

## SMD Type 600 W

### ■ Features

1. RoHS compliant and halogen-free
2. Low leakage
3. Very fast response time
4. Excellent clamping capability
5. 600W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle): 0.01%
6. High reliability application and automotive grade AEC Q101 qualified
7. ESD protection of data lines in accordance with IEC 61000-4-2,30kV(Air),30kV(Contact)



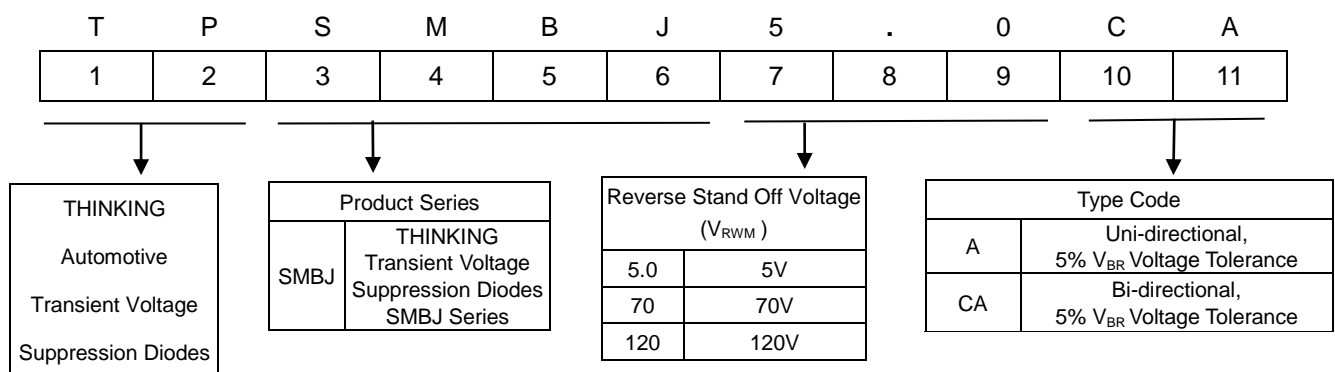
### ■ Recommended Applications

1. Telecommunication
2. Computer
3. Industrial device
4. Consumer electronic device
5. Automotive

### ■ Mechanical Data

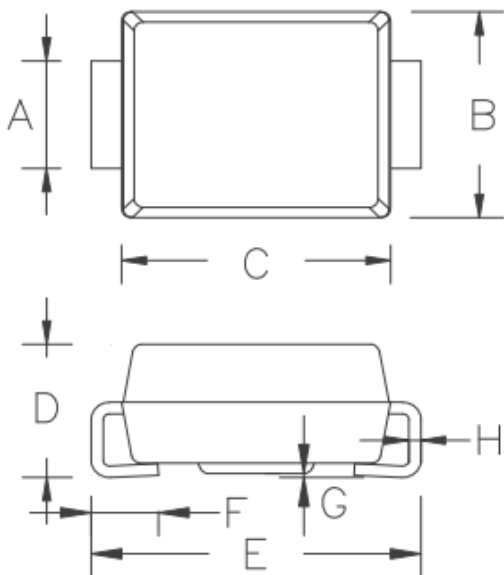
1. Case: DO-214AA (SMB), molded plastic
2. Epoxy : UL 94V-0 rate flame retardant
3. Terminal: Solderable per MIL-STD-750, method 2026.
4. Polarity: Color band denotes cathode end

### ■ Part Number Code

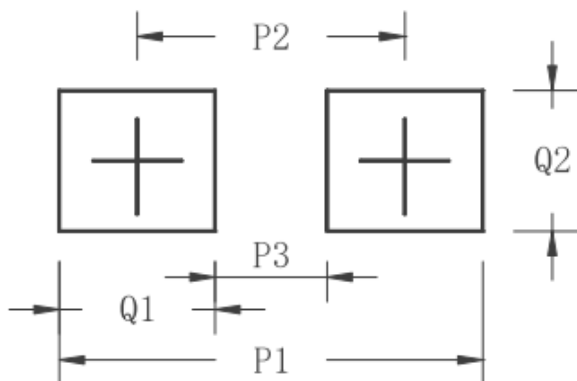


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### Structures and Dimensions



