3000W 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
- Weight: 0.21g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	18	V
V_{BR}	21.1	V
P_{PPM}	3000	W
$T_{J\ MAX}$	175	°C
Polarity	Uni-directional	
Package	DO-214AB (SMC)	

DO-214AB (SMC)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Non-repetitive peak impulse power dissipation with 10/1000μs waveform (1)	P_{PPM}	3000	W
Steady state power dissipation at T_L=25°C (2)	P_D	8.5	W
Peak forward surge current 8.3 ms single half sine-wave	I_{FSM}	300	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°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 per diode	$R_{\Theta JL}$	17	°C/W
Junction-to-ambient thermal resistance per diode	$R_{\Theta JA}$	50	°C/W
Junction-to-case thermal resistance per diode	$R_{\Theta JC}$	10	°C/W

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

ELECTRICAL SPECIFICATIONS (T_A = 25°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	αT (2)
				min	typ	max	I_T	max			max
		µA	V	V			mA	V (3)	A	Ω	10^{-4}/°C
3KSMC21AH	3K21A	3	18	20	21.1	22.2	1	29.2	102.7	0.079	9.2

Note:

1. Pulse test: tp < 30 ms
2. To calculate V_{BR} or V_C versus junction temperature, use following formulas:
   V_{BR} at T_J = V_{BR} at 25°C x (1 + αT x (T_J-25))
   V_C at T_J = V_C at 25°C x (1 + αT x (T_J-25))
3. To calculate maximum clamping voltage at other surge level, use the following formula:
   V_{Cmax} = V_C - R_D x (I_{PP} – $I_{PPappli}$) where $I_{PPappli}$ is the surge current in the application.

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
3KSMC21AH V7G	SMC	850 / 7" reel
3KSMC21AH V6G	SMC	3,000 / 13" reel

