

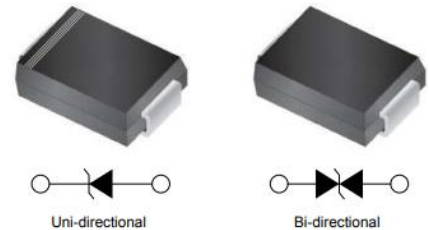
Transient Voltage Suppression Diodes: SMBJ Series

SMD Type 600 W



■ Features

1. Glass passivated chip
2. 600W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.01%
3. Excellent clamping capability
4. Very fast response time
5. Low clamping voltage
6. Low leakage current
7. Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C
8. JESD22-A114-B ESD Voltage: HBM 15KV
9. JEDEC EIA/JESD22-C101F ESD Voltage: CDM 500V
10. JEDEC EIA/JESD22-A115 ESD Voltage: MM 400V
11. ESD-immunity acc. IEC 61000-4-2 ±30kV(contact), ±30kV(air)
12. Halogen free and RoHS compliant



■ Recommended Applications

1. Computers
2. Telecom system
3. Industrial equipment
4. Consumer electronic applications
5. Other VCC bus and I/O interfaces

■ Mechanical Data

1. Case: Molded plastic, SMB/ DO-214AA
2. Epoxy: UL 94V-0 rate flame retardant
3. Terminals: Solderable per MIL-STD-750, method 2026
4. Polarity: Color band denotes cathode end
5. Mounting Position: Any

■ Part Number Code

S	M	B	J	5	.	0	C	A	Y
1	2	3	4	5	6	7	8	9	10

Product Series	
SMBJ	THINKING Transient Voltage Suppression Diodes SMBJ Series

Reverse Stand Off Voltage (V_{RWM})	
5.0	5V
70	70V
120	120V

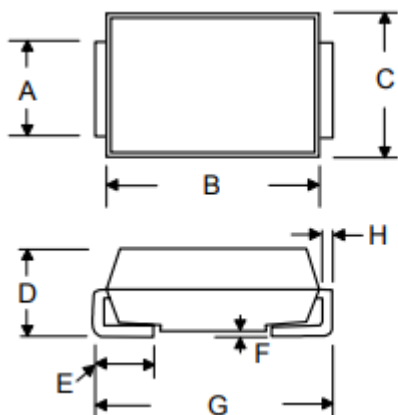
Type Code	
AY	Uni-directional, 5% V_{BR} Voltage Tolerance
CAY	Bi-directional, 5% V_{BR} Voltage Tolerance

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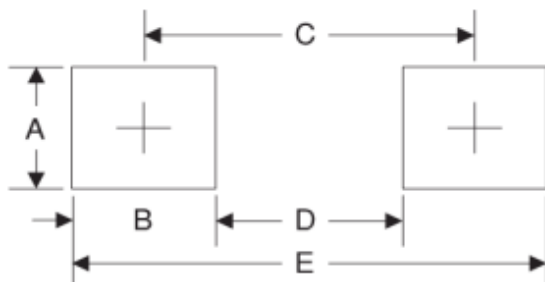
SMD Type 600 W



Structures and Dimensions



Symbol	Dimensions in millimeters	
	Min	Max
A	1.80	2.20
B	4.06	4.75
C	3.30	3.94
D	1.99	2.61
E	0.76	1.52
F	-	0.20
G	5.08	5.59
H	0.15	0.31



Symbol	Unit (mm)	Unit (inch)
A	2.30	0.091
B	2.00	0.078
C	4.10	0.161
D	2.10	0.083
E	6.10	0.240

