

Description

Transient voltage suppression diodes, also known as TVS diodes, are protective electronic parts that protect electrical equipment from voltage spikes introduced by wires.

Features

- For surface mounted applications
- Excellent clamping capability
- 5000 W peak pulse power capability with a 10/1000 μ s Waveform.
- V_{RWM} 12-190V
- Low profile package and low inductance
- Typical IR less than 1uA above 12V
- Fast response time: typically less than 1.0ps from 0V to V_{BR} min.

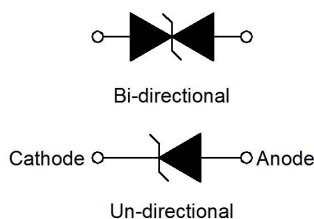
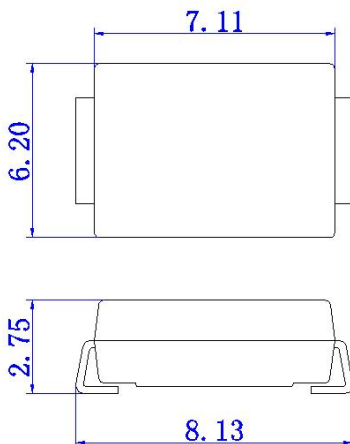
Applications

- computer system
- domestic appliance
- video input

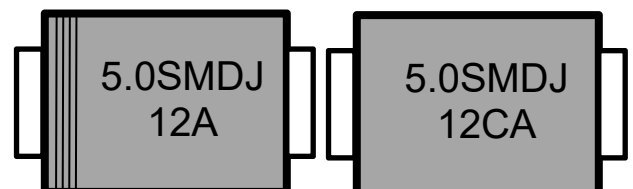
Mechanical Characteristics

- Package: SMC/DO-214AB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0 .RoHS compliant
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Weight: 0.28g(approximate)

Dimensions & Symbol (Unit: mm Max)



Marking Information



5.0SMDJ12A: 5.0SMDJ12A Marking code
5.0SMDJ12CA: 5.0SMDJ12CA Marking code

Ordering information

Out line	Reel (pcs)	Reel diameters
Taping	3K	13inch

Electrical Characteristics (T=25°C)

