

Surface Mount Transient Voltage Suppressors (TVS)

1.0SMBJ Series
5.0 to 85 V
1000W
DO-214AA(SMB)

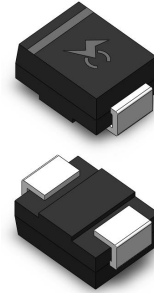
Description

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

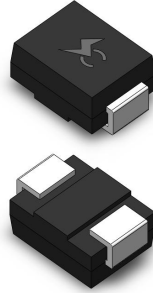
Features

- ◆ Glass passivated or planar junction.
- ◆ Excellent clamping capability.
- ◆ Repetition rate (duty cycle): 0.01%.
- ◆ Typical I_R less than $1\mu A$ above 10V.
- ◆ Low profile package and low inductance.
- ◆ 1000W peak pulse power capability at $10 \times 1000\mu s$ waveform.
- ◆ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ◆ High temperature soldering: $260^\circ C/10s$ at terminals.
- ◆ Plastic package has Underwriters Laboratory Flammability 94V-0.
- ◆ For surface mounted applications in order to optimize board space.

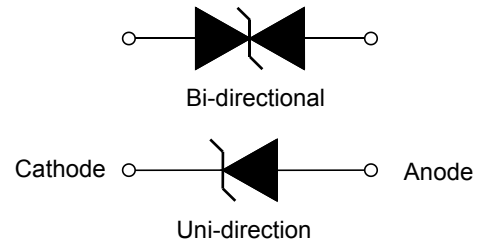
Uni-directional




Bi-directional



Functional Diagram



Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E341027

Absolute Maximum Ratings ($T_A=25^\circ C$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000 μs waveform	P_{PP}	1000	W
Steady state power dissipation at $T_L=75^\circ C$	$P_{M(AV)}$	5.0	W
Maximum instantaneous forward voltage at 50A for unidirectional	V_F	5.0	V
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$
Operating junction temperature range	T_J	-55 to +125	$^\circ C$

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Electrical Characteristics (T_A=25°C)

Part Number		Marking		Reverse Stand-Off Voltage V _{RWM} (V)	Maximum Reverse Leakage I _R @V _{RWM} (μA)	Breakdown Voltage V _{BR} @I _T (V)		Test Current I _T (mA)	Maximum Clamping Voltage V _C @I _{PP} (V)	Maximum Peak Pulse Current I _{PP} (A)
Uni	Bi	Uni	Bi			MIN	MAX			
1.0SMBJ5.0A	1.0SMBJ5.0CA	AKE	AAE	5.0	200	6.40	7.00	10	9.2	108.7
1.0SMBJ6.0A	1.0SMBJ6.0CA	AKG	AAG	6.0	200	6.67	7.37	10	10.3	97.1
1.0SMBJ6.5A	1.0SMBJ6.5CA	AKK	AAK	6.5	100	7.22	7.98	10	11.2	89.3
1.0SMBJ7.0A	1.0SMBJ7.0CA	AKM	AAM	7.0	80	7.78	8.60	10	12.0	83.4
1.0SMBJ7.5A	1.0SMBJ7.5CA	AKP	AAP	7.5	50	8.33	9.21	1	12.9	77.6
1.0SMBJ8.0A	1.0SMBJ8.0CA	AKR	AAR	8.0	20	8.89	9.83	1	13.6	73.6
1.0SMBJ8.5A	1.0SMBJ8.5CA	AKT	AAT	8.5	10	9.44	10.40	1	14.4	69.5
1.0SMBJ9.0A	1.0SMBJ9.0CA	AKV	AAV	9.0	5	10.00	11.10	1	15.4	65.0
1.0SMBJ10A	1.0SMBJ10CA	AKX	AAX	10	2	11.10	12.30	1	17.0	58.9
1.0SMBJ11A	1.0SMBJ11CA	AKZ	AAZ	11	1	12.20	13.50	1	18.2	55.0
1.0SMBJ12A	1.0SMBJ12CA	ALE	ABE	12	1	13.30	14.70	1	19.9	50.3
1.0SMBJ13A	1.0SMBJ13CA	ALG	ABG	13	1	14.40	15.90	1	21.5	46.6
1.0SMBJ14A	1.0SMBJ14CA	ALK	ABK	14	1	15.60	17.20	1	23.2	43.1
1.0SMBJ15A	1.0SMBJ15CA	ALM	ABM	15	1	16.70	18.50	1	24.4	41.0
1.0SMBJ16A	1.0SMBJ16CA	ALP	ABP	16	1	17.80	19.70	1	26.0	38.5
1.0SMBJ17A	1.0SMBJ17CA	ALR	ABR	17	1	18.90	20.90	1	27.6	36.3
1.0SMBJ18A	1.0SMBJ18CA	ALT	ABT	18	1	20.00	22.10	1	29.2	34.3
1.0SMBJ19A	1.0SMBJ19CA	ALB	ABB	19	1	21.10	23.30	1	30.8	32.5
1.0SMBJ20A	1.0SMBJ20CA	ALV	ABV	20	1	22.20	24.50	1	32.4	30.9
1.0SMBJ22A	1.0SMBJ22CA	ALX	ABX	22	1	24.40	26.90	1	35.5	28.2
1.0SMBJ24A	1.0SMBJ24CA	ALZ	ABZ	24	1	26.70	29.50	1	38.9	25.7
1.0SMBJ26A	1.0SMBJ26CA	AME	ACE	26	1	28.90	31.90	1	42.1	23.8
1.0SMBJ28A	1.0SMBJ28CA	AMG	ACG	28	1	31.10	34.40	1	45.4	22.1
1.0SMBJ30A	1.0SMBJ30CA	AMK	ACK	30	1	33.30	36.80	1	48.4	20.7
1.0SMBJ33A	1.0SMBJ33CA	AMM	ACM	33	1	36.70	40.60	1	53.3	18.8
1.0SMBJ36A	1.0SMBJ36CA	AMP	ACP	36	1	40.00	44.20	1	58.1	17.3
1.0SMBJ40A	1.0SMBJ40CA	AMR	ACR	40	1	44.40	49.10	1	64.5	15.5
1.0SMBJ43A	1.0SMBJ43CA	AMT	ACT	43	1	47.80	52.80	1	69.4	14.4

