

Surface Mount Transient Voltage Suppressors

SMDJ-AT Series 3000W Transient Voltage Suppressor

Description

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

Working Voltage: 5.0 to 440 V

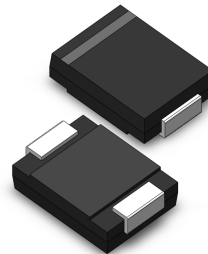
Features

- ◆ Glass passivated or planar junction
- ◆ Excellent clamping capability
- ◆ Repetition rate (duty cycle): 0.01%
- ◆ Low profile package and low inductance
- ◆ 3000W Peak Pulse power capability at 10×1000µs waveform.
- ◆ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ◆ High temperature soldering: 260°C/10s at terminals.
- ◆ Plastic package has Underwriters Laboratory Flammability 94V-0.
- ◆ For surface mounted applications in order to optimize board space.
- ◆ High reliability application and automotive grade AECQ101 qualified .

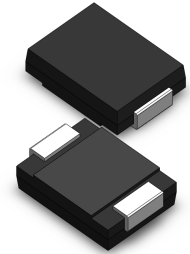
Applications

- ◆ I/O Interface.
- ◆ AC/DC Power supply
- ◆ Low frequency signal transmission line (RS232, RS485, etc.)

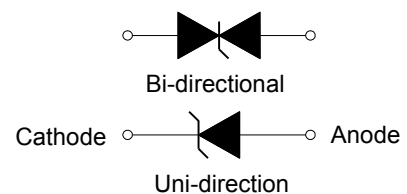
Uni-directional



Bi-directional



Functional Diagram



Mechanical Data

- ◆ Package: SMC/DO-214AB
- ◆ Case Material: "Green" Molding Compound.
- ◆ UL Flammability Classification Rating 94V-0
- ◆ Polarity: Color band denotes cathode except bi-directional models
- ◆ Standard Packaging: 12mm tape (EIA STD RS-481)
- ◆ Weight: 0.28g
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

Maximum Ratings and Thermal Characteristics ($T_A=25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000µs waveform	P_{PPM}	3000	W
Steady state power dissipation at $T_L=75\text{ }^{\circ}\text{C}$	$P_{M(AV)}$	8.0	W
Maximum Instantaneous Forward Voltage at 30A for Unidirectional	V_F	5.0	V
Storage temperature range	T_{stg}	-55 to +150	$^{\circ}\text{C}$
Operating junction temperature range	T_j	-55 to +150	$^{\circ}\text{C}$

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Electrical Characteristics (@ 25°C Unless Otherwise Specified)

