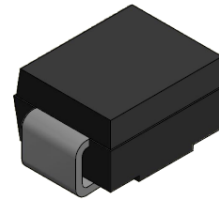


Transient Voltage Suppressor
Features

- IEC 61000-4-2(ESD) $\pm 15KV$ (air), $\pm 8KV$ (contact)
- 600Watts peak pulse power (tp=10/1000 μ S)
- Low clamping voltage
- Moisture sensitivity level: level 1

Exterior


SMB

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 Numbering and Electrical Parameter

| Part Number | | Marking | | Reverse Stand off Voltage V_R (V) | V_{BR} min. (V) | V_{BR} max. (V) | I_t (mA) | Max Clamping Voltage $V_C@I_{PP}^{(1)}$ (V) | Max Peak Pulse Current $I_{PP}^{(1)}$ (A) | Max Reverse Leakage $I_R@V_R$ (μ A) |
|--------------|-------------|---------|------|-------------------------------------|-------------------|-------------------|------------|---|---|--|
| BI | UNI | BI | UNI | | | | | | | |
| BV-SMBJ5CA | BV-SMBJ5A | B5C | B5 | 5 | 6.4 | 7 | 10 | 9.2 | 65.3 | 800 |
| BV-SMBJ6CA | BV-SMBJ6A | B6C | B6 | 6 | 6.67 | 7.37 | 10 | 10.3 | 58.3 | 800 |
| BV-SMBJ6.5CA | BV-SMBJ6.5A | B6.5C | B6.5 | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 53.6 | 500 |
| BV-SMBJ7CA | BV-SMBJ7A | B7C | B7 | 7 | 7.78 | 8.6 | 10 | 12 | 50 | 200 |
| BV-SMBJ7.5CA | BV-SMBJ7.5A | B7.5C | B7.5 | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 46.6 | 100 |
| BV-SMBJ8CA | BV-SMBJ8A | B8C | B8 | 8 | 8.89 | 9.83 | 1 | 13.6 | 44.2 | 50 |
| BV-SMBJ8.5CA | BV-SMBJ8.5A | B8.5C | B8.5 | 8.5 | 9.44 | 10.4 | 1 | 14.4 | 41.7 | 20 |
| BV-SMBJ9CA | BV-SMBJ9A | B9C | B9 | 9 | 10 | 11.1 | 1 | 15.4 | 39 | 10 |
| BV-SMBJ10CA | BV-SMBJ10A | B10C | B10 | 10 | 11.1 | 12.3 | 1 | 17 | 35.3 | 5 |
| BV-SMBJ11CA | BV-SMBJ11A | B11C | B11 | 11 | 12.2 | 13.5 | 1 | 18.2 | 33 | 1 |
| BV-SMBJ12CA | BV-SMBJ12A | B12C | B12 | 12 | 13.3 | 14.7 | 1 | 19.9 | 30.2 | 1 |
| BV-SMBJ13CA | BV-SMBJ13A | B13C | B13 | 13 | 14.4 | 15.9 | 1 | 21.5 | 28 | 1 |
| BV-SMBJ14CA | BV-SMBJ14A | B14C | B14 | 14 | 15.6 | 17.2 | 1 | 23.2 | 25.9 | 1 |

| Part Number | | Marking | | Reverse Stand off Voltage $V_R(V)$ | V_{BR} min. (V) | V_{BR} max. (V) | I_t (mA) | Max Clampin g Voltage $V_C@I_{PP}^{\text{①}}$ (V) | Max Peak Pulse Current $I_{PP}^{\text{①}}$ (A) | Max Reverse Leakage $I_R@V_R$ (uA) |
|--------------|-------------|---------|------|------------------------------------|-------------------|-------------------|------------|---|--|------------------------------------|
| BI | UNI | BI | UNI | | | | | | | |
| BV-SMBJ15CA | BV-SMBJ15A | B15C | B15 | 15 | 16.7 | 18.5 | 1 | 24.4 | 24.6 | 1 |
| BV-SMBJ16CA | BV-SMBJ16A | B16C | B16 | 16 | 17.8 | 19.7 | 1 | 26 | 23.1 | 1 |
| BV-SMBJ17CA | BV-SMBJ17A | B17C | B17 | 17 | 18.9 | 20.9 | 1 | 27.6 | 21.8 | 1 |
| BV-SMBJ18CA | BV-SMBJ18A | B18C | B18 | 18 | 20 | 22.1 | 1 | 29.2 | 20.6 | 1 |
| BV-SMBJ20CA | BV-SMBJ20A | B20C | B20 | 20 | 22.2 | 24.5 | 1 | 32.4 | 18.6 | 1 |
| BV-SMBJ22CA | BV-SMBJ22A | B22C | B22 | 22 | 24.4 | 26.9 | 1 | 35.5 | 16.9 | 1 |
| BV-SMBJ24CA | BV-SMBJ24A | B24C | B24 | 24 | 26.7 | 29.5 | 1 | 38.9 | 15.5 | 1 |
| BV-SMBJ26CA | BV-SMBJ26A | B26C | B26 | 26 | 28.9 | 31.9 | 1 | 42.1 | 14.3 | 1 |
| BV-SMBJ28CA | BV-SMBJ28A | B28C | B28 | 28 | 31.1 | 34.4 | 1 | 45.4 | 13.3 | 1 |
| BV-SMBJ30CA | BV-SMBJ