# Automotive, Surface Mount 5000 W In DO-214AB





# **Additional Information**







Resources

Accessories

Samples

#### **Agency Approvals**

Agency	Agency File Number
<b>71</b> °	E128662

## **Maximum Ratings & Thermal Characteristics**

Parameter	Symbol	Value	Unit
Peak Power Dissipation (Note 1) $@T_L = 25  ^{\circ}\text{C}$ , Pulse Width = 1 ms	P <sub>PPM</sub>	5000	W
DC Power Dissipation @ $T_L = 75$ °C Measured Zero Lead Length (Note 2) Derate Above 75 °C	P <sub>D</sub>	5.4 54.6	W mW/°C
DC Power Dissipation (Note 3) $@T_A = 25  ^{\circ}\text{C}$ Derate Above 25 $^{\circ}\text{C}$	P <sub>D</sub>	2.0 13.3	W mW/°C
Operating and Storage Temperature Range	T <sub>J</sub> T <sub>stg</sub>	-65 to +175	°C
Thermal Resistance from Junction-to-Ambient	R <sub>eJA</sub>	75	°C/W
Thermal Resistance from Junction-to-Lead	R <sub>eJL</sub>	18.3	°C/W

Stresses exceeding maximum ratings may damage the device. Maximum ratings are stress ratings only. Functional operation above the recommended operating conditions is not implied. Extended exposure to stresses above the recommended operating conditions may affect device reliability.

- 1. 10 x 1000 μs, non-repetitive.
- 2. 1 inch square copper pad, FR-4 board.
- 3. FR-4 board, using Littelfuse minimum recommended footprint

# **Description**

The SZ5KASMC series is designed to protect voltage sensitive components from high voltage, high energy transients. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The SZ5KASMC series is supplied in cost-effective, highly reliable DO-214AB package and it is ideal for use in automotive electronic applications.

## **Features and Benefits**

- Automotive grade, AEC-Q101 qualified and PPAP capable
- Peak power 5000 W@1 ms
- Working peak reverse voltage range - 10 V to 36 V for Bidirectional
- Standard zener breakdown voltage range - 11.1 V to 44.2 V
- Compact design in DO-214AB package
- ESD protection of data lines in accordance with IEC 61000-4-2 30 kV (Air), 30 kV (Contact)
- ESD rating of class 3 (>16 KV) per human body model
- Zener transient overvoltage suppressors

- Excellent clamping capability
- UL recognized compound meeting flammability rating V-0
- V<sub>BR</sub>@T<sub>J</sub>=V<sub>BR</sub>@25°C x (1+αT x (T<sub>J</sub> - 25))(αT: Temperature coefficient, typical value is 0.1%)
- Maximum temperature coefficient specified
- Response time is typically <</li>1 ns
- These components are Pb-free and are ROHS compliant
- UL recgonized as an isolated loop circuit protector to UL 497R

# **Applications**

TVS devices are ideal for the protection of I/O Interfaces,  $\rm V_{cc}$  bus and other vulnerable circuits used in automotive application.

### **Functional Diagram**



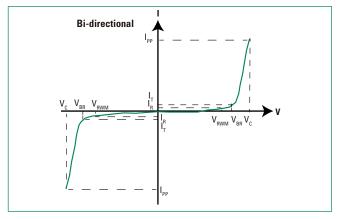


## **Electrical Characteristics**

Part Number	Marking	Working Peak Reverse Voltage V <sub>RWM</sub>	Volta	down ge V <sub>BR</sub>	Test Current I <sub>T</sub>	Maximum Clamping Voltage V <sub>c</sub> @ I <sub>pp</sub>	Maximum Peak Pulse Current I	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub>	Agency Approval
		(V) (Note 5)	Min	Max	(mA)	(V) (Note 7)	(A) PP	(μΑ) "	71
SZ5KASMC10CAT3G	5BAR	10.0	11.1	12.3	1	17.0	294.1	20	X
SZ5KASMC11CAT3G	5BAT	11.0	12.2	13.5	1	18.2	274.7	20	Χ
SZ5KASMC12CAT3G	5BEP	12.0	13.3	14.7	1	19.9	251.3	10	X
SZ5KASMC13CAT3G	5BEQ	13.0	14.4	15.9	1	21.5	232.6	10	X
SZ5KASMC14CAT3G	5BER	14.0	15.6	17.2	1	23.2	215.5	5	X
SZ5KASMC15CAT3G	5BES	15.0	16.7	18.5	1	24.4	204.9	5	X
SZ5KASMC16CAT3G	5BET	16.0	17.8	19.7	1	26.0	192.3	5	Χ
SZ5KASMC17CAT3G	5BEU	17.0	18.9	20.9	1	27.6	181.2	5	X
SZ5KASMC18CAT3G	5BEV	18.0	20.0	22.1	1	29.2	171.2	5	X
SZ5KASMC20CAT3G	5BEW	20.0	22.2	24.5	1	32.4	154.3	5	Χ
SZ5KASMC22CAT3G	5BEX	22.0	24.4	26.9	1	35.5	140.8	5	X
SZ5KASMC24CAT3G	5BEZ	24.0	26.7	29.5	1	38.9	128.5	5	X
SZ5KASMC26CAT3G	5BFE	26.0	28.9	31.9	1	42.1	118.2	5	X
SZ5KASMC28CAT3G	5BFG	28.0	31.1	34.4	1	45.4	110.1	5	X
SZ5KASMC30CAT3G	5BFK	30.0	33.3	36.8	1	48.4	103.3	5	X
SZ5KASMC33CAT3G	5BFM	33.0	36.7	40.6	1	53.3	93.8	5	X
SZ5KASMC36CAT3G	5BFP	36.0	40.0	44.2	1	58.1	86.1	5	X

<sup>5.</sup> A transient suppressor is normally selected according to the maximum working peak reverse voltage (V<sub>RWM</sub>), which should be equal to or greater than the DC or continuous peak operating voltage level.