Part Number		Marking		V _R	I _R @V _R	V _{BR} @I _T		I _T	V _C @I _{PP}	I _{PP} ^①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
5.0SMDJ12A	5.0SMDJ12CA	5.0SMDJ12A	5.0SMDJ12CA	12.0	1	13.30	14.70	1	19.9	251.3
5.0SMDJ13A	5.0SMDJ13CA	5.0SMDJ13A	5.0SMDJ13CA	13.0	1	14.40	15.90	1	21.5	232.6
5.0SMDJ14A	5.0SMDJ14CA	5.0SMDJ14A	5.0SMDJ14CA	14.0	1	15.60	17.20	1	23.2	215.6
5.0SMDJ15A	5.0SMDJ15CA	5.0SMDJ15A	5.0SMDJ15CA	15.0	1	16.70	18.50	1	24.4	205.0
5.0SMDJ16A	5.0SMDJ16CA	5.0SMDJ16A	5.0SMDJ16CA	16.0	1	17.80	19.70	1	26.0	192.4
5.0SMDJ17A	5.0SMDJ17CA	5.0SMDJ17A	5.0SMDJ17CA	17.0	1	18.90	20.90	1	27.6	181.2
5.0SMDJ18A	5.0SMDJ18CA	5.0SMDJ18A	5.0SMDJ18CA	18.0	1	20.00	22.10	1	29.2	171.3
5.0SMDJ20A	5.0SMDJ20CA	5.0SMDJ20A	5.0SMDJ20CA	20.0	1	22.20	24.50	1	32.4	154.4
5.0SMDJ22A	5.0SMDJ22CA	5.0SMDJ22A	5.0SMDJ22CA	22.0	1	24.40	26.90	1	35.5	140.9
5.0SMDJ24A	5.0SMDJ24CA	5.0SMDJ24A	5.0SMDJ24CA	24.0	1	26.70	29.50	1	38.9	128.6
5.0SMDJ26A	5.0SMDJ26CA	5.0SMDJ26A	5.0SMDJ26CA	26.0	1	28.90	31.90	1	42.1	118.8
5.0SMDJ28A	5.0SMDJ28CA	5.0SMDJ28A	5.0SMDJ28CA	28.0	1	31.10	34.40	1	45.4	110.2
5.0SMDJ30A	5.0SMDJ30CA	5.0SMDJ30A	5.0SMDJ30CA	30.0	1	33.30	36.80	1	48.4	103.4
5.0SMDJ33A	5.0SMDJ33CA	5.0SMDJ33A	5.0SMDJ33CA	33.0	1	36.70	40.60	1	53.3	93.81
5.0SMDJ36A	5.0SMDJ36CA	5.0SMDJ36A	5.0SMDJ36CA	36.0	1	40.00	44.20	1	58.1	86.06
5.0SMDJ40A	5.0SMDJ40CA	5.0SMDJ40A	5.0SMDJ40CA	40.0	1	44.40	49.10	1	64.5	77.52
5.0SMDJ43A	5.0SMDJ43CA	5.0SMDJ43A	5.0SMDJ43CA	43.0	1	47.80	52.80	1	69.4	72.05
5.0SMDJ45A	5.0SMDJ45CA	5.0SMDJ45A	5.0SMDJ45CA	45.0	1	50.00	55.30	1	72.7	68.78
5.0SMDJ48A	5.0SMDJ48CA	5.0SMDJ48A	5.0SMDJ48CA	48.0	1	53.30	58.90	1	77.4	64.60
5.0SMDJ51A	5.0SMDJ51CA	5.0SMDJ51A	5.0SMDJ51CA	51.0	1	56.70	62.70	1	82.4	60.68
5.0SMDJ54A	5.0SMDJ54CA	5.0SMDJ54A	5.0SMDJ54CA	54.0	1	60.00	66.30	1	87.1	57.41
5.0SMDJ58A	5.0SMDJ58CA	5.0SMDJ58A	5.0SMDJ58CA	58.0	1	64.40	71.20	1	93.6	53.42
5.0SMDJ60A	5.0SMDJ60CA	5.0SMDJ60A	5.0SMDJ60CA	60.0	1	66.70	73.70	1	96.8	51.66
5.0SMDJ64A	5.0SMDJ64CA	5.0SMDJ64A	5.0SMDJ64CA	64.0	1	71.10	78.60	1	103.0	48.55
5.0SMDJ70A	5.0SMDJ70CA	5.0SMDJ70A	5.0SMDJ70CA	70.0	1	77.80	86.00	1	113.0	44.25

Electrical Characteristics (T=25°C)

