

SuperTVS – 600W Transient Voltage Suppressor

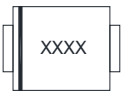
1. Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Meets MSL level 1, per J-STD-020
- IEC 61000-4-2(ESD) $\pm 30\text{KV}$ (air) $\pm 30\text{KV}$ (contact)
- 600W peak pulse power capability at 10/1000 μs waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical IR less than 1 μA above 10V
- Plastic package has underwriters laboratory flammability 94V-0
- High Temperature soldering: 260 $^{\circ}\text{C}$ /10 seconds at terminals

2. Mechanical Data

- Case: JEDEC DO-214AA. Molded plastic over glass passivated junction
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Standard Packaging: 12mm tape
- Weight: 0.10g

3. Marking Information

BI- directional	UNI-directional	Marking
		XXXX= Product type marking code (See Electrical Characteristics Table)
		

4. Maximum Ratings and Characteristics

Ratings at 25 $^{\circ}$ ambient temperature unless otherwise specified

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 μs waveform (Note1,2)	P _{PPM}	600	W
Peak pulse current of at 10/1000 μs waveform (Note1)	I _{PPM}	See Table	A
Steady state power dissipation at TA=50 $^{\circ}\text{C}$	P _{M(AV)}	5.0	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (Note3)	I _{FSM}	100	A

SMBJ SERIES

Rev-1.5

Operating junction and Storage Temperature Range	T_J, T_{STG}	-65 to 150	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	°C/W
Maximum instantaneous forward voltage @ at 50A for unidirectional only (Note4)	V_F	3.5/5	V

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^\circ\text{C}$ per Fig.2.
2. Mounted on 5.0mm×5.0mm copper pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.
4. $V_F<3.5\text{V}$ for devices of $V_{BR}<200\text{V}$ and $V_F<5.0\text{V}$ for devices of $V_{BR}>201\text{V}$.

5. Electrical Characteristics ($T_A=25^\circ\text{C}$)

Part Number	Part Number	Marking		Reverse Stand off Voltage V_R	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T	Maximum Clamping Voltage V_C @ I_{PP}	Maximum Peak Pulse Current I_{PP}	Maximum Reverse Leakage I_R @ V_R	ROHS2.0
		UNI	BI	(V)	MIN	MAX	(mA)	(V)	(A)	(μA)	
SMBJ5.0A	SMBJ5.0CA	KE	AE	5	6.4	7	10	9.2	65.3	400	y
SMBJ6.0A	SMBJ6.0CA	KG	AG	6	6.67	7.37	10	10.3	58.3	400	y
SMBJ6.5A	SMBJ6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	53.6	250	y
SMBJ7.0A	SMBJ7.0CA	KM	AM	7	7.78	8.6	10	12	50	100	y
SMBJ7.5A	SMBJ7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	46.6	80	y
SMBJ8.0A	SMBJ8.0CA	KR	AR	8	8.89	9.83	1	13.6	44.2	50	y
SMBJ8.5A	SMBJ8.5CA	KT	AT	8.5	9.44	10.4	1	14.4	41.7	20	y
SMBJ9.0A	SMBJ9.0CA	KV	AV	9	10	11.1	1	15.4	39	10	y
SMBJ10A	SMBJ10CA	KX	AX	10	11.1	12.3	1	17	35.3	5	y
SMBJ11A	SMBJ11CA	KZ	AZ	11	12.2	13.5	1	18.2	33	1	y
SMBJ12A	SMBJ12CA	LE	BE	12	13.3	14.7	1	19.9	30.2	1	y
SMBJ13A	SMBJ13CA	LG	BG	13	14.4	15.9	1	21.5	28	1	y
SMBJ14A	SMBJ14CA	LK	BK	14	15.6	17.2	1	23.2	25.9	1	y
SMBJ15A	SMBJ15CA	LM	BM	15	16.7	18.5	1	24.4	24.6	1	y
SMBJ16A	SMBJ16CA	LP	BP	16	17.8	19.7	1	26	23.1	1	y
SMBJ17A	SMBJ17CA	LR	BR	17	18.9	20.9	1	27.6	21.8	1	y
SMBJ18A	SMBJ18CA	LT	BT	18	20	22.1	1	29.2	20.6	1	y
SMBJ20A	SMBJ20CA	LV	BV	20	22.2	24.5	1	32.4	18.6	1	y
SMBJ22A	SMBJ22CA	LX	BX	22	24.4	26.9	1	35.5	16.9	1	y
SMBJ24A	SMBJ24CA	LZ	BZ	24	26.7	29.5	1	38.9	15.5	1	y
SMBJ26A	SMBJ26CA	ME	CE	26	28.9	31.9	1	42.1	14.3	1	y

