

Transient Voltage Suppressor

Version: B1 2021/12/08

Features

- IEC 61000-4-2(ESD) $\pm 15\text{KV}(\text{air})$, $\pm 8\text{KV}(\text{contact})$
- 5000Watts peak pulse power ($t_p=10/1000\mu\text{S}$)
- Quick response to surge voltage
- Low clamping voltage
- Moisture sensitivity level: Level 1
- Molding compound meets UL 94 V-0 flammability rating
- EFT protection of data lines in accordance with IEC 61000-4-4(IEC801-4)

Exterior



DO-214AB (SMC)

Application Information

- DC Port
- RS485/232/422
- I/O Port

Agency Approvals

Icon	Description
RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003
UL	UL Certificated E232249

Schematic symbol



BI-directional



UNI-directional

Part Number and Electrical Parameter

Part Number		Marking		$V_R(\text{V})$	V_{BR} min.(V)	V_{BR} max.(V)	I_t (mA)	Max V_c @ $I_{PP}^{\text{①}}$ (V)	$I_{PP}^{\text{①}}$ (A)	$I_R@V_R$ (uA)
BI	UNI	BI	UNI							
BV-5SMDJ11CA	BV-5SMDJ11A	5D11C	5D11	11	12.2	13.5	1	18.2	275	800
BV-5 SMDJ12CA	BV-5SMDJ12A	5D12C	5D12	12	13.3	14.7	1	19.9	252	800
BV-5SMDJ13CA	BV-5SMDJ13A	5D13C	5D13	13	14.4	15.9	1	21.5	233	500
BV-5SMDJ14CA	BV-5SMDJ14A	5D14C	5D14	14	15.6	17.2	1	23.2	216	200
BV-5SMDJ15CA	BV-5SMDJ15A	5D15C	5D15	15	16.7	18.5	1	24.4	205	100
BV-5SMDJ16CA	BV-5SMDJ16A	5D16C	5D16	16	17.8	19.7	1	26	193	50
BV-5SMDJ17CA	BV-5SMDJ17A	5D17C	5D17	17	18.9	20.9	1	27.6	181	20
BV-5SMDJ18CA	BV-5SMDJ18A	5D18C	5D18	18	20	22.1	1	29.2	172	10
BV-5SMDJ20CA	BV-5SMDJ20A	5D20C	5D20	20	22.2	24.5	1	32.4	155	5
BV-5SMDJ22CA	BV-5SMDJ22A	5D22C	5D22	22	24.4	26.9	1	35.5	141	5
BV-5SMDJ24CA	BV-5SMDJ24A	5D24C	5D24	24	26.7	29.5	1	38.9	129	2
BV-5SMDJ26CA	BV-5SMDJ26A	5D26C	5D26	26	28.9	31.9	1	42.1	119	2
BV-5SMDJ28CA	BV-5SMDJ28A	5D28C	5D28	28	31.1	34.4	1	45.4	110	2
BV-5SMDJ30CA	BV-5SMDJ30A	5D30C	5D30	30	33.3	36.8	1	48.4	103	2
BV-5SMDJ33CA	BV-5SMDJ33A	5D33C	5D33	33	36.7	40.6	1	53.3	93.9	2
BV-5SMDJ36CA	BV-5SMDJ36A	5D36C	5D36	36	40	44.2	1	58.1	86.1	2
BV-5SMDJ40CA	BV-5SMDJ40A	5D40C	5D40	40	44.4	49.1	1	64.5	77.6	2