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Part Number		Marking		Reverse Stand-Off Voltage V _{RWM} (V)	Maximum Reverse Leakage I _R @V _{RWM} (μA)	Breakdown Voltage V _{BR} @I _T (V)		Test Current I _T (mA)	Maximum Clamping Voltage V _C @I _{PP} (V)	Maximum Peak Pulse Current I _{PP} (A) ①
Uni	Bi	Uni	Bi			MIN	MAX			
1.0SMBJ45A	1.0SMBJ45CA	AMV	ACV	45	1	50.00	55.30	1	72.7	13.8
1.0SMBJ48A	1.0SMBJ48CA	AMX	ACX	48	1	53.30	58.90	1	77.4	13.0
1.0SMBJ51A	1.0SMBJ51CA	AMZ	ACZ	51	1	56.70	62.70	1	82.4	12.2
1.0SMBJ54A	1.0SMBJ54CA	ANE	ADE	54	1	60.00	66.30	1	87.1	11.5
1.0SMBJ58A	1.0SMBJ58CA	ANG	ADG	58	1	64.40	71.20	1	93.6	10.7
1.0SMBJ60A	1.0SMBJ60CA	ANK	ADK	60	1	66.70	73.70	1	96.8	10.4
1.0SMBJ64A	1.0SMBJ64CA	ANM	ADM	64	1	71.10	78.60	1	103.0	9.7
1.0SMBJ70A	1.0SMBJ70CA	ANP	ADP	70	1	77.80	86.00	1	113.0	8.9
1.0SMBJ75A	1.0SMBJ75CA	ANR	ADR	75	1	83.30	92.10	1	121.0	8.3
1.0SMBJ78A	1.0SMBJ78CA	ANT	ADT	78	1	86.70	95.80	1	126.0	8.0
1.0SMBJ80A	1.0SMBJ80CA	ANB	ADB	80	1	88.80	97.60	1	129.6	7.7
1.0SMBJ85A	1.0SMBJ85CA	ANV	ADV	85	1	94.40	104.0	1	137.0	7.3

Notes:

① Surge waveform:10/1000μs.

