Transient Voltage Suppression Diodes: TPSMDJ Series

SMD Type 3000 W

■ Features

1. High reliability application and automotive grade AEC-Q101 qualified
2. 3000W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle): 0.01%
3. Low leakage current
4. Excellent clamping capability
5. Very fast response time
6. RoHS compliant
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-214AB (SMC), molded plastic meets
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

T	P	S	M	D	J	5	.	0	C	A
1	2	3	4	5	6	7	8	9	10	11

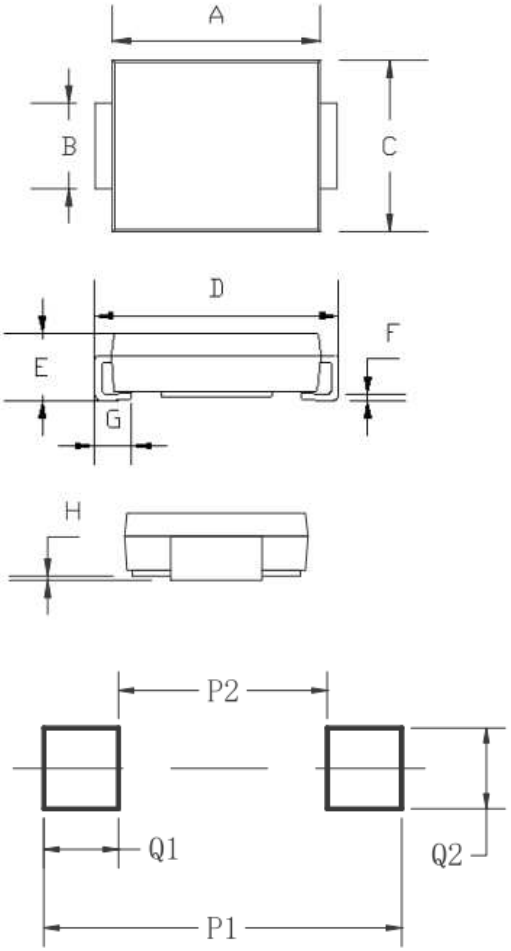
1
THINKING Transient Voltage Suppression Diodes

3	
Product Series	
SMDJ	THINKING Transient Voltage Suppression Diodes SMDJ Series

7	
Reverse Stand Off Voltage (V_{RWM})	
5.0	5V
70	70V
120	120V

10	
Type Code	
A	Uni-directional, 5% V_{BR} Voltage Tolerance
CA	Bi-directional, 5% V_{BR} Voltage Tolerance

■ Structures and Dimensions



SMC / DO-214AB		
Dimensions	Millimeters	
	Min	Max
A	6.60	7.15
B	2.75	3.27
C	5.55	6.22
D	7.75	8.13
E	1.98	2.80
F	0.15	0.31
G	0.75	1.52
H	0.00	0.30

SMC / DO-214AB	
Dimensions	Millimeters
P1	9.90
P2	3.84
Q1	3.03
Q2	3.82

■ Maximum Rating (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at T_A=25 ℃ by 10/1000μs waveform (Note1, 2)	P_{PPM}	3000	W
Peak forward surge current, 8.3ms single half sine wave on rated load (Note 3)	I_{FSM}	300	A
Power dissipation on infinite heatsink at T_L=75℃	P_D	6.5	W
Maximum instantaneous forward voltage at 100A for unidirectional only	VF	3.5	V
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	°C/W
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	°C/W
Operating junction and storage temperature range	T_J, T_{STG}	-65~+150	ºC

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

(2) Mounted on copper pad area of 0.31” x 0.31” (8.0 x 8.0mm) 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

■ Electrical Characteristics (T_A=25℃ unless otherwise noted)