SMBJ SERIES

Rev-1.5

Part Number	Part Number	Marking		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage $V_C @ I_{PP}$ (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage $I_R @ V_R$ (μA)	ROHS2.0
UNI	BI	UNI	BI		MIN	MAX	(mA)	(V)			
SMBJ28A	SMBJ28CA	MG	CG	28	31.1	34.4	1	45.4	13.3	1	y
SMBJ30A	SMBJ30CA	MK	CK	30	33.3	36.8	1	48.4	12.4	1	y
SMBJ33A	SMBJ33CA	MM	CM	33	36.7	40.6	1	53.3	11.3	1	y
SMBJ36A	SMBJ36CA	MP	CP	36	40	44.2	1	58.1	10.4	1	y
SMBJ40A	SMBJ40CA	MR	CR	40	44.4	49.1	1	64.5	9.3	1	y
SMBJ43A	SMBJ43CA	MT	CT	43	47.8	52.8	1	69.4	8.7	1	y
SMBJ45A	SMBJ45CA	MV	CV	45	50	55.3	1	72.7	8.3	1	y
SMBJ48A	SMBJ48CA	MX	CX	48	53.3	58.9	1	77.4	7.8	1	y
SMBJ51A	SMBJ51CA	MZ	CZ	51	56.7	62.7	1	82.4	7.3	1	y
SMBJ54A	SMBJ54CA	NE	DE	54	60	66.3	1	87.1	6.9	1	y
SMBJ58A	SMBJ58CA	NG	DG	58	64.4	71.2	1	93.6	6.5	1	y
SMBJ60A	SMBJ60CA	NK	DK	60	66.7	73.7	1	96.8	6.2	1	y
SMBJ64A	SMBJ64CA	NM	DM	64	71.1	78.6	1	103	5.9	1	y
SMBJ70A	SMBJ70CA	NP	DP	70	77.8	86	1	113	5.3	1	y
SMBJ75A	SMBJ75CA	NR	DR	75	83.3	92.1	1	121	5	1	y
SMBJ78A	SMBJ78CA	NT	DT	78	86.7	95.8	1	126	4.8	1	y
SMBJ85A	SMBJ85CA	NV	DV	85	94.4	104	1	137	4.4	1	y
SMBJ90A	SMBJ90CA	NX	DX	90	100	111	1	146	4.1	1	y
SMBJ100A	SMBJ100CA	NZ	DZ	100	111	123	1	162	3.7	1	y
SMBJ110A	SMBJ110CA	PE	EE	110	122	135	1	177	3.4	1	y
SMBJ120A	SMBJ120CA	PG	EG	120	133	147	1	193	3.1	1	y
SMBJ130A	SMBJ130CA	PK	EK	130	144	159	1	209	2.9	1	y
SMBJ150A	SMBJ150CA	PM	EM	150	167	185	1	243	2.5	1	y
SMBJ160A	SMBJ160CA	PP	EP	160	178	197	1	259	2.3	1	y
SMBJ170A	SMBJ170CA	PR	ER	170	189	209	1	275	2.2	1	y
SMBJ180A	SMBJ180CA	PT	ET	180	201	222	1	292	2.1	1	y
SMBJ200A	SMBJ200CA	PV	EV	200	224	247	1	324	1.9	1	y
SMBJ220A	SMBJ220CA	PX	EX	220	246	272	1	356	1.7	1	y
SMBJ250A	SMBJ250CA	PZ	EZ	250	279	309	1	405	1.5	1	y
SMBJ300A	SMBJ300CA	QE	FE	300	335	371	1	486	1.3	1	y
SMBJ350A	SMBJ350CA	QG	FG	350	391	432	1	567	1.1	1	y
SMBJ400A	SMBJ400CA	QK	FK	400	447	494	1	648	0.9	1	y
SMBJ440A	SMBJ440CA	QM	FM	440	492	543	1	713	0.9	1	y

