

**Transient Voltage Suppressor**
**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

**Exterior**


DO-214AB

**Application information**

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

**Agency Approvals**

Icon	Description
<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003

**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 Vc @ $I_{PP}^{\text{D}}$ (V)	$I_{PP}^{\text{D}}$ (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

**Transient Voltage Suppressor**

Part Number		Marking		$V_R$ (V)	$V_{BR}$ min.(V)	$V_{BR}$ max.(V)	$I_t$ (mA)	@ $I_{PP}^{\textcircled{1}}$ (V)	$I_{PP}^{\textcircled{1}}$ (A)	$I_R@V_R$ ( $\mu$ A)
BI	UNI	BI	UNI							
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
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

 Note: absolute maximum ratings measured at  $T = 25^{\circ}\text{C}$  RH = 45%-75% (unless otherwise noted).

 ① Surge Waveform: 10/1000 $\mu$  S

**Mark**


BI:5DXXC



UNI:5DXX

**Part Number System**

BV 5SMDJ XX C A

(1) (2) (3) (4) (5)

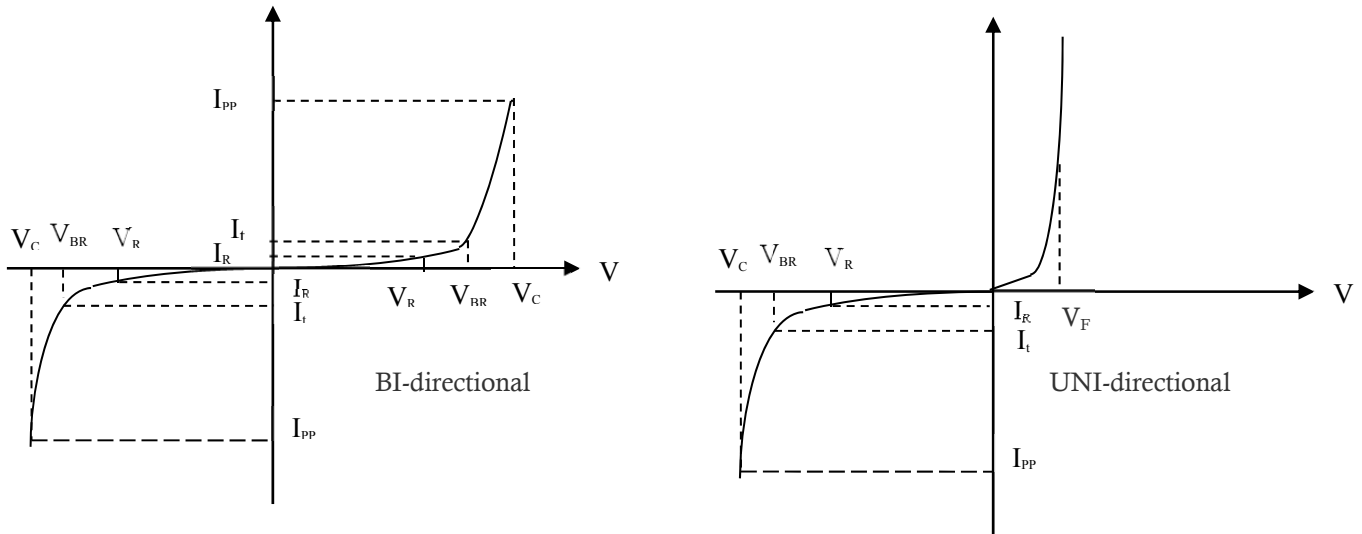
(1) Bencent Transient Voltage Suppressor

 (3)  $V_R = \text{XXV}$ 

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

(2) Series Code

(4) BI-directional

**Transient Voltage Suppressor**
**V-I Curve**


Parameters	Definition
$V_F$	Forward Voltage drop for UNI-directional
$V_C$	Clamping Voltage
$I_{PP}$	Surge Waveform 10/1000 $\mu$ 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	$^{\circ}$ C
$T_S$	Storage Temperature Range	-55 to +150	$^{\circ}$ C

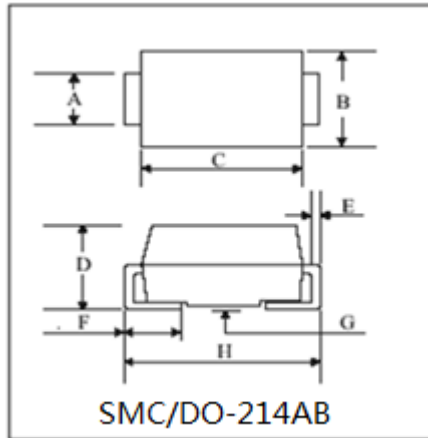
**Environmental Characteristics**

Testing items	Technical standards
High Temperature Reverse Bias Test	Temperature: $150 \pm 3^{\circ}$ C Bias=80% $V_R$ Time:168H
High Temperature Life Test	Temperature: $150^{\circ}$ C Time:168H
High-low Temperature Cycle Test	Temperature: From $-40^{\circ}$ C to $125^{\circ}$ C Dwell time : 30min,10cycles
High Temperature &High Humidity Test	Temperature: $85^{\circ}$ C Humidity:85% Time:168H
Pressure Cooker Test	Temperature: $121^{\circ}$ C, 2atm. Humidity:100% Time:24H
Resistance of Soldering Heat	Temperature: $260 \pm 5^{\circ}$ C Time of dip soldering: 10s, 3times