Part Number		Marking		Reverse Stand-Off Voltage $V_{RWM}(V)$	Breakdown Voltage $V_{BR}(V)$ @ 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 @ $V_{RWM}(\mu A)$
Uni	Bi	Uni	Bi		MIN	MAX				
SMDJ5.0A-AT	SMDJ5.0CA-AT	RDET	DDET	5.0	6.40	7.00	10	9.2	326.1	800
SMDJ6.0A-AT	SMDJ6.0CA-AT	RDGT	DDGT	6.0	6.67	7.37	10	10.3	291.3	800
SMDJ6.5A-AT	SMDJ6.5CA-AT	RDKT	DDKT	6.5	7.22	7.98	10	11.2	267.9	500
SMDJ7.0A-AT	SMDJ7.0CA-AT	PDMT	DDMT	7.0	7.78	8.60	10	12.0	250.0	200
SMDJ7.5A-AT	SMDJ7.5CA-AT	PDPT	DDPT	7.5	8.33	9.21	1	12.9	232.6	100
SMDJ8.0A-AT	SMDJ8.0CA-AT	PDRT	DDRT	8.0	8.89	9.83	1	13.6	220.6	50
SMDJ8.5A-AT	SMDJ8.5CA-AT	PDTT	DDTT	8.5	9.44	10.4	1	14.4	208.3	20
SMDJ9.0A-AT	SMDJ9.0CA-AT	PDVT	DDVT	9.0	10.0	11.1	1	15.4	194.8	5
SMDJ10A-AT	SMDJ10CA-AT	PDXT	DDXT	10	11.1	12.3	1	17.0	176.5	1
SMDJ11A-AT	SMDJ11CA-AT	PDZT	DDZT	11	12.2	13.5	1	18.2	164.8	1
SMDJ12A-AT	SMDJ12CA-AT	PEET	DEET	12	13.3	14.7	1	19.9	150.8	1
SMDJ13A-AT	SMDJ13CA-AT	PEGT	DEGT	13	14.4	15.9	1	21.5	139.5	1
SMDJ14A-AT	SMDJ14CA-AT	PEKT	DEKT	14	15.6	17.2	1	23.2	129.3	1
SMDJ15A-AT	SMDJ15CA-AT	PEMT	DEMT	15	16.7	18.5	1	24.4	123.0	1
SMDJ16A-AT	SMDJ16CA-AT	PEPT	DEPT	16	17.8	19.7	1	26.0	115.4	1
SMDJ17A-AT	SMDJ17CA-AT	PERT	DERT	17	18.9	20.9	1	27.6	108.7	1
SMDJ18A-AT	SMDJ18CA-AT	PETT	DETT	18	20.0	22.1	1	29.2	102.7	1
SMDJ20A-AT	SMDJ20CA-AT	PEVT	DEVV	20	22.2	24.5	1	32.4	92.6	1
SMDJ22A-AT	SMDJ22CA-AT	PEXT	DEXT	22	24.4	26.9	1	35.5	84.5	1
SMDJ24A-AT	SMDJ24CA-AT	PEZT	DEZT	24	26.7	29.5	1	38.9	77.1	1
SMDJ26A-AT	SMDJ26CA-AT	PFET	DFET	26	28.9	31.9	1	42.1	71.3	1
SMDJ28A-AT	SMDJ28CA-AT	PFGT	DFGT	28	31.1	34.4	1	45.4	66.1	1
SMDJ30A-AT	SMDJ30CA-AT	PFKT	DFKT	30	33.3	36.8	1	48.4	62.0	1
SMDJ33A-AT	SMDJ33CA-AT	PFMT	DFMT	33	36.7	40.6	1	53.3	56.3	1
SMDJ36A-AT	SMDJ36CA-AT	PFPT	DFPT	36	40.0	44.2	1	58.1	51.6	1
SMDJ40A-AT	SMDJ40CA-AT	PFRT	DFRT	40	44.4	49.1	1	64.5	46.5	1
SMDJ43A-AT	SMDJ43CA-AT	PFTT	DFTT	43	47.8	52.8	1	69.4	43.2	1
SMDJ45A-AT	SMDJ45CA-AT	PFVT	DFVT	45	50.0	55.3	1	72.7	41.3	1
SMDJ48A-AT	SMDJ48CA-AT	PFXT	DFXT	48	53.3	58.9	1	77.4	38.8	1
SMDJ51A-AT	SMDJ51CA-AT	PFZT	DFZT	51	56.7	62.7	1	82.4	36.4	1

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Part Number		Marking		Reverse Stand-Off Voltage $V_{RWM}(V)$	Breakdown Voltage V_{BR} (V) @ 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_{RWM} (μA)
Uni	Bi	Uni	Bi		MIN	MAX				
SMDJ54A-AT	SMDJ54CA-AT	RGET	DGET	54	60.0	66.3	1	87.1	34.4	1
SMDJ58A-AT	SMDJ58CA-AT	PGGT	DGGT	58	64.4	71.2	1	93.6	32.1	1
SMDJ60A-AT	SMDJ60CA-AT	PGKT	DGKT	60	66.7	73.7	1	96.8	31.0	1
SMDJ64A-AT	SMDJ64CA-AT	PGMT	DGMT	64	71.1	78.6	1	103.0	29.1	1
SMDJ70A-AT	SMDJ70CA-AT	PGPT	DGPT	70	77.8	86.0	1	113.0	26.5	1
SMDJ75A-AT	SMDJ75CA-AT	PGRT	DGRT	75	83.3	92.1	1	121.0	24.8	1
SMDJ78A-AT	SMDJ78CA-AT	PGTT	DGTT	78	86.7	95.8	1	126.0	23.8	1
SMDJ85A-AT	SMDJ85CA-AT	PGVT	DGVT	85	94.4	104.0	1	137.0	21.9	1
SMDJ90A-AT	SMDJ90CA-AT	PGXT	DGXT	90	100.0	111.0	1	146.0	20.5	1
SMDJ100A-AT	SMDJ100CA-AT	PGZT	DGZT	100	111.0	123.0	1	162.0	18.5	1
SMDJ110A-AT	SMDJ110CA-AT	PHET	DHET	110	122.0	135.0	1	177.0	16.9	1
SMDJ120A-AT	SMDJ120CA-AT	PHGT	DHGT	120	133.0	147.0	1	193.0	15.5	1
SMDJ130A-AT	SMDJ130CA-AT	PHKT	DHKT	130	144.0	159.0	1	209.0	14.4	1
SMDJ150A-AT	SMDJ150CA-AT	PHMT	DHMT	150	167.0	185.0	1	243.0	12.3	1
SMDJ160A-AT	SMDJ160CA-AT	PHPT	DHPT	160	178.0	197.0	1	259.0	11.6	1
SMDJ170A-AT	SMDJ170CA-AT	PHRT	DHRT	170	189.0	209.0	1	275.0	10.9	1
SMDJ180A-AT	SMDJ180CA-AT	PHTT	DHTT	180	201.0	222.0	1	292.0	10.3	1
SMDJ190A-AT	SMDJ190CA-AT	PHVT	DHVT	190	211.0	233.0	1	308.0	9.7	1
SMDJ200A-AT	SMDJ200CA-AT	PHWT	DHWT	200	224.0	247.0	1	324.0	9.3	1
SMDJ210A-AT	SMDJ210CA-AT	PHUT	DHUT	210	237.0	263.0	1	340.0	8.8	1
SMDJ220A-AT	SMDJ220CA-AT	PHXT	DHXT	220	246.0	272.0	1	356.0	8.4	1
SMDJ250A-AT	SMDJ250CA-AT	PHZT	DHZT	250	279.0	309.0	1	405.0	7.8	1
SMDJ300A-AT	SMDJ300CA-AT	PJET	DJET	300	335.0	371.0	1	486.0	6.5	1
SMDJ350A-AT	SMDJ350CA-AT	PJGT	DJGT	350	391.0	432.0	1	567.0	5.5	1
SMDJ400A-AT	SMDJ400CA-AT	PJKT	DJKT	400	447.0	494.0	1	648.0	4.8	1
SMDJ440A-AT	SMDJ440CA-AT	PJMT	DJMT	440	492.0	543.0	1	713.0	4.4	1

