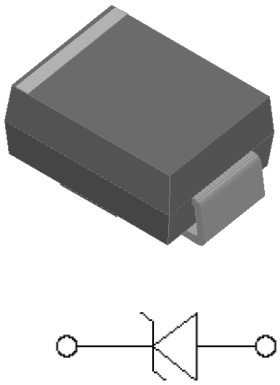
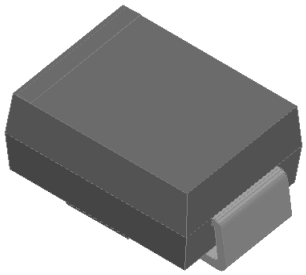
Surface Mount Transient Voltage Suppressors

Uni-directional



Bi-directional



Features

- UL recognition, file # E517074
- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- 2000 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 (T_a=25℃ Unless otherwise specified）

PARAMETER	SYMBOL	UNIT	Max
Peak power dissipation, with a 10/1000us waveform (1) (2) (Fig.1)	P_{PPM}	W	2000
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（T_a=25℃ Unless otherwise specified）

PARAMETER	SYMBOL	UNIT	VALUE
Maximum instantaneous forward voltage @ at 25A for unidirectional only	V_F	V	5.0

Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above T_A= 25℃ per Fig.2.

(2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal.

■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:

(3) Non-repetitive current pulse, per Fig. 3 and derated above T_A= 25℃per Fig.2.

(4) 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

■Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SMB20J SERIES	F1	Approximate 0.0975	3000	/	48000	13” reel
SMB20J SERIES	F2	Approximate 0.0975	750	3000	24000	7” reel
SMB20J SERIES	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@ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP}(4) (A)	Maximum Clamping Voltage Vc @ I_{PP} (V)
		Min(V)	Max (V)	I_T(3)(mA)				
SMB20J11A	SMB20J11CA	12.2	13.5	1	5	11	109.89	18.2
SMB20J12A	SMB20J12CA	13.3	14.7	1	5	12	100.5	19.9
SMB20J13A	SMB20J13CA	14.4	15.9	1	5	13	93.02	21.5
SMB20J14A	SMB20J14CA	15.6	17.2	1	5	14	86.21	23.2
SMB20J15A	SMB20J15CA	16.7	18.5	1	5	15	81.97	24.4
SMB20J16A	SMB20J16CA	17.8	19.7	1	5	16	76.92	26
SMB20J17A	SMB20J17CA	18.9	20.9	1	5	17	72.46	27.6
SMB20J18A	SMB20J18CA	20	22.1	1	5	18	68.49	29.2
SMB20J19A	SMB20J19CA	21.1	23.3	1	5	19	64.94	30.8
SMB20J20A	SMB20J20CA	22.20	24.50	1	5	20.0	61.73	32.4
SMB20J22A	SMB20J22CA	24.40	26.90	1	5	22.0	56.33	35.5
SMB20J24A	SMB20J24CA	26.70	29.50	1	5	24.0	51.41	38.9
SMB20J26A	SMB20J26CA	28.90	31.90	1	5	26.0	47.51	42.1
SMB20J28A	SMB20J28CA	31.10	34.40	1	5	28.0	44.05	45.4
SMB20J30A	SMB20J30CA	33.30	36.80	1	5	30.0	41.32	48.4
SMB20J33A	SMB20J33CA	36.70	40.60	1	5	33.0	37.52	53.3
SMB20J36A	SMB20J36CA	40.00	44.20	1	5	36.0	34.43	58.1
SMB20J40A	SMB20J40CA	44.40	49.10	1	5	40.0	31.01	64.5

