優恩半導體
UN Semiconductor®

Surface Mount Transient Voltage Suppressors

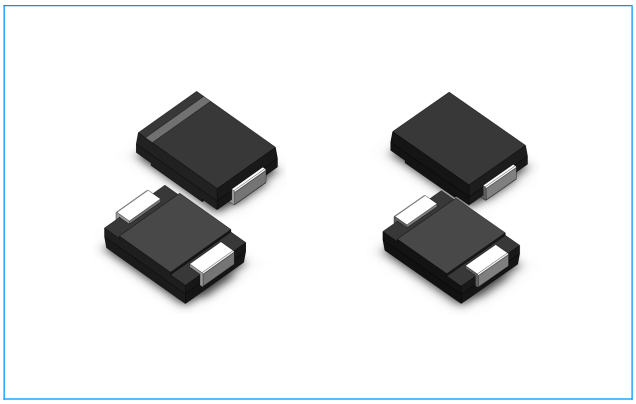
TPSMC Series 12 To 91V 1500W

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: 12 to 91 V

Peak Pulse Power: 1500 W



Features

- Glass passivated chip
- 1500W peak pulse power capability with a 10/1000 us 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 ℃ unless otherwise noted)

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 μs waveform(1)	P_{PPM}	1500	W
Power Dissipation on Infinite Heat Sink at T_L=75°C	P_D	6.5	W
Peak pulse current with a 10/1000 μs waveform(1)	I_{PP}	See Next Table	A
Operating junction and storage temperature range	T_J , T_{STG}	-55 to +150	° 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℃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 (@ 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				
TPSMC12A	TPSMC12CA	12AA	12CA	10.2	11.40	12.60	1	16.7	89.82	5
TPSMC13A	TPSMC13CA	13AA	13CA	11.1	12.35	13.65	1	18.2	82.42	1
TPSMC15A	TPSMC15CA	15AA	15CA	12.8	14.25	15.75	1	21.2	70.75	1
TPSMC16A	TPSMC16CA	16AA	16CA	13.6	15.20	16.80	1	22.5	66.67	1
TPSMC18A	TPSMC18CA	18AA	18CA	15.3	17.10	18.90	1	25.2	59.52	1
TPSMC20A	TPSMC20CA	20AA	20CA	17.1	19.00	21.00	1	27.7	54.15	1
TPSMC22A	TPSMC22CA	22AA	22CA	18.8	20.90	23.10	1	30.6	49.02	1
TPSMC24A	TPSMC24CA	24AA	24CA	20.5	22.80	25.20	1	33.2	45.18	1
TPSMC27A	TPSMC27CA	27AA	27CA	23.1	25.65	28.35	1	37.5	40.00	1
TPSMC30A	TPSMC30CA	30AA	30CA	25.6	28.50	31.50	1	41.4	36.23	1
TPSMC33A	TPSMC33CA	33AA	33CA	28.2	31.35	34.65	1	45.7	32.82	1
TPSMC36A	TPSMC36CA	36AA	36CA	30.8	34.20	37.80	1	49.9	30.06	1
TPSMC39A	TPSMC39CA	39AA	39CA	33.3	37.05	40.95	1	53.9	27.83	1
TPSMC43A	TPSMC43CA	43AA	43CA	36.8	40.85	45.15	1	59.3	25.30	1
TPSMC47A	TPSMC47CA	47AA	47CA	40.2	44.65	49.35	1	64.8	23.15	1
TPSMC51A	TPSMC51CA	51AA	51CA	43.6	48.45	53.55	1	70.1	21.40	1
TPSMC56A	TPSMC56CA	56AA	56CA	47.8	53.20	58.80	1	77.0	19.48	1
TPSMC62A	TPSMC62CA	62AA	62CA	53.0	58.90	65.10	1	85.0	17.65	1
TPSMC68A	TPSMC68CA	68AA	68CA	58.1	64.60	71.40	1	92.0	16.30	1
TPSMC75A	TPSMC75CA	75AA	75CA	64.1	71.25	78.75	1	103.0	14.56	1
TPSMC82A	TPSMC82CA	82AA	82CA	70.1	77.90	86.10	1	113.0	13.27	1
TPSMC91A	TPSMC91CA	91AA	91CA	77.8	86.45	95.55	1	125.0	12.00	1

Note:

(1) The available parts are "A" type only,the parts without A(VBR is ±10%) is not available

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

(3) For Bi-Directional devices having VR of 10 volts and under, the IR limit is double

