

TVS Diode – SMDJ Series

Features

- Plastic package, excellent insulation strength.
- Glass passivated chip junction in SMD package.
- Excellent voltage clamping capability.
- Low Zener impedance.
- 3000W peak pulse power capability on 10/1000μs waveform.
- Typical leakage current less than 1μA above 13V.
- Very fast response time, typically less than 1.0ps from 0 volt to V_{BR} minimum.
- High temperature soldering guaranteed: 265°C/10 sec.
- MSL: JEDEC-J-STD-020, Level 1

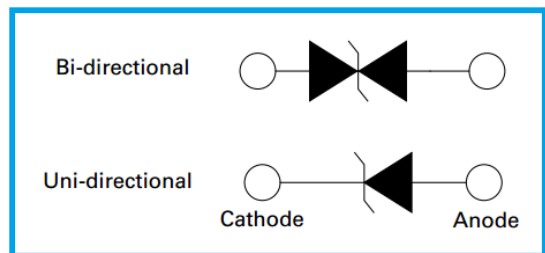


Applications

- I/O interface, V_{CC} bus
- Telecom
- Industrial and consumer electronic applications.
- Relay and electromagnetic valve surge absorption.

Agency Approval

- UL file no.: E474915



Mechanical and Physical Data

- Case: JEDEC SMC molded plastic.
- Surface mount device, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional.

Maximum Ratings and Thermal Characteristics

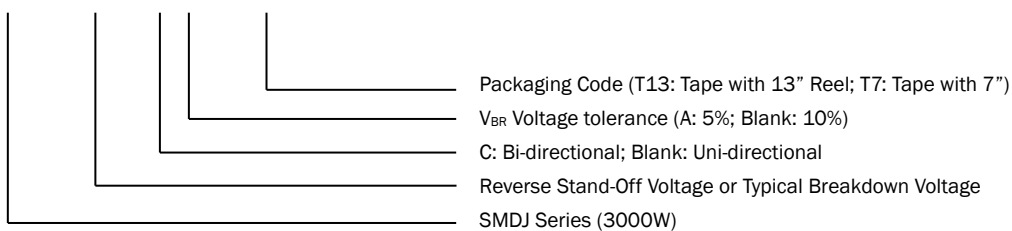
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, Fig.1).	P _{PPM}	Min 3000	Watt
Peak Pulse Current of 10/1000μs waveform (Note 1, Fig.3).	I _{PPM}	See Table	Amp
Steady State Power Dissipation at TL = 75°C, Lead lengths 0.375", (9.5mm) (Fig.5).	P _{M(AV)}	6.5	Watt
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I _{FSM}	300	Amp
Operating Junction and Storage Temperature Range.	T _J , T _{STG}	-55~150	°C

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A = 25°C per Fig.2.
2. 8.3ms single half sine wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

Part Number Code

SMDJ □□□ CA - □□□



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I-V Curve Characteristics



- I_{PPM} Peak Pulse Power Dissipation – Maximum power dissipation
- V_R Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation
- V_{BR} Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current (I_T)
- V_C Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (Peak Impulse Current)
- I_R Reverse Leakage Current – Current measured at V_R
- V_F Forward Voltage Drop for Uni-directional

Electrical Characteristics

Part Number		Marking		Reverse Stand Off Voltage V_R (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) @ I_{PP}	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R (μ A) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
SMDJ5.0A	SMDJ5.0CA	RDE	DDE	5.0	6.40	7.00	10	9.2	326.09	800
SMDJ6.0A	SMDJ6.0CA	RDG	DDG	6.0	6.67	7.37	10	10.3	291.26	800
SMDJ6.5A	SMDJ6.5CA	RDK	DDK	6.5	7.22	7.98	10	11.2	267.86	500
SMDJ7.0A	SMDJ7.0CA	PDM	DDM	7.0	7.78	8.60	10	12.0	250.00	200
SMDJ7.5A	SMDJ7.5CA	PDP	DDP	7.5	8.33	9.21	1	12.9	232.56	100
SMDJ8.0A	SMDJ8.0CA	PDR	DDR	8.0	8.89	9.83	1	13.6	220.59	50
SMDJ8.5A	SMDJ8.5CA	PDT	DDT	8.5	9.44	10.4	1	14.4	208.33	20
SMDJ9.0A	SMDJ9.0CA	PDV	DDV	9.0	10.0	11.1	1	15.4	194.81	10
SMDJ10A	SMDJ10CA	PDX	DDX	10.0	11.1	12.3	1	17.0	176.47	5
SMDJ11A	SMDJ11CA	PDZ	DDZ	11.0	12.2	13.5	1	18.2	164.84	2
SMDJ12A	SMDJ12CA	PEE	DEE	12.0	13.3	14.7	1	19.9	150.75	2
SMDJ13A	SMDJ13CA	PEG	DEG	13.0	14.4	15.9	1	21.5	139.53	2
SMDJ14A	SMDJ14CA	PEK	DEK	14.0	15.6	17.2	1	23.2	129.31	2
SMDJ15A	SMDJ15CA	PEM	DEM	15.0	16.7	18.5	1	24.4	122.95	2
SMDJ16A	SMDJ16CA	PEP	DEP	16.0	17.8	19.7	1	26.0	115.38	2
SMDJ17A	SMDJ17CA	PER	DER	17.0	18.9	20.9	1	27.6	108.70	2
SMDJ18A	SMDJ18CA	PET	DET	18.0	20.0	22.1	1	29.2	102.74	2

