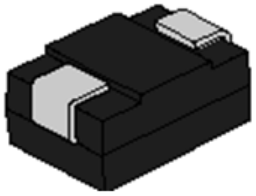
5.0SMDJ Series

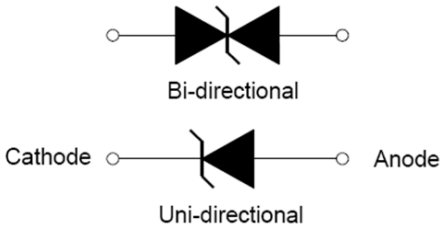
5000W Transient Voltage Suppressor

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.



SMC



Symbol

FEATURES:

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 5000W peak pulse power capability at 10×1000μs waveform.
- ✧ Typical I_R less than 1μA above 30V.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ High temperature to reflow soldering: 260℃/40s at terminals.
- ✧ Plastic package has under writers laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD020, LF maximum peak of 260℃.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ AEC-Q101 qualified.

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating junction and storage temperature range	T_J/ T_{STG}	-55 to +150	℃
Power Dissipation on Infinite Heat Sink T_L=50℃	P_D	6.5	W
Peak pulse power dissipation on 10/1000μs waveform	P_{PP}	5000	W
Maximum instantaneous forward voltage at 100A for unidirectional only	V_F	3.5	V
Peak forward surge current, 8.3ms single half sine wave(Note 1)	I_{FSM}	300	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	℃/W

Notes:

1. 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℃)

PART NUMBER		REVERSE STAND -OFF VOLTAGE	BREAKDOWN VOLTAGE VBR(V)MAX.@I T		TEST CURRENT	REVERSE LEAKAGE @VRWM	PEAK PULSE CURRENT	MAXIMUM CLAMPING VOLTAGE @Ipp
BI- POLAR	UNI-POLAR	VRWM (V)	VBR MIN(V)	VBR MAX(V)	IT (mA)	IR (μA)	Ipp (A)	Vc (v)
5.0SMDJ5.0CA	5.0SMDJ5.0A	5.0	6.40	7.00	10	800	543.5	9.2
5.0SMDJ6.0CA	5.0SMDJ6.0A	6.0	6.67	7.37	10	800	485.5	10.3
5.0SMDJ 6.5CA	5.0SMDJ 6.5A	6.5	7.22	7.98	10	800	446.5	11.2
5.0SMDJ7.0 CA	5.0SMDJ7.0 A	7.0	7.78	8.60	10	800	416.7	12.0
5.0SMDJ 7.5CA	5.0SMDJ 7.5A	7.5	8.33	9.21	1	800	387.7	12.9
5.0SMDJ 8.0CA	5.0SMDJ 8.0A	8.0	8.89	9.83	1	800	367.7	13.6
5.0SMDJ8.5 CA	5.0SMDJ8.5 A	8.5	9.44	10.40	1	800	347.2	14.4
5.0SMDJ9.0 CA	5.0SMDJ9.0 A	9.0	10.00	11.10	1	800	324.7	15.4
5.0SMDJ10CA	5.0SMDJ10A	10.0	11.1	12.30	1	800	294.2	17.0
5.0SMDJ11CA	5.0SMDJ11A	11.0	12.20	13.50	1	800	277.5	18.2
5.0SMDJ12CA	5.0SMDJ12A	12.0	13.30	14.70	1	5	252.0	19.9
5.0SMDJ13CA	5.0SMDJ13A	13.0	14.40	15.90	1	5	233.0	21.5
5.0SMDJ14CA	5.0SMDJ14A	14.0	15.60	17.20	1	5	216.0	23.2
5.0SMDJ15CA	5.0SMDJ15A	15.0	16.70	18.50	1	5	205.0	24.4
5.0SMDJ16CA	5.0SMDJ16A	16.0	17.80	19.70	1	5	193.0	26.0
5.0SMDJ17CA	5.0SMDJ17A	17.0	18.90	20.90	1	5	181.0	27.6
5.0SMDJ18CA	5.0SMDJ18A	18.0	20.00	22.10	1	5	172.0	29.2
5.0SMDJ20CA	5.0SMDJ20A	20.0	22.20	24.50	1	5	155.0	32.4
5.0SMDJ22CA	5.0SMDJ22A	22.0	24.40	26.90	1	5	141.0	35.5
5.0SMDJ24CA	5.0SMDJ24A	24.0	26.70	29.50	1	5	129.0	38.9
5.0SMDJ26CA	5.0SMDJ26A	26.0	28.90	31.90	1	5	119.0	42.1
5.0SMDJ28CA	5.0SMDJ28A	28.0	31.10	34.40	1	5	110.0	45.4
5.0SMDJ30CA	5.0SMDJ30A	30.0	33.30	36.80	1	5	103.0	48.4
5.0SMDJ33CA	5.0SMDJ33A	33.0	36.70	40.60	1	5	93.9	53.3

