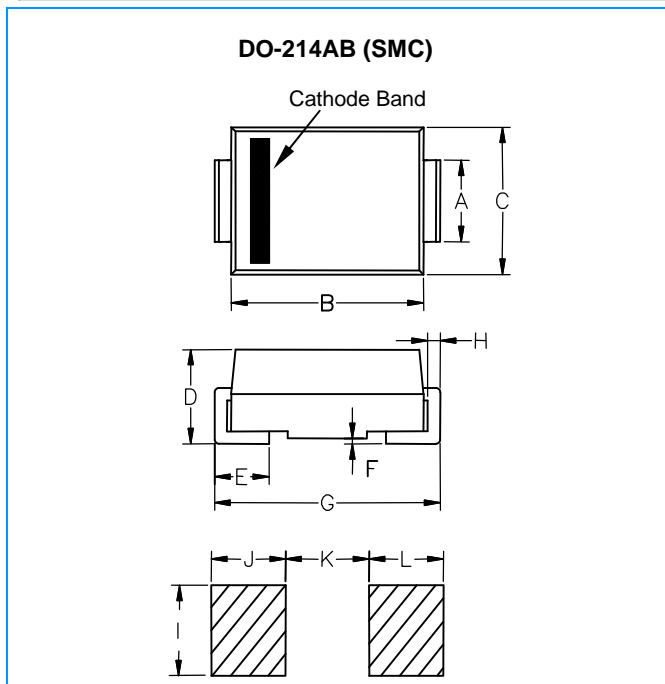
### TPSMDJ Series 10 To 78V 3000W

#### 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	-