

Surface Mount Transient Voltage Suppressors

SM5Z Series 14 To 36 V 3600W

Description

The SM5Z series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Working Voltage: 14 to 36 V

Peak Pulse Power: 3600 W

Features

- ◆ Glass passivated chip
- ◆ 3600 W peak pulse power capability with a 10/1000 us waveform, repetitive rate (duty cycle):0.01 %
- ◆ $T_J = 175\text{ }^\circ\text{C}$ capability suitable for high reliability and automotive requirement
- ◆ Meets ISO7637-2 surge specification (varied by test condition)Meet AEC-Q101 requirement
- ◆ Low leakage
- ◆ Uni-directional polarity
- ◆ Excellent clamping capability
- ◆ Very fast response time
- ◆ RoHS compliant

Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application



Mechanical Data

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

Primary Characteristics

V_{RWM}	14V to 43V
P_{PPM} (10/1000 μ s)	3600W
P_{PPM} (10/10000 μ s)	2800W
P_D	5W
I_{FSM}	500A
$T_{J\max}$	175 $^\circ$ C
Package	DO-218AB

Maximum Ratings and Thermal Characteristics ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units
Peak Pulse Power Dissipation	P_{PPM}	with 10/1000 μ s waveform	3600
		with 10/10000 μ s waveform	2800
Power Dissipation on Infinite Heat Sink at $T_L = 25\text{ }^\circ\text{C}$ (Fig.1)	P_D	5	W
Peak Pulse Current with a 10/1000 μ s waveform	I_{PP}	See Next Table	A
Peak forward surge current 8.3 ms single half sine Wave	I_{FSM}	500	A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to +175	$^\circ\text{C}$
Typical thermal resistance, junction to case	$R_{\theta JC}$	0.90	$^\circ\text{C/Watt}$

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

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Electrical Characteristics (@ 25°C Unless Otherwise Specified)

Part Number	Stand-Off Voltage V_{MW} (V)	Breakdown Voltage V_{BR} (V)		Test Current I_T (mA)	Maximum Reverse Leakage I_R @ V_{RWM} (uA)	Maximum I_R @ V_{RWM} $T_J = 175$ (uA)	Maximum Reverse Surge Current I_{PP} (A) ⁽¹⁾	Maximum Clamping Voltage V_C @ I_{PP} (V)
		MIN.	MAX.					
SM5Z14A	14	15.60	17.20	5.0	10	150	155.0	23.2
SM5Z15A	15	16.70	18.50	5.0	10	150	148.0	24.4
SM5Z16A	16	17.80	19.70	5.0	10	150	138.0	26.0
SM5Z17A	17	18.90	20.90	5.0	10	150	130.0	27.6
SM5Z18A	18	20.00	22.10	5.0	10	150	123.0	29.2
SM5Z20A	20	22.20	24.50	5.0	10	150	111.0	32.4
SM5Z22A	22	24.40	26.90	5.0	10	150	101.0	35.5
SM5Z24A	24	26.70	29.50	5.0	10	150	93.0	38.9
SM5Z26A	26	28.90	31.90	5.0	10	150	86.0	42.1
SM5Z28A	28	31.10	34.40	5.0	10	150	79.0	45.4
SM5Z30A	30	33.30	36.80	5.0	10	150	74.0	48.4
SM5Z33A	33	36.70	40.60	5.0	10	150	68.0	53.3
SM5Z36A	36	40.00	44.20	5.0	10	150	62.0	58.1

NOTE: Surge current waveform is defined at 10/1000uS waveform

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

Figure 1 – Power Derating Curve

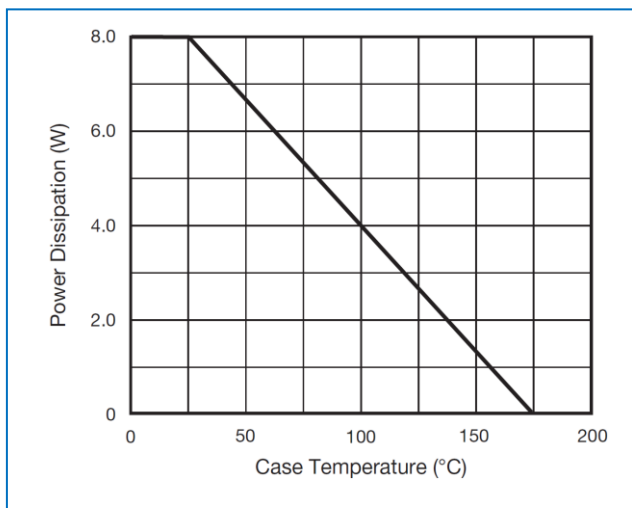
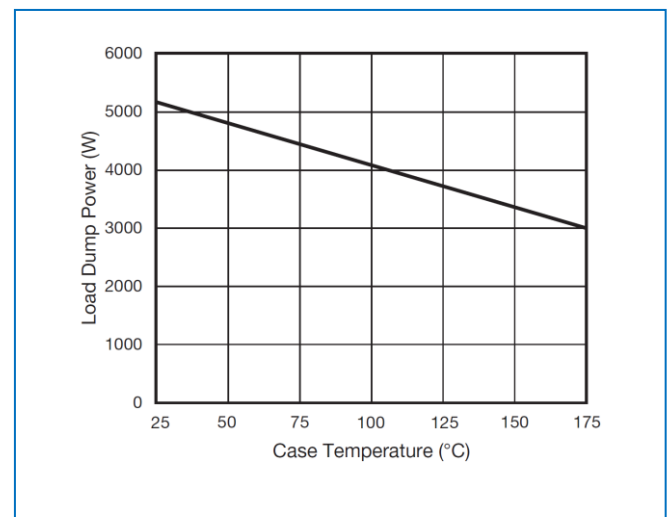