Part Number		Marking		V _R	I _R @V _R	V _{BR} @I _T		I _T	V _C @I _{PP}	I _{PP} ^①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
5.0SMDJ75A	5.0SMDJ75CA	5.0SMDJ75A	5.0SMDJ75CA	75.0	1	83.30	92.10	1	121.0	41.33
5.0SMDJ78A	5.0SMDJ78CA	5.0SMDJ78A	5.0SMDJ78CA	78.0	1	86.70	95.80	1	126.0	39.69
5.0SMDJ85A	5.0SMDJ85CA	5.0SMDJ85A	5.0SMDJ85CA	85.0	1	94.40	104.0	1	137.0	36.50
5.0SMDJ90A	5.0SMDJ90CA	5.0SMDJ90A	5.0SMDJ90CA	90.0	1	100.0	111.0	1	146.0	34.25
5.0SMDJ100A	5.0SMDJ100CA	5.0SMDJ100A	5.0SMDJ100CA	100.0	1	111.0	123.0	1	162.0	30.87
5.0SMDJ110A	5.0SMDJ110CA	5.0SMDJ110A	5.0SMDJ110CA	110.0	1	122.0	135.0	1	177.0	28.25
5.0SMDJ120A	5.0SMDJ120CA	5.0SMDJ120A	5.0SMDJ120CA	120.0	1	133.0	147.0	1	193.0	25.91
5.0SMDJ130A	5.0SMDJ130CA	5.0SMDJ130A	5.0SMDJ130CA	130.0	1	144.0	159.0	1	209.0	23.93
5.0SMDJ150A	5.0SMDJ150CA	5.0SMDJ150A	5.0SMDJ150CA	150.0	1	167.0	185.0	1	243.0	20.58
5.0SMDJ160A	5.0SMDJ160CA	5.0SMDJ160A	5.0SMDJ160CA	160.0	1	178.0	197.0	1	259.0	19.31
5.0SMDJ170A	5.0SMDJ170CA	5.0SMDJ170A	5.0SMDJ170CA	170.0	1	189.0	209.0	1	275.0	18.19
5.0SMDJ180A	5.0SMDJ180CA	5.0SMDJ180A	5.0SMDJ180CA	180.0	1	201.0	222.0	1	292.0	17.13
5.0SMDJ190A	5.0SMDJ190CA	5.0SMDJ190A	5.0SMDJ190CA	190.0	1	209.0	233.0	1	308.0	16.24

Notes:

① Surge waveform: 10/1000μs

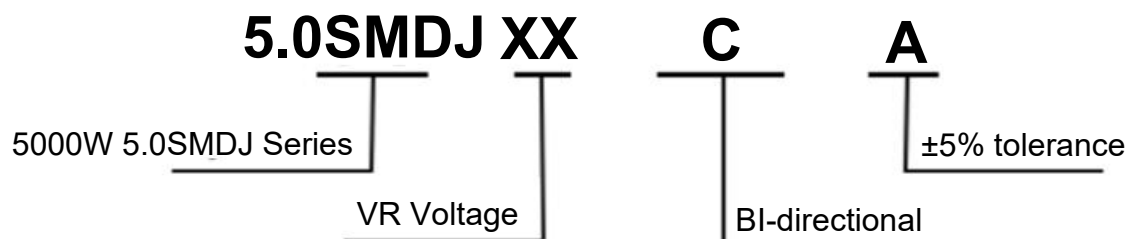
V_R : Stand-off Voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown Voltage

