

## Surface Mount Transient Voltage Suppressors

TPSMB10J Series 15 To 40V 1000W

### 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: 15 to 40 V

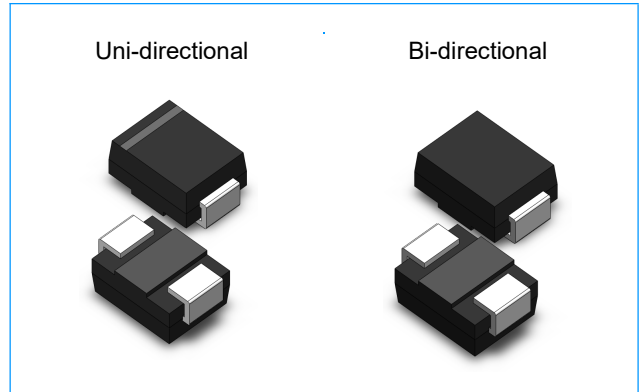
Peak Pulse Power: 1000 W

### Features

- ◆ Glass passivated chip
- ◆ 1000W peak pulse power capability with a 10/1000  $\mu$ A 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 guranteed
- ◆ Polarity: Color band denotes cathode end except Bipolar
- ◆ Mounting position: Any

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

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	$P_{PPM}$	1000	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 $\mu$ 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	$V_F$	3.5	V
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup>	$I_{FSM}$	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(@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				
TPSMB10J15A	TPSMB10J15CA	PALM	DABM	15.0	16.70	18.50	1	24.4	40.98	1
TPSMB10J16A	TPSMB10J16CA	PALP	DABP	16.0	17.80	19.70	1	26.0	38.46	1
TPSMB10J17A	TPSMB10J17CA	PALR	DABR	17.0	18.90	20.90	1	27.6	36.23	1
TPSMB10J18A	TPSMB10J18CA	PALT	DABT	18.0	20.00	22.10	1	29.2	34.25	1
TPSMB10J19A	TPSMB10J19CA	PALB	DABB	19.0	21.10	23.30	1	30.8	32.49	1
TPSMB10J20A	TPSMB10J20CA	PALV	DABV	20.0	22.20	24.50	1	32.4	30.86	1
TPSMB10J22A	TPSMB10J22CA	PALX	DABX	22.0	24.40	26.90	1	35.5	28.17	1
TPSMB10J24A	TPSMB10J24CA	PALZ	DABZ	24.0	26.70	29.50	1	38.9	25.71	1
TPSMB10J26A	TPSMB10J26CA	PAME	DACE	26.0	28.90	31.90	1	42.1	23.75	1
TPSMB10J28A	TPSMB10J28CA	PAMG	DACG	28.0	31.10	34.40	1	45.4	22.03	1
TPSMB10J30A	TPSMB10J30CA	PAMK	DACK	30.0	33.30	36.80	1	48.4	20.66	1
TPSMB10J33A	TPSMB10J33CA	PAMM	DACM	33.0	36.70	40.60	1	53.3	18.76	1
TPSMB10J36A	TPSMB10J36CA	PAMP	DACP	36.0	40.00	44.20	1	58.1	17.21	1
TPSMB10J40A	TPSMB10J40CA	PAMR	DACR	40.0	44.40	49.10	1	64.5	15.50	1

**Note:**

- (1) Add suffix ' CA ' after part number to specify Bi-directional devices
- (2) Suffix 'A ' denotes 5% tolerance device.

