

5000W, 10V- 40V Surface Mount Transient Voltage Suppressor

FEATURES

- AEC-Q101 qualified
- Moisture sensitivity level: level 1, per J-STD-020
- Meets IEC 61000-4-2 (Level: 4) / ISO 10605 (Level: L4)
- Meets ISO 7637-2 (Pulse 1/2a/2b/3a/3b)
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

- Switching mode power supply (SMPS)
- Motor for BLDC
- Lighting application
- Battery Management System
- Automotive

MECHANICAL DATA

- Case: DO-214AB (SMC)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.244g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
V_{WM}	10 - 40	V
V_{BR}	12 - 47	V
P_{PPM}	5000	W
$T_{J\ MAX}$	175	°C
Polarity	Uni-directional	
Package	DO-214AB (SMC)	



DO-214AB (SMC)



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Non-repetitive peak impulse power dissipation with 10/1000 μs waveform ⁽¹⁾	P_{PPM}	5000	W
Steady state power dissipation at $T_L = 25^\circ\text{C}$ ⁽²⁾	P_D	12.5	W
Peak forward surge current 8.3ms single half sine-wave	I_{FSM}	350	A
Junction temperature	T_J	-55 to +175	°C
Storage temperature	T_{STG}	-55 to +175	°C

Notes:

1. Non-repetitive current pulse per Fig.3 and derated above $T_A = 25^\circ\text{C}$ per Fig.1
2. Units mounted on PCB (16mm x 16mm Cu pad test board)

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\theta JL}$	12	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	48	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	9	°C/W

Thermal Performance Note: Units mounted on PCB (16mm x 16mm Cu pad test board)

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Part number	Marking code	I_R max at V_{WM}		V_{BR} at $I_T^{(1)}$				V_C at I_{PPM} 10 / 1000 μs		R_D 10 / 1000 μs	$\alpha T^{(2)}$
				Min	Typ	Max	I_T	Max			Max
		μA	V	V		mA		$V^{(3)}$	$A^{(4)}$	Ω	$10^{-4}/^\circ\text{C}$
5KSMC10AH	5K10A	5	10	11.4	12.0	12.6	1	17.0	294.1	0.017	7.8
5KSMC13AH	5K13A	3	13	14.3	15.0	15.8	1	21.5	232.6	0.028	8.4
5KSMC15AH	5K15A	3	15	16.7	17.6	18.5	1	24.4	204.9	0.033	8.8
5KSMC16AH	5K16A	3	16	17.8	18.7	19.6	1	26.0	192.3	0.038	8.8
5KSMC18AH	5K18A	3	18	20	21.1	22.2	1	29.2	171.2	0.047	9.2
5KSMC20AH	5K20A	3	20	22.2	23.4	24.6	1	32.4	154.3	0.058	9.4
5KSMC22AH	5K22A	3	22	24.4	25.7	27.0	1	35.5	140.8	0.070	9.6
5KSMC24AH	5K24A	3	24	26.7	28.1	29.5	1	38.9	128.5	0.084	9.6
5KSMC26AH	5K26A	3	26	28.9	30.4	31.9	1	42.1	118.8	0.098	9.7
5KSMC28AH	5K28A	3	28	31.1	32.7	34.3	1	45.4	110.1	0.115	9.8
5KSMC30AH	5K30A	3	30	33.3	35.1	36.9	1	48.4	103.3	0.129	9.9
5KSMC33AH	5K33A	3	33	36.7	38.6	40.5	1	53.3	93.8	0.157	10.0
5KSMC36AH	5K36A	3	36	40.0	42.1	44.2	1	58.1	86.0	0.186	10.0
5KSMC40AH	5K40A	3	40	44.4	46.7	49.0	1	64.5	77.5	0.229	10.1

Notes:

- Pulse test: $t_p < 30\text{ms}$
- To calculate V_{BR} or V_C versus junction temperature, use following formulas:
 V_{BR} at $T_J = V_{BR}$ at $25^\circ\text{C} \times (1 + \alpha T \times (T_J - 25))$
 V_C at $T_J = V_C$ at $25^\circ\text{C} \times (1 + \alpha T \times (T_J - 25))$
- To calculate maximum clamping voltage at other surge level, use the following formula:
 $V_{Cmax} = V_C - R_D \times (I_{PP} - I_{PPappli})$ where $I_{PPappli}$ is the surge current in the application.