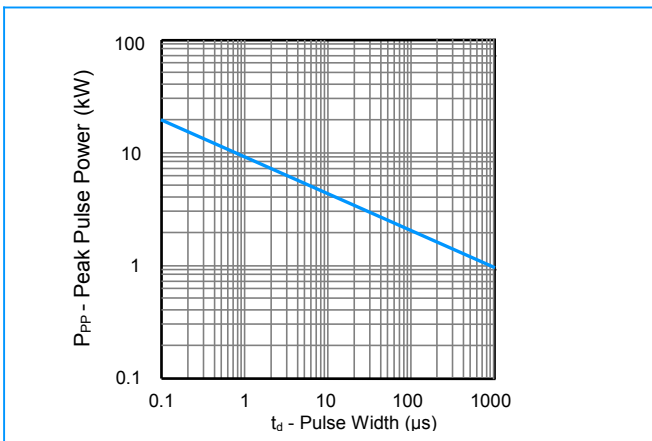
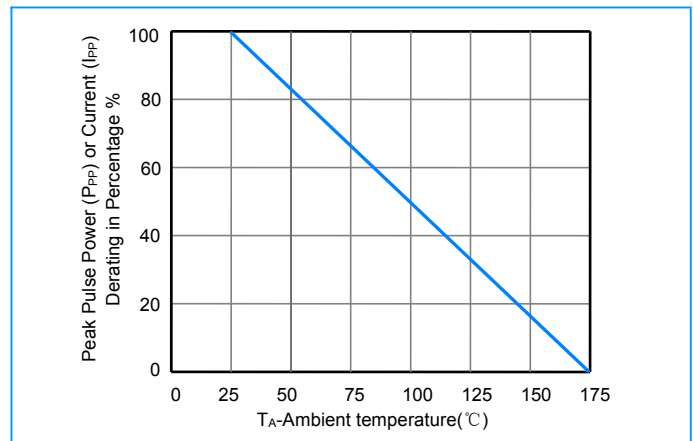
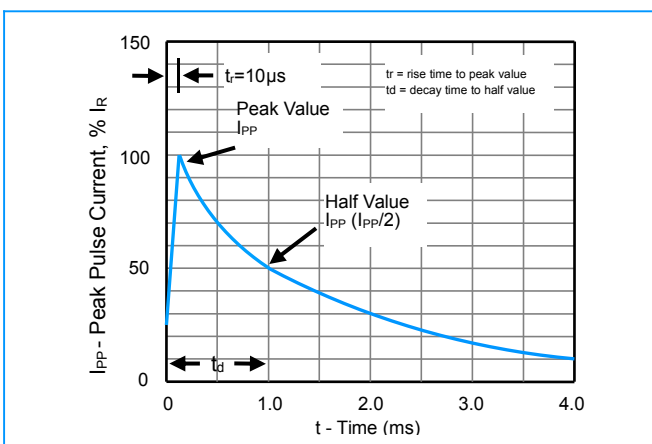
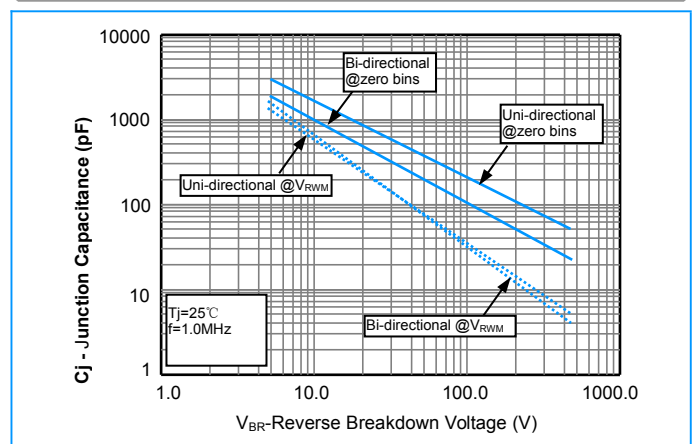
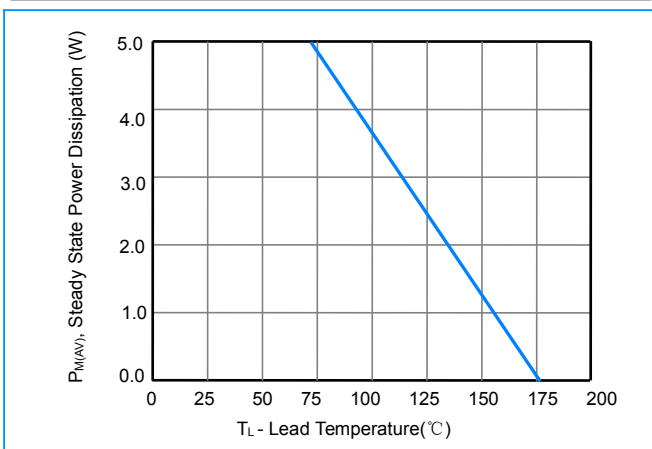
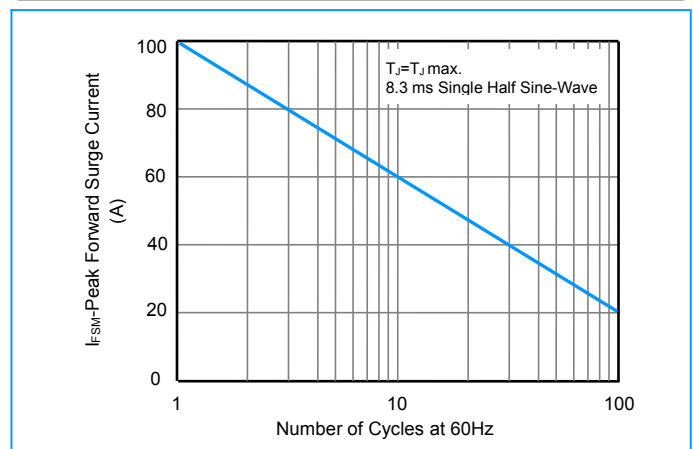
 V_{RWM}: Stand-off Voltage -- Maximum voltage that can be applied.

