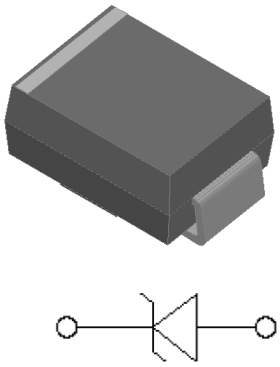
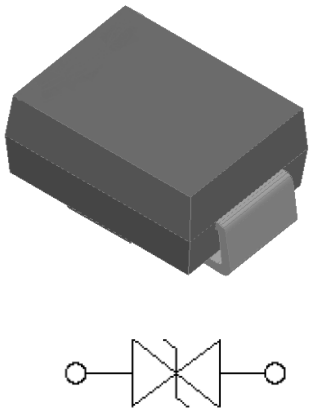
Surface Mount Transient Voltage Suppressors

Uni-directional



Bi-directional



Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- 600 W peak pulse power capability with a 10/1000 μs waveform
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
- High temperature soldering guaranteed: 260 °C/10 s at terminals
- Meets MSL level 1
- Component in accordance to RoHS

Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, telecommunication.

Mechanical Data

- **Package**: DO-214AA (SMB)
  Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals**: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D
- **Polarity**: For uni-directional types the band denotes cathode end, no marking on bi-directional types

■Maximum Ratings (Ta=25℃ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Max
Peak power dissipation, with a 10/1000us waveform (1) (2) (Fig.1)	P_{PPM}	W	600
Peak pulse current, with a 10/1000us waveform(1)	I_{PPM}	A	See Next Table
Power dissipation, on infinite heat sink at TL=75℃	P_D	W	5.0
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only (2)	I_{FSM}	A	100
Operating junction and storage temperature range	T_J,T_{STG}	℃	-55 to +150
Electrostatic Discharge（IEC61000-4-2 air discharge）	ESD	KV	±30
Electrostatic Discharge（IEC61000-4-2 contact discharge）			

■Electrical Characteristics（Ta=25℃ Unless otherwise specified）

PARAMETER	SYMBOL	UNIT	VALUE
Maximum instantaneous forward voltage @ at 50A for unidirectional only (3)	V_F	V	3.5/5.0

■Thermal Characteristics （T_a=25℃ Unless otherwise specified）

PARAMETER	SYMBOL	UNIT	Conditions	VALUE
Thermal resistance(Typical)	$R_{\theta JL}$	℃/W	junction to lead	20
	$R_{\theta JA}$	℃/W	junction to ambient	100

Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above T_A= 25℃per Fig.2.
(2) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.3" x 0.3" (8.0 mm x 8.0 mm) copper pad areas
(3) V_F<3.5V for devices of V_{BR}<200V and V_F<5.0V for devices of V_{BR}>201V.

■Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SMBJ5.0A-SMBJ400CA	F1	Approximate 0.0975	3000	/	48000	13” reel
SMBJ5.0A-SMBJ400CA	F2	Approximate 0.0975	750	3000	24000	7” reel
SMBJ5.0A-SMBJ400CA	F3	Approximate 0.0975	500	2000	16000	7” reel