Part Number (Uni)	Part Number (Bi)	Breakdown Voltage V_{BR}@I_T			Maximum Reverse Leakage I_R@ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP}(4) (A)	Maximum Clamping Voltage Vc @ I_{PP} (V)
		Min(V)	Max (V)	I_T(3)(mA)				
SMB20J43A	SMB20J43CA	47.80	52.80	1	5	43.0	28.81	69.4
SMB20J45A	SMB20J45CA	50.00	55.30	1	5	45.0	27.51	72.7
SMB20J48A	SMB20J48CA	53.30	58.90	1	5	48.0	25.84	77.4
SMB20J51A	SMB20J51CA	56.70	62.70	1	5	51.0	24.27	82.4
SMB20J54A	SMB20J54CA	60.00	66.30	1	5	54.0	22.96	87.1
SMB20J58A	SMB20J58CA	64.40	71.20	1	5	58.0	21.37	93.6
SMB20J60A	SMB20J60CA	66.7	73.7	1	5	60	20.66	96.8
SMB20J64A	SMB20J64CA	71.1	78.6	1	5	64	19.42	103
SMB20J70A	SMB20J70CA	77.8	86	1	5	70	17.7	113
SMB20J75A	SMB20J75CA	83.3	92.1	1	5	75	16.53	121
SMB20J78A	SMB20J78CA	86.7	95.8	1	5	78	15.87	126
SMB20J80A	SMB20J80CA	88.8	97.6	1	5	80	15.43	129.6
SMB20J85A	SMB20J85CA	94.4	104	1	5	85	14.6	137
SMB20J90A	SMB20J90CA	100	111	1	5	90	13.7	146
SMB20J100A	SMB20J100CA	111	123	1	5	100	12.35	162
SMB20J110A	SMB20J110CA	122	135	1	5	110	11.3	177

Notes:
(3) Pulse test: t_p≤50ms.
(4) Surge current waveform per Fig. 3 and derated per Fig.2.

■ **Characteristics** (Typical)