Maximum Rating (TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak power dissipation with a 10/1000μs waveform (Note 1,2)	P _{PPM}	600	W
Peak pulse current with 10/1000 μs waveform (Note 1)	I _{PPM}	See next table	A
Peak forward surge current, 8.3 ms single half sine-wave (Note 3)	I _{FSM}	100	A
Power dissipation on infinite heatsink at T _L =75°C	P _D	5	W
Typical thermal resistance junction to ambient	R _{θJA}	100	°C/W
Typical thermal resistance junction to lead	R _{θJL}	20	°C/W
Operating junction and storage temperature range	T _J , T _{STG}	-55 to +150	°C

Note:

1. Non-repetitive current pulse, per Fig. 3 and derated above T_A=25°C per Fig. 2.
2. Mounted on 5.0 x 5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

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■ Electrical Characteristics (T_A=25°C unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage V _{BR} @ I _T		Test Current	Maximum Clamping Voltage V _C @ I _{pp}	Maximum Peak Pulse Current	Maximum Reverse Leakage I _R @ V _{RWM}	Marking Code	
		V _{RWM} (V)	Min(V)	Max(V)	I _T (mA)	V _C (V)	I _{pp} (A)	I _R (μA)	Uni	Bi
SMBJ5.0AY	SMBJ5.0CAY	5	6.4	7	10	9.2	65.22	800	KE	AE
SMBJ6.0AY	SMBJ6.0CAY	6	6.7	7.37	10	10.3	58.25	800	KG	AG
SMBJ6.5AY	SMBJ6.5CAY	6.5	7.2	7.98	10	11.2	53.57	500	KK	AK
SMBJ7.0AY	SMBJ7.0CAY	7	7.8	8.6	10	12	50	200	KM	AM
SMBJ7.5AY	SMBJ7.5CAY	7.5	8.3	9.21	1	12.9	46.51	100	KP	AP
SMBJ8.0AY	SMBJ8.0CAY	8	8.9	9.83	1	13.6	44.12	50	KR	AR
SMBJ8.5AY	SMBJ8.5CAY	8.5	9.4	10.4	1	14.4	41.67	10	KT	AT
SMBJ9.0AY	SMBJ9.0CAY	9	10	11.1	1	15.4	38.96	5	KV	AV
SMBJ10AY	SMBJ10CAY	10	11.1	12.3	1	17	35.29	5	KX	AX
SMBJ11AY	SMBJ11CAY	11	12.2	13.5	1	18.2	32.97	1	KZ	AZ
SMBJ12AY	SMBJ12CAY	12	13.3	14.7	1	19.9	30.15	1	LE	BE
SMBJ13AY	SMBJ13CAY	13	14.4	15.9	1	21.5	27.91	1	LG	BG
SMBJ14AY	SMBJ14CAY	14	15.6	17.2	1	23.2	25.86	1	LK	BK
SMBJ15AY	SMBJ15CAY	15	16.7	18.5	1	24.4	24.59	1	LM	BM
SMBJ16AY	SMBJ16CAY	16	17.8	19.7	1	26	23.08	1	LP	BP
SMBJ17AY	SMBJ17CAY	17	18.9	20.9	1	27.6	21.75	1	LR	BR
SMBJ18AY	SMBJ18CAY	18	20	22.1	1	29.2	20.55	1	LT	BT
SMBJ19AY	SMBJ19CAY	19	21.1	23.3	1	30.8	19.49	1	LW	BW
SMBJ20AY	SMBJ20CAY	20	22.2	24.5	1	32.4	18.52	1	LV	BV
SMBJ22AY	SMBJ22CAY	22	24.4	26.9	1	35.5	16.9	1	LX	BX
SMBJ24AY	SMBJ24CAY	24	26.7	29.5	1	38.9	15.42	1	LZ	BZ
SMBJ26AY	SMBJ26CAY	26	28.9	31.9	1	42.1	14.25	1	ME	CE
SMBJ28AY	SMBJ28CAY	28	31.1	34.4	1	45.4	13.22	1	MG	CG
SMBJ30AY	SMBJ30CAY	30	33.3	36.8	1	48.4	12.4	1	MK	CK
SMBJ33AY	SMBJ33CAY	33	36.7	40.6	1	53.3	11.26	1	MM	CM
SMBJ36AY	SMBJ36CAY	36	40	44.2	1	58.1	10.33	1	MP	CP
SMBJ40AY	SMBJ40CAY	40	44.4	49.1	1	64.5	9.3	1	MR	CR
SMBJ43AY	SMBJ43CAY	43	47.8	52.8	1	69.4	8.65	1	MT	CT
SMBJ45AY	SMBJ45CAY	45	50	55.3	1	72.7	8.25	1	MV	CV
SMBJ48AY	SMBJ48CAY	48	53.3	58.9	1	77.4	7.75	1	MX	CX