■Electrical Characteristics（T_a=25℃ Unless otherwise specified）

Part Number (Uni)	Part Number (Bi)	Breakdown Voltage V_{BR}@I_T			Maximum Reverse Leakage I_R(6)@ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP}(5) (A)	Maximum Clamping Voltage Vc @ I_{PP} (V)
		Min(V)	Max (V)	I_T(4)(mA)				
SMBJ5.0A	SMBJ5.0CA(4)	6.4	7.07	10	800	5	65.22	9.2
SMBJ6.0A	SMBJ6.0CA	6.67	7.37	10	800	6	58.25	10.3
SMBJ6.5A	SMBJ6.5CA	7.22	7.98	10	500	6.5	53.57	11.2
SMBJ7.0A	SMBJ7.0CA	7.78	8.6	10	200	7	50	12
SMBJ7.5A	SMBJ7.5CA	8.33	9.21	1	100	7.5	46.51	12.9
SMBJ8.0A	SMBJ8.0CA	8.89	9.83	1	50	8	44.12	13.6
SMBJ8.5A	SMBJ8.5CA	9.44	10.4	1	10	8.5	41.67	14.4
SMBJ9.0A	SMBJ9.0CA	10	11.1	1	5	9	38.96	15.4
SMBJ10A	SMBJ10CA	11.1	12.3	1	5	10	35.29	17
SMBJ11A	SMBJ11CA	12.2	13.5	1	5	11	32.97	18.2
SMBJ12A	SMBJ12CA	13.3	14.7	1	5	12	30.15	19.9
SMBJ13A	SMBJ13CA	14.4	15.9	1	1	13	27.91	21.5
SMBJ14A	SMBJ14CA	15.6	17.2	1	1	14	25.86	23.2
SMBJ15A	SMBJ15CA	16.7	18.5	1	1	15	24.59	24.4
SMBJ16A	SMBJ16CA	17.8	19.7	1	1	16	23.08	26
SMBJ17A	SMBJ17CA	18.9	20.9	1	1	17	21.74	27.6
SMBJ18A	SMBJ18CA	20	22.1	1	1	18	20.55	29.2
SMBJ19A	SMBJ19CA	21.1	23.3	1	1	19	19.49	30.8
SMBJ20A	SMBJ20CA	22.2	24.5	1	1	20	18.52	32.4
SMBJ22A	SMBJ22CA	24.4	26.9	1	1	22	16.9	35.5
SMBJ24A	SMBJ24CA	26.7	29.5	1	1	24	15.42	38.9
SMBJ26A	SMBJ26CA	28.9	31.9	1	1	26	14.25	42.1
SMBJ28A	SMBJ28CA	31.1	34.4	1	1	28	13.22	45.4
SMBJ30A	SMBJ30CA	33.3	36.8	1	1	30	12.4	48.4
SMBJ33A	SMBJ33CA	36.7	40.6	1	1	33	11.26	53.3

■Electrical Characteristics（T_a=25℃ Unless otherwise specified）

Part Number (Uni)	Part Number (Bi)	Breakdown Voltage V_{BR}@I_T			Maximum Reverse Leakage I_R[6]@ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP}[5] (A)	Maximum Clamping Voltage Vc @ I_{PP} (V)
		Min(V)	Max (V)	I_T[4](mA)				
SMBJ36A	SMBJ36CA	40	44.2	1	1	36	10.33	58.1
SMBJ40A	SMBJ40CA	44.4	49.1	1	1	40	9.3	64.5
SMBJ43A	SMBJ43CA	47.8	52.8	1	1	43	8.65	69.4
SMBJ45A	SMBJ45CA	50	55.3	1	1	45	8.25	72.7
SMBJ48A	SMBJ48CA	53.3	58.9	1	1	48	7.75	77.4
SMBJ51A	SMBJ51CA	56.7	62.7	1	1	51	7.28	82.4
SMBJ54A	SMBJ54CA	60	66.3	1	1	54	6.89	87.1
SMBJ58A	SMBJ58CA	64.4	71.2	1	1	58	6.41	93.6
SMBJ60A	SMBJ60CA	66.7	73.7	1	1	60	6.2	96.8
SMBJ64A	SMBJ64CA	71.1	78.6	1	1	64	5.83	103
SMBJ70A	SMBJ70CA	77.8	86	1	1	70	5.31	113
SMBJ75A	SMBJ75CA	83.3	92.1	1	1	75	4.96	121
SMBJ78A	SMBJ78CA	86.7	95.8	1	1	78	4.76	126
SMBJ80A	SMBJ80CA	88.8	97.6	1	1	80	4.63	129.6
SMBJ85A	SMBJ85CA	94.4	104	1	1	85	4.38	137
SMBJ90A	SMBJ90CA	100	111	1	1	90	4.11	146
SMBJ100A	SMBJ100CA	111	123	1	1	100	3.7	162
SMBJ110A	SMBJ110CA	122	135	1	1	110	3.39	177
SMBJ120A	SMBJ120CA	133	147	1	1	120	3.11	193
SMBJ130A	SMBJ130CA	144	159	1	1	130	2.87	209
SMBJ140A	SMBJ140CA	155	171	1	1	140	2.65	226.8
SMBJ150A	SMBJ150CA	167	185	1	1	150	2.47	243
SMBJ160A	SMBJ160CA	178	197	1	1	160	2.32	259
SMBJ170A	SMBJ170CA	189	209	1	1	170	2.18	275
SMBJ180A	SMBJ180CA	200	220	1	1	180	2.06	291.6
SMBJ190A	SMBJ190CA	211	232	1	1	190	1.95	307.8
SMBJ200A	SMBJ200CA	224	247	1	1	200	1.85	324
SMBJ220A	SMBJ220CA	246	272	1	1	220	1.69	356
SMBJ250A	SMBJ250CA	279	309	1	1	250	1.48	405
SMBJ300A	SMBJ300CA	335	371	1	1	300	1.23	486
SMBJ350A	SMBJ350CA	391	432	1	1	350	1.06	567
SMBJ400A	SMBJ400CA	447	494	1	1	400	0.93	648
SMBJ440A	SMBJ440CA	492	543	1	1	440	0.84	713