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

Figure 1 - Pulse Waveform

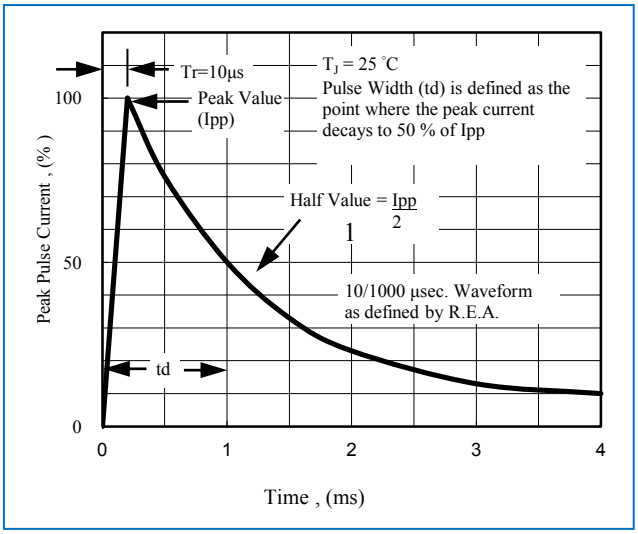

Figure 2 - Pulse Derating Curve

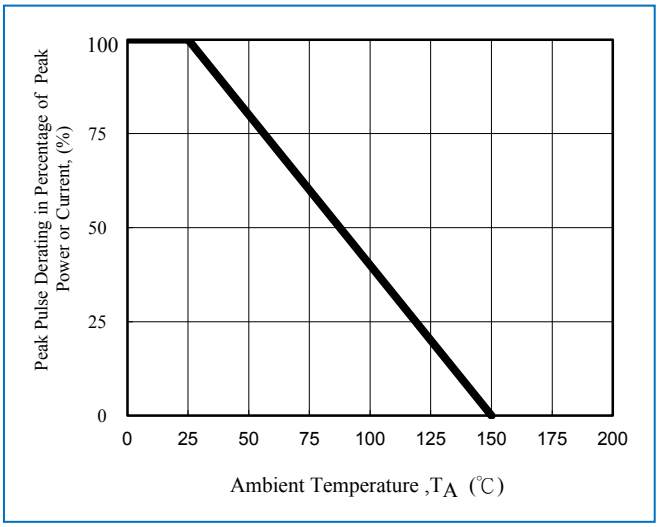

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Figure 3 - Peak Pulse Power Rating Curve