For bidirectional type having V_{RWM} of 10 volts and less, the IR limit is double.

6. Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

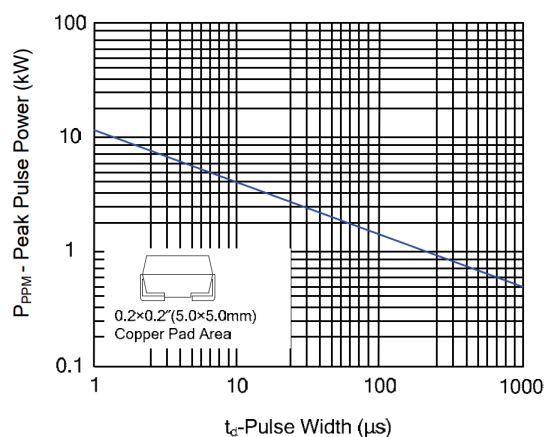


Figure 2 Pulse Derating Curve

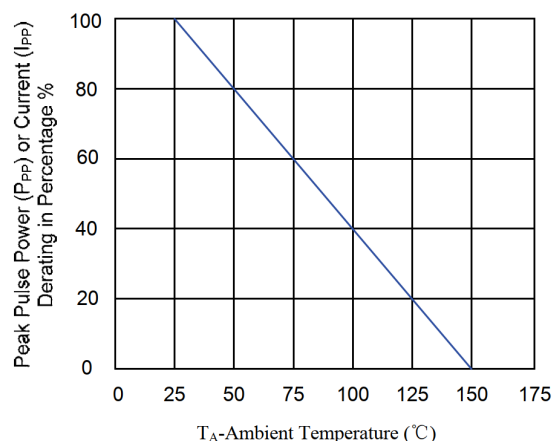


Figure 3 Pulse Waveform