 V_{BR}: Breakdown Voltage.

 V_C: Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{PP}.

 I_R: Reverse Leakage Current.

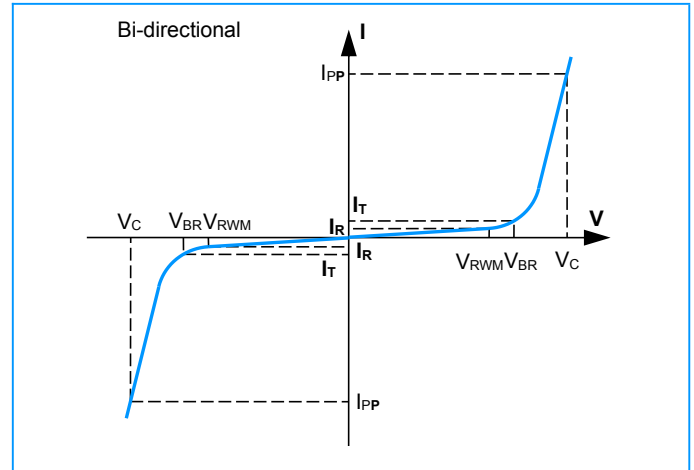
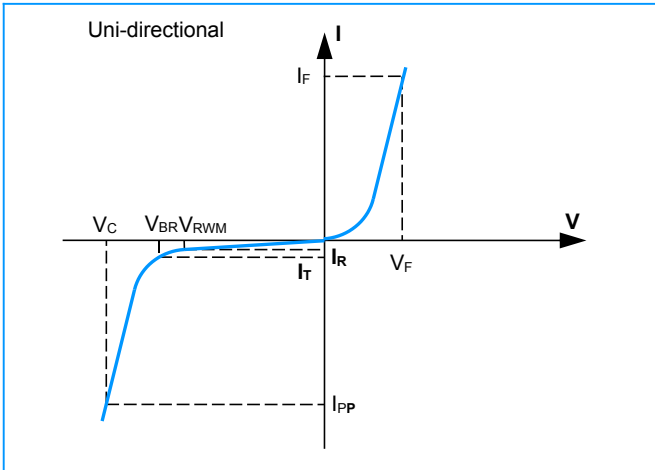
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Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)
Figure 1 - Peak Pulse Power Rating Curve

Figure 2 - Pulse Derating Curve

Figure 3 - Pulse Waveform

Figure 4 - Typical Junction Capacitance

Figure 5 - Steady State Power Derating Curve

Figure 6 - Maximum Non-Repetitive Surge Current


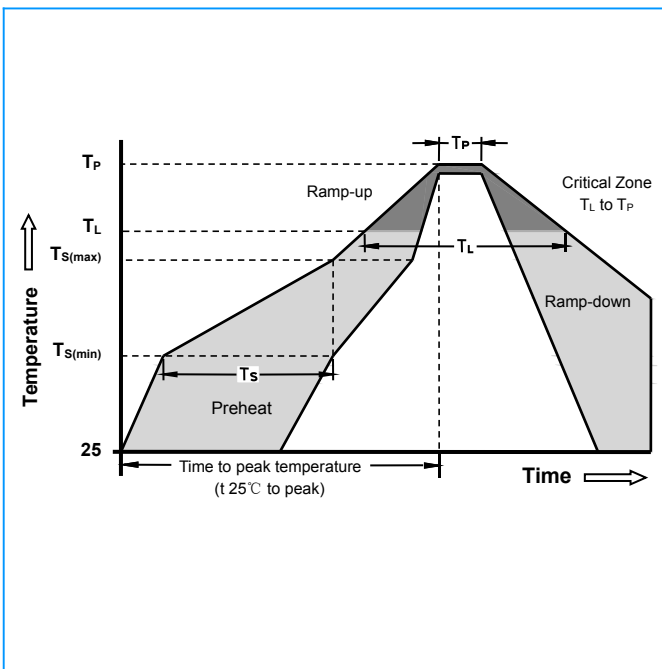
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V-I Curve Characteristics