SMB / DO-214AA		
Dimensions	Millimeters	
	Min	Max
A	1.85	2.20
B	3.30	3.94
C	4.05	4.85
D	1.99	2.65
E	5.08	5.59
F	0.75	1.52
G	0.00	0.20
H	0.15	0.31



SMB / DO-214AA	
Dimensions	Millimeters
P1	6.8
P2	4.3
P3	1.8
Q1	2.5
Q2	2.3

# Transient Voltage Suppression Diodes: TPSMBJ Series

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

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at TA=25 °C by 10/1000µs waveform (Note1、 2)	P <sub>PPM</sub>	600	W
Peak forward surge current, 8.3ms single half sine wave on rated load (Note 3)	I <sub>FSM</sub>	100	A
Power dissipation on infinite heatsink at TL=75°C	P <sub>D</sub>	5	W
Maximum instantaneous forward voltage at 50A for unidirectional only	VF	3.5/5	V
Typical thermal resistance junction to ambient	R <sub>θJA</sub>	100	°C/W
Typical thermal resistance junction to lead	R <sub>θJL</sub>	20	°C/W
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-65~+150	°C

Notes : (1) Non-repetitive current pulse, per Fig. 3 and derated above TA=25°C per Fig. 2

(2) Mounted on copper pad area of 0.2" x 0.2" (5.0 x 5.0mm) 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

(4) VF<3.5V for devices of VBR<200V and VF<5.0V for devices of VBR>201V

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

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage VRWM ( V )	Breakage Voltage VBR @ IT		Test Current IT( mA )	Maximum Clamping Voltage VC @ Ipp	Maximum Peak Pulse Current Ipp(A)	Maximum Reverse Leakage IR @VRWM IR(µA)	Marking Code	
			Min( V )	Max( V )					Uni	Bi
TPSMBJ5.0A	TPSMBJ5.0CA	5	6.4	7	10	9.2	65.22	800	KE	AE
TPSMBJ6.0A	TPSMBJ6.0CA	6	6.67	7.37	10	10.3	58.25	800	KG	AG
TPSMBJ6.5A	TPSMBJ6.5CA	6.5	7.22	7.98	10	11.2	53.57	500	KK	AK
TPSMBJ7.0A	TPSMBJ7.0CA	7	7.78	8.6	10	12	50	200	KM	AM
TPSMBJ7.5A	TPSMBJ7.5CA	7.5	8.33	9.21	1	12.9	46.51	100	KP	AP
TPSMBJ8.0A	TPSMBJ8.0CA	8	8.89	9.83	1	13.6	44.12	50	KR	AR
TPSMBJ8.5A	TPSMBJ8.5CA	8.5	9.44	10.4	1	14.4	41.67	10	KT	AT
TPSMBJ9.0A	TPSMBJ9.0CA	9	10	11.1	1	15.4	38.96	5	KV	AV
TPSMBJ10A	TPSMBJ10CA	10	11.1	12.3	1	17	35.29	5	KX	AX
TPSMBJ11A	TPSMBJ11CA	11	12.2	13.5	1	18.2	32.97	5	KZ	AZ
TPSMBJ12A	TPSMBJ12CA	12	13.3	14.7	1	19.9	30.15	5	LE	BE
TPSMBJ13A	TPSMBJ13CA	13	14.4	15.9	1	21.5	27.91	1	LG	BG
TPSMBJ14A	TPSMBJ14CA	14	15.6	17.2	1	23.2	25.86	1	LK	BK