Note:

- (1) Add suffix ' CA ' after part number to specify Bi-directional devices
- (2) Suffix 'A ' denotes 5% tolerance device.

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

Figure 1 - Pulse Waveform

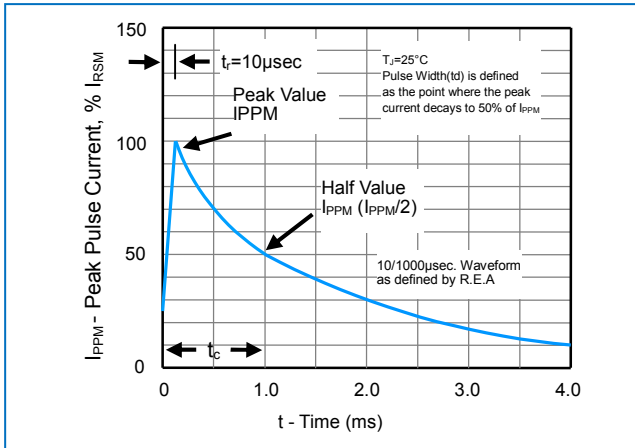
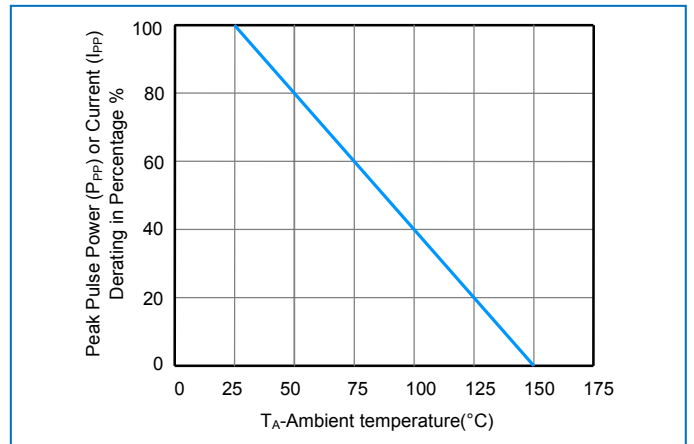
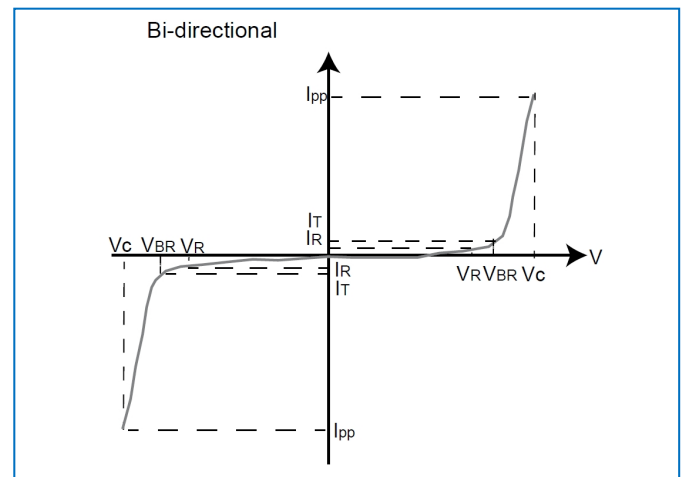
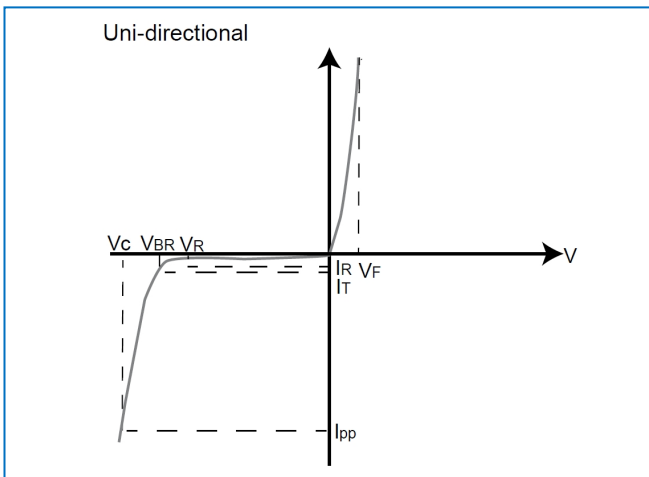