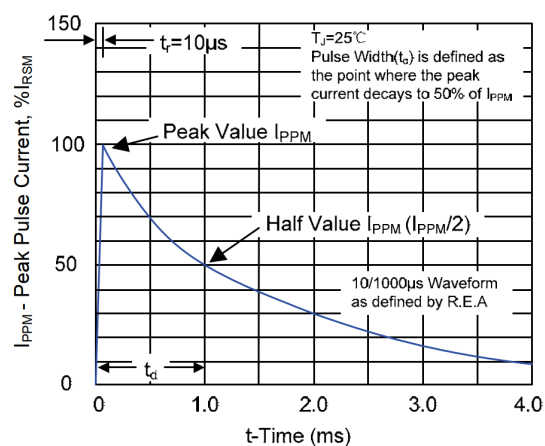


Figure 4 Typical Junction Capacitance

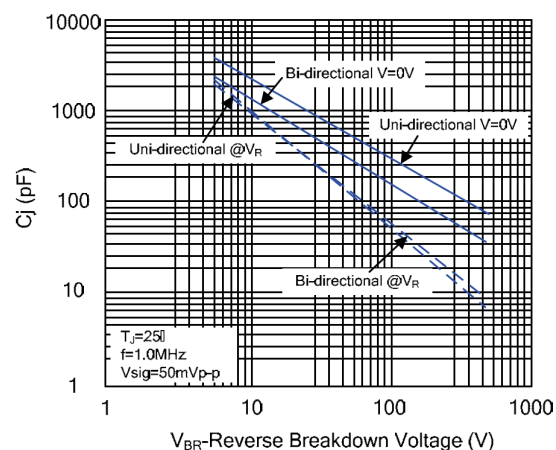
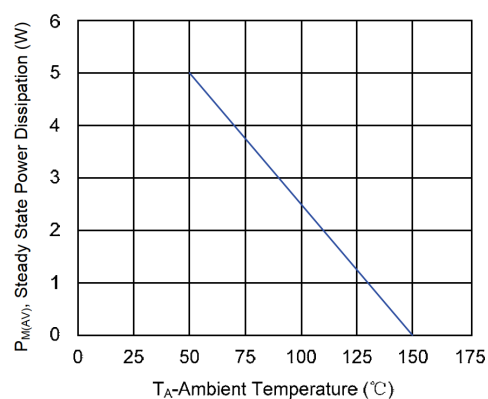
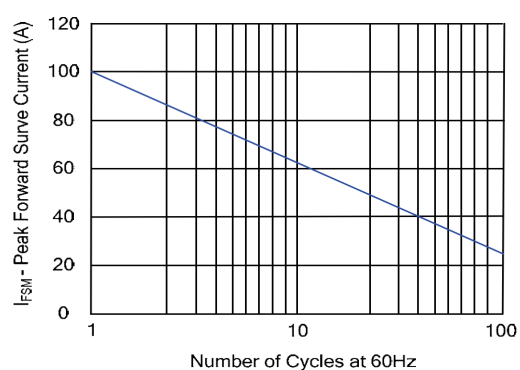


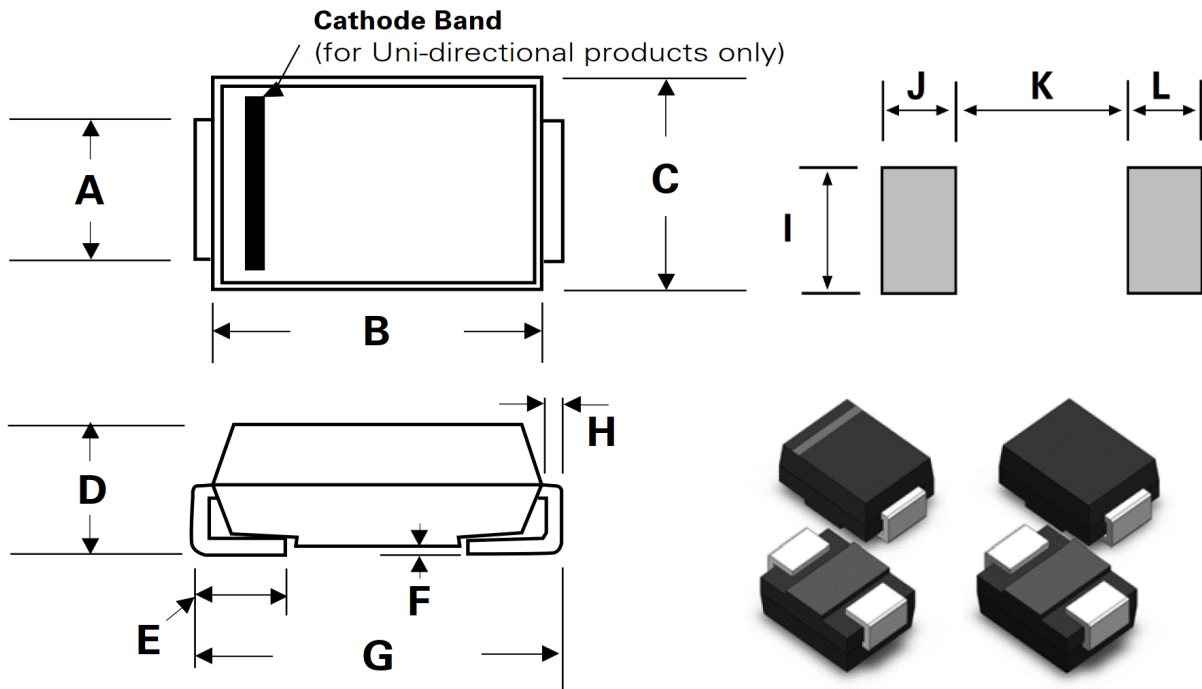
Figure 5 Steady State Power Dissipation Derating Curve

