

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 |
|-------------|------------------------------------|
| RoHS | Compliance with 2011/65/EU |
| HF | 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}^{D} (V) | I_{PP}^{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) | $I_R@V_R$ (μ 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 μ 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) $V_R = \text{XXV}$

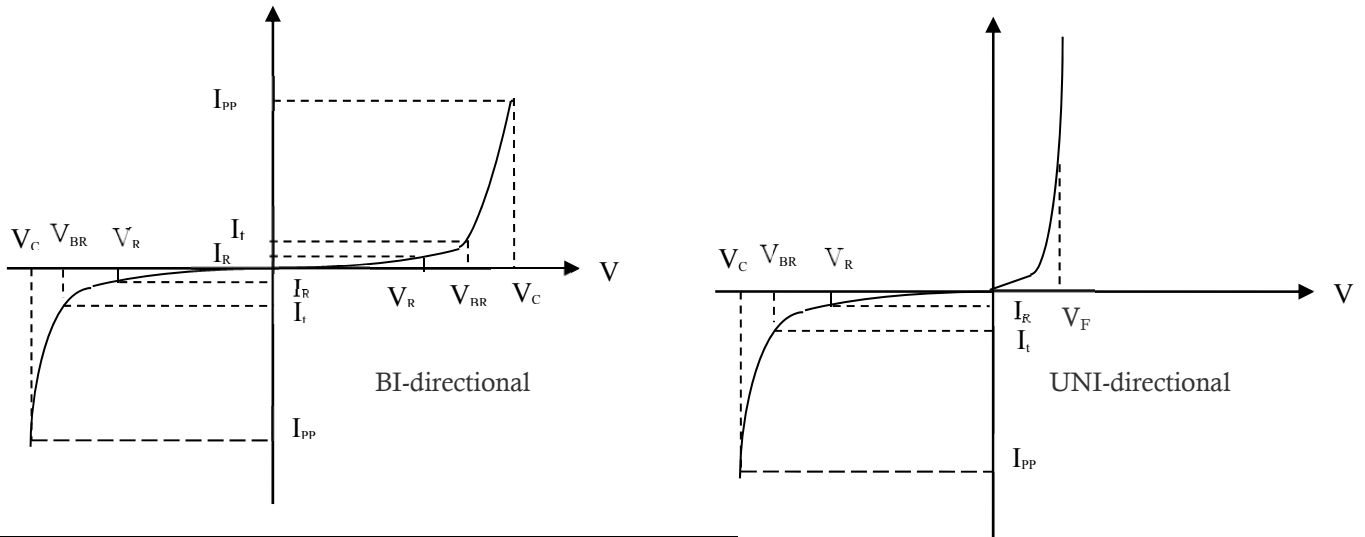
(5) Suffix 'A' denotes 5% tolerance devices

(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 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 | $^{\circ}C$ |
| T_S | Storage Temperature Range | -55 to +150 | $^{\circ}C$ |

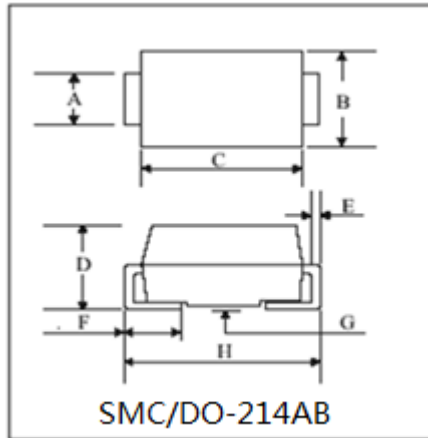
Environmental Characteristics

| 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 $^{\circ}C$ to125 $^{\circ}C$ 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

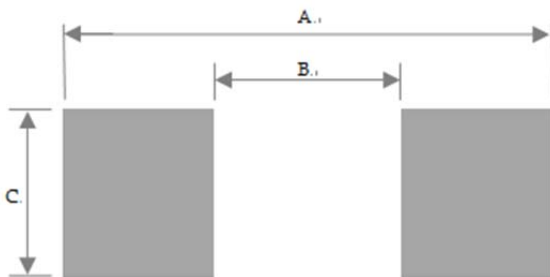
Transient Voltage Suppressor

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 |

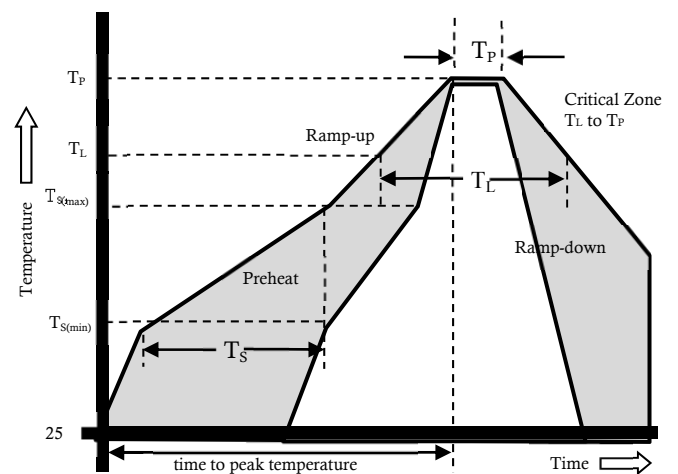
Recommended Soldering Pad

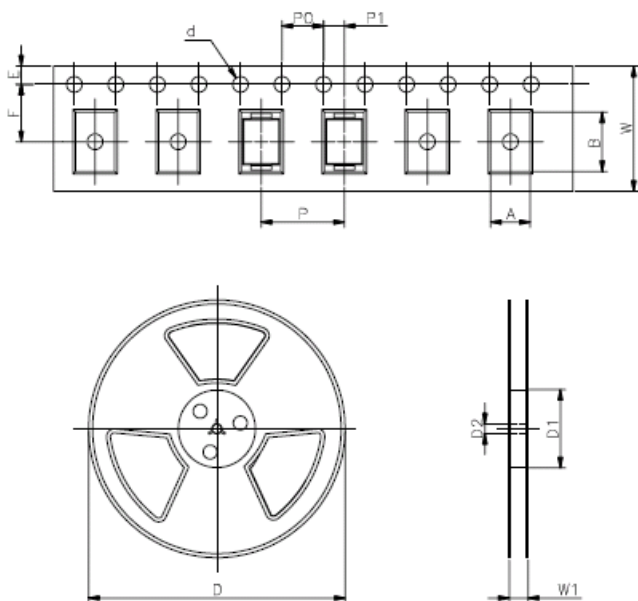


| REF | mm | inch |
|-----|------|-------|
| A | 8.25 | 0.325 |
| B | 5.05 | 0.199 |
| C | 3.05 | 0.12 |

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 |

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