### Ratings and Characteristics Curves(TA=25C unless otherwise noted)

Figure 1-Pulse Waveform

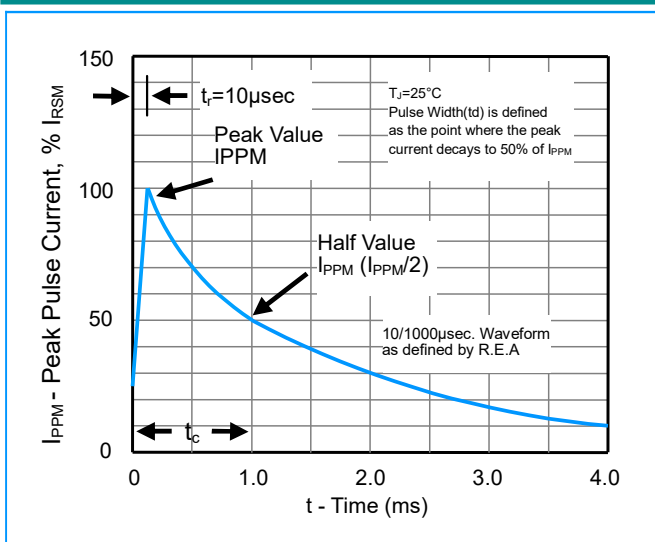
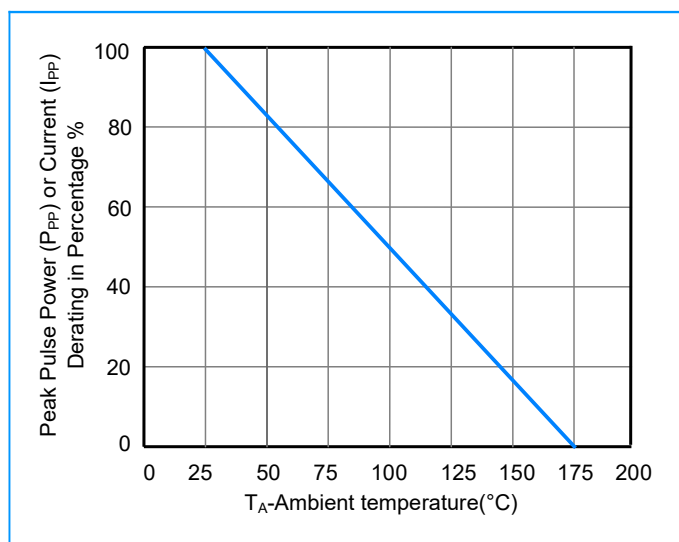


Figure 2-Pulse Derating Curve



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Figure 3-Peak Pulse Power Rating Curve