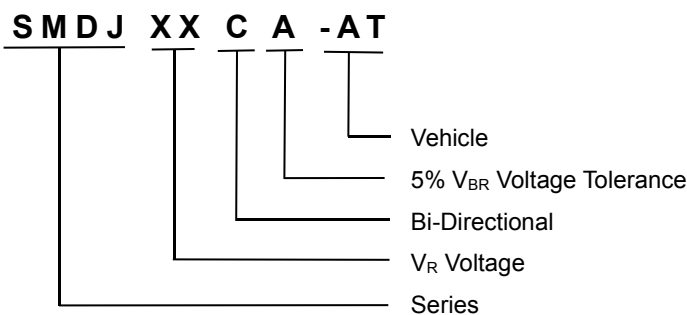
Figure 2 - Pulse Derating Curve



1-V Curves Characteristics



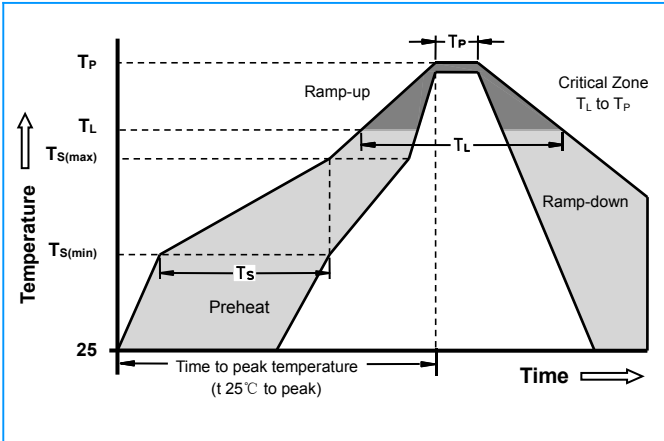
Part Numbering



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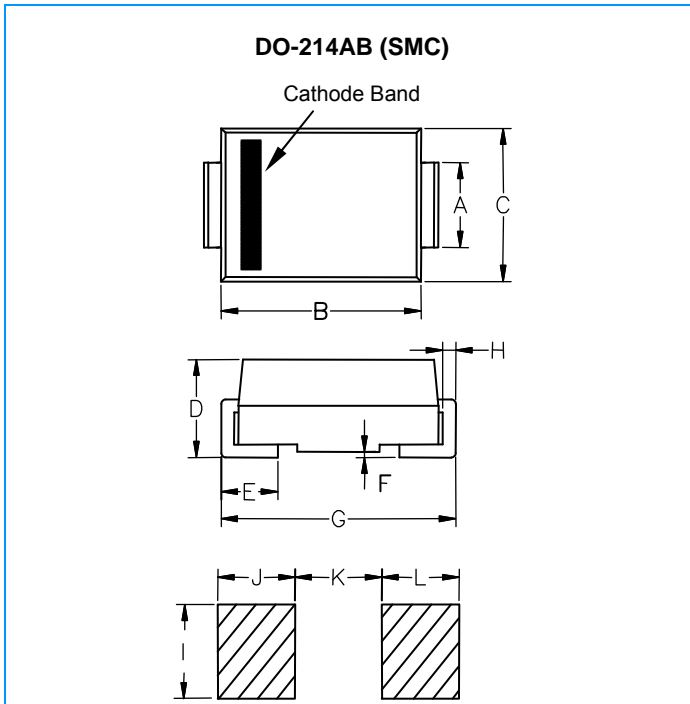
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Soldering Parameters



Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min ($T_{S(min)}$)	150°C
	-Temperature Max ($T_{S(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquidus Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°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 (T_P)		8 minutes Max
Do not exceed		260°C

Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.86	3.160
B	0.260	0.280	6.520	7.020
C	0.220	0.245	5.520	6.150
D	0.079	0.103	1.980	2.590
E	0.030	0.060	0.750	1.510
F	-	0.008	-	0.203
G	0.305	0.320	7.640	8.020
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200
L	0.094	-	2.400	-