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Part Number		Marking		Reverse Stand Off Voltage V_R (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) @ I_{PP}	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R (μ A) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
SMDJ20A	SMDJ20CA	PEV	DEV	20.0	22.2	24.5	1	32.4	92.59	2
SMDJ22A	SMDJ22CA	PEX	DEX	22.0	24.4	26.9	1	35.5	84.51	2
SMDJ24A	SMDJ24CA	PEZ	DEZ	24.0	26.7	29.5	1	38.9	77.12	2
SMDJ26A	SMDJ26CA	PFE	DFE	26.0	28.9	31.9	1	42.1	71.26	2
SMDJ28A	SMDJ28CA	PFQ	DFQ	28.0	31.1	34.4	1	45.4	66.08	2
SMDJ30A	SMDJ30CA	PFK	DFK	30.0	33.3	36.8	1	48.4	61.98	2
SMDJ33A	SMDJ33CA	PFM	DFM	33.0	36.7	40.6	1	53.3	56.29	2
SMDJ36A	SMDJ36CA	PFQ	DFQ	36.0	40.0	44.2	1	58.1	51.64	2
SMDJ40A	SMDJ40CA	PFR	DFR	40.0	44.4	49.1	1	64.5	46.51	2
SMDJ43A	SMDJ43CA	PFT	DFT	43.0	47.8	52.8	1	69.4	43.23	2
SMDJ45A	SMDJ45CA	PFV	DFV	45.0	50.0	55.3	1	72.7	41.27	2
SMDJ48A	SMDJ48CA	PFX	DFX	48.0	53.3	58.9	1	77.4	38.76	2
SMDJ51A	SMDJ51CA	PFZ	DFZ	51.0	56.7	62.7	1	82.4	36.41	2
SMDJ54A	SMDJ54CA	PGE	DGE	54.0	60.0	66.3	1	87.1	34.44	2
SMDJ58A	SMDJ58CA	PGG	DGG	58.0	64.4	71.2	1	93.6	32.05	2
SMDJ60A	SMDJ60CA	PGK	DGK	60.0	66.7	73.7	1	96.8	30.99	2
SMDJ64A	SMDJ64CA	PGM	DGM	64.0	71.0	78.6	1	103.0	29.13	2
SMDJ70A	SMDJ70CA	PGP	DGP	70.0	77.8	86.0	1	113.0	26.55	2
SMDJ75A	SMDJ75CA	PGR	DGR	75.0	83.3	92.1	1	121.0	24.79	2
SMDJ78A	SMDJ78CA	PGT	DGT	78.0	86.7	95.8	1	126.0	23.81	2
SMDJ80A	SMDJ80CA	PGB	DGB	80.0	88.8	97.6	1	129.6	23.15	2
SMDJ85A	SMDJ85CA	PGV	DGV	85.0	94.4	104.0	1	137.0	21.90	2
SMDJ90A	SMDJ90CA	PGX	DGX	90.0	100.0	111.0	1	146.0	20.55	2
SMDJ100A	SMDJ100CA	PGZ	DGZ	100.0	111.0	123.0	1	162.0	18.52	2
SMDJ110A	SMDJ110CA	PHE	DHE	110.0	122.0	135.0	1	177.0	16.95	2
SMDJ120A	SMDJ120CA	PHG	DHG	120.0	133.0	147.0	1	193.0	15.54	2
SMDJ130A	SMDJ130CA	PHK	DHK	130.0	144.0	159.0	1	209.0	14.35	2
SMDJ150A	SMDJ150CA	PHM	DHM	150.0	167.0	185.0	1	243.0	12.35	2
SMDJ160A	SMDJ160CA	PHP	DHP	160.0	178.0	197.0	1	259.0	11.58	2
SMDJ170A	SMDJ170CA	PHR	DHR	170.0	189.0	209.0	1	275.0	10.91	2
SMDJ180A	SMDJ180CA	HHT	IHT	180.0	201.0	222.0	1	292.0	10.29	2
SMDJ190A	SMDJ190CA	HHV	IHV	190.0	209.0	243.0	1	308.0	9.75	2
SMDJ200A	SMDJ200CA	HHX	IHX	200.0	224.0	247.0	1	324.0	9.26	2
SMDJ220A	SMDJ220CA	HHE	IHE	220.0	246.0	272.0	1	356.0	8.43	2
SMDJ250A	SMDJ250CA	PHZ	DHZ	250.0	279.0	309.0	1	405.0	7.41	2
SMDJ300A	SMDJ300CA	PJE	DJE	300.0	335.0	371.0	1	486.0	6.17	2
SMDJ350A	SMDJ350CA	PJG	DJG	350.0	391.0	432.0	1	567.0	5.29	2
SMDJ400A	SMDJ400CA	PJK	DJK	400.0	447.0	494.0	1	648.0	4.63	2
SMDJ440A	SMDJ440CA	PJM	DJM	440.0	492.0	543.0	1	713.0	4.21	2