Figure 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)



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Figure 3 - Pulse Waveform

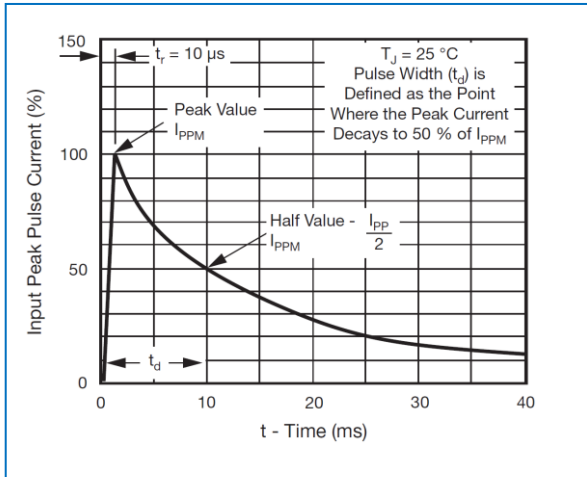
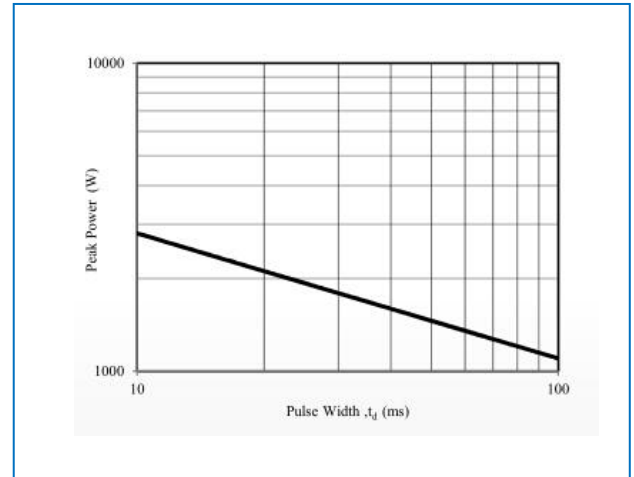
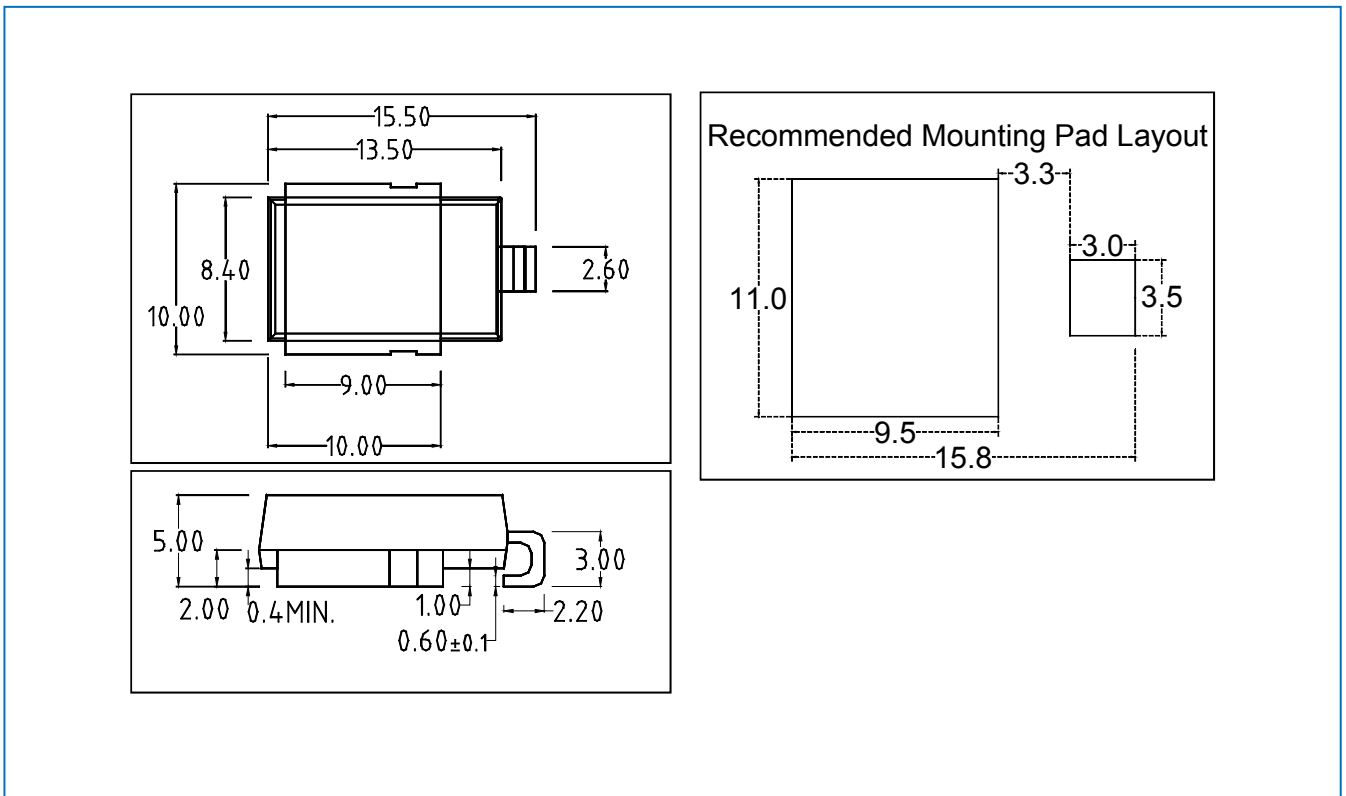