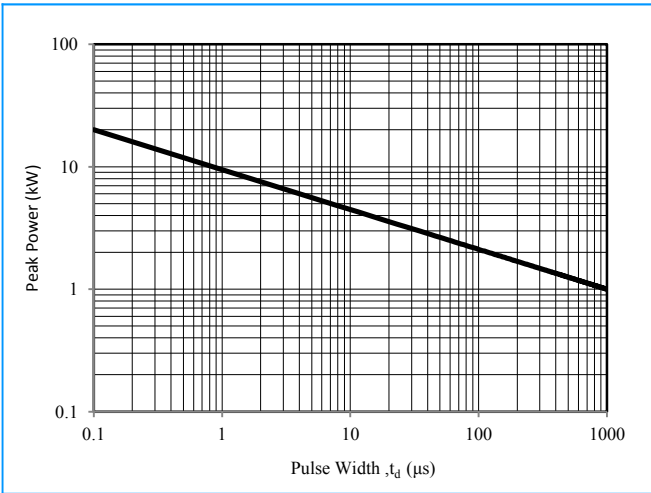


Figure 4-Steady State Power Derating Curve

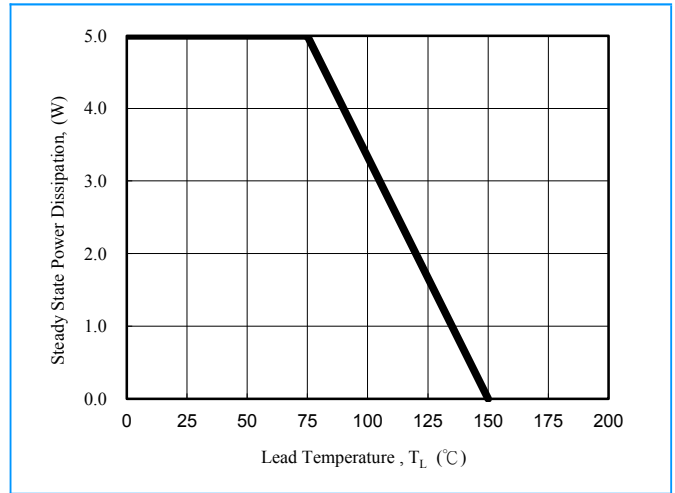


Figure 5-Maximum Non-Repetitive Surge Current

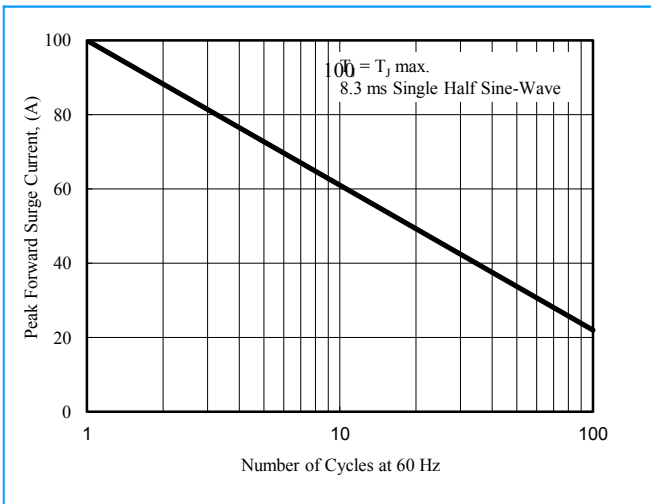
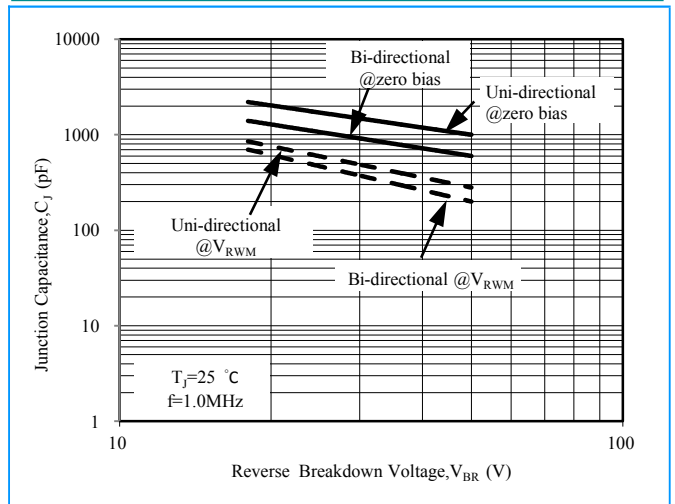
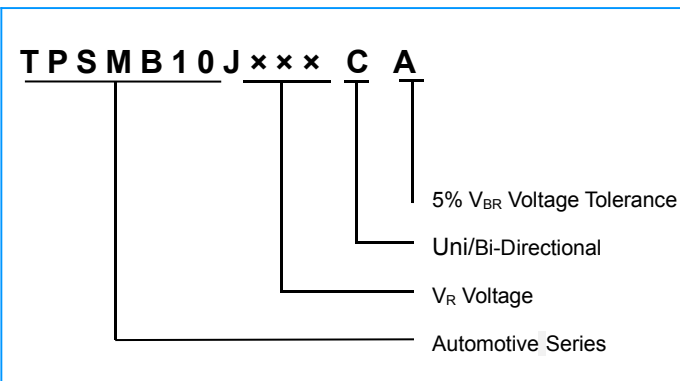


Figure 6-Typical Junction Capacitance



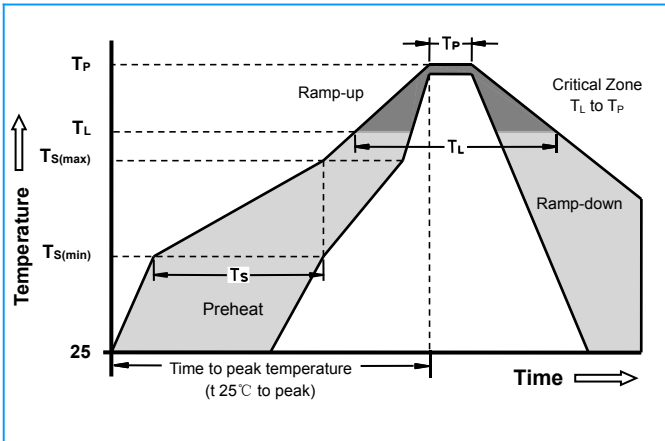
### Part Numbering



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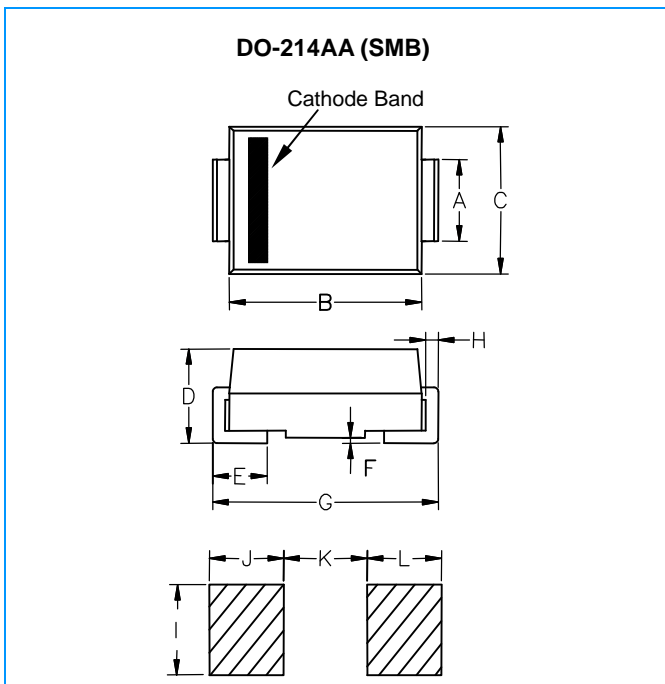
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### Soldering Parameters



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	0.077	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	-