Figure 6 Maximum Non-Repetitive Forward Surge Current
Uni-Directional Only

SMBJ SERIES

Rev-1.5

7. Dimension (SMB/DO-214AA)

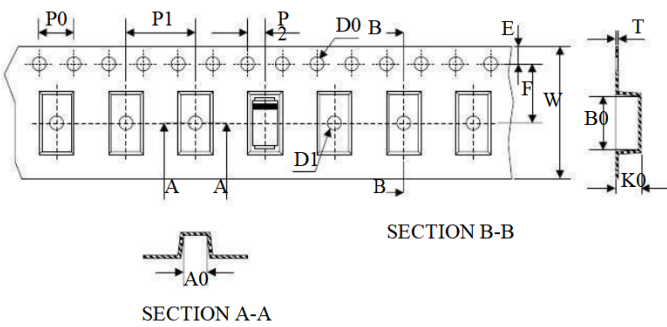
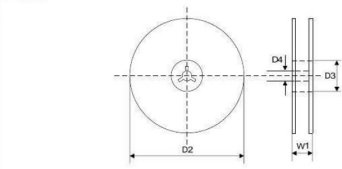
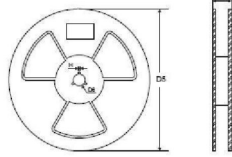


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.086	1.80	2.2
B	0.16	0.18	4.06	4.57
C	0.13	0.155	3.3	3.94
D	0.084	0.096	2.13	2.44
E	0.03	0.06	0.76	1.52
F	-	0.008	-	0.203
G	0.205	0.22	5.08	5.59
H	0.006	0.012	0.152	0.305
I	0.089	-	2.26	-
J	0.085	-	2.16	-
K	-	0.107	-	2.74
L	0.085	-	2.16	-

SMBJ SERIES

Rev-1.5

8. Packaging

	Symbol	Dimension
	W	12.0±0.20
	P0	4.0±0.10
	P1	8.00±0.10
	P2	2.0±0.10
	D0	φ1.55±0.10
	D1	φ1.5±0.10
	E	1.75±0.10
	F	5.50±0.10
	A0	3.86±0.15
	B0	5.65±0.10
	K0	2.75±0.15
	T	0.25±0.05
	D2	φ178.0±2.0
	D3	φ50.0min.
	D4	φ13.0±0.5
	W1	16.0±2.0
	Quantity: 500PCS	
	D5	330.0±2.0
	D6	13.5±0.5
	H	2.5±1.0
	W2	16.0±2.0
	Quantity: 3000PCS	

DISCLAIMER

ELECSUPER SUPERTVS PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with ElecSuper products. You are solely responsible for

- (1) selecting the appropriate ElecSuper products for your application;
- (2) designing, validating and testing your application;
- (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements.

These resources are subject to change without notice. ElecSuper grants you permission to use these resources only for development of an application that uses the ElecSuper products described in the resource. Other reproduction and display of these resources are prohibited. No license is granted to any other ElecSuper intellectual property right or to any third party intellectual property right. ElecSuper disclaims responsibility for, and you will fully indemnify ElecSuper and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources. ElecSuper's products are provided subject to ElecSuper's Terms of Sale or other applicable terms available either on www.elecsuper.com or provided in conjunction with such ElecSuper products. ElecSuper's provision of these resources does not expand or otherwise alter ElecSuper's applicable warranties or warranty disclaimers for ElecSuper products.