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

I_R: Reverse Leakage Current

Part number code

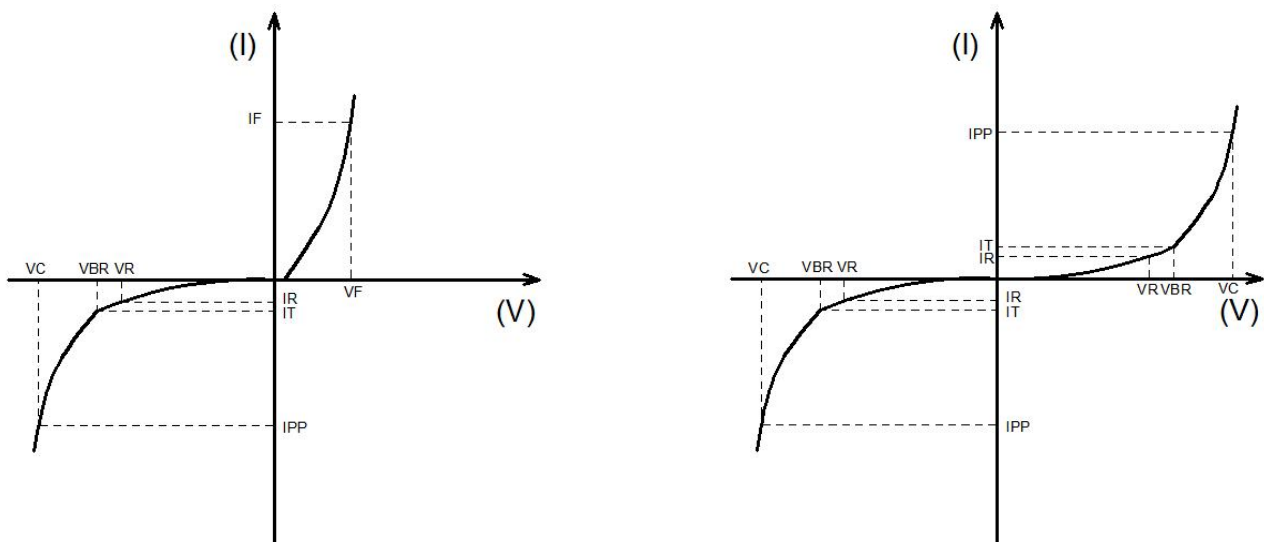


Absolute Maximum Ratings($T=25^{\circ}\text{C}$, $\text{RH}=45\%-75\%$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000 μs waveform	P_{PP}	5000	W
Steady state power dissipation at $T_L=75^{\circ}\text{C}$	$P_{M(AV)}$	6.5	W
Operating junction temperature range	T_j	-55 to +125	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

Ratings And V-I Characteristics Curves ($T=25^{\circ}\text{C}$, unless otherwise noted)

FIG1: V-I cure characteristics



Symbol	Parameter
I_F	Mean Forward Current
V_F	Maximum Forward Voltage @ I_F
V_R	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_R
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}