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
5KSMCxAH	DO-214AB (SMC)	3,000 / Tape & Reel

Notes:

- "x" defines voltage from 10V (5KSMC10AH) to 40V (5KSMC40AH)

CHARACTERISTICS CURVES

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

Fig.1 Pulse Power or Current vs. Initial Junction Temperature

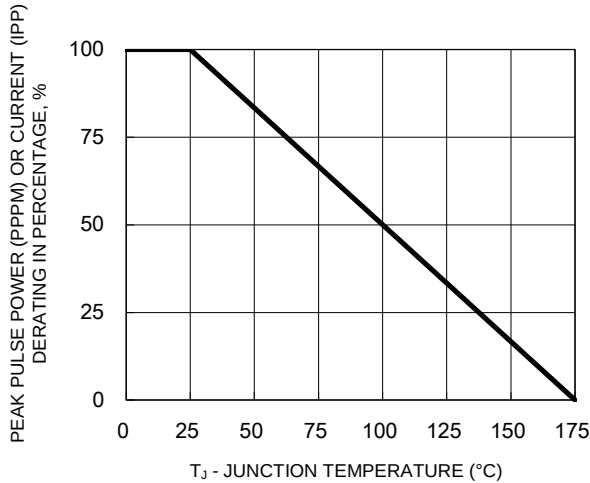


Fig.2 Steady State Power Derating

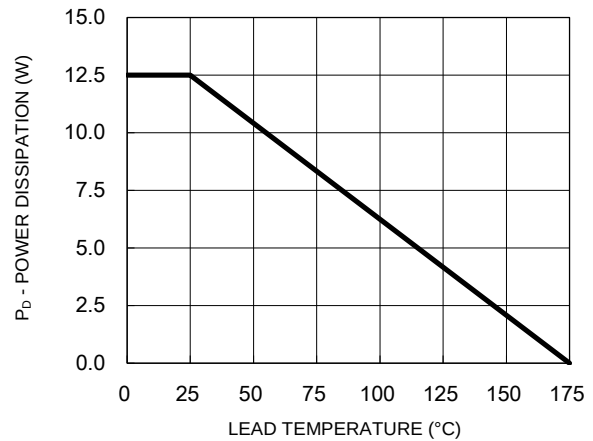


Fig.3 Clamping Power Pulse Waveform

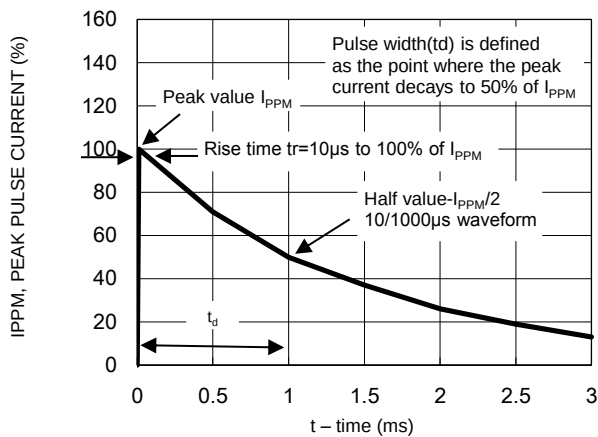


Fig.4 Typical Junction Capacitance

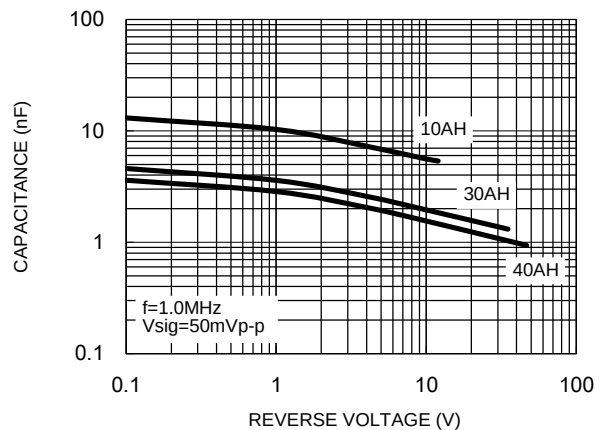


Fig.5 Typical Transient Thermal Impedance

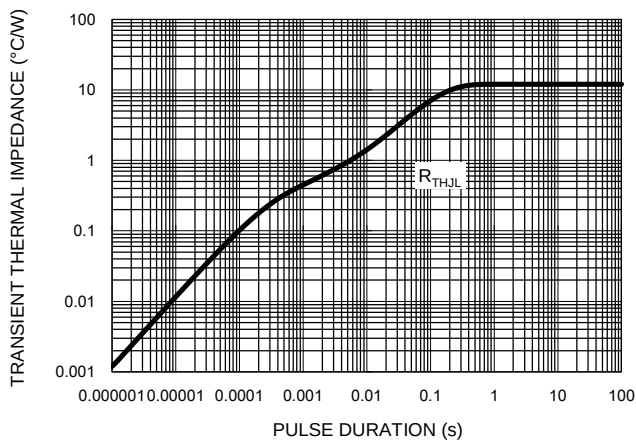