ELECTRICAL CHARACTERISTICS (T_A=25℃)

PART NUMBER		REVERSE STAND -OFF VOLTAGE	BREAKDOWN VOLTAGE VBR(V)MAX.@I T		TEST CURRENT	REVERSE LEAKAGE @VRWM	PEAK PULSE CURRENT	MAXIMUM CLAMPING VOLTAGE @Ipp
BI- POLAR	UNI-POLAR	VRWM (V)	VBR MIN(V)	VBR MAX(V)	IT (mA)	IR (μA)	Ipp (A)	Vc (v)
5.0SMDJ36CA	5.0SMDJ36A	36.0	40.00	44.20	1	5	86.1	58.1
5.0SMDJ40CA	5.0SMDJ40A	40.0	44.40	49.10	1	5	77.6	64.5
5.0SMDJ43CA	5.0SMDJ43A	43.0	47.80	52.80	1	5	72.1	69.4
5.0SMDJ45CA	5.0SMDJ45A	45.0	50.00	55.30	1	5	68.8	72.7
5.0SMDJ48CA	5.0SMDJ48A	48.0	53.30	58.90	1	5	64.7	77.4
5.0SMDJ51CA	5.0SMDJ51A	51.0	56.70	62.70	1	5	60.7	82.4
5.0SMDJ54CA	5.0SMDJ54A	54.0	60.00	66.30	1	5	57.5	87.1
5.0SMDJ58CA	5.0SMDJ58A	58.0	64.40	71.20	1	5	53.5	93.6
5.0SMDJ60CA	5.0SMDJ60A	60.0	66.70	73.70	1	5	51.7	96.8
5.0SMDJ64CA	5.0SMDJ64A	64.0	71.10	78.60	1	5	48.6	103.0
5.0SMDJ70CA	5.0SMDJ70A	70.0	77.80	86.00	1	5	44.3	113.0
5.0SMDJ75CA	5.0SMDJ75A	75.0	83.30	92.10	1	5	41.4	121.0
5.0SMDJ78CA	5.0SMDJ78A	78.0	86.70	95.80	1	5	39.7	126.0
5.0SMDJ85CA	5.0SMDJ85A	85.0	94.40	104.0	1	5	36.5	137.0
5.0SMDJ90CA	5.0SMDJ90A	90.0	100.0	111.0	1	5	34.3	146.0
5.0SMDJ100CA	5.0SMDJ100A	100.0	111.0	123.0	1	5	30.9	162.0
5.0SMDJ110CA	5.0SMDJ110A	110.0	122.0	135.0	1	5	28.3	177.0
5.0SMDJ120CA	5.0SMDJ120A	120.0	133.0	147.0	1	5	26.0	193.0
5.0SMDJ130CA	5.0SMDJ130A	130.0	144.0	159.0	1	5	24.0	209.0
5.0SMDJ140CA	5.0SMDJ140A	140.0	156.0	172.0	1	5	22.2	226.1
5.0SMDJ150CA	5.0SMDJ150A	150.0	167.0	185.0	1	5	20.6	243.0
5.0SMDJ160CA	5.0SMDJ160A	160.0	178.0	197.0	1	5	19.3	259.0
5.0SMDJ170CA	5.0SMDJ170A	170.0	189.0	209.0	1	5	18.2	275.0
5.0SMDJ180CA	5.0SMDJ180A	180.0	200.0	222.0	1	5	17.5	292.0
5.0SMDJ190CA	5.0SMDJ190A	190.0	211.0	232.0	1	5	16.5	308.0
5.0SMDJ200CA	5.0SMDJ200A	200.0	224.0	247.0	1	5	15.4	325.0
5.0SMDJ210CA	5.0SMDJ210A	210.0	231.0	268.0	1	5	14.9	340.0
5.0SMDJ220CA	5.0SMDJ220A	220.0	246.0	272.0	1	5	14.1	357.0
5.0SMDJ250CA	5.0SMDJ250A	250.0	279.0	309.0	1	5	12.4	406.0
5.0SMDJ300CA	5.0SMDJ300A	300.0	335.0	371.0	1	5	10.3	487.0
5.0SMDJ350CA	5.0SMDJ350A	350.0	391.0	432.0	1	5	8.9	568.0
5.0SMDJ400CA	5.0SMDJ400A	400.0	4470	494.0	1	5	7.8	649.0
5.0SMDJ440CA	5.0SMDJ440A	440.0	492.0	543.0	1	5	7.1	714.0

