Surface Mount Transient Voltage Suppressors

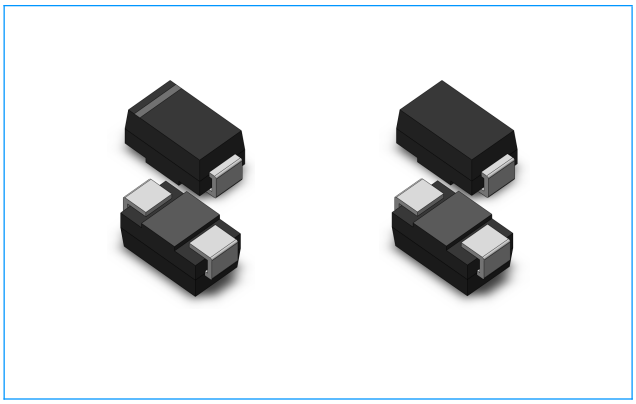
TPSMA Series 12 To 100V 400W

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: 12 to 100 V

Peak Pulse Power: 400 W



Features

- Glass passivated chip
- 400W peak pulse power capability with a 10/1000 uA 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 guranteed
- 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 ℃ unless otherwise noted)

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 μs waveform(1)	P_{PPM}	400	W
Power Dissipation on Infinite Heat Sink at T_L=75°C	P_D	1.0	W
Peak pulse current with a 10/1000 μs waveform(1)	I_{PP}	See Next Table	A
Operating junction and storage temperature range (V_{BR} ≤ 47V)	T_J , T_{STG}	-55 to +175	° C
Operating junction and storage temperature range (V_{BR} > 47V)		-55 to +150	° C
Maximum instantaneous forward voltage at 25 A for unidirectional only	V_F	3.5	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℃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℃ 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				
TPSMA12A	TPSMA12CA	12AA	12CA	12	11.40	12.60	1	16.7	23.95	5
TPSMA13A	TPSMA13CA	13AA	13CA	13	12.35	13.65	1	18.2	21.98	1
TPSMA15A	TPSMA15CA	15AA	15CA	15	14.25	15.75	1	21.2	18.87	1
TPSMA16A	TPSMA16CA	16AA	16CA	16	15.20	16.80	1	22.5	17.78	1
TPSMA18A	TPSMA18CA	18AA	18CA	18	17.10	18.90	1	25.2	15.87	1
TPSMA20A	TPSMA20CA	20AA	20CA	20	19.00	21.00	1	27.7	14.44	1
TPSMA22A	TPSMA22CA	22AA	22CA	22	20.90	23.10	1	30.6	13.07	1
TPSMA24A	TPSMA24CA	24AA	24CA	24	22.80	25.20	1	33.2	12.05	1
TPSMA27A	TPSMA27CA	27AA	27CA	27	25.65	28.35	1	37.5	10.67	1
TPSMA30A	TPSMA30CA	30AA	30CA	30	28.50	31.50	1	41.4	9.66	1
TPSMA33A	TPSMA33CA	33AA	33CA	33	31.35	34.65	1	45.7	8.75	1
TPSMA36A	TPSMA36CA	36AA	36CA	36	34.20	37.80	1	49.9	8.02	1
TPSMA39A	TPSMA39CA	39AA	39CA	39	37.05	40.95	1	53.9	7.42	1
TPSMA43A	TPSMA43CA	43AA	43CA	43	40.85	45.15	1	59.3	6.75	1
TPSMA47A	TPSMA47CA	47AA	47CA	47	44.65	49.35	1	64.8	6.17	1
TPSMA51A	TPSMA51CA	51AA	51CA	51	48.45	53.55	1	70.1	5.71	1
TPSMA56A	TPSMA56CA	56AA	56CA	56	53.20	58.80	1	77.0	5.19	1
TPSMA62A	TPSMA62CA	62AA	62CA	62	58.90	65.10	1	85.0	4.71	1
TPSMA68A	TPSMA68CA	68AA	68CA	68	64.60	71.40	1	92.0	4.35	1
TPSMA75A	TPSMA75CA	75AA	75CA	75	71.25	78.75	1	103	3.88	1
TPSMA82A	TPSMA82CA	82AA	82CA	82	77.90	86.10	1	113	3.54	1
TPSMA91A	TPSMA91CA	91AA	91CA	91	86.45	95.55	1	125	3.20	1
TPSMA100A	TPSMA100CA	100AA	100CA	100	95.00	105.0	1	137	2.92	1

Note:

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

Ratings and Characteristics Curves (T_A=25℃ unless otherwise noted)