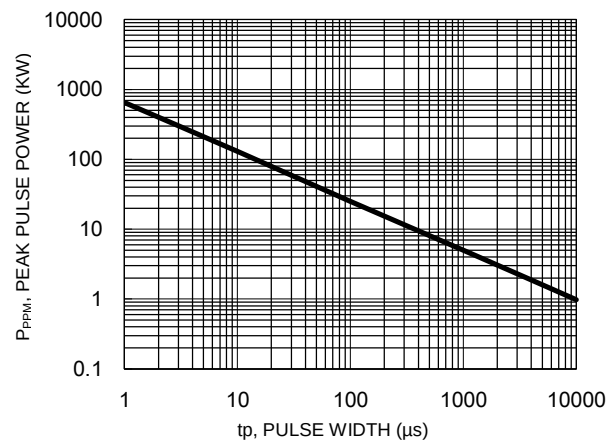
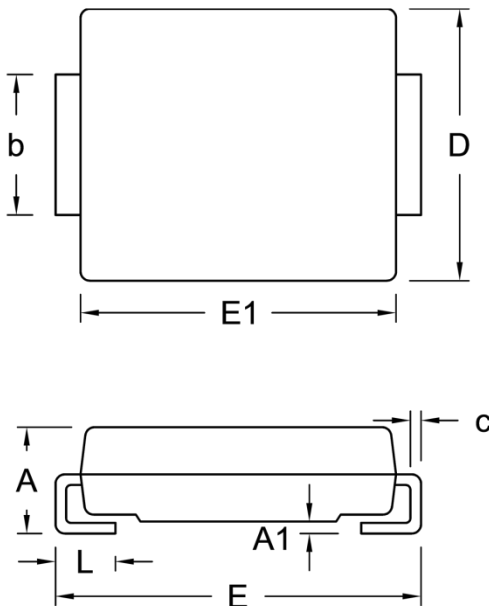


Fig.6 Peak Pulse Power Rating Cure



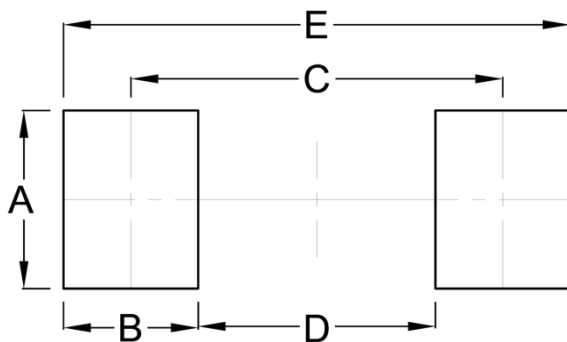
PACKAGE OUTLINE DIMENSIONS

DO-214AB (SMC)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	2.00	2.62	0.079	0.103
A1	-	0.20	-	0.008
b	2.90	3.20	0.114	0.126
c	0.15	0.31	0.006	0.012
D	5.59	6.22	0.220	0.245
E	7.75	8.13	0.305	0.320
E1	6.60	7.11	0.260	0.280
L	1.00	1.60	0.039	0.063

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	3.30	0.130
B	2.50	0.098
C	6.90	0.272
D	4.40	0.173
E	9.40	0.370

MARKING DIAGRAM



P/N = Marking Code
 G = Green Compound
 YW = Date Code
 F = Factory Code

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