Part Number		Marking		V _R (V)	V _{BR} min.(V)	V _{BR} max.(V)	I _t (mA)	@I _{PP} ^① (V)	I _{PP} ^① (A)	I _R @V _R (uA)
BI	UNI	BI	UNI							
BV-5SMDJ43CA	BV-5SMDJ43A	5D43C	5D43	43	47.8	52.8	1	69.4	72.1	2
BV-5SMDJ45CA	BV-5SMDJ45A	5D45C	5D45	45	50	55.3	1	72.7	68.8	2
BV-5SMDJ48CA	BV-5SMDJ48A	5D48C	5D48	48	53.3	58.9	1	77.4	64.7	2
BV-5SMDJ51CA	BV-5SMDJ51A	5D51C	5D51	51	56.7	62.7	1	82.4	60.7	2
BV-5SMDJ54CA	BV-5SMDJ54A	5D54C	5D54	54	60	66.3	1	87.1	57.5	2
BV-5SMDJ58CA	BV-5SMDJ58A	5D58C	5D58	58	64.4	71.2	1	93.6	53.5	2
BV-5SMDJ60CA	BV-5SMDJ60A	5D60C	5D60	60	66.7	73.7	1	96.8	51.7	2
BV-5SMDJ64CA	BV-5SMDJ64A	5D64C	5D64	64	71.1	78.6	1	103	48.6	2
BV-5SMDJ70CA	BV-5SMDJ70A	5D70C	5D70	70	77.8	86	1	113	44.3	2
BV-5SMDJ75CA	BV-5SMDJ75A	5D75C	5D75	75	83.3	92.1	1	121	41.4	2
BV-5SMDJ78CA	BV-5SMDJ78A	5D78C	5D78	78	86.7	95.8	1	126	39.7	2
BV-5SMDJ85CA	BV-5SMDJ85A	5D85C	5D85	85	94.4	104	1	137	36.5	2
BV-5SMDJ90CA	BV-5SMDJ90A	5D90C	5D90	90	100	111	1	146	34.3	2
BV-5SMDJ100CA	BV-5SMDJ100A	5D100C	5D100	100	111	123	1	162	30.9	2
BV-5SMDJ110CA	BV-5SMDJ110A	5D110C	5D110	110	122	135	1	177	28.3	2
BV-5SMDJ120CA	BV-5SMDJ120A	5D120C	5D120	120	133	147	1	193	26	2
BV-5SMDJ130CA	BV-5SMDJ130A	5D130C	5D130	130	144	159	1	209	24	2
BV-5SMDJ150CA	BV-5SMDJ150A	5D150C	5D150	150	167	185	1	243	20.6	2
BV-5SMDJ160CA	BV-5SMDJ160A	5D160C	5D160	160	178	197	1	259	19.3	2
BV-5SMDJ170CA	BV-5SMDJ170A	5D170C	5D170	170	189	209	1	275	18.2	2

Note: absolute maximum ratings measured at T= 25°C RH = 45%-75% (unless otherwise noted).

①Surge Waveform: 10/1000μS

Mark



BI:5DXXC

cathode



anode

UNI:5DXX

Part Number System

BV 5SMDJ XX C A
(1) (2) (3) (4) (5)