Figure 1 - Pulse Waveform

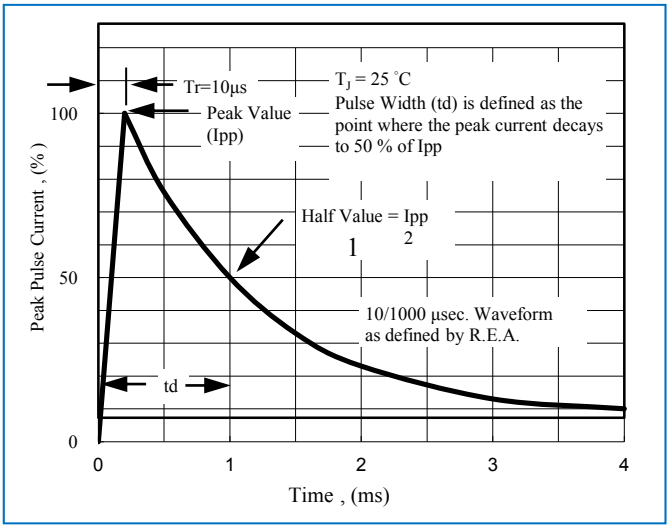
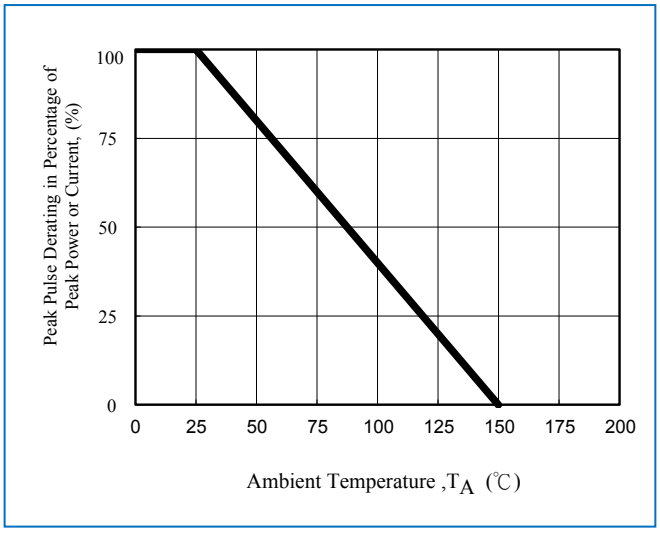


Figure 2 - Pulse Derating Curve



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Figure 3 - Peak Pulse Power Rating Curve