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Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage VBR @ IT		Test Current	Maximum Clamping Voltage VC @ Ipp	Maximum Peak Pulse Current	Maximum Reverse Leakage IR @VRWM	Marking Code	
		VRWM ( V )	Min( V )	Max( V )	IT( mA )	VC( V )	Ipp(A)	IR(μA)	Uni	Bi
TPSMBJ15A	TPSMBJ15CA	15	16.7	18.5	1	24.4	24.59	1	LM	BM
TPSMBJ16A	TPSMBJ16CA	16	17.8	19.7	1	26	23.08	1	LP	BP
TPSMBJ17A	TPSMBJ17CA	17	18.9	20.9	1	27.6	21.74	1	LR	BR
TPSMBJ18A	TPSMBJ18CA	18	20	22.1	1	29.2	20.55	1	LT	BT
TPSMBJ20A	TPSMBJ20CA	20	22.2	24.5	1	32.4	18.52	1	LV	BV
TPSMBJ22A	TPSMBJ22CA	22	24.4	26.9	1	35.5	16.90	1	LX	BX
TPSMBJ24A	TPSMBJ24CA	24	26.7	29.5	1	38.9	15.42	1	LZ	BZ
TPSMBJ26A	TPSMBJ26CA	26	28.9	31.9	1	42.1	14.25	1	ME	CE
TPSMBJ28A	TPSMBJ28CA	28	31.1	34.4	1	45.4	13.22	1	MG	CG
TPSMBJ30A	TPSMBJ30CA	30	33.3	36.8	1	48.4	12.40	1	MK	CK
TPSMBJ33A	TPSMBJ33CA	33	36.7	40.6	1	53.3	11.26	1	MM	CM
TPSMBJ36A	TPSMBJ36CA	36	40	44.2	1	58.1	10.33	1	MP	CP
TPSMBJ40A	TPSMBJ40CA	40	44.4	49.1	1	64.5	9.30	1	MR	CR
TPSMBJ43A	TPSMBJ43CA	43	47.8	52.8	1	69.4	8.65	1	MT	CT
TPSMBJ45A	TPSMBJ45CA	45	50	55.3	1	72.7	8.25	1	MV	CV
TPSMBJ48A	TPSMBJ48CA	48	53.3	58.9	1	77.4	7.75	1	MX	CX
TPSMBJ51A	TPSMBJ51CA	51	56.7	62.7	1	82.4	7.28	1	MZ	CZ
TPSMBJ54A	TPSMBJ54CA	54	60	66.3	1	87.1	6.89	1	NE	DE
TPSMBJ58A	TPSMBJ58CA	58	64.4	71.2	1	93.6	6.41	1	NG	DG
TPSMBJ60A	TPSMBJ60CA	60	66.7	73.7	1	96.8	6.20	1	NK	DK
TPSMBJ64A	TPSMBJ64CA	64	71.1	78.6	1	103	5.83	1	NM	DM
TPSMBJ70A	TPSMBJ70CA	70	77.8	86	1	113	5.31	1	NP	DP
TPSMBJ75A	TPSMBJ75CA	75	83.3	92.1	1	121	4.96	1	NR	DR
TPSMBJ78A	TPSMBJ78CA	78	86.7	95.8	1	126	4.76	1	NT	DT
TPSMBJ85A	TPSMBJ85CA	85	94.4	104	1	137	4.38	1	NV	DV
TPSMBJ90A	TPSMBJ90CA	90	100	111	1	146	4.11	1	NX	DX
TPSMBJ100A	TPSMBJ100CA	100	111	123	1	162	3.70	1	NZ	DZ

