

Transient Voltage Suppressors (TVS) Data Sheet

Features

- High current transient suppressor
- Glass passivated junction.
- Low leakage current
- Excellent Clamping Capability.
- 8000W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Uni-directional polarity
- Meets RoHS2.0 (2011/65/EU) but Halogen
- Meets MSL level 1, per J-STD-020
- Meets ISO7637-2 5a surge specification
- AEC-Q101 qualified (Automotive grade with suffix "Q".)
- Exsemi technology

Mechanical Data

- Case: DO-218AB
- Polarity: Heatsink is anode
- Epoxy: UL 94V-0 rate flame retardant

Applications

- SM8T Series TVS diodes can be used in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application.

Maximum Ratings and Characteristics

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 μ s waveform (Note1)	P _{PPM}	Minimum 8000	Watts
Peak pulse current of at 10/1000 μ s waveform (Note 1)	I _{PPM}	See Table	Amps
Power dissipation on infinite heatsink at T _L =25 $^{\circ}$ C	P _D	8	Watts
Peak forward surge current, 8.3ms single half sine-wave	I _{FSM}	700	Amps
Operating junction and Storage Temperature Rang	T _J , T _{STG}	-55 to +175	$^{\circ}$ C

Note: 1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25 $^{\circ}$ C per Fig.2.

Electrical Characteristics ($T_A=25^{\circ}\text{C}$)

Part Number		V_R	$I_R@V_R$		$V_{BR} @ I_T$		I_T	$V_C @ I_{pp}$	I_{pp}
Uni-polar	Bi-polar	V	$\mu\text{A}@25^{\circ}\text{C}$	$\mu\text{A}@175^{\circ}\text{C}$	min(V)	max (V)	mA	V	A
SM8T10A	SM8T10CA	10.0	5	250	11.1	12.3	5	17.0	471
SM8T11A	SM8T11CA	11.0	5	150	12.2	13.5	5	18.2	440
SM8T12A	SM8T12CA	12.0	5	150	13.3	14.7	5	19.9	403
SM8T13A	SM8T13CA	13.0	5	150	14.4	15.9	5	21.5	372
SM8T14A	SM8T14CA	14.0	5	150	15.6	17.2	5	23.2	345
SM8T15A	SM8T15CA	15.0	5	150	16.7	18.5	5	24.4	328
SM8T16A	SM8T16CA	16.0	5	150	17.8	19.7	5	26.0	308
SM8T17A	SM8T17CA	17.0	5	150	18.9	20.9	5	27.6	290
SM8T18A	SM8T18CA	18.0	5	150	20.0	22.1	5	29.2	274
SM8T20A	SM8T20CA	20.0	5	150	22.2	24.5	5	32.4	247
SM8T22A	SM8T22CA	22.0	5	150	24.4	26.9	5	35.5	225
SM8T24A	SM8T24CA	24.0	5	150	26.7	29.5	5	38.9	206
SM8T26A	SM8T26CA	26.0	5	150	28.9	31.9	5	42.1	190
SM8T28A	SM8T28CA	28.0	5	150	31.1	34.4	5	45.4	176
SM8T30A	SM8T30CA	30.0	5	150	33.3	36.8	5	48.4	165
SM8T32A	SM8T32CA	32.0	5	150	35.5	39.4	5	51.4	156
SM8T33A	SM8T33CA	33.0	5	150	36.7	40.6	5	53.3	150
SM8T36A	SM8T36CA	36.0	5	150	40.0	44.2	5	58.1	138
SM8T40A	SM8T40CA	40.0	5	150	44.4	49.1	5	64.5	124
SM8T43A	SM8T43CA	43.0	5	150	47.8	52.8	5	69.4	115

Note:

①. For all types maximum $V_F = 1.8\text{ V}$ at $I_F = 100\text{ A}$ measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

②. Surge waveform: 10/1000 μs

V_R : Stand-off Voltage -- Maximum voltage that can be applied

V_{BR} : Breakdown Voltage

V_C : Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{pp}

I_R : Reverse Leakage Current

I_T : Test current

Ratings and Characteristic Curves ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Figure 1. Reverse Power Capability