# I-V Curve Characteristics (TA = 25 °C unless otherwise noted) For Bi-directional



Symbol	Parameter			
I <sub>PP</sub> Maximum Reverse Peak Pulse Current				
$V_{c}$	Clamping Voltage @ I <sub>pp</sub>			
V <sub>RWM</sub> Working Peak Reverse Voltage				
I <sub>R</sub> Maximum Reverse Leakage Current @ V <sub>RWM</sub>				
V <sub>BR</sub> Breakdown Voltage @ I <sub>T</sub>				
I <sub>T</sub>	Breakdown Current Current			



<sup>6.</sup>  $\rm V_{BR}$  measured at pulse test current  $\rm I_T$  at an ambient temperature of 25 °C.

<sup>7.</sup> Surge current waveform per figure 2 and decrate per figure 4 of the general data – 5000 watt at the beginning of this group.

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**Figure 1. Pulse Rating Curve** 

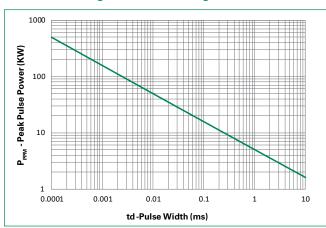


Figure 2. 10/1000 µs Pulse Waveform

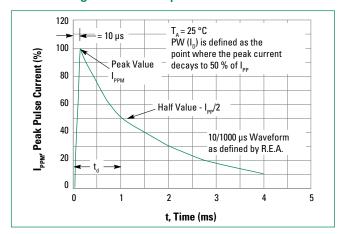
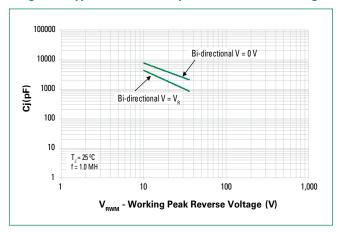
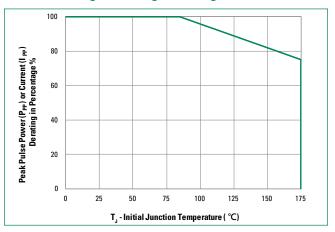


Figure 3. Typical Junction Capacitance vs. Bias Voltage



**Figure 4. Surge Derating Curve** 

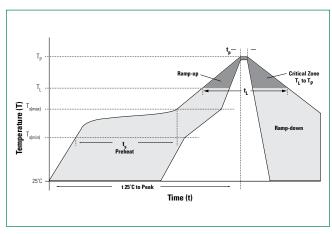




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# **Soldering Parameters**

Reflow Cond	Lead-free assembly	
Pre Heat	-Temperature Min (T <sub>s(min)</sub> )	150 °C
	-Temperature Max (T <sub>s(max)</sub> )	200 °C
	-Time (min to max) (t <sub>s</sub> )	60 - 120 seconds
Average Ran	3 °C/second max	
$T_{\text{S(max)}}$ to $T_{\text{L}}$ -	3 °C/second max	
Reflow	-Temperature (T <sub>L</sub> ) (Liquidus)	217 °C
nellow	-Time (min to max) (t <sub>s</sub> )	60 – 150 seconds
Peak Temper	260+0/-5 °C	
Time within	30 seconds max	
Ramp-down	6 °C/second max	
Time 25 °C t	8 minutes max.	
Do Not Exce	260 °C	



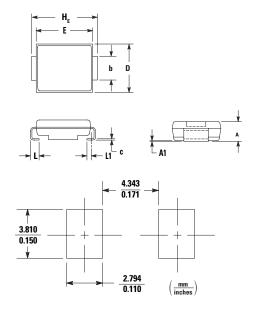
# **Physical Specifications**

Weight	0.00733 ounce, 0.228 grams			
Case	JEDEC DO-214AB. Void-free, transfer-molded, thermosetting plastic epoxy meets UL 94V-0			
Polarity	Color band denotes cathode except bidirectional			
Terminal	Matte Tin-plated leads, solderable per JESD22-B102			

# **Environmental Specifications**

High Temperature Storage	JESD22-A103
HTRB	JESD22-A108
Temperature Cycling	JESD22-A104
MSL	JEDEC J-STD-020, Level 1
H3TRB	JESD22-A101
RSH	JESD22A111

### **Dimensions**



Dim	Inches			Millimeters		
DIM	Min	Nom	Max	Min	Nom	Max
А	0.079	0.087	0.095	2.00	2.22	2.41
A1	0.002	0.004	0.008	0.05	0.10	0.20
b	0.115	0.118	0.125	2.92	3.00	3.18
С	0.006	0.009	0.012	0.15	0.23	0.30
D	0.220	0.230	0.240	5.59	5.84	6.10
Е	0.260	0.270	0.280	6.60	6.86	7.11
H <sub>E</sub>	0.305	0.313	0.320	7.75	7.94	8.13
L	0.030	0.040	0.050	0.76	1.02	1.27
L1	0.020 REF			0.51 REF		

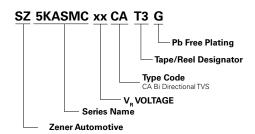
# **Ordering Information**

Device	Package	Shipping
SZ5KASMCxxCAT3G	SMC (Pb-Free)	2,500 / Tape & Reel



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### **Part Numbering System**



### **Part Marking System**



XXXX = Marking Code

Y = Year M = Month

A = Assembly Location

**WW** = Lot Code

# **Tape and Reel Specification**