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Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage VBR @ IT		Test Current IT( mA )	Maximum Clamping Voltage VC @ Ipp	Maximum Peak Pulse Current Ipp(A)	Maximum Reverse Leakage IR @VRWM	Marking Code	
			VRWM ( V )	Min( V )					Max( V )	Uni
TPSMBJ110A	TPSMBJ110CA	110	122	135	1	177	3.39	1	PE	EE
TPSMBJ120A	TPSMBJ120CA	120	133	147	1	193	3.11	1	PG	EG
TPSMBJ130A	TPSMBJ130CA	130	144	159	1	209	2.87	1	PK	EK
TPSMBJ150A	TPSMBJ150CA	150	167	185	1	243	2.47	1	PM	EM
TPSMBJ160A	TPSMBJ160CA	160	178	197	1	259	2.32	1	PP	EP
TPSMBJ170A	TPSMBJ170CA	170	189	209	1	275	2.18	1	PR	ER
TPSMBJ180A	TPSMBJ180CA	180	200	220	1	291	2.06	1	PT	ET
TPSMBJ188A	TPSMBJ188CA	188	209	231	1	304	1.97	1	PB	EB
TPSMBJ200A	TPSMBJ200CA	200	224	247	1	324	1.85	1	PV	EV
TPSMBJ220A	TPSMBJ220CA	220	246	272	1	356	1.69	1	PX	EX
TPSMBJ250A	TPSMBJ250CA	250	279	309	1	405	1.48	1	PZ	EZ
TPSMBJ300A	TPSMBJ300CA	300	335	371	1	486	1.23	1	QE	FE
TPSMBJ350A	TPSMBJ350CA	350	391	432	1	567	1.06	1	QG	FG
TPSMBJ400A	TPSMBJ400CA	400	447	494	1	648	0.93	1	QK	FK
TPSMBJ440A	TPSMBJ440CA	440	492	543	1	713	0.84	1	QM	FM

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### Rate and Characteristic Curve ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Fig.1 - Peak Pulse Power Rating Curve