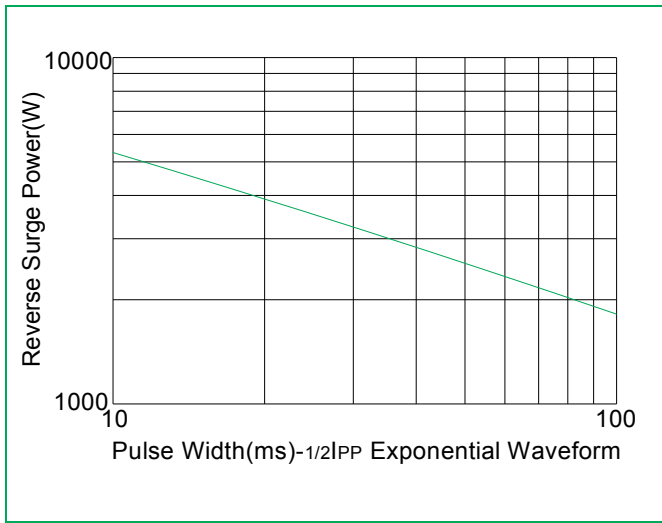


Figure 2. Pulse Waveform

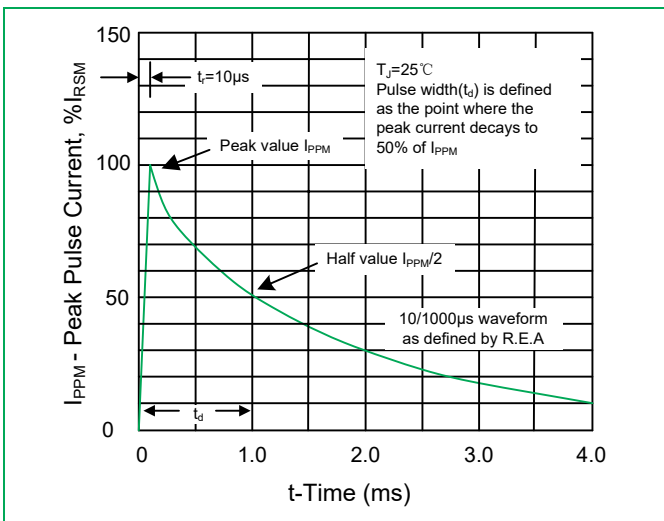


Figure 3. Steady State Power Dissipation Derating Curve

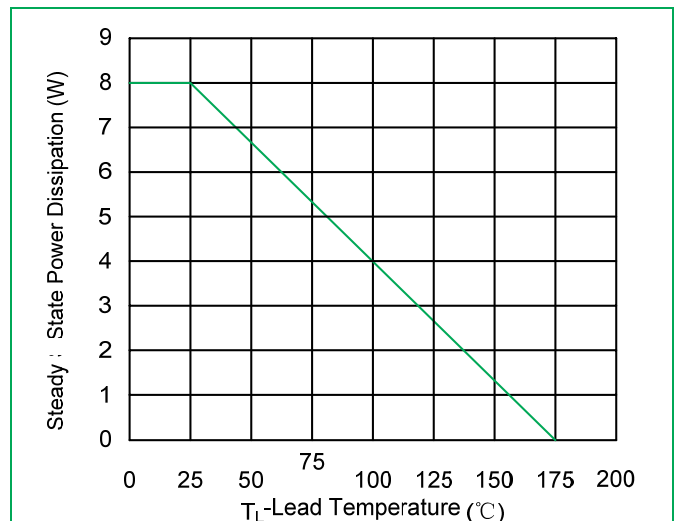