(1) Bencent Transient Voltage Suppressor

(3) V_R=XXV

(5) Suffix 'A' denotes 5% tolerance devices

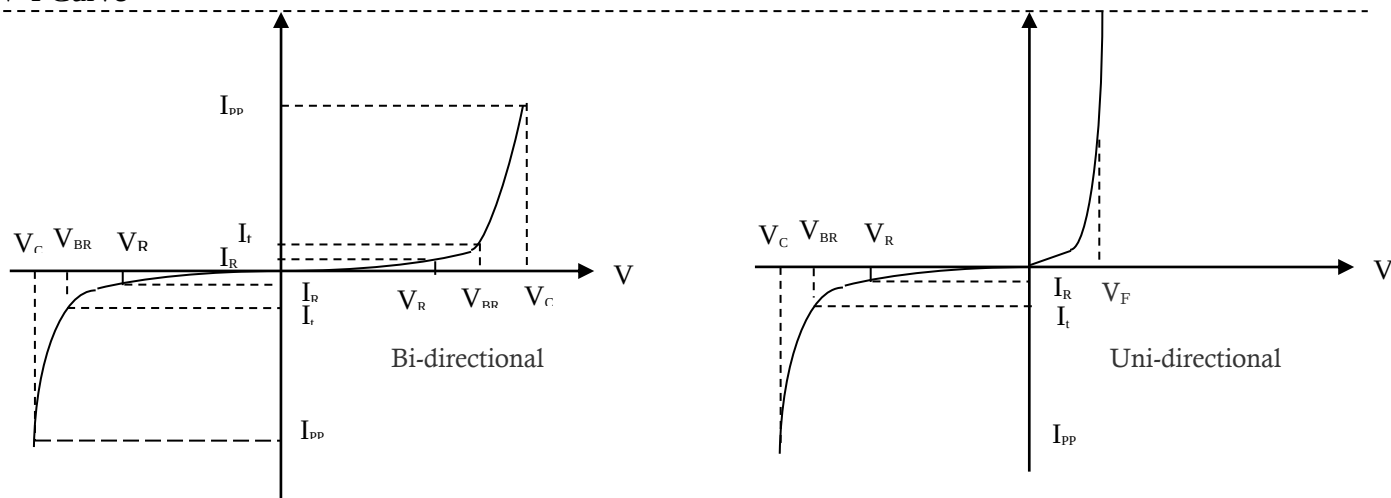
(2) Series Code

(4) BI-directional

Transient Voltage Suppressor

Version: B1 2021/12/08

V-I Curve



Parameters	Definition
V_F	Forward Voltage drop for UNI-directional
V_C	Clamping Voltage
I_{PP}	Surge Waveform 10/1000 μ s
V_R	Stand-off Voltage
V_{BR}	Breakdown Voltage
I_R	Reverse Leakage Current
I_T	Test Current
P_{PP}	Peak Pulse Power Dissipation

Thermal Considerations

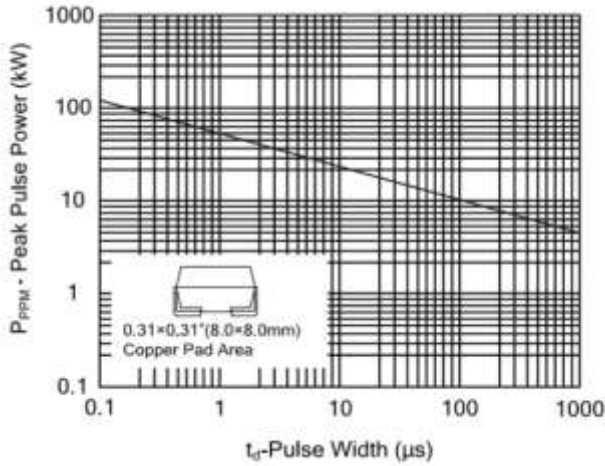
symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-55 to +150	$^{\circ}\text{C}$
T_S	Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$
V_F	Maximum Instantaneous Forward; Voltage at 100A for Unidirectional Only (Note 1)	3.5/5	V
I_{FSM}	Peak Forward Surge Current, 8.3ms;Single Half Sine Wave (Note 2)	300	A

Notes:

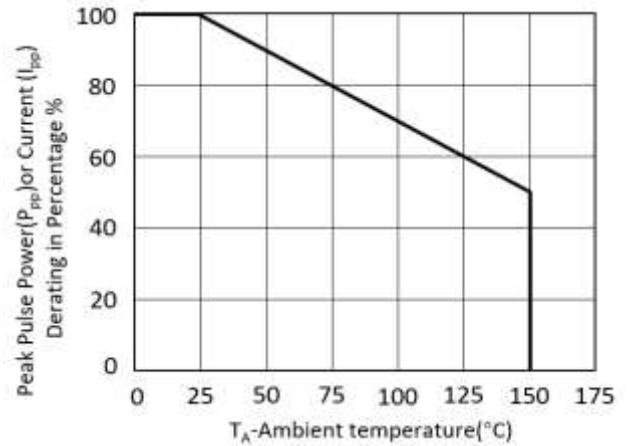
1. $V_F < 3.5\text{V}$ for single die parts and $V_F < 5.0\text{V}$ for stacked-die parts.
2. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.