Soldering Parameters

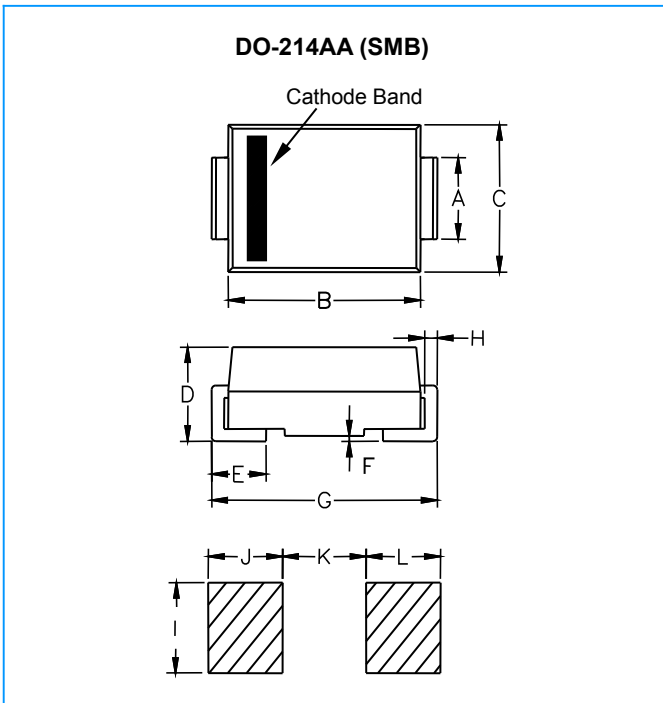


Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min ($T_{S(min)}$)	150°C
	-Temperature Max ($T_{S(max)}$)	200°C
	-Time (min to max) (T_S)	60 - 180 seconds
Average ramp up rate (Liquidus Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (T_L)	60 - 150 seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5 °C of actual peak Temperature (t_p)		30 seconds max
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes max
Do not exceed		260°C

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Dimensions

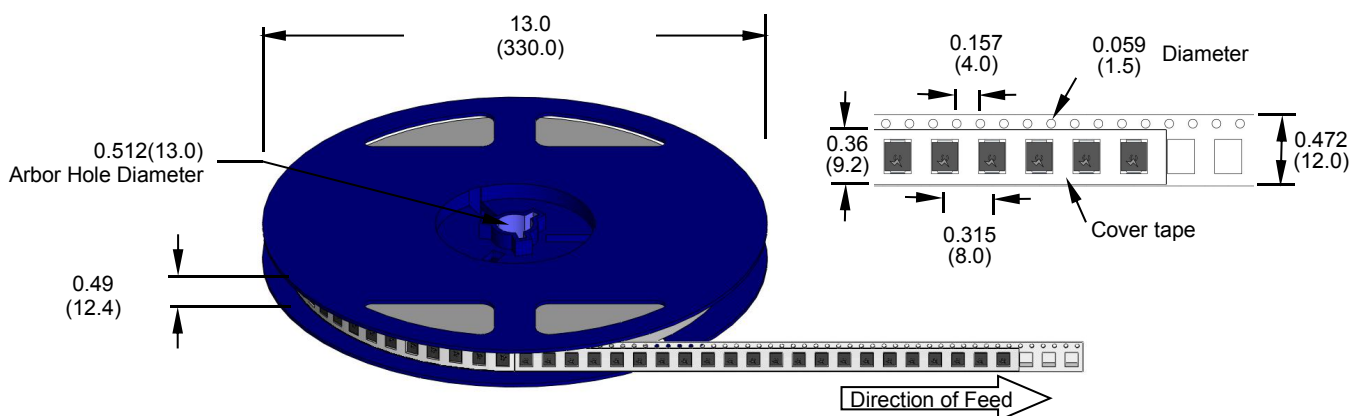


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.073	0.087	1.85	2.21
B	0.167	0.187	4.25	4.75
C	0.130	0.155	3.30	3.94
D	0.083	0.096	2.11	2.44
E	0.030	0.060	0.76	1.52
F	0.002	0.008	0.051	0.203
G	0.200	0.220	5.08	5.59
H	0.006	0.012	0.15	0.31
I	0.090	-	2.40	-
J	0.085	-	2.10	-
K	-	0.100	-	2.60
L	0.085	-	2.10	-

Packaging

Part Number	Component Package	Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)
1.0SMBJ Series	DO-214AA (SMB)	Taping	3000	48000	330

Tape and Reel Specifications



Dimensions are in inches (and millimeters)