Note:

1. For bi-directional type having V_R of 10 volts and less, the I_R limit is double.

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Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

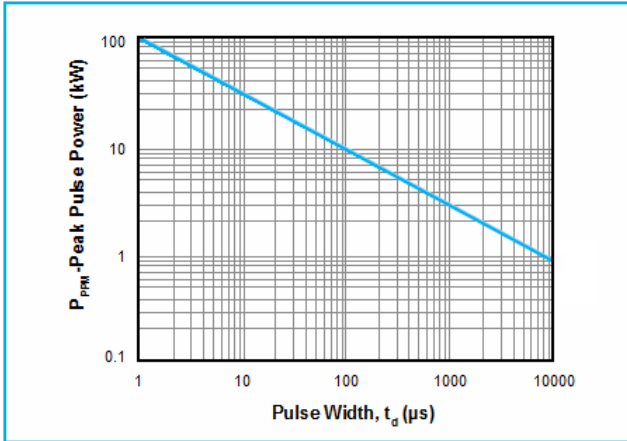


Fig 2 - Pulse Derating Curve

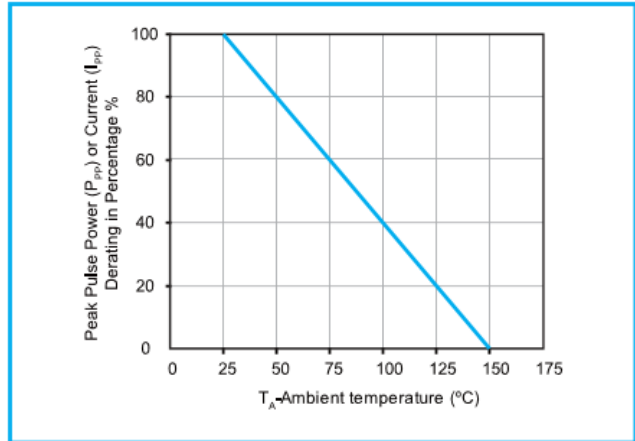


Fig 3 - Pulse Waveform

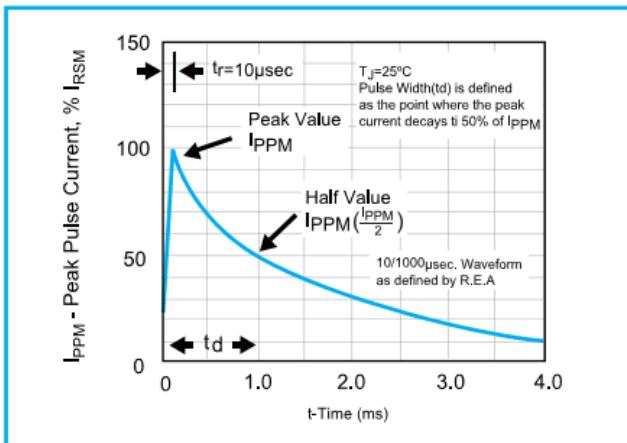


Fig 4 - Typical Junction Capacitance

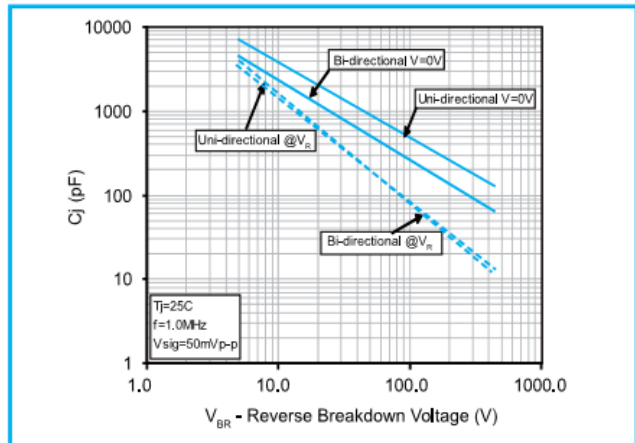


Fig 5 - Steady State Power Dissipation Derating Curve

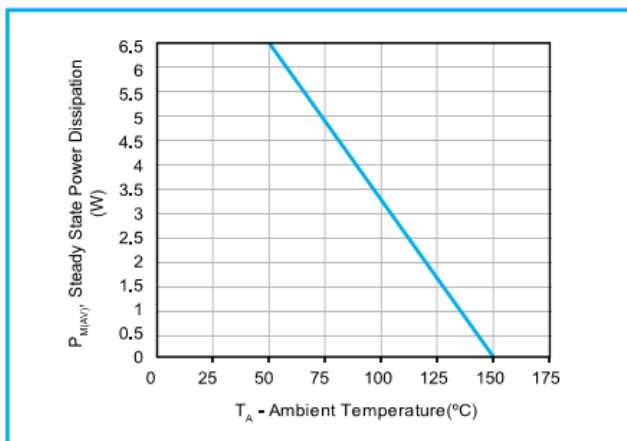
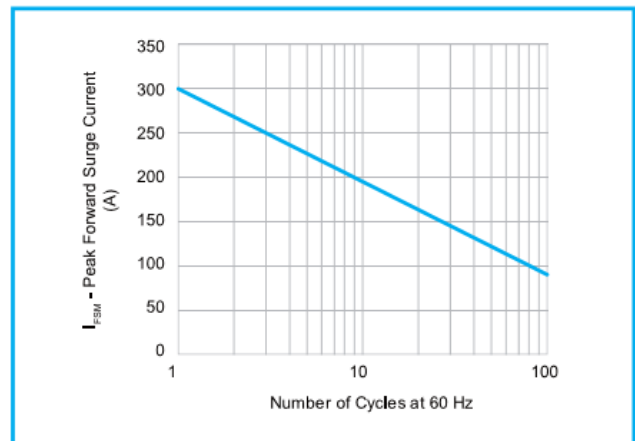
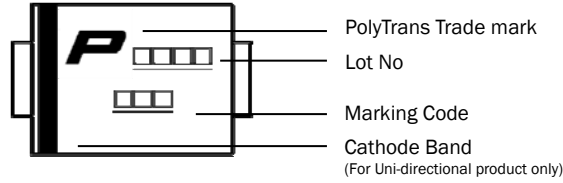


Fig 6 - Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

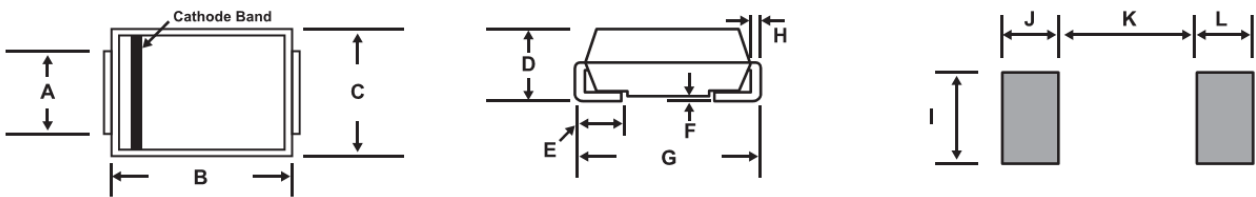


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Marking Definitions



Physical Dimensions



Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	2.90	3.20	0.114	0.126
B	6.60	7.11	0.260	0.280
C	5.59	6.22	0.220	0.245
D	2.20	2.80	0.087	0.110
E	0.76	1.52	0.030	0.060
F	-	0.20	-	0.008
G	7.75	8.13	0.305	0.320
H	0.15	0.31	0.006	0.012
I	3.30	-	0.129	-
J	2.40	-	0.094	-
K	-	4.20	-	0.165
L	2.40	-	0.094	-

Lead Free Reflow Soldering Recommendations

Preheat	
- Temperature Min (T_{s_min})	150°C
- Temperature Max (T_{s_max})	200°C
- Time (T_{s_min} to T_{s_max})	60-180 seconds
- Average Ramp-Up Rate	1~3°C/second
Peak Temperature	260°C max.
Time within 5°C of actual Peak Temperature (t_p)	40 seconds max.
Ramp-Down Rate	6 °C /second max.



Note: If the soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

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Packaging Information

Part Number	Packaging Code	Component Package	Quantity	Packaging Option	Packaging Specification
SMDJ Series	T13	DO-214AB	3000	Tape & Reel - 16mm tape/13" reel	EIA STD RS-481
SMDJ Series	T7	DO-214AB	500	Tape & Reel - 16mm tape/7" reel	EIA STD RS-481

Tape and Reel Specifications

