

1000W, 10V - 100V Surface Mount Transient Voltage Suppressor

FEATURES

- AEC-Q101 qualified
- Ideal for automated placement
- Glass passivated chip junction
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps from 0 V to BV min
- Meets ISO 7637-2 (Pulse 1/2a/2b/3a/3b)
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS

PARAMETER	VALUE	UNIT
V_{WM}	8.55 - 85.5	V
V_{BR} (uni-directional)	9.5 - 105	V
V_{BR} (bi-directional)	9.5 - 105	V
P_{PPSM}	1000	W
$T_{J\ MAX}$	175	
Package	DO-214AA (SMB)	
Configuration	Single die	

APPLICATIONS

- Protect sensitive circuit from damage by high voltage transients
- Lighting, ESD transient voltage protection of IC, system
- Inductive switching load protection of IC, system
- Electrical Fast Transient Immunity protection of IC, system



DO-214AA (SMB)

MECHANICAL DATA

- Case: DO-214AA (SMB)
- 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: As marked
- Weight: 0.110g (approximately)

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_{PK}	1000	W
Steady state power dissipation at $T_A = 25^\circ\text{C}$	P_D	5	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load for Uni-directional only	I_{FSM}	100	A
Forward Voltage @ $I_F = 50\text{A}$ for Uni-directional only ⁽²⁾	V_F	3.5 / 5.0	V
Junction temperature	T_J	-55 to +175	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +175	$^\circ\text{C}$

Notes:

1. Non-repetitive current pulse per Fig. 3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2
2. $V_F = 3.5\text{V}$ for devices of $V_{BR} \leq 50\text{V}$ and $V_F = 5.0\text{V}$ max. for devices $V_{BR} > 50\text{V}$

Devices for Bipolar Applications

1. For Bidirectional use CAH suffix

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\theta JL}$	20	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	100	°C/W

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

Device	Device Marking Code	Breakdown Voltage $V_{BR}@I_T$ (V) (Note 1)		Test Current I_T (mA)	Stand-Off Voltage V_{WM} (V)	Maximum Reverse Leakage @ V_{WM} (μA)	Maximum Peak impulse Current I_{PP} (A)	Maximum Clamping Voltage $V_C@I_{PP}$ (V)
		Min	Max					
1KSMB10AH	A10E	9.5	10.5	1.0	8.55	10.0	69.0	14.5
1KSMB10CAH	N10E							
1KSMB11AH	A10F	10.5	11.6	1.0	9.40	5.0	64.1	15.6
1KSMB11CAH	N10F							
1KSMB12AH	A10G	11.4	12.6	1.0	10.2	5.0	59.9	16.7
1KSMB12CAH	N10G							
1KSMB13AH	A10H	12.4	13.7	1.0	11.1	5.0	54.9	18.2
1KSMB13CAH	N10H							
1KSMB15AH	A10I	14.3	15.8	1.0	12.8	5.0	47.2	21.2
1KSMB15CAH	N10I							
1KSMB16AH	A10J	15.2	16.8	1.0	13.6	1.0	44.4	22.5
1KSMB16CAH	N10J							
1KSMB18AH	A10K	17.1	18.9	1.0	15.3	1.0	39.2	25.5
1KSMB18CAH	N10K							
1KSMB20AH	A10L	19.0	21.0	1.0	17.1	1.0	36.1	27.7
1KSMB20CAH	N10L							
1KSMB22AH	A10M	20.9	23.1	1.0	18.8	1.0	32.7	30.6
1KSMB22CAH	N10M							
1KSMB24AH	A10N	22.8	25.2	1.0	20.5	1.0	30.1	33.2
1KSMB24CAH	N10N							
1KSMB27AH	A10O	25.7	28.4	1.0	23.1	1.0	26.7	37.5
1KSMB27CAH	N10O							
1KSMB30AH	A10P	28.5	31.5	1.0	25.6	1.0	24.2	41.4
1KSMB30CAH	N10P							
1KSMB33AH	A10Q	31.4	34.7	1.0	28.2	1.0	21.9	45.7
1KSMB33CAH	N10Q							
1KSMB36AH	A10R	34.2	37.8	1.0	30.8	1.0	20.0	49.9
1KSMB36CAH	N10R							
1KSMB39AH	A10S	37.1	41.0	1.0	33.3	1.0	18.6	53.9
1KSMB39CAH	N10S							
1KSMB43AH	A10T	40.9	45.2	1.0	36.8	1.0	16.9	59.3
1KSMB43CAH	N10T							
1KSMB47AH	A10U	44.7	49.4	1.0	40.2	1.0	15.4	64.8
1KSMB47CAH	N10U							
1KSMB51AH	A10V	48.5	53.6	1.0	43.6	1.0	14.3	70.1
1KSMB51CAH	N10V							
1KSMB56AH	A10W	53.2	58.8	1.0	47.8	1.0	13.0	77.0
1KSMB56CAH	N10W							
1KSMB62AH	A10X	58.9	65.1	1.0	53.0	1.0	11.8	85.0
1KSMB62CAH	N10X							
1KSMB68AH	A10Y	64.6	71.4	1.0	58.1	1.0	10.9	92.0
1KSMB68CAH	N10Y							