Typical Characteristics

FIG2: Pulse Derating Curve

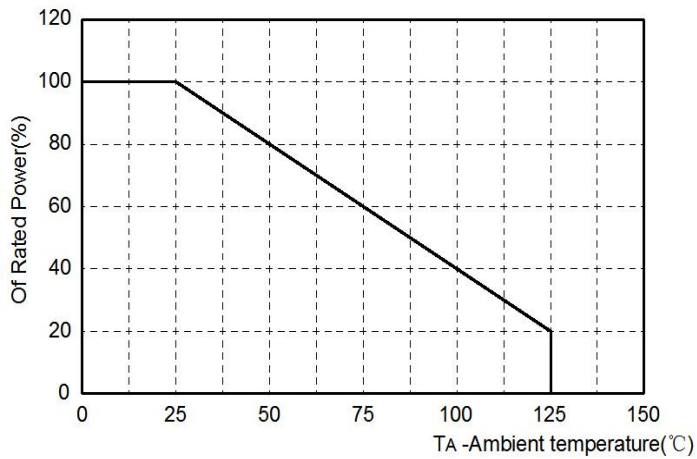


FIG3: Pulse Waveform

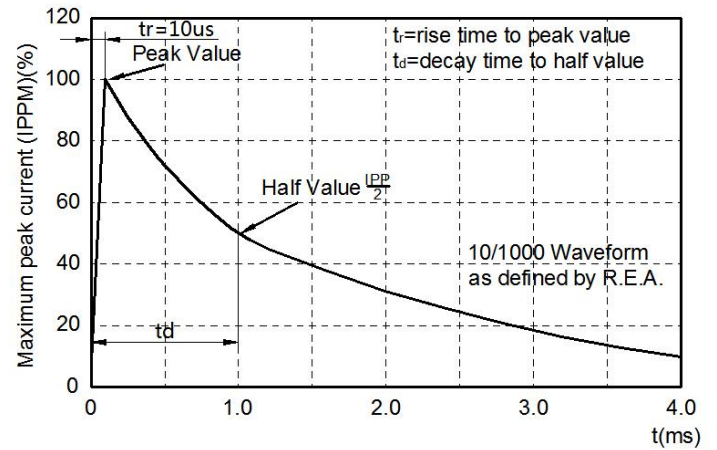


FIG4: Peak Pulse Power Rating Curve

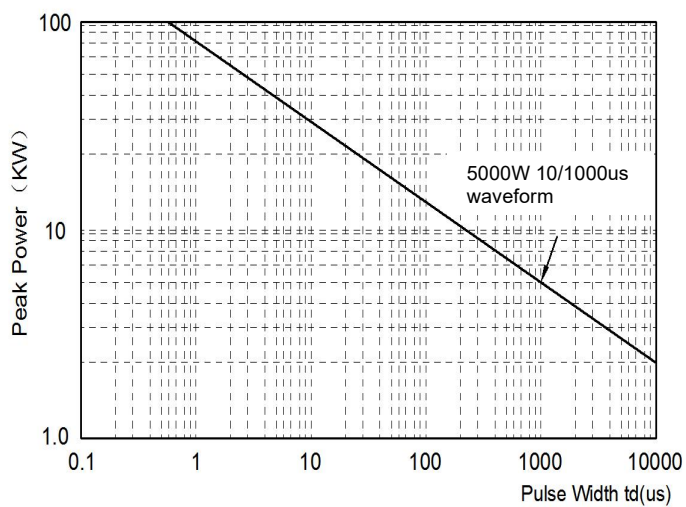
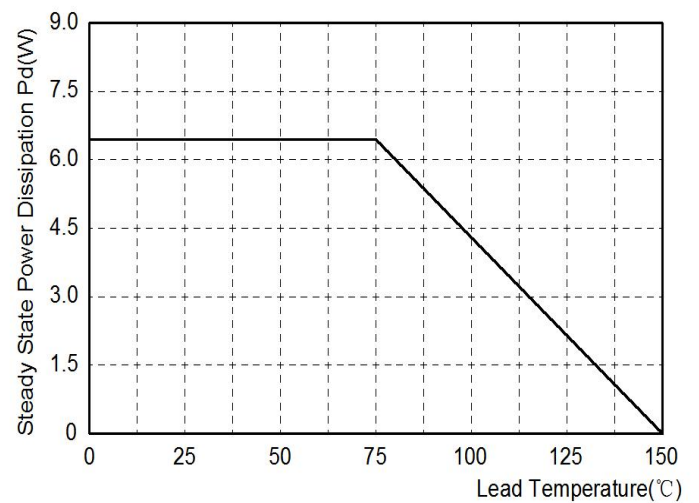
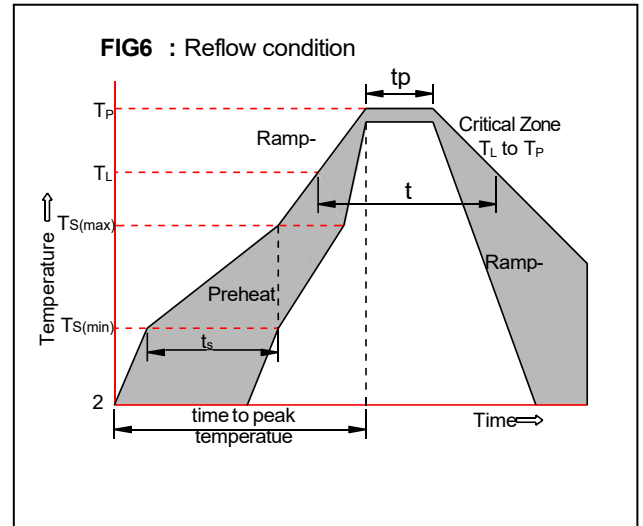


