

Surface Mount Transient Voltage Suppressors

TPSMAJ Series 10 To 85V 400W

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 85 V

Peak Pulse Power: 400 W

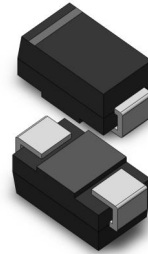
Features

- ◆ Glass passivated chip
- ◆ 400 W 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

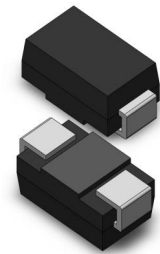
Application

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.

Uni-directional



Bi-directional



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 Thermall Characteristics(TA=25C Unless otherwise noted)

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾	P_{PPM}	400	W
Power Dissipation on Infinite Heat Sink at $T_L=75^{\circ}C$	P_D	1.0	W
Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾	I_{PP}	See Next Table	A
Junction and storage temperature range	T_J, T_{STG}	-55 to +175	$^{\circ}C$
Operating temperature range	T_{OP}	-55 to +150	$^{\circ}C$
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}	40	A

Note:

(1)Non-repetitive current pulse per Fig.5 and derated above $T_A=25^{\circ}C$ 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) $V_F < 3.5V$ for devices of $V_{BR} < 200V$ and $V_F < 5.0V$ for devices of $V_{BR} > 201V$

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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				
TPSMAJ10A	TPSMAJ10CA	AXA	WXA	10.0	11.10	12.30	1	17.0	23.53	5
TPSMAJ11A	TPSMAJ11CA	AZA	WZA	11.0	12.20	13.50	1	18.2	21.98	1
TPSMAJ12A	TPSMAJ12CA	BEA	XEA	12.0	13.30	14.70	1	19.9	20.10	1
TPSMAJ13A	TPSMAJ13CA	BGA	XGA	13.0	14.40	15.90	1	21.5	18.60	1
TPSMAJ14A	TPSMAJ14CA	BKA	XKA	14.0	15.60	17.20	1	23.2	17.24	1
TPSMAJ15A	TPSMAJ15CA	BMA	XMA	15.0	16.70	18.50	1	24.4	16.39	1
TPSMAJ16A	TPSMAJ16CA	BPA	XPA	16.0	17.80	19.70	1	26.0	15.38	1
TPSMAJ17A	TPSMAJ17CA	BRA	XRA	17.0	18.90	20.90	1	27.6	14.49	1
TPSMAJ18A	TPSMAJ18CA	BTA	XTA	18.0	20.00	22.10	1	29.2	13.70	1
TPSMAJ19A	TPSMAJ19CA	BBA	XBA	19.0	21.10	23.30	1	29.2	13.00	1
TPSMAJ20A	TPSMAJ20CA	BVA	XVA	20.0	22.20	24.50	1	32.4	12.35	1
TPSMAJ22A	TPSMAJ22CA	BXA	XXA	22.0	24.40	26.90	1	35.5	11.27	1
TPSMAJ24A	TPSMAJ24CA	BZA	XZA	24.0	26.70	29.50	1	38.9	10.28	1
TPSMAJ26A	TPSMAJ26CA	CEA	YEA	26.0	28.90	31.90	1	42.1	9.50	1
TPSMAJ28A	TPSMAJ28CA	CGA	YGA	28.0	31.10	34.40	1	45.4	8.81	1
TPSMAJ30A	TPSMAJ30CA	CKA	YKA	30.0	33.30	36.80	1	48.4	8.26	1
TPSMAJ33A	TPSMAJ33CA	CMA	YMA	33.0	36.70	40.60	1	53.3	7.50	1
TPSMAJ36A	TPSMAJ36CA	CPA	YPA	36.0	40.00	44.20	1	58.1	6.88	1
TPSMAJ40A	TPSMAJ40CA	CRA	YRA	40.0	44.40	49.10	1	64.5	6.20	1
TPSMAJ43A	TPSMAJ43CA	CTA	YTA	43.0	47.80	52.80	1	69.4	5.76	1
TPSMAJ45A	TPSMAJ45CA	CVA	YVA	45.0	50.00	55.30	1	72.7	5.50	1
TPSMAJ48A	TPSMAJ48CA	CXA	YXA	48.0	53.30	58.90	1	77.4	5.17	1
TPSMAJ51A	TPSMAJ51CA	CZA	YZA	51.0	56.70	62.70	1	82.4	4.85	1
TPSMAJ54A	TPSMAJ54CA	REA	ZEA	54.0	60.00	66.30	1	87.1	4.59	1
TPSMAJ58A	TPSMAJ58CA	RGA	ZGA	58.0	64.40	71.20	1	93.6	4.27	1
TPSMAJ60A	TPSMAJ60CA	RKA	ZKA	60.0	66.70	73.70	1	96.8	4.13	1
TPSMAJ64A	TPSMAJ64CA	RMA	ZMA	64.0	71.10	78.60	1	103.0	3.88	1
TPSMAJ70A	TPSMAJ70CA	RPA	ZPA	70.0	77.80	86.00	1	113.0	3.54	1
TPSMAJ75A	TPSMAJ75CA	RRA	ZRA	75.0	83.30	92.10	1	121.0	3.31	1
TPSMAJ78A	TPSMAJ78CA	RTA	ZTA	78.0	86.70	95.80	1	126.0	3.17	1
TPSMAJ80A	TPSMAJ80CA	RBA	ZBA	80.0	88.80	97.60	1	129.6	3.09	1
TPSMAJ85A	TPSMAJ85CA	RVA	ZVA	85.0	94.40	104.00	1	137.0	2.92	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(TA=25°C unless otherwise noted)