① Surge waveform:10/1000μs

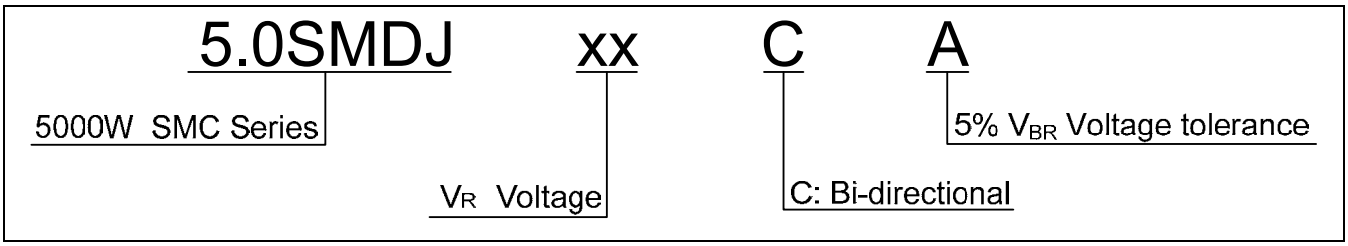
V_R: Stand-off voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown voltage

V_C: Clamping voltage -- Peak voltage measured across the suppressor at a specified I_{PP}

I_R: Reverse leakage current

ORDERING INFORMATION



RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25℃, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

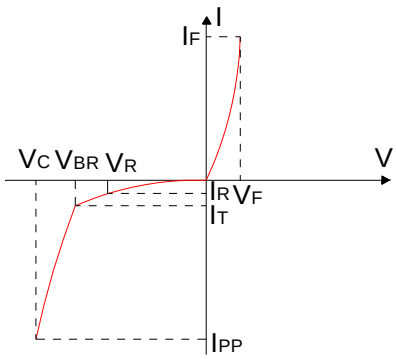


FIG.2:V- I curve characteristics (Bi-directional)

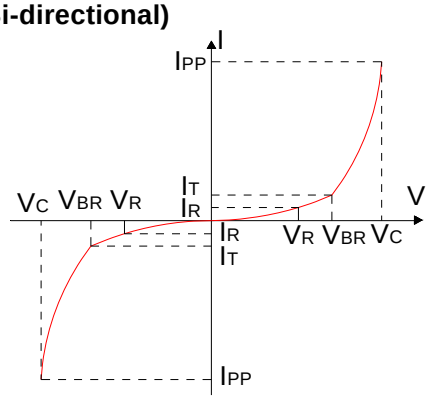


FIG.3: Pulse waveform

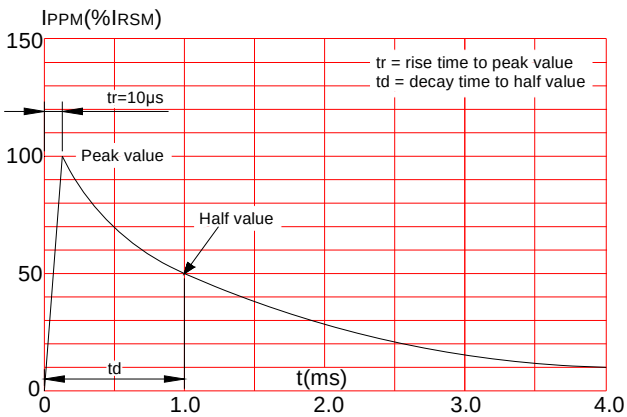
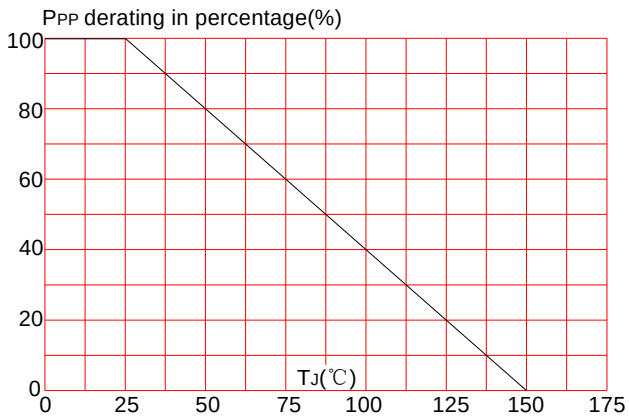