Typical Characteristics

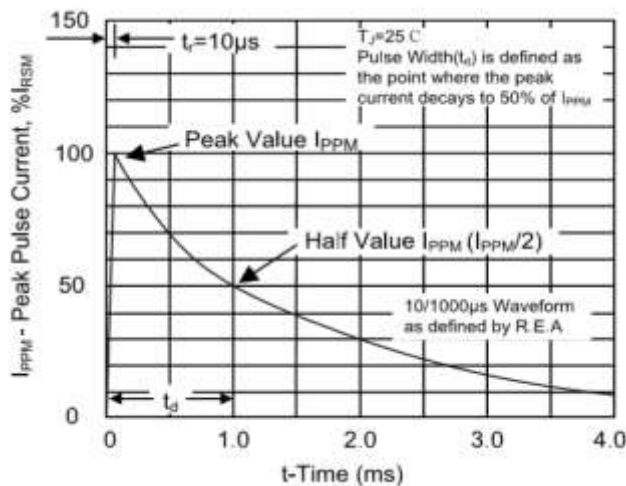
Peak Pulse Power Rating Curve



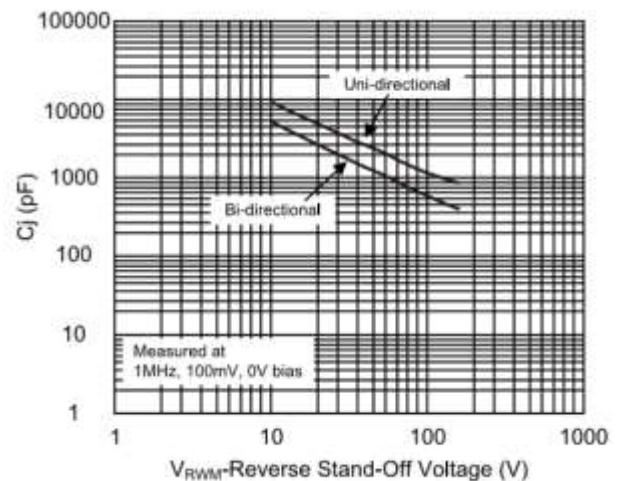
Pulse Derating Curve



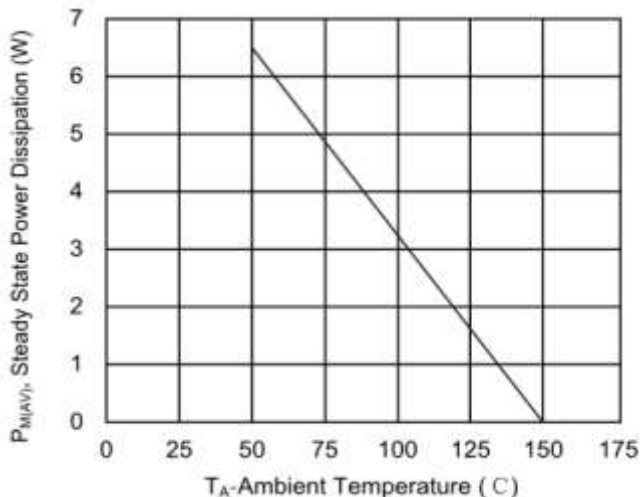
Pulse Waveform



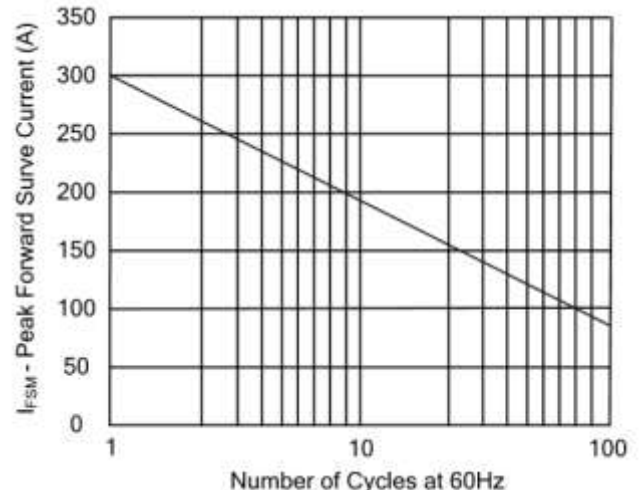
Typical Junction Capacitance



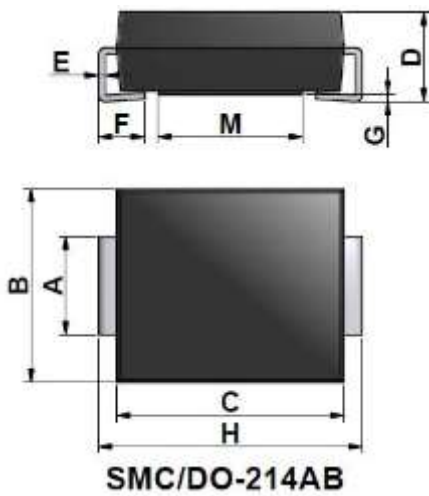
Steady State Power Dissipation Derating Curve



Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

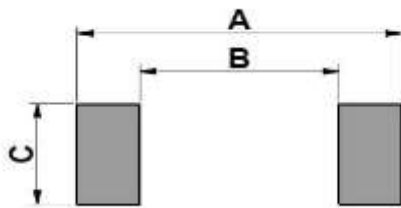


Product Dimensions



REF	mm	inch
A	3 ± 0.1	0.118 ± 0.004
B	5.9 ± 0.3	0.232 ± 0.012
C	7 ± 0.2	0.276 ± 0.008
D	2.6 ± 0.35	0.102 ± 0.014
E	0.2 ± 0.1	0.008 ± 0.004
F	1.3 ± 0.4	0.051 ± 0.016
G	$0 \sim 0.4$	$0.000 \sim 0.016$
H	8 ± 0.3	0.315 ± 0.012
M	4.4 ± 0.2	0.173 ± 0.008

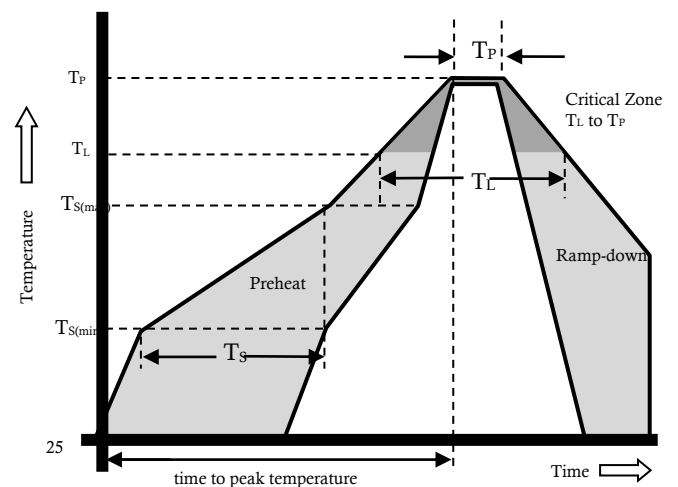
Recommended Soldering Pad



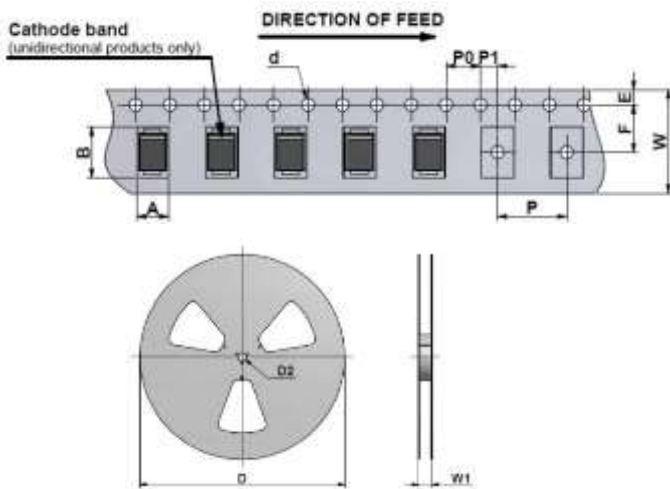
REF	mm	inch
A	8.25	0.325
B	5.05	0.199
C	3.05	0.120

Reflow Profile

Reflow Condition		Pb-Free Assembly
Pre Heat	Temperature Min.	+150°C
	Temperature Max.	+200°C
	Time(Min to Max)	60 – 180 seconds
Average ramp up rate (Liquidus Temp (T _L) to peak)		3°C/second max
Ts(max) to T _L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T _L) (Liquidus)	217°C
	- Temperature (T _L)	60 – 150 seconds
Peak Temp (T _P)		260+0/-5 °C
Time within 5°C of actual Peak Temp (T _P)		8-15 seconds
Ramp-down Rate		6°C/s max
Time 25°C to peak Temp (T _P)		8 min max.
Do not exceed		260°C



PackageReel Information



REF.	mm	inch
A	6.1 ± 0.3	0.240 ± 0.012
B	8.3 ± 0.3	0.327 ± 0.012
d	1.5 ± 0.1	0.059 ± 0.004
D	330.0	13.0
D2	13 ± 1.5	0.512 ± 0.059
E	1.7 ± 0.3	0.067 ± 0.012
F	7.5 ± 0.3	0.295 ± 0.012
P	8 ± 0.3	0.315 ± 0.012
P0	4 ± 0.3	0.157 ± 0.012
P1	2 ± 0.3	0.079 ± 0.012
W	16 ± 0.5	0.630 ± 0.020
W1	23 ± 3	0.906 ± 0.118

Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)	Carton Size(mm)		
				L	W	H
Taping	3,000	48,000	330	360	360	385