Notes:
(4) Pulse test: t_p≤50ms.
(5) Surge current waveform per Fig. 3 and derated per Fig.2.
(6) For bi-directional types having V_{RWM} of 10 V and less, the I_R limit is doubled.
(7) For the bi-directional SMBJ5.0CA, the maximum V_{BR} is 7.25 V.

■ Characteristics (Typical)

FIG1:Peak Pulse Power Rating Curve

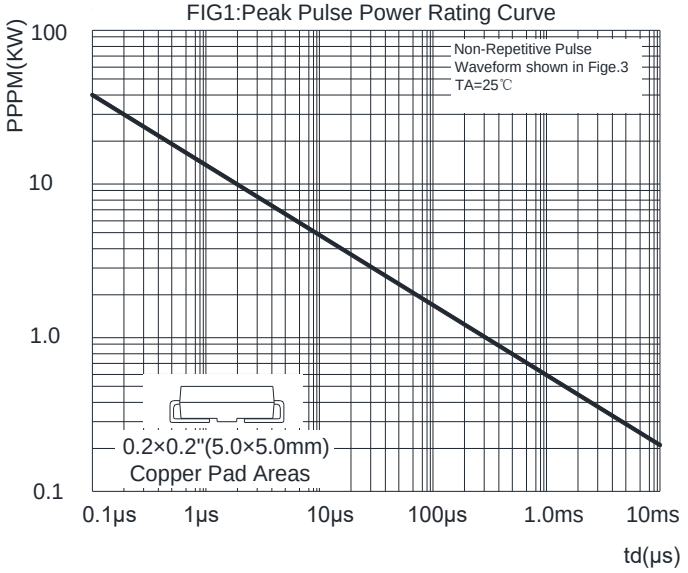


FIG2: Pulse Power or Current vs. Initial Junction Temperature