Figure 4. Typical Transient Thermal Impedance

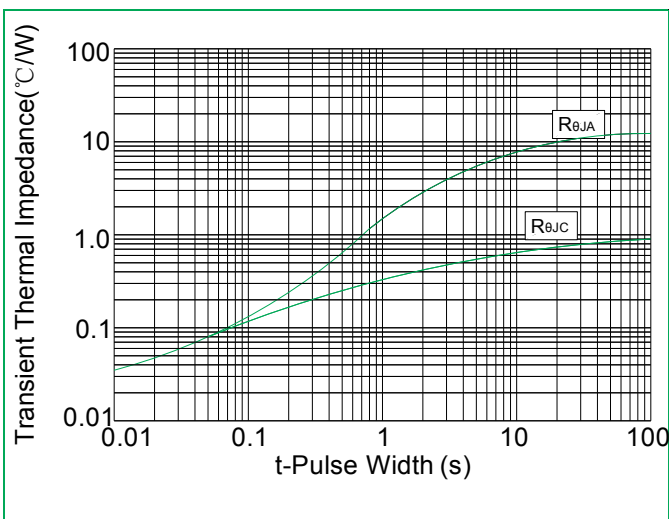
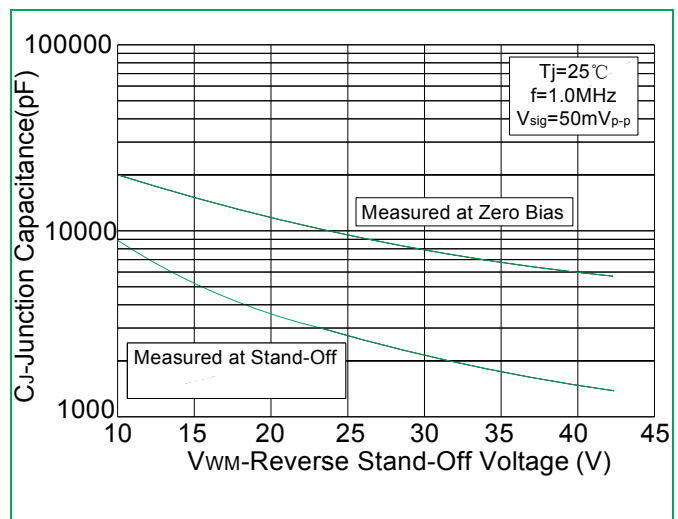
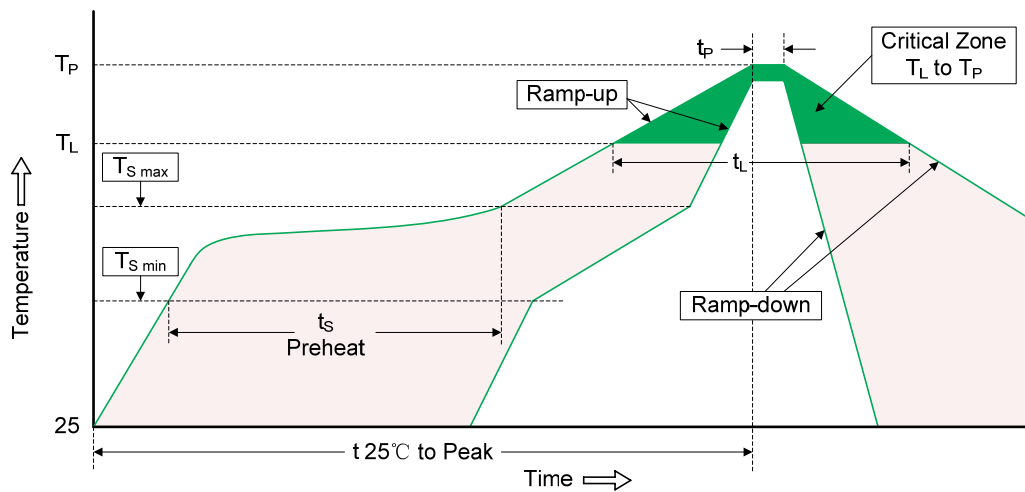