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Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage V _{RWM} (V)	Breakage Voltage V _{BR} @ I _T		Test Current I _T (mA)	Maximum Clamping Voltage V _C @ I _{pp} V _C (V)	Maximum Peak Pulse Current I _{pp} (A)	Maximum Reverse Leakage I _R @ V _{RWM} I _R (μA)	Marking Code	
			Min(V)	Max(V)					Uni	Bi
SMBJ51AY	SMBJ51CAY	51	56.7	62.7	1	82.4	7.28	1	MZ	CZ
SMBJ54AY	SMBJ54CAY	54	60	66.3	1	87.1	6.89	1	NE	DE
SMBJ58AY	SMBJ58CAY	58	64.4	71.2	1	93.6	6.41	1	NG	DG
SMBJ60AY	SMBJ60CAY	60	66.7	73.7	1	96.8	6.2	1	NK	DK
SMBJ64AY	SMBJ64CAY	64	71.1	78.6	1	103	5.83	1	NM	DM
SMBJ70AY	SMBJ70CAY	70	77.8	86	1	113	5.31	1	NP	DP
SMBJ75AY	SMBJ75CAY	75	83.3	92.1	1	121	4.96	1	NR	DR
SMBJ78AY	SMBJ78CAY	78	86.7	95.8	1	126	4.76	1	NT	DT
SMBJ80AY	SMBJ80CAY	80	88.8	97.6	1	129.6	4.63	1	NW	DW
SMBJ85AY	SMBJ85CAY	85	94.4	104	1	137	4.38	1	NV	DV
SMBJ90AY	SMBJ90CAY	90	100	111	1	146	4.11	1	NX	DX
SMBJ100AY	SMBJ100CAY	100	111	123	1	162	3.7	1	NZ	DZ
SMBJ110AY	SMBJ110CAY	110	122	135	1	177	3.39	1	PE	FE
SMBJ120AY	SMBJ120CAY	120	133	147	1	193	3.11	1	PG	FG
SMBJ130AY	SMBJ130CAY	130	144	159	1	209	2.87	1	PK	FK
SMBJ140AY	SMBJ140CAY	140	155	171	1	226.8	2.65	1	PL	FL
SMBJ150AY	SMBJ150CAY	150	167	185	1	243	2.47	1	PM	FM
SMBJ160AY	SMBJ160CAY	160	178	197	1	259	2.32	1	PP	FP
SMBJ170AY	SMBJ170CAY	170	189	209	1	275	2.18	1	PR	FR
SMBJ180AY	SMBJ180CAY	180	200	220	1	291.6	2.06	1	PT	FT
SMBJ190AY	SMBJ190CAY	190	211	232	1	307.8	1.95	1	PU	FU
SMBJ200AY	SMBJ200CAY	200	224	247	1	324	1.85	1	PV	FV
SMBJ220AY	SMBJ220CAY	220	246	272	1	356	1.69	1	PX	FX
SMBJ250AY	SMBJ250CAY	250	279	309	1	405	1.48	1	PZ	FZ
SMBJ300AY	SMBJ300CAY	300	335	371	1	486	1.23	1	QE	GE
SMBJ350AY	SMBJ350CAY	350	391	432	1	567	1.06	1	QG	GG
SMBJ400AY	SMBJ400CAY	400	447	494	1	648	0.93	1	QK	GK
SMBJ440AY	SMBJ440CAY	440	492	543	1	713	0.84	1	QM	GM