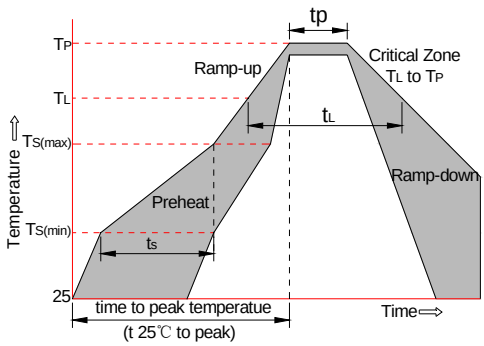
FIG.4: Pulse derating curve



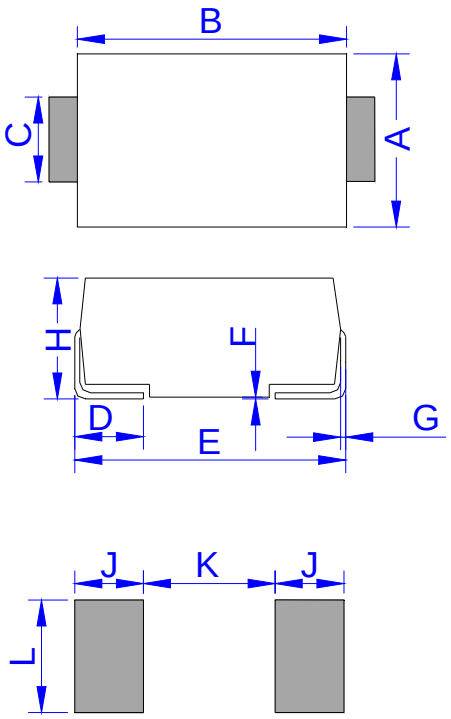
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see FIG.5)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG.5: Reflow condition



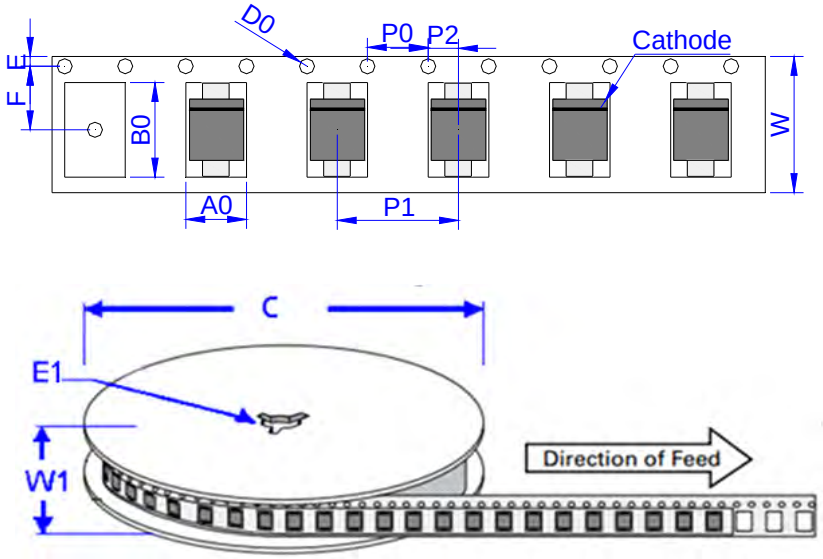
PACKAGE MECHANICAL DATA



DO-214AB (SMC)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	5.75	6.25	0.226	0.246
B	6.90	7.40	0.272	0.291
C	2.75	3.25	0.108	0.128
D	0.95	1.52	0.037	0.060
E	7.70	8.20	0.303	0.323
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.15	2.62	0.085	0.103
J	2.40		0.094	
K		4.20		0.165
L	3.30		0.130	

TAPE AND REEL SPECIFICATION-SMC



Ref.	Dimensions	
	Millimeters	Inches
A0	6.05 ± 0.3	0.238 ± 0.012
B0	8.31 ± 0.3	0.327 ± 0.012
C	330.0	13.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	7.50 ± 0.2	0.295 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.3145 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	16.0 ± 0.2	0.630 ± 0.008
W1	19.7 ± 2.0	0.776 ± 0.079

PART No.	UNIT WEIGHT (g/PCS) typ.	REEL (PCS)
5.0SMDJxxCA/A	0.294/0.342 (NOTE)	3,000

Notes： 0. 342g/PCS for single die; 0.294g/PCS for stacked dies

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