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

Device	Device Marking Code	Breakdown voltage $V_{BR}@I_T$ (V) (Note 1)		Test current I_T (mA)	Stand-Off Voltage V_{WM} (V)	Maximum Reverse leakage @ V_{WM} (μA)	Maximum peak impulse current I_{PP} (A)	Maximum clamping voltage $V_C@I_{PP}$ (V)
		Min	Max					
1KSMB75AH	A10Z	71.3	78.8	1.0	64.1	1.0	9.7	103
1KSMB75CAH	N10Z							
1KSMB82AH	B10A	77.9	86.1	1.0	70.1	1.0	8.8	113
1KSMB82CAH	O10A							
1KSMB91AH	B10B	86.5	95.5	1.0	77.8	1.0	8.0	125
1KSMB91CAH	O10B							
1KSMB100AH	B10C	95	105	1.0	85.5	1.0	7.3	137
1KSMB100CAH	O10C							

Notes:

- V_{BR} measure after I_T applied for 30ms, I_T =square wave pulse or equivalent.
- All terms and symbols are consistent with ANSI/IEEE C62.35.
- For Bidirectional use CAH suffix

ORDERING INFORMATION

ORDERING CODE ⁽¹⁾	PACKAGE	PACKING
1KSMBxH	DO-214AA (SMB)	3,000 / Tape & Reel

Notes:

- "x" defines voltage from 10V(1KSMB10AH) to 100V(1KSMB100CAH)