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

Fig.1 - Peak Pulse Power Rating Curve

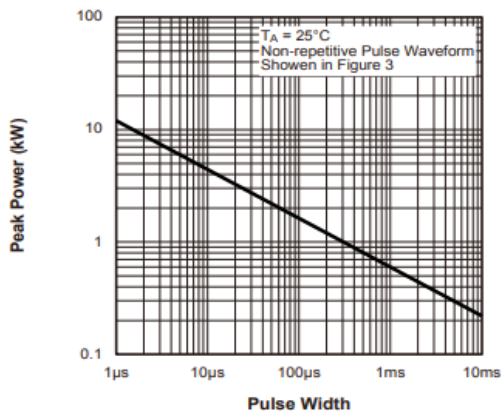


Fig.2 - Pulse Derating Curve

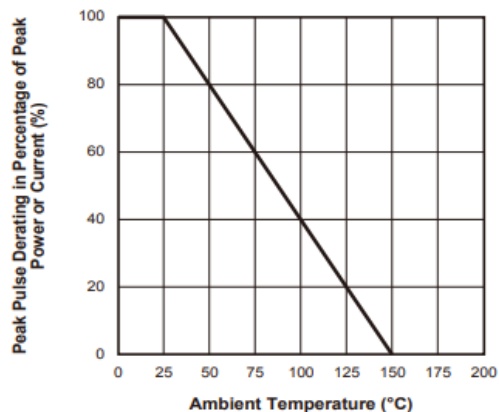


Fig.3 - Pulse Waveform

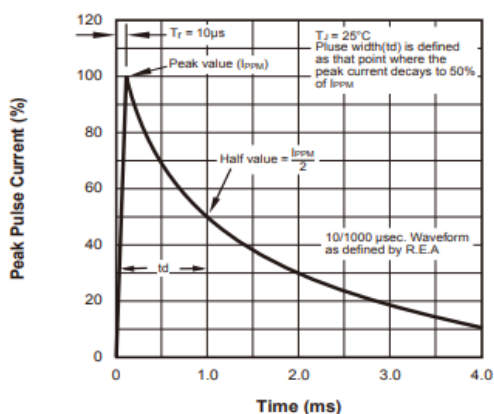
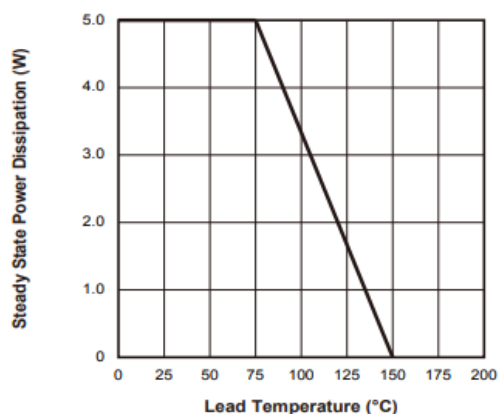