Note: The above testing items can be specified by customer's special request

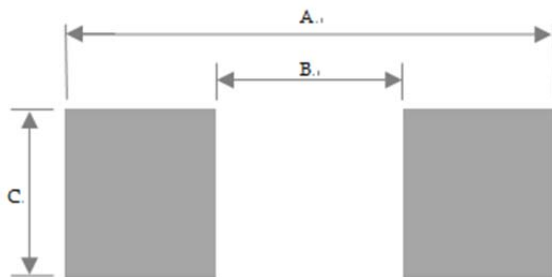
**Transient Voltage Suppressor**

## Product Dimensions



REF	mm	inch
A	2.85--3.05	0.112--0.120
B	5.85--6.15	0.230--0.242
C	6.75--7.05	0.266--0.278
D	2.45--2.95	0.096--0.116
E	0.15--0.25	0.006--0.012
F	0.90--1.60	0.035--0.063
G	0.00--0.40	0.000--0.016
H	7.75--8.25	0.305--0.325

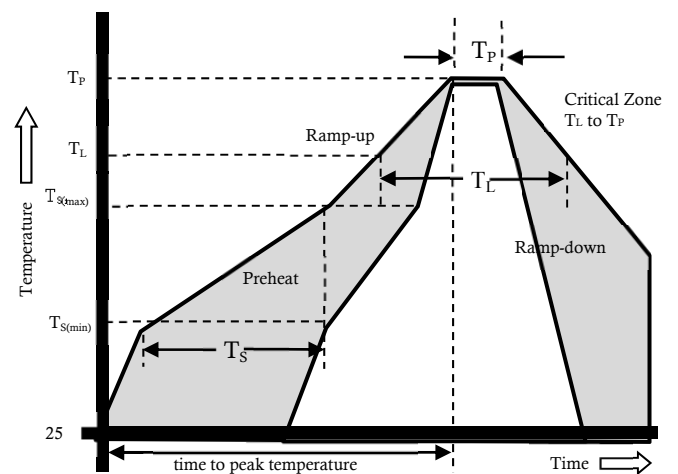
## Recommended Soldering Pad

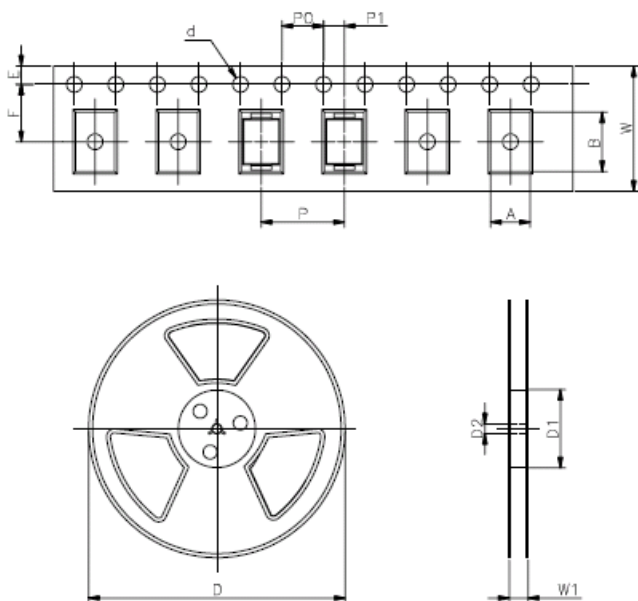


REF	mm	inch
A	8.25	0.325
B	5.05	0.199
C	3.05	0.12

## Reflow Profile

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



**Transient Voltage Suppressor**
**Package Reel Information**


REF.	mm	inch
A	6.15+/-0.1	0.242+/-0.004
B	8.2+/-0.1	0.323+/-0.004
d	1.5+/-0.05	0.059+/-0.002
D	330.0	13.0
D1	72+/-3	2.835+/-0.118
D2	13+/-0.3	0.512+/-0.012
E	1.75+/-0.1	0.069+/-0.004
F	5.5+/-0.05	0.212+/-0.002
P	8.0+/-0.1	0.315+/-0.004
P0	4.0+/-0.1	0.157+/-0.004
P1	2.0+/-0.05	0.079+/-0.004
W	16+/-0.1	0.630+/-0.004
W1	22+/-2.0	0.866+/-0.079

Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)	Carton Size(mm)		
				L	W	H
Taping	3,000	24,000	330	360	360	380