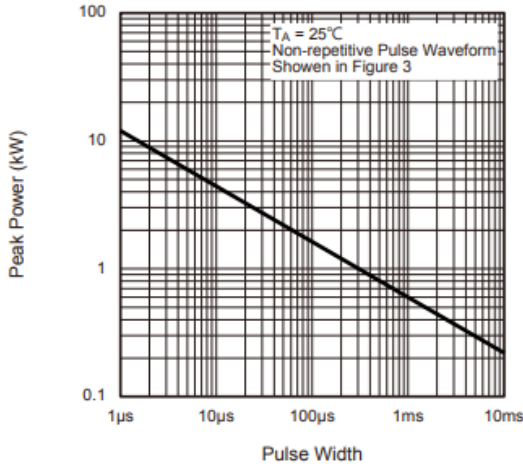


Fig.2 - Pulse Derating Curve

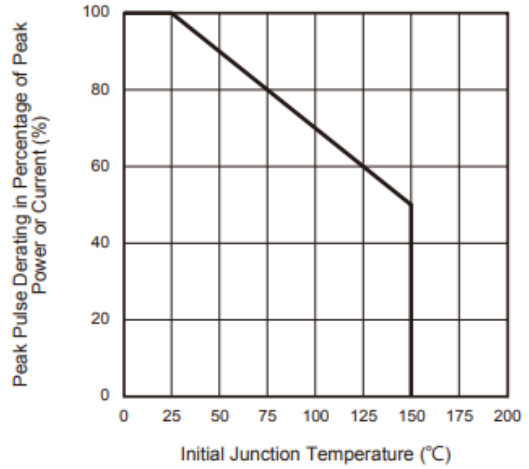


Fig.3 - Pulse Waveform

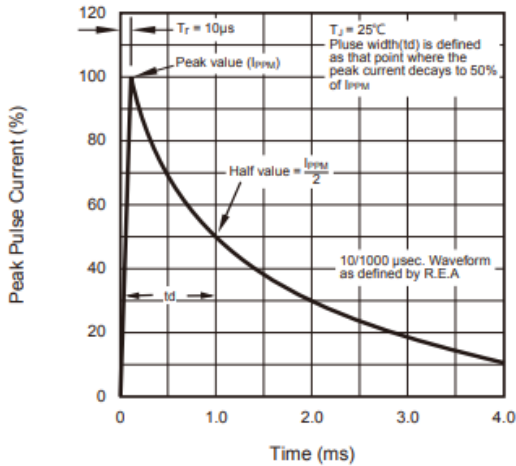


Fig.4 - Typical Junction Capacitance

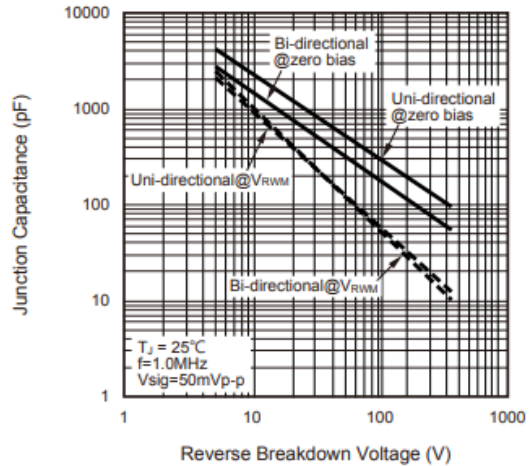


Fig.5 - Steady State Power Derating Curve

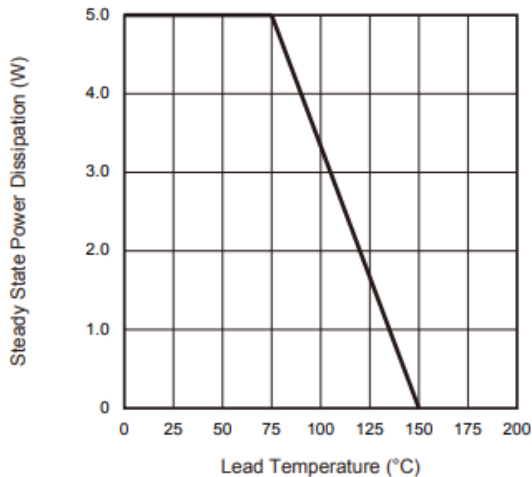
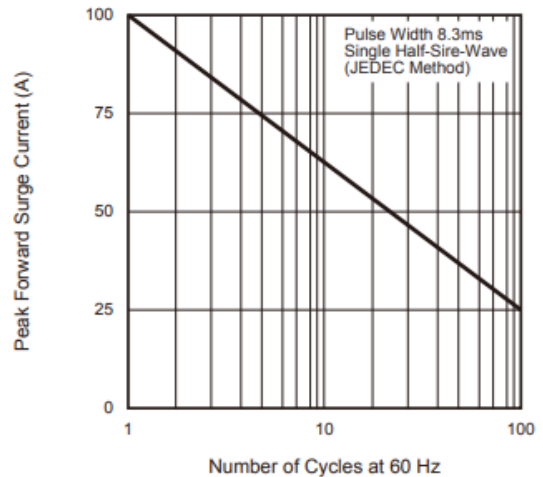