FIG1:Peak Pulse Power Rating Curve

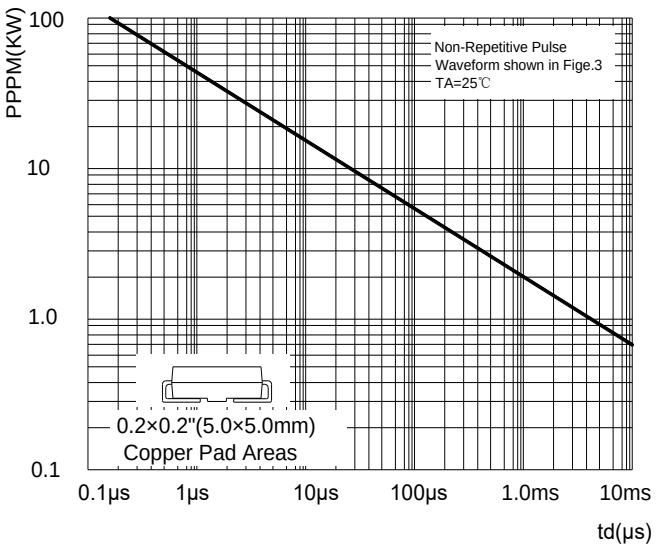


FIG2: Pulse Power or Current vs. Initial Junction Temperature

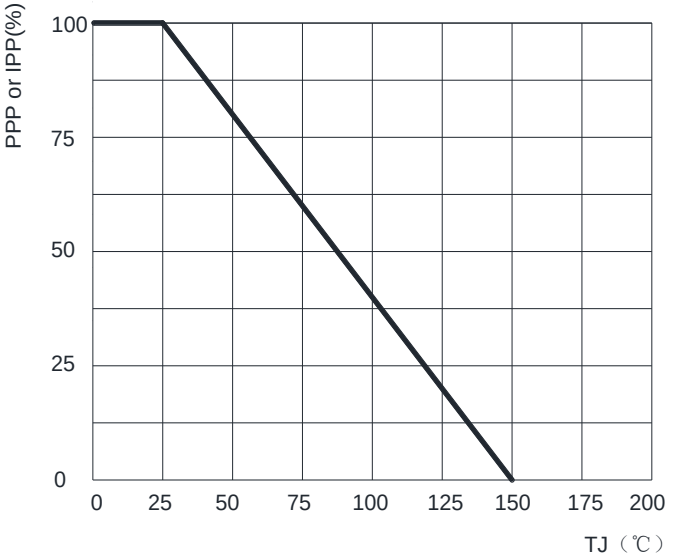


FIG3: Pulse Waveform

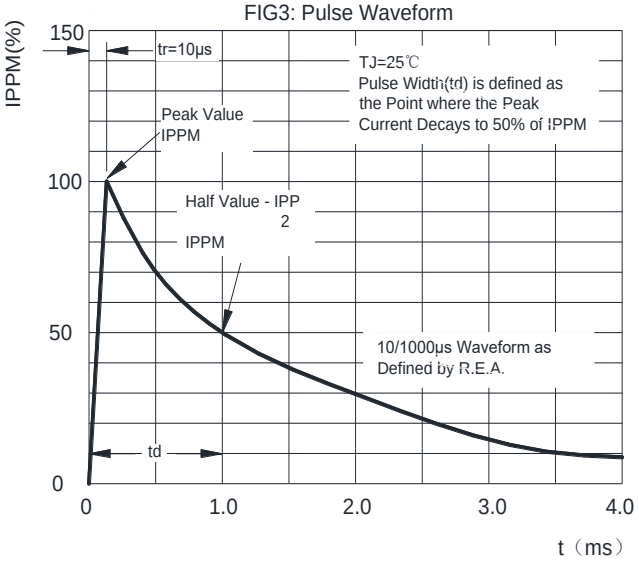
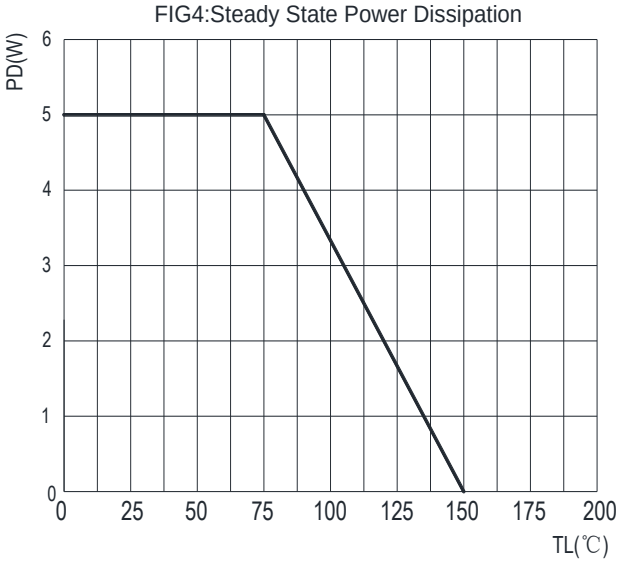
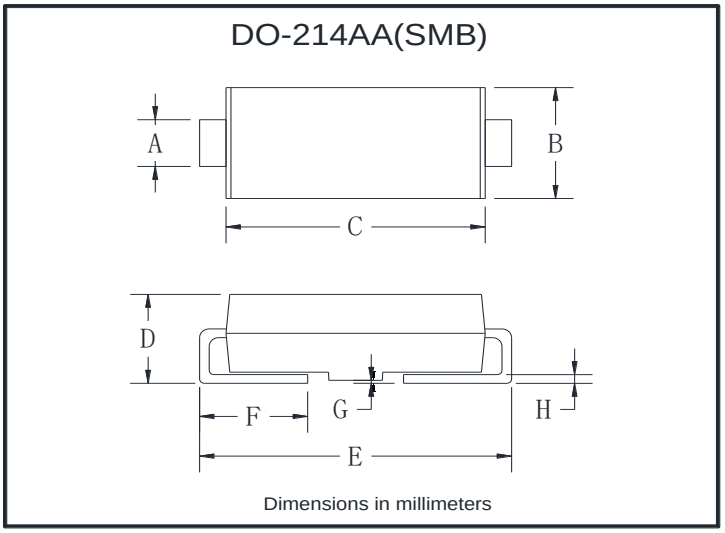


FIG4:Steady State Power Dissipation

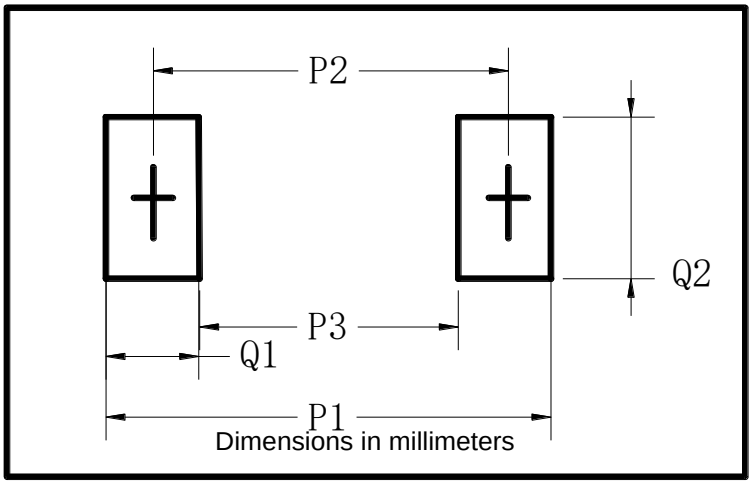


■ Outline Dimensions



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

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