FIG5: Steady State Power Dissipation

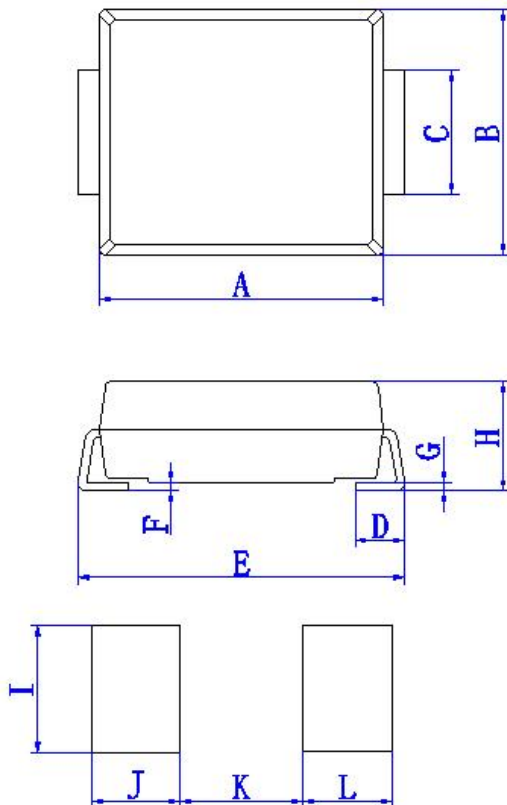


Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

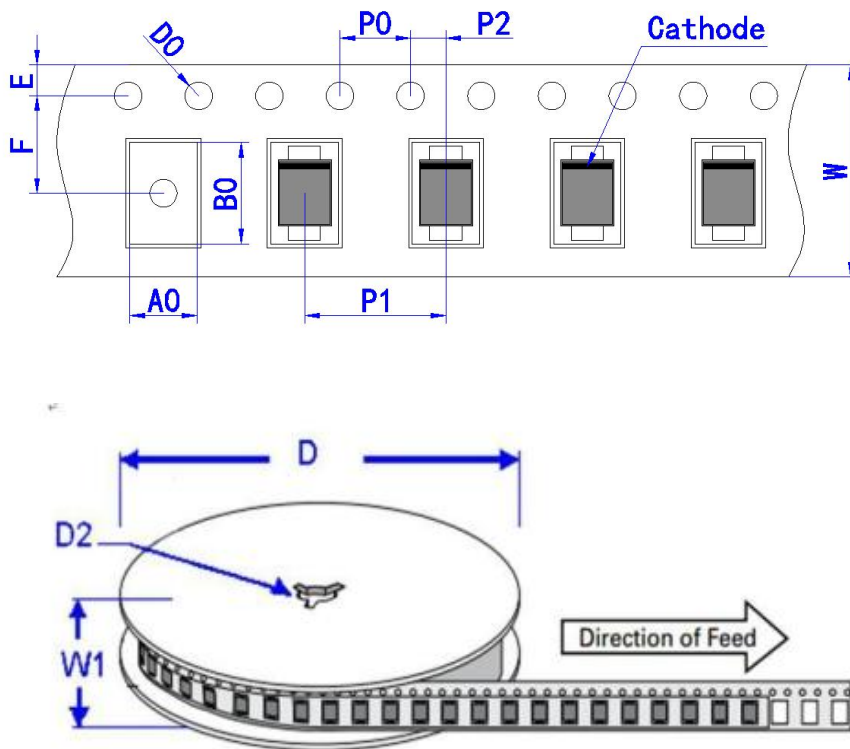


Package mechanical data & Suggested Land Pattern



Ref.(mm)	Millimeters	
	Min.	Max.
A	6.60	7.11
B	5.59	6.20
C	2.75	3.20
D	0.76	1.52
E	7.71	8.13
F	0.051	0.203
G	0.15	0.25
H	2.06	2.75
I	3.30	
J	1.30	
K		5.30
L	1.30	

Tape & reel specification - SMC



Ref.	Millimeters
A0	6.20 ± 0.20
B0	8.31 ± 0.20
C	330.00
D0	1.55 ± 0.10
E	1.75 ± 0.20
E1	13.50 ± 1.00
F	7.50 ± 0.10
P0	8.00 ± 0.20
P1	4.00 ± 0.20
P2	2.00 ± 0.20
W	16.00 ± 0.30
W1	20.00 ± 4.00
D	333.00 ± 2.00
D2	13.50 ± 0.30

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