Figure 1-Pulse Waveform

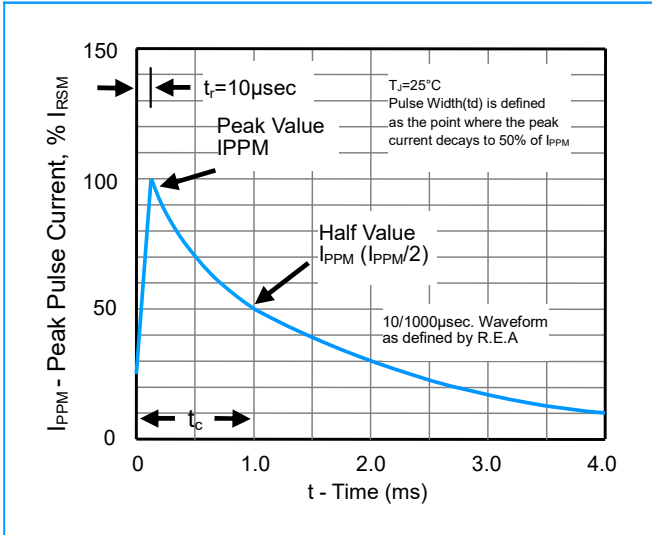


Figure 2-Pulse Derating Curve

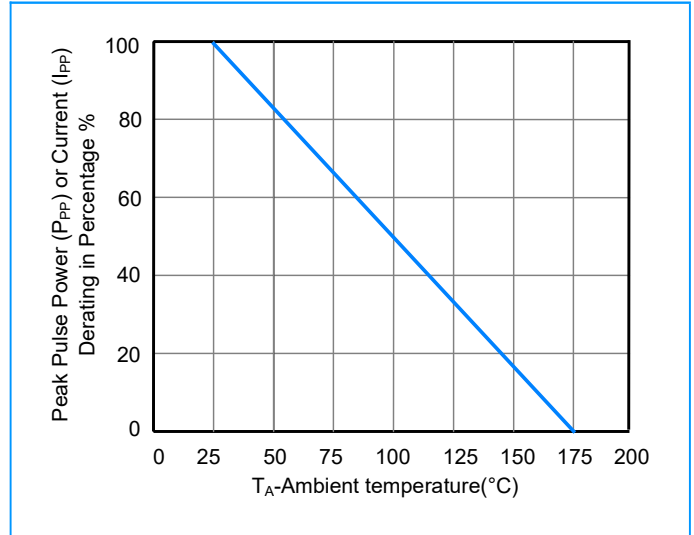


Figure 3-Peak Pulse Power Rating Curve

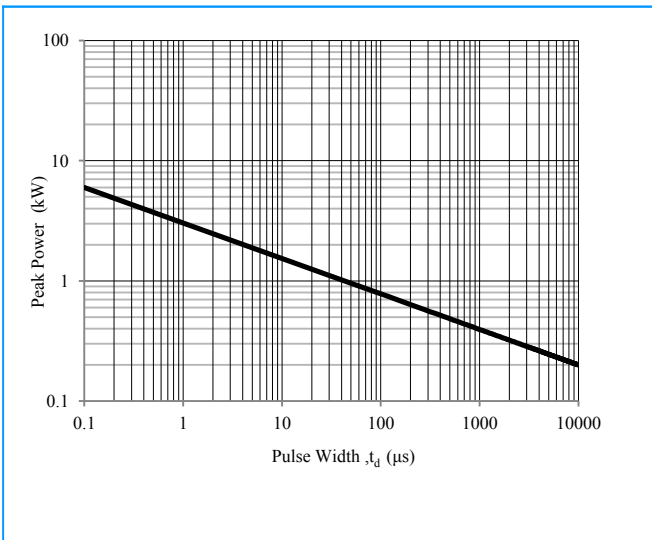
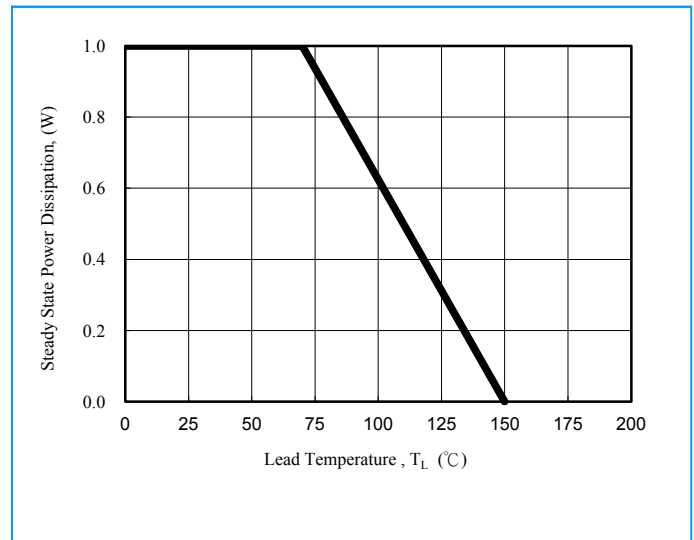