Fig.4 - Steady State Power Derating Curve

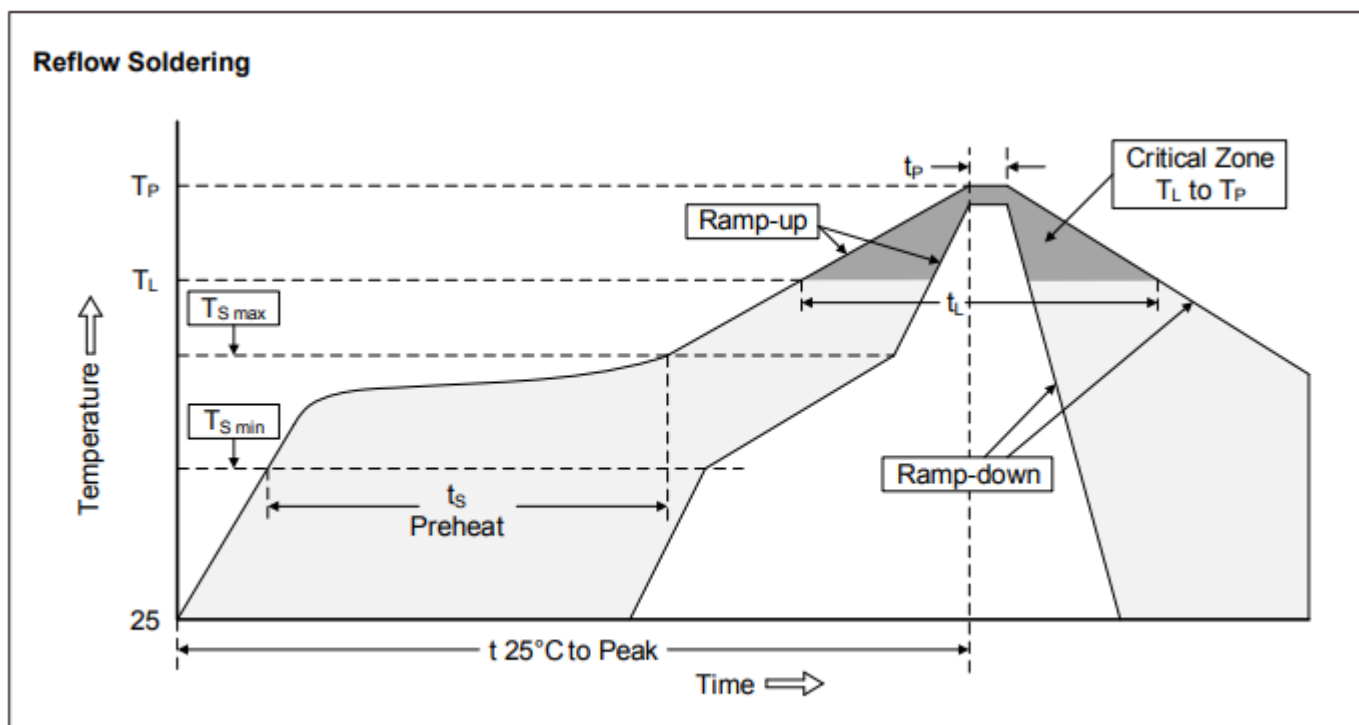


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■ Soldering Recommendation



Recommended Conditions

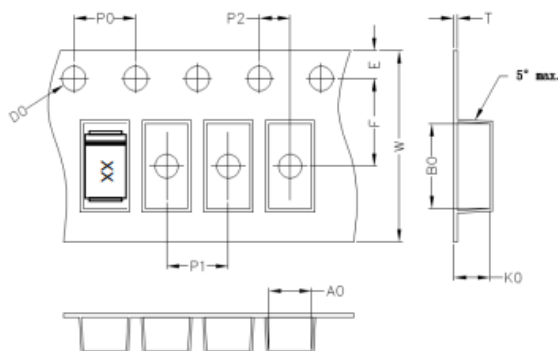
Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s)	150°C 200°C 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_p)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

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■ Packaging



A0	B0	K0	D0	E	F
3.80	5.40	2.45	1.55	1.75	5.50
P0	P1	P2	T	W	Tolerance
4.0	8.0	2.0	0.25	12	0.1

■ Quantity

Series Type	Packaging option	Base quantity	Packaging specification
SMBJ	Tape and reel	3000pcs / reel	EIA STD RS-481

■ Warehouse Storage Conditions of product

- Storage Condition:
 1. Storage Temperature: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
 2. Relative Humidity: $\leq 75\% \text{RH}$
 3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.