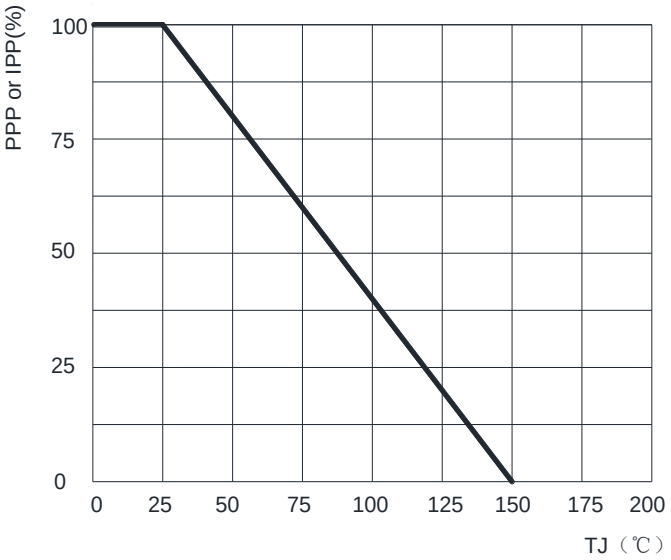


FIG3: Pulse Waveform

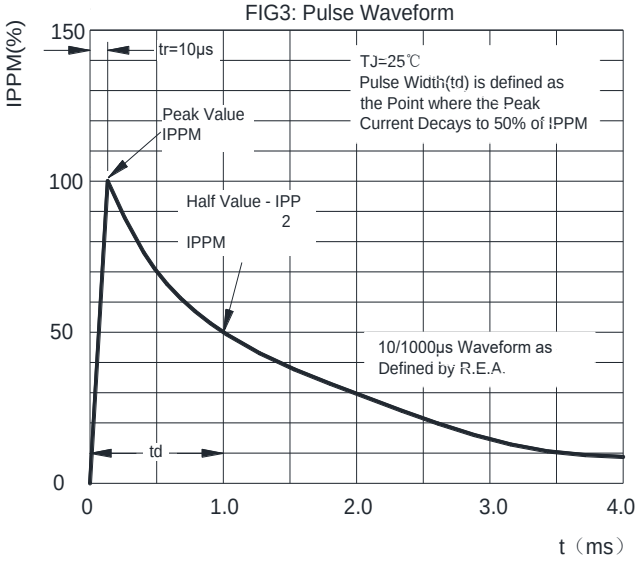


FIG4:Typical Transient Thermal Impedance

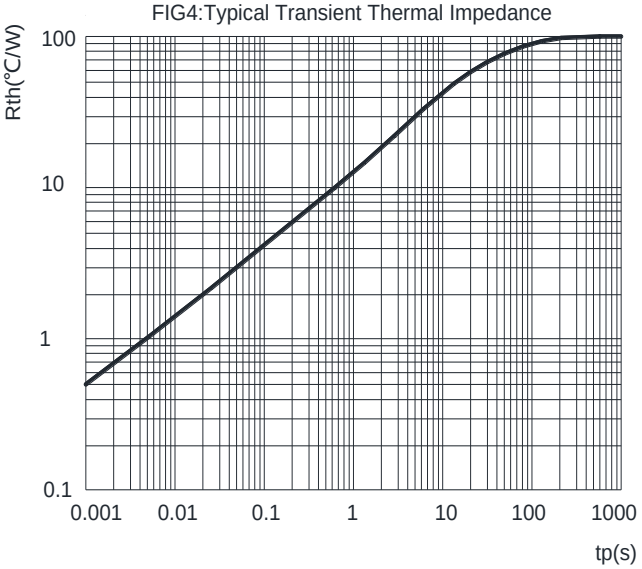


FIG5: Maximum Non-Repetitive Surge Current

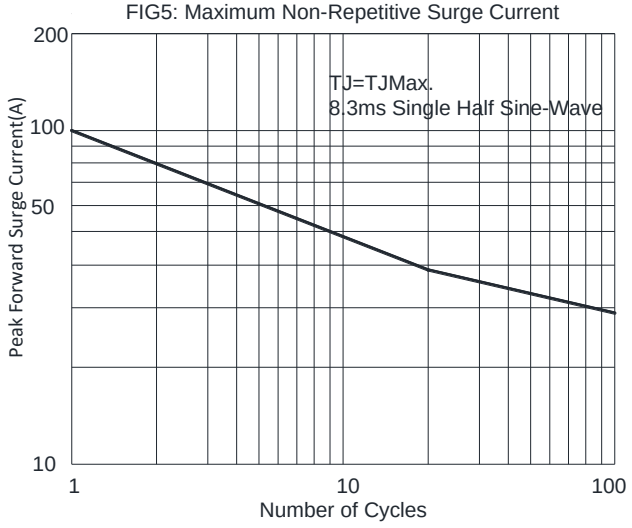
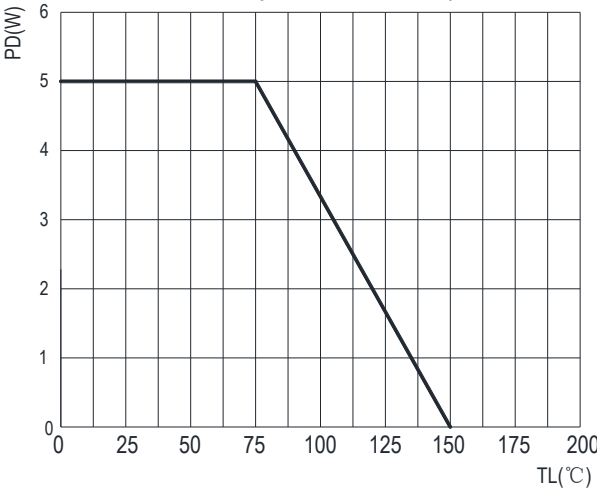
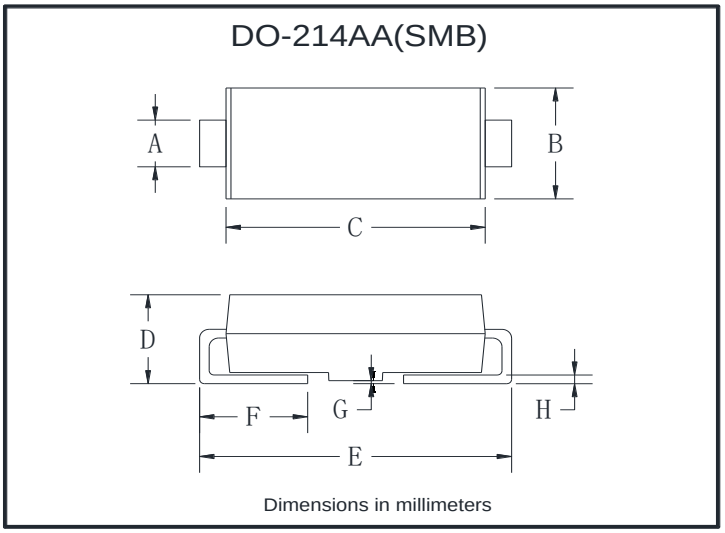


FIG6:Steady State Power Dissipation

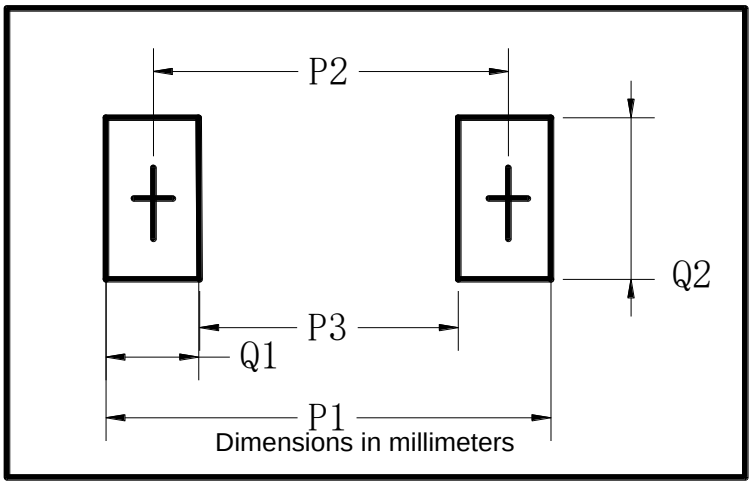


■ Outline Dimensions



DO-214AA(SMB)		
Dim	Min	Max
A	1.85	2.15
B	3.30	3.94
C	4.05	4.75
D	1.99	2.61
E	5.21	5.59
F	0.90	1.41
G	0.05	0.20
H	0.15	0.31

■ Suggested pad layout



DO-214AA(SMB)	
Dim	Millimeters
P1	6.8
P2	4.3
P3	1.8
Q1	2.5
Q2	2.3

Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website http:// www.21yangjie.com , or consult your nearest Yangjie's sales office for further assistance.