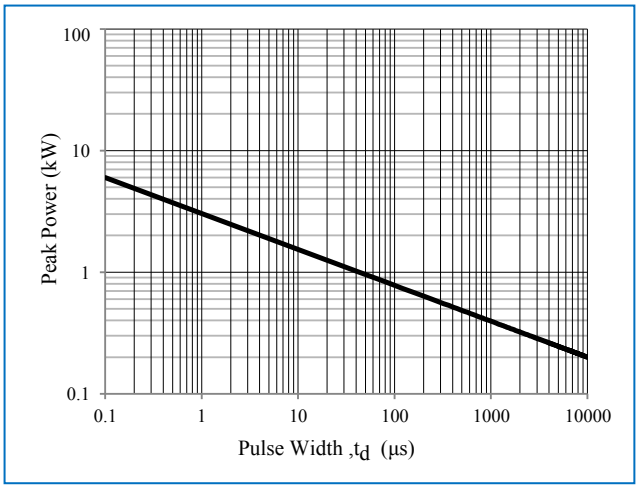


Figure 4 - Steady State Power Derating Curve

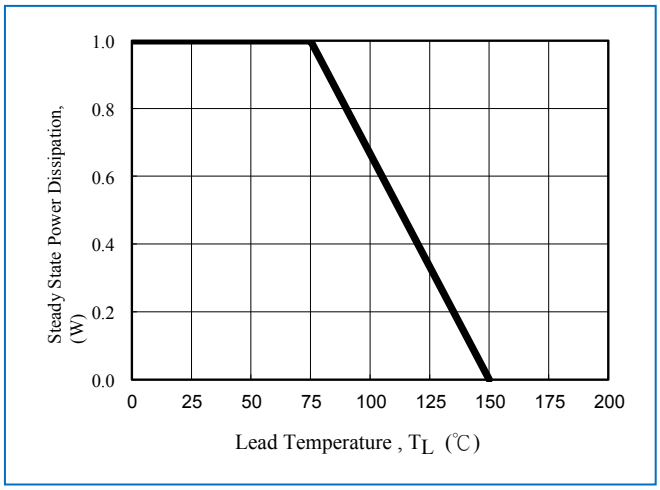


Figure 5 - Maximum Non-Repetitive Surge Current

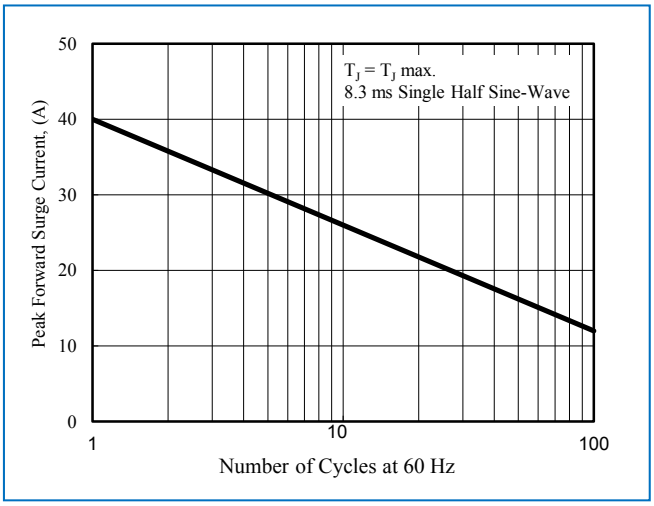
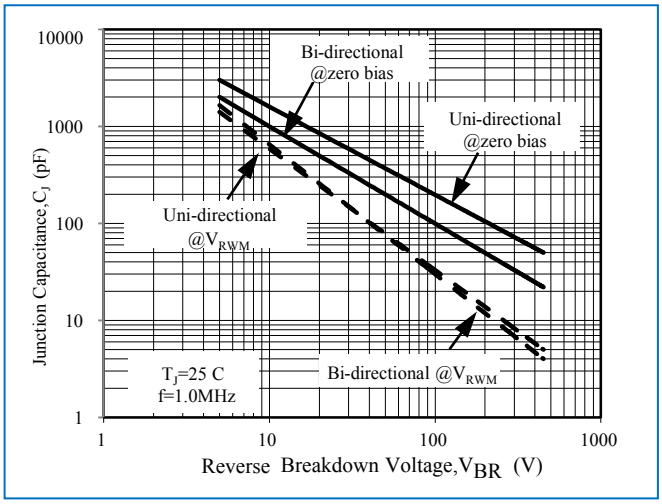
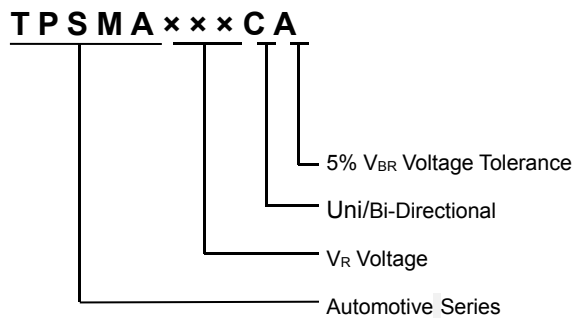


Figure 6 - Typical Junction Capacitance



Part Numbering

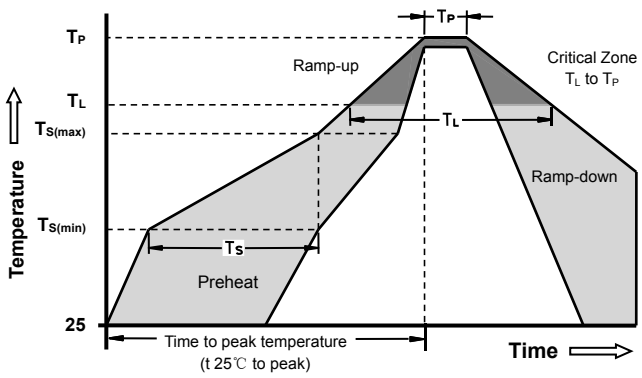


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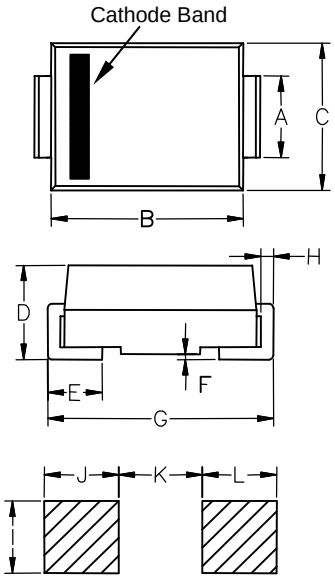
Soldering Parameters



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 TL - 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

DO-214AC (SMA)



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	-

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