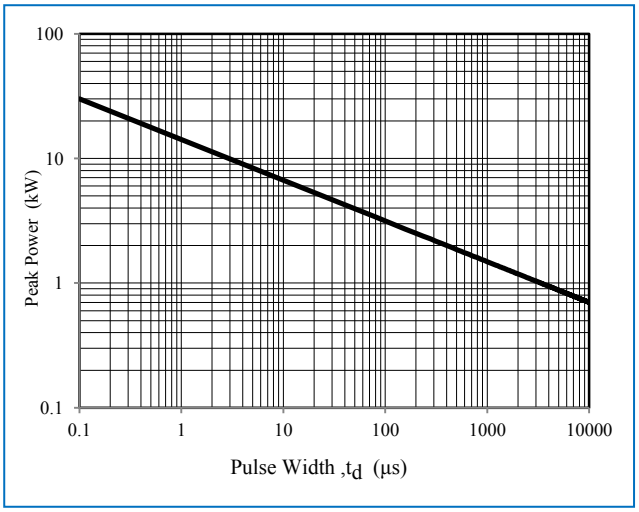


Figure 4 - Steady State Power Derating Curve

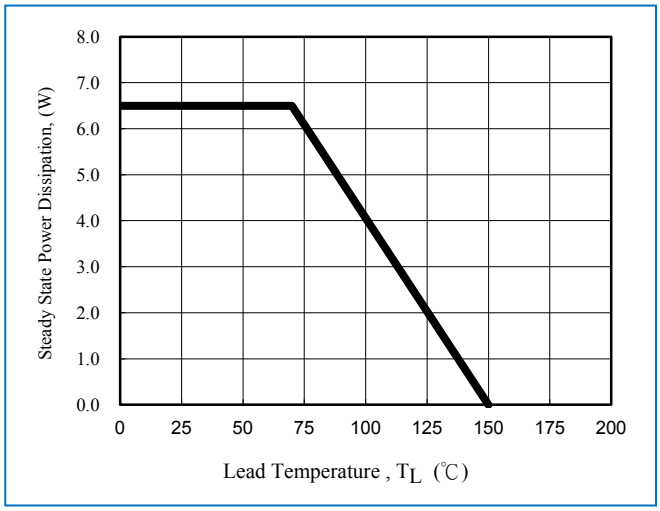


Figure 5 - Maximum Non-Repetitive Surge Current

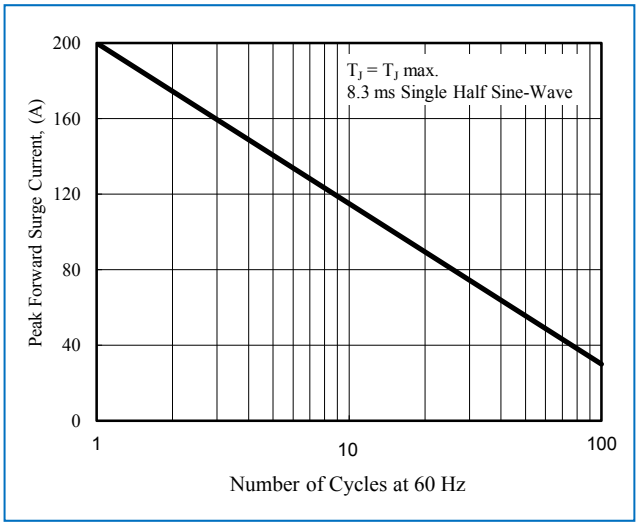
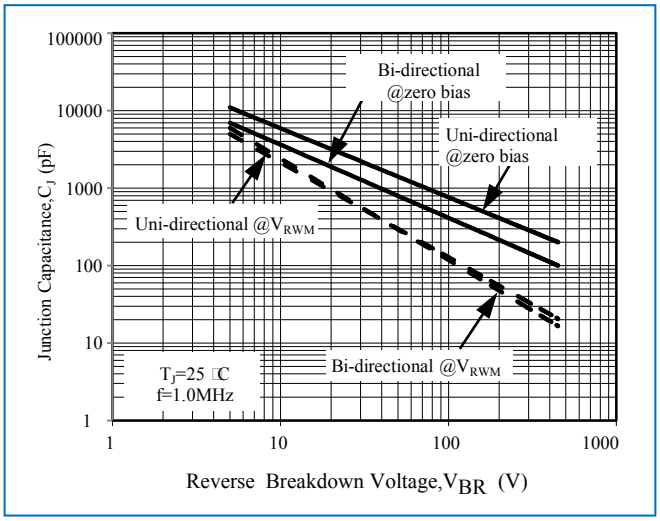
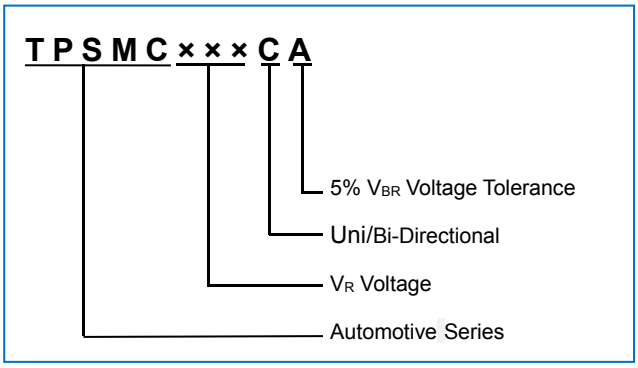


Figure 6 - Typical Junction Capacitance



Part Numbering



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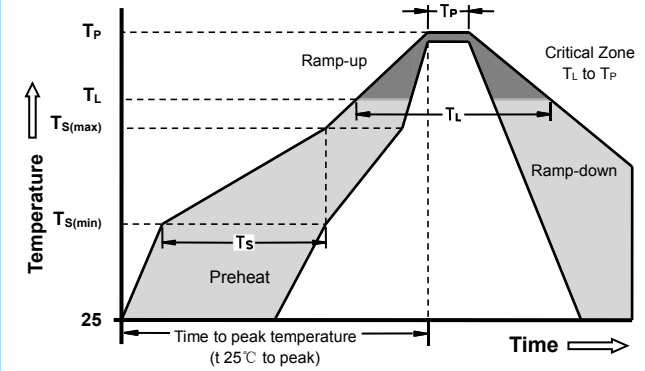
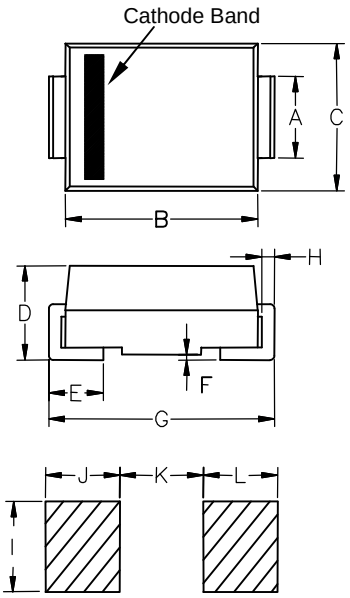
Soldering Parameters



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-214AB (SMC)



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	-