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
TPSMDJ10A	TPSMDJ10CA	10	11.1	12.3	1	17	176.47	5	PDX	DDX
TPSMDJ11A	TPSMDJ11CA	11	12.2	13.5	1	18.2	164.84	2	PDZ	DDZ
TPSMDJ12A	TPSMDJ12CA	12	13.3	14.7	1	19.9	150.75	2	PEE	DEE
TPSMDJ13A	TPSMDJ13CA	13	14.4	15.9	1	21.5	139.53	2	PEG	DEG
TPSMDJ14A	TPSMDJ14CA	14	15.6	17.2	1	23.2	129.31	2	PEK	DEK
TPSMDJ15A	TPSMDJ15CA	15	16.7	18.5	1	24.4	122.95	2	PEM	DEM
TPSMDJ16A	TPSMDJ16CA	16	17.8	19.7	1	26	115.38	2	PEP	DEP
TPSMDJ17A	TPSMDJ17CA	17	18.9	20.9	1	27.6	108.70	2	PER	DER
TPSMDJ18A	TPSMDJ18CA	18	20	22.1	1	29.2	102.74	2	PET	DET
TPSMDJ20A	TPSMDJ20CA	20	22.2	24.5	1	32.4	92.59	2	PEV	DEV
TPSMDJ22A	TPSMDJ22CA	22	24.4	26.9	1	35.5	84.51	2	PEX	DEX
TPSMDJ24A	TPSMDJ24CA	24	26.7	29.5	1	38.9	77.12	2	PEZ	DEZ
TPSMDJ26A	TPSMDJ26CA	26	28.9	31.9	1	42.1	71.26	2	PFE	DFE
TPSMDJ28A	TPSMDJ28CA	28	31.1	34.4	1	45.4	66.08	2	PFG	DFG
TPSMDJ30A	TPSMDJ30CA	30	33.3	36.8	1	48.4	61.98	2	PFK	DFK
TPSMDJ33A	TPSMDJ33CA	33	36.7	40.6	1	53.3	56.29	2	PFM	DFM
TPSMDJ36A	TPSMDJ36CA	36	40	44.2	1	58.1	51.64	2	PFP	DFP
TPSMDJ40A	TPSMDJ40CA	40	44.4	49.1	1	64.5	46.51	2	PFR	DFR
TPSMDJ43A	TPSMDJ43CA	43	47.8	52.8	1	69.4	43.23	2	PFT	DFT
TPSMDJ45A	TPSMDJ45CA	45	50	55.3	1	72.7	41.27	2	PFV	DFV
TPSMDJ48A	TPSMDJ48CA	48	53.3	58.9	1	77.4	38.76	2	PFX	DFX
TPSMDJ51A	TPSMDJ51CA	51	56.7	62.7	1	82.4	36.41	2	PFZ	DFZ
TPSMDJ54A	TPSMDJ54CA	54	60	66.3	1	87.1	34.44	2	RGE	DGE
TPSMDJ58A	TPSMDJ58CA	58	64.4	71.2	1	93.6	32.05	2	PGG	DGG
TPSMDJ60A	TPSMDJ60CA	60	66.7	73.7	1	96.8	30.99	2	PGK	DGK
TPSMDJ64A	TPSMDJ64CA	64	71.1	78.6	1	103	29.13	2	PGM	DGM
TPSMDJ70A	TPSMDJ70CA	70	77.8	86	1	113	26.55	2	PGP	DGP
TPSMDJ75A	TPSMDJ75CA	75	83.3	92.1	1	121	24.79	2	PGR	DGR

■ Electrical Characteristics (T_A=25℃ unless otherwise noted)

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
TPSMDJ78A	TPSMDJ78CA	78	86.7	95.8	1	126	23.81	2	PGT	DGT
TPSMDJ85A	TPSMDJ85CA	85	94.4	104	1	137	21.90	2	PGV	DGV
TPSMDJ90A	TPSMDJ90CA	90	100	111	1	146	20.55	2	PGX	DGX
TPSMDJ100A	TPSMDJ100CA	100	111	123	1	162	18.52	2	PGZ	DGZ
TPSMDJ110A	TPSMDJ110CA	110	122	135	1	177	16.95	2	PHE	DHE
TPSMDJ120A	TPSMDJ120CA	120	133	147	1	193	15.54	2	PHG	DHG
TPSMDJ130A	TPSMDJ130CA	130	144	159	1	209	14.35	2	PHK	DHK
TPSMDJ150A	TPSMDJ150CA	150	167	185	1	243	12.35	2	PHM	DHM
TPSMDJ160A	TPSMDJ160CA	160	178	197	1	259	11.58	2	PHP	DHP
TPSMDJ170A	TPSMDJ170CA	170	189	209	1	275	10.91	2	PHR	DHR

■ Rate and Characteristic Curve (T_A=25℃ unless otherwise noted)