Figure 5. Typical Junction Capacitance



Recommended Soldering Conditions

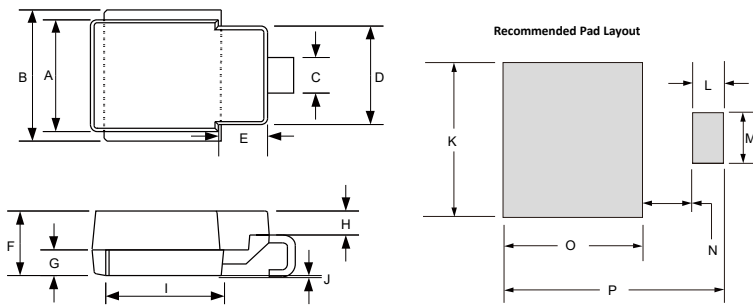
Reflow Soldering



Recommended Conditions

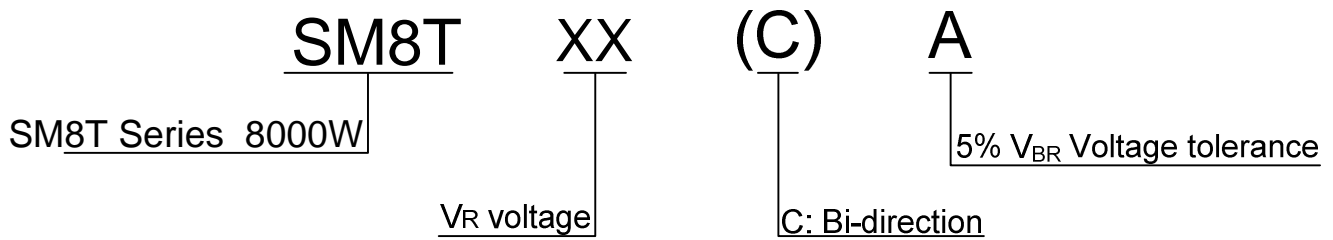
Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat	
-Temperature Min ($T_{S\ min}$)	150°C
-Temperature Max ($T_{S\ max}$)	200°C
-Time (min to max) (t_s)	60-180 seconds
$T_{S\ max}$ to T_L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T_L)	217°C
-Time (t_L)	60-150 seconds
Peak Temperature (T_P)	260°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	8 minutes max.

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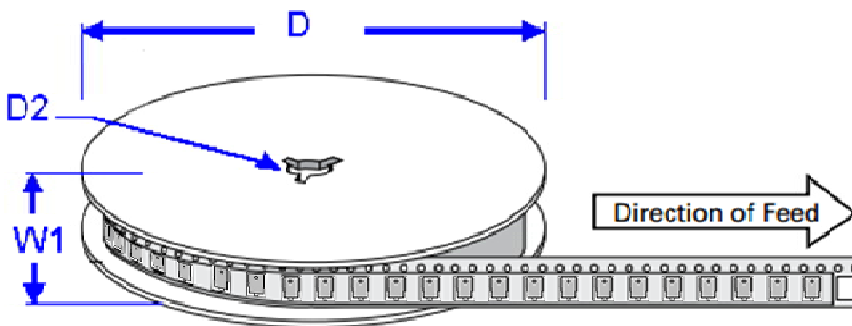


DIM	Millimeters		Inch	
	Min	Max	Min	Max
A	8.300	8.700	0.3268	0.3425
B	9.500	10.500	0.3740	0.4134
C	2.400	3.000	0.0945	0.1181
D	7.000	8.000	0.2756	0.3150
E	3.200	3.800	0.1260	0.1496
F	4.600	5.200	0.1811	0.2047
G	1.700	2.300	0.0669	0.0906
H	1.500	2.100	0.0591	0.0827
I	8.500	9.500	0.3346	0.3740
J	-	0.160	-	0.0063
K	9.500	10.500	0.3740	0.4134
L	1.700	2.300	0.0669	0.0906
M	2.400	3.000	0.0945	0.1181
N	3.200	3.800	0.1260	0.1496
O	8.700	9.300	0.3425	0.3661
P	14.800	15.400	0.5827	0.6063

Part Number Code and Marking



Packaging



Dimensions	millimeters	inches
D	330 ± 0.2	13.0 ± 0.008
D2	13.2 ± 0.2	0.52 ± 0.008
W1	24 ± 0.2	0.94 ± 0.008

OUTLINE	REEL (PCS)	PER CARTON (PCS)	REEL DIAMETERS (mm)
TAPING	750	3000	330