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

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

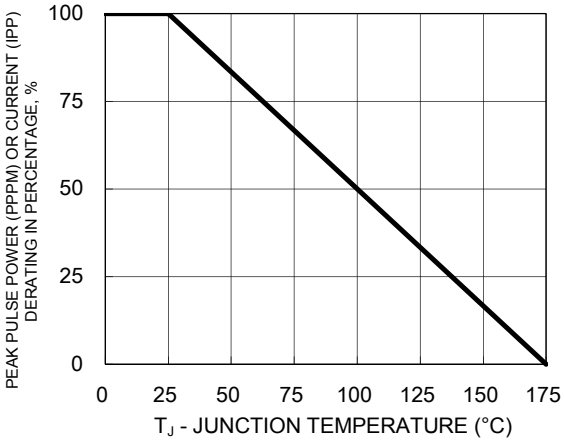


Fig.2 Steady State Power Derating

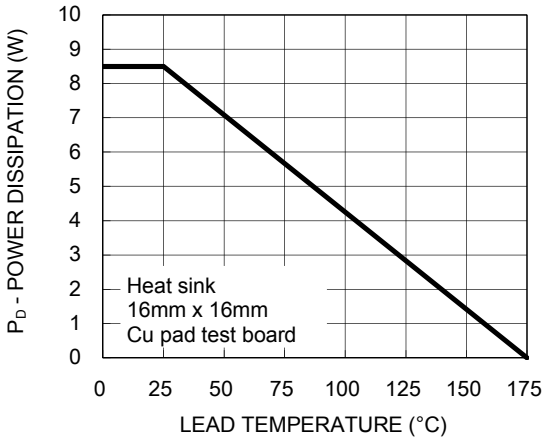


Fig.3 Clamping Power Pulse Waveform

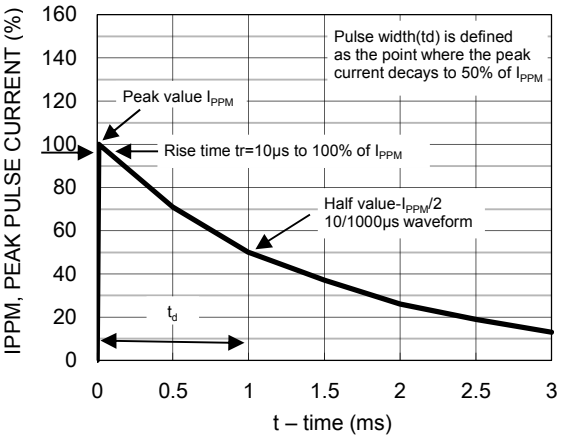


Fig.4 Typical Junction Capacitance

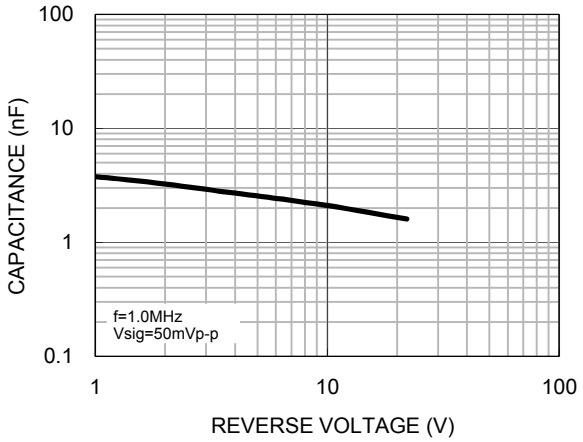


Fig.5 Typical Transient Thermal Impedance

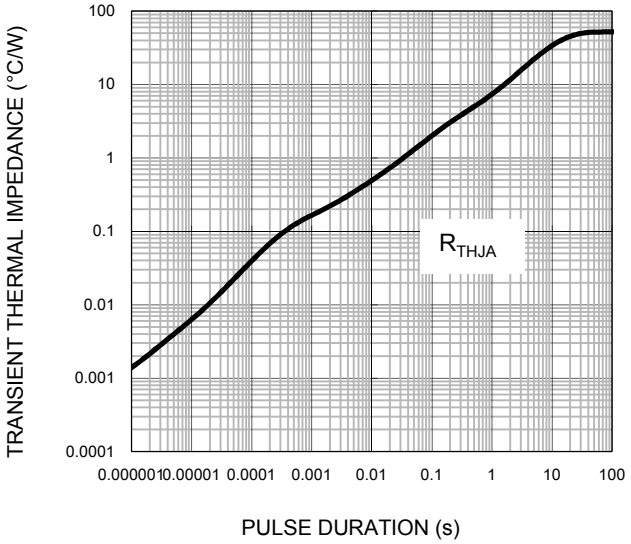
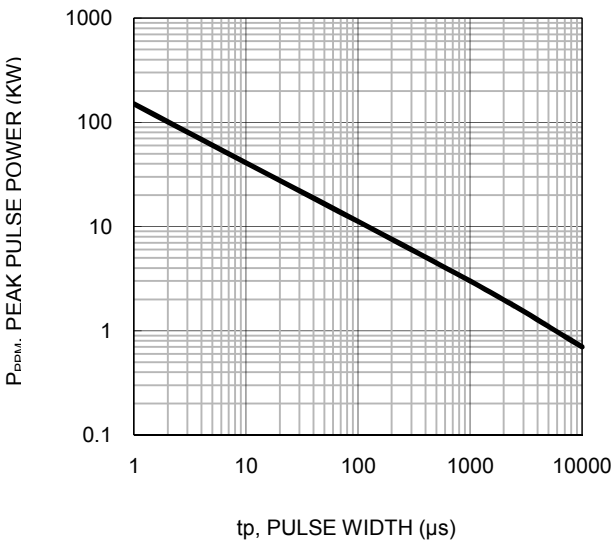
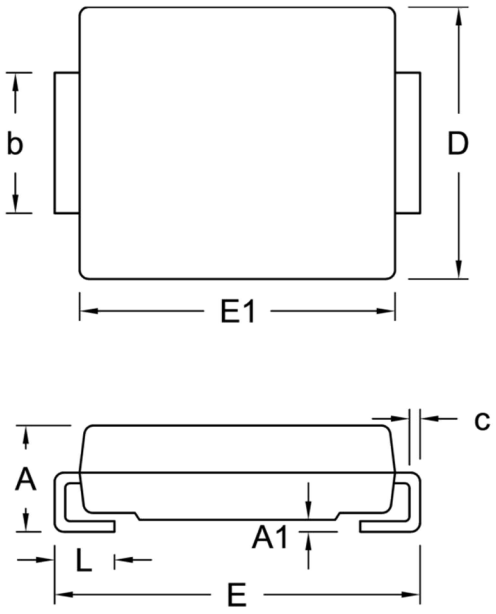


Fig.6 Peak Pulse Power Rating Cure



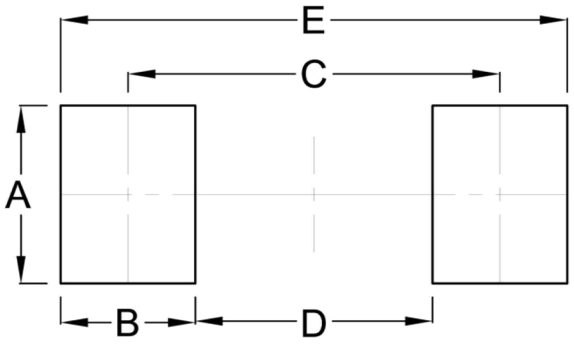
PACKAGE OUTLINE DIMENSIONS

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

Note: Cathode band for unidirectional products only

P/N = Marking Code
YW = Date Code
F = Factory Code

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