Fig.1 - Peak Pulse Power Rating Curve

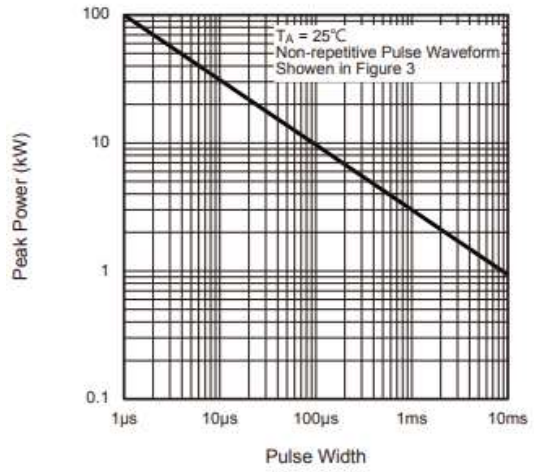


Fig.2 - Pulse Derating Curve

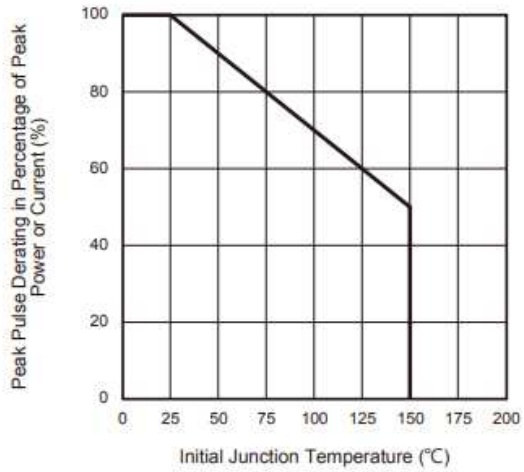


Fig.3 - Pulse Waveform

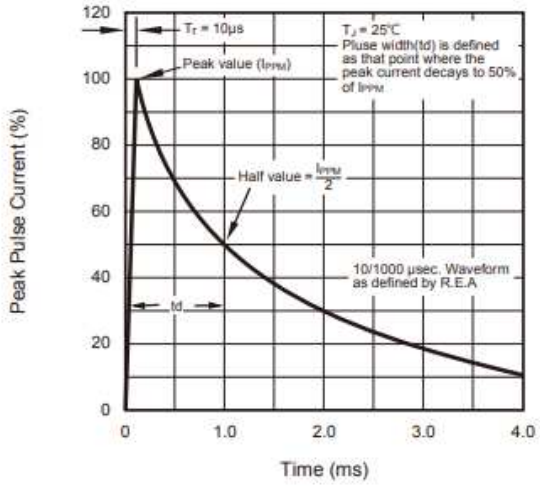


Fig.4 - Typical Junction Capacitance

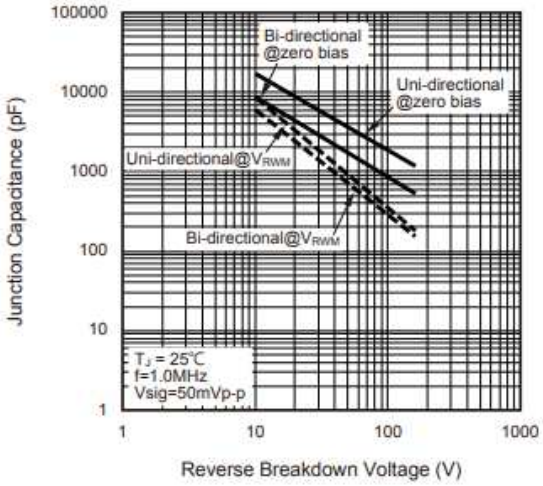


Fig.5 - Steady State Power Derating Curve

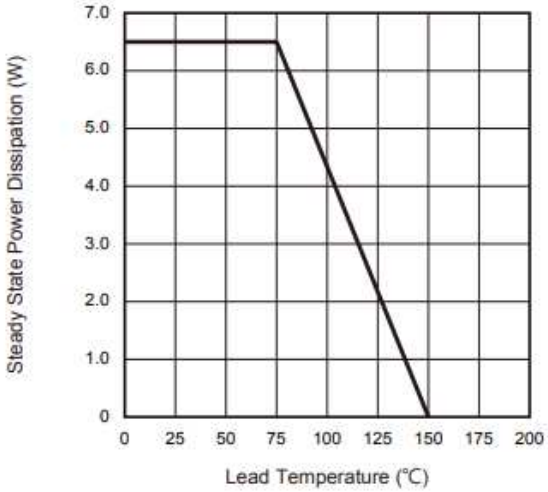
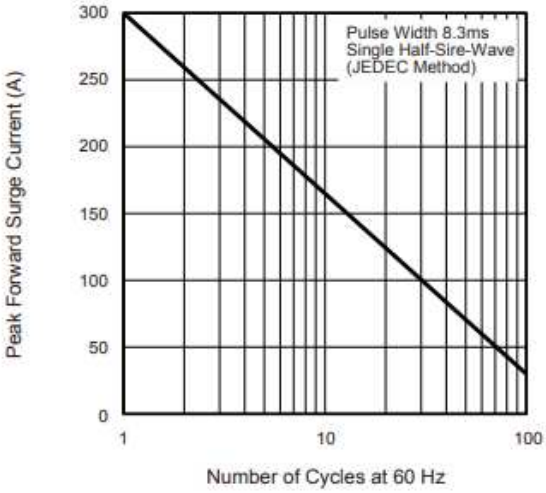
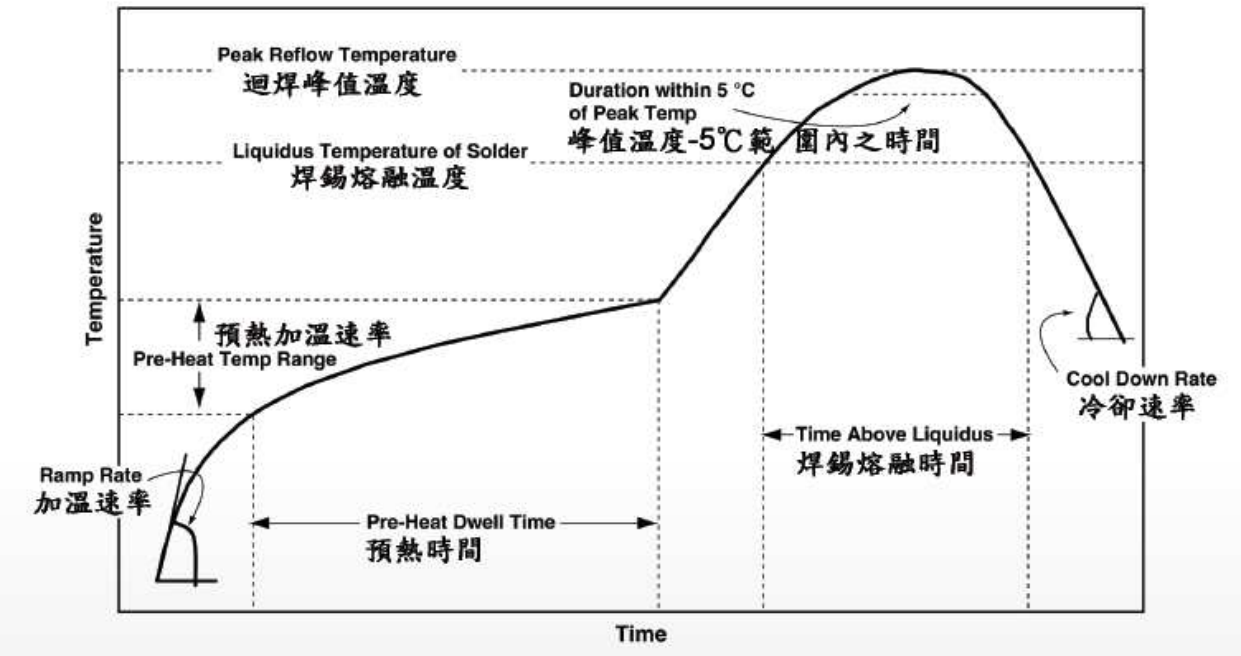


Fig.6 - Maximum Non-Repetitive Surge Current

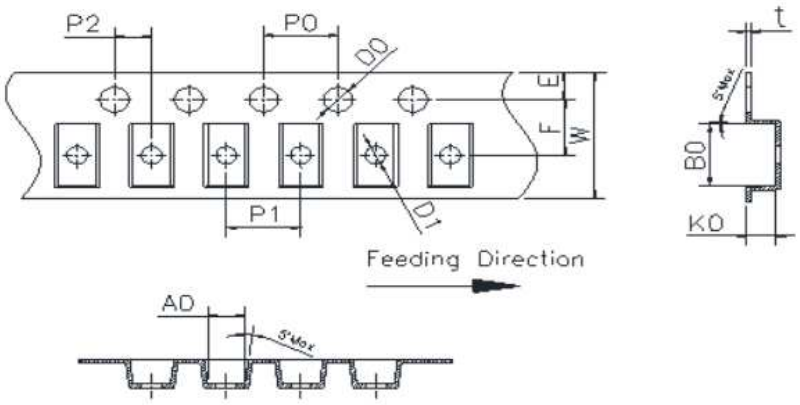


IR-reflow soldering profile



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

■ Packaging



Item	Symbol	DO-214AB (SMC)
		Unit:mm
Carrier width	A0	6.05±0.1
Carrier length	B0	8.31±0.1
Carrier depth	K0	2.54±0.1
Sprocket hole	D0/D1	1.55±0.05
Sprocket hole position	E	1.75±0.1
Punch hole position	F	7.5±0.1
Sprocket hole pitch	P0	4±0.1
Carrier pitch	P1	8±0.1
Embossment center	P2	2±0.1
Tape thickness	t	0.3±0.02
Tape width	W	16±0.3

■ Quantity

Series Type	Reel Size（inch）	Quantity (pcs/reel)
TPSMDJ	13	3,000

■ Warehouse Storage Conditions of product

● Storage Condition:

1. Storage Temperature: ≤25℃
2. Relative Humidity: 50%~80%RH
3. Keep away from corrosive atmosphere and sunlight.

● Period of Storage: 1 year.