CHARACTERISTICS CURVES

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

Fig.1 Peak Pulse Power Rating Curve

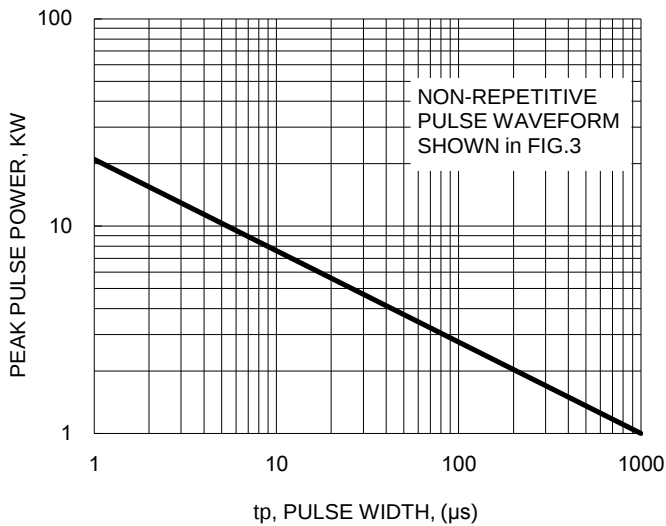


Fig.2 Pulse Derating Curve

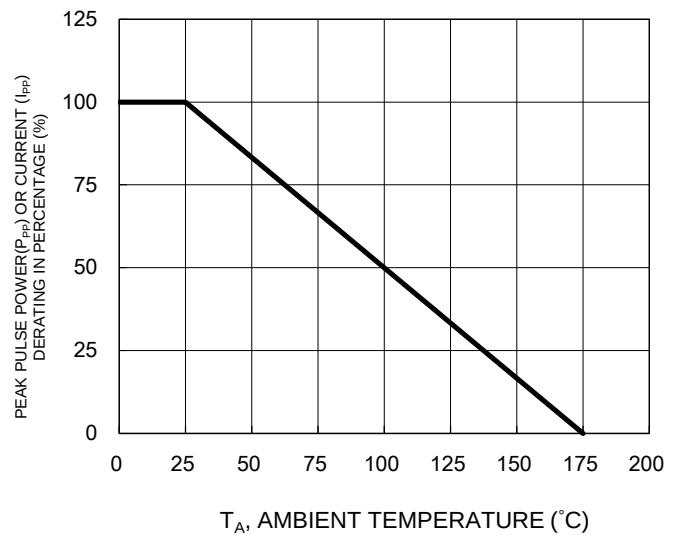


Fig.3 Clamping Power Pulse Waveform

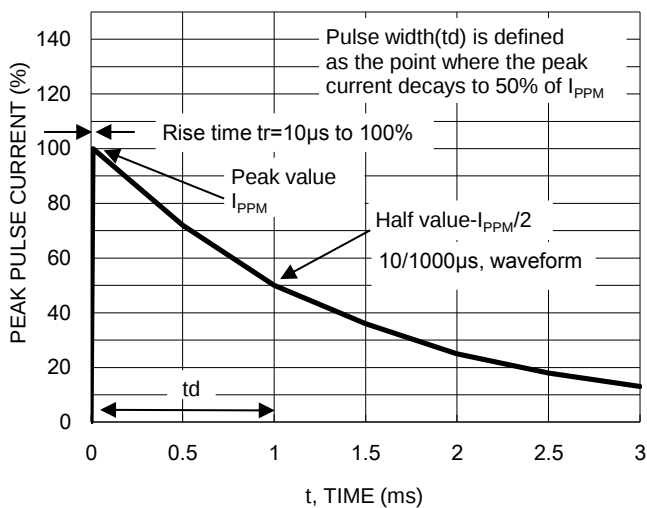
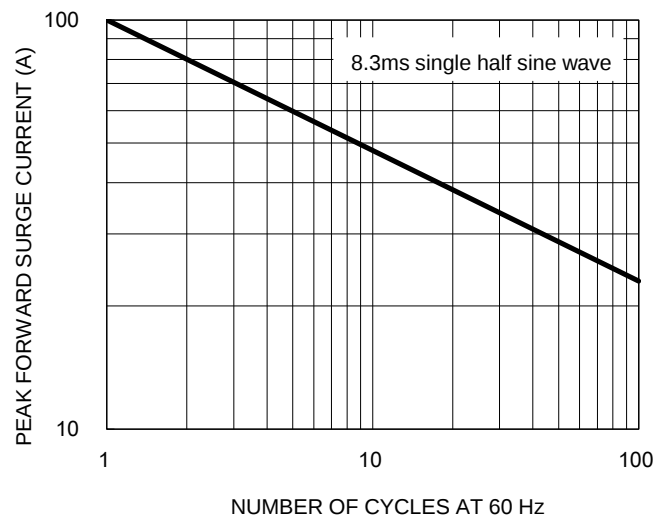


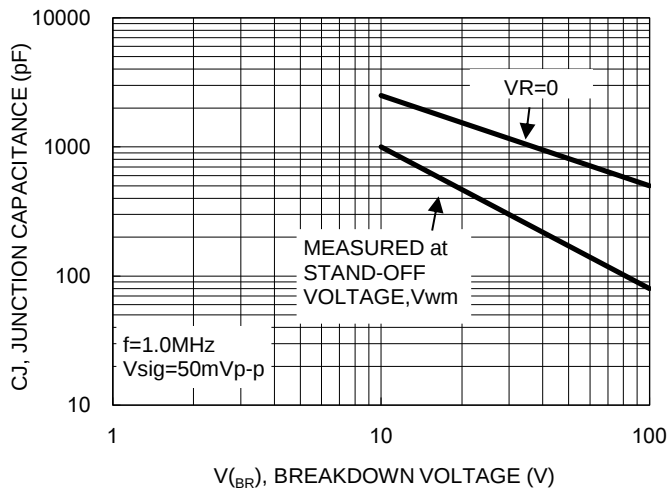
Fig.4 Maximum Non-Repetitive Forward Surge Current Unidirectional Only



CHARACTERISTICS CURVES

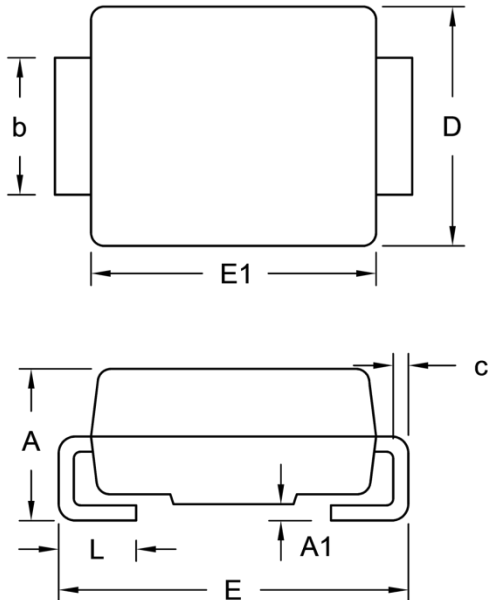
($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.5 Typical Junction Capacitance



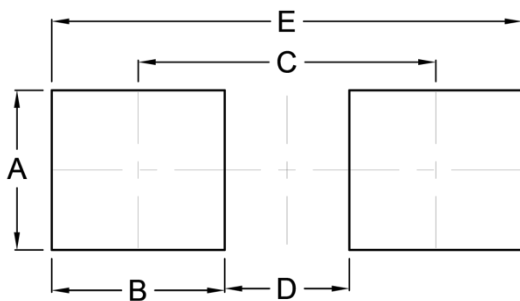
PACKAGE OUTLINE DIMENSIONS

DO-214AA (SMB)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	1.95	2.65	0.077	0.104
A1	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.31	0.006	0.012
D	3.30	3.95	0.130	0.156
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
L	0.75	1.60	0.030	0.063

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	2.30	0.091
B	2.50	0.098
C	4.30	0.169
D	1.80	0.071
E	6.80	0.268

MARKING DIAGRAM



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

Cathode band for uni-directional products only

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