Fig.6 - Maximum Non-Repetitive Surge Current

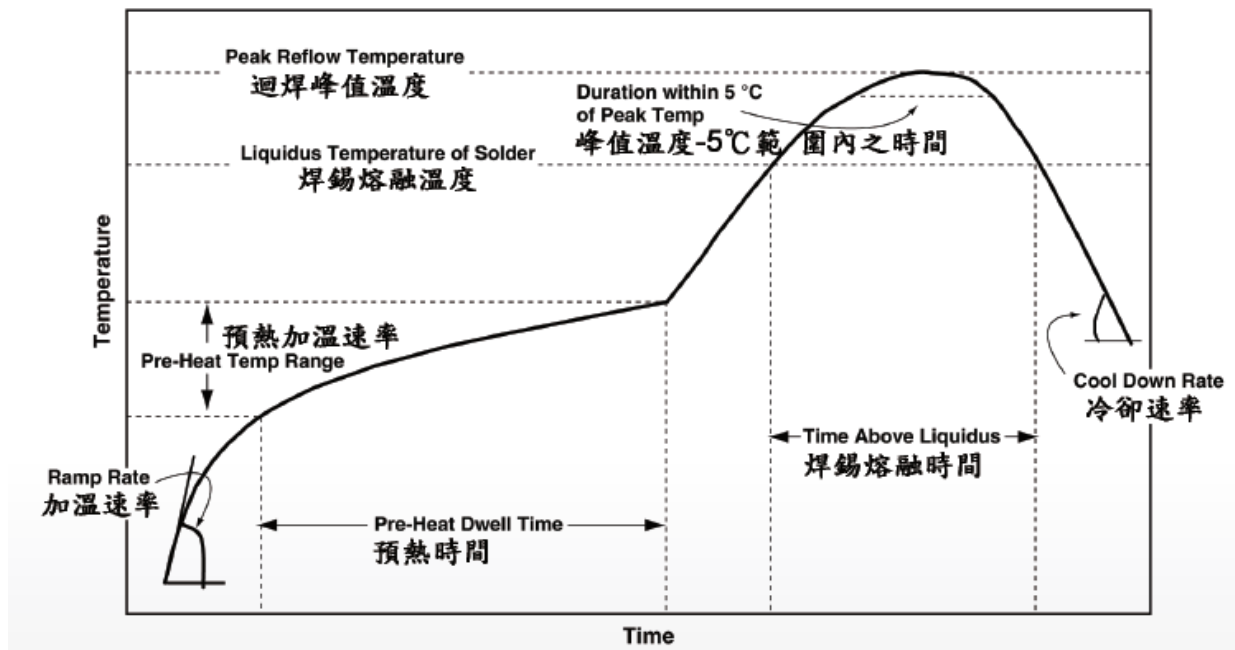


# Transient Voltage Suppression Diodes: TPSMBJ Series

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### IR-reflow soldering profile



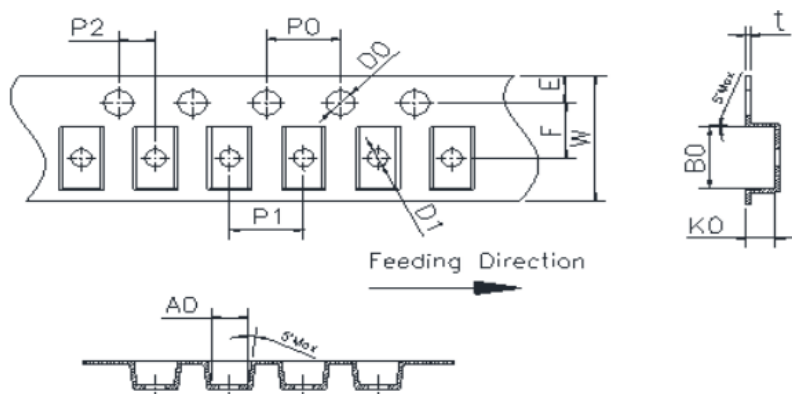
LEAD(Pb)-FREE SOLDER(SnAgCu) REFLOW PROFILE ATTRIBUTES	
PROFILE ATTRIBUTE	PROFILE ATTRIBUTE
Peak Reflow Temperature	260(+8/-8)°C
Time within 5°C of Peak Temperature	30s max
Liquidus Temperature of Solder	217°C
Cool Down Rate	6 °C/s max
Time above Liquidus	60s to 150s
Pre-heat Temperature Range	150°C to 200°C
Pre-heat Dwell Time	60s to 120s
Maximum Ramp Rate	3 °C/s max

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### ■ Packaging



Item	Symbol	DO-214AA (SMB)
		Unit:mm
Carrier width	A0	3.76±0.1
Carrier length	B0	5.69±0.1
Carrier depth	K0	2.67±0.1
Sprocket hole	D0/D1	1.5±0.05
Sprocket hole position	E	1.75±0.1
Punch hole position	F	5.5±0.05
Sprocket hole pinth	P0	4±0.1
Carrier pinth	P1	8±0.1
Embossment center	P2	2±0.1
Tape thickness	t	0.23±0.1
Tape width	W	12±0.3

### ■ Quantity

**MPQ: 3,000pcs**

PackageType	Reel Size (inch)	Quantity (pcs/reel)
DO-214AA	13	3,000

### ■ Warehouse Storage Conditions of product

- Storage Condition:
  1. Storage Temperature: 15~30°C
  2. Relative Humidity: ≤75%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.