Figure 4-Steady State Power Derating Curve



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Figure 5-Maximum Non-Repetitive Surge Current

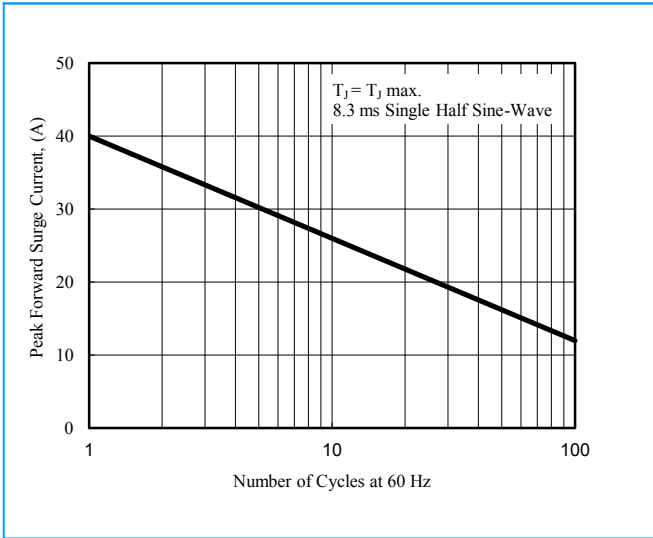
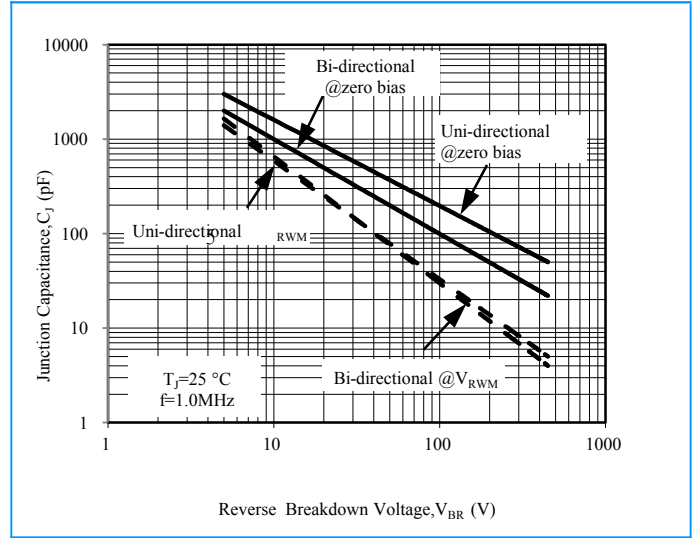
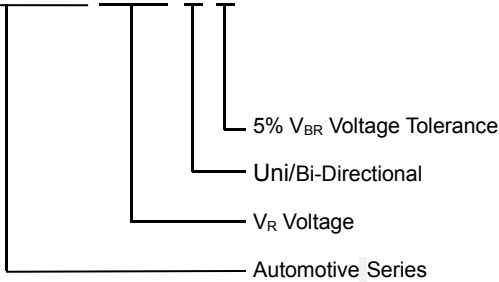