Fig. 4 - Peak Pulse Power Rating Curve



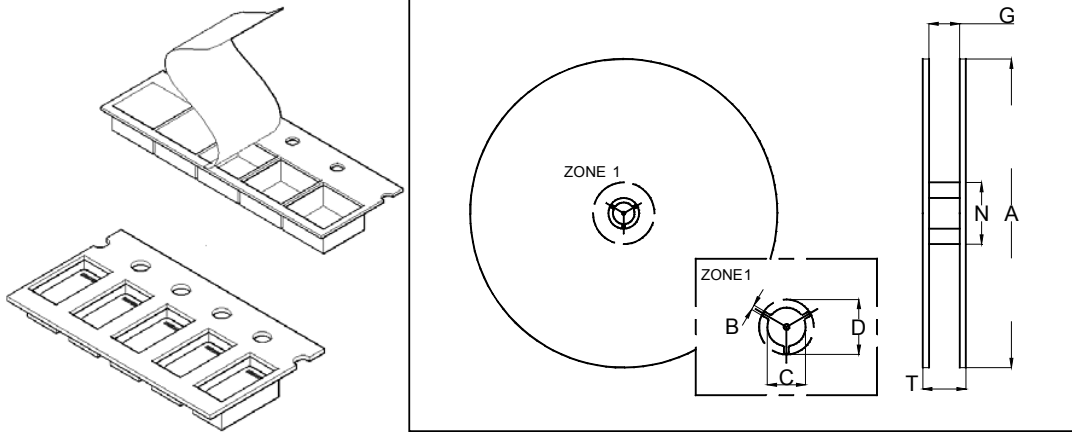
Package Outline Dimensions Unit: inches (millimeters)



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SURFACE MOUNT TAPE AND REEL PACKAGING



DIMENSIONS in millimeters (inches)

TAPE SIZE	A MAX.	B MIN.	C	D MIN.	N MIN.	G MAX.	T MAX.
24 mm (0.945)	330 ± 2.0 (13.0 ± 0.079) 178 ± 2.0 (7.0 ± 0.079)	1.5 (0.059)	13.0 ± 0.20 (0.51 ± 0.0008)	20.2 (0.795)	50 (1.97)	26.4 (1.039)	30.4 (1.197)

Recommended Soldering Parameters

IR-Reflow Condition			
Pre Heat	Temp. min	150	°C
	Temp. max	200	°C
	Time(min to max)	60-180	sec
Ramp up rate (150-200°C)		<3	°C/sec

Reflow	Liquidus Temp.	>220	°C
	Peak Temp.	255-260	sec
	Time(Liq. to Peak)	60-150	sec
Ramp up rate (220-200°C)		<3	°C/sec
Time within actual peak temp.		10-30	sec

Ramp down Rate	<5	°C/sec
Time(25°C to Peak temp.)	<6	min
Do not exceed	280	°C