Figure 6-Typical Junction Capacitance



Part Numbering

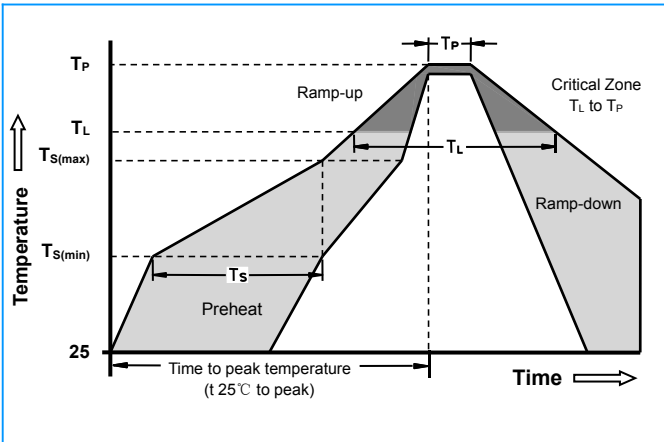
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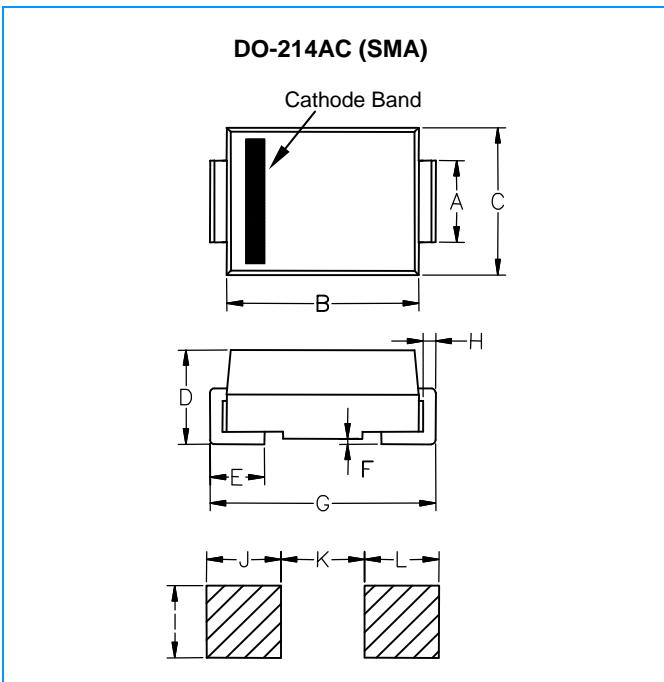
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Soldering Parameters



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	0.049	0.064	1.230	1.630
B	0.162	0.179	4.10	4.550
C	0.099	0.109	2.510	2.760
D	0.077	0.089	1.960	2.260
E	0.030	0.060	0.750	1.510
F	-	0.008	-	0.203
G	0.192	0.206	4.87	5.220
H	0.006	0.012	0.152	0.305
I	0.070	-	1.800	-
J	0.082	-	2.100	-
K	-	0.090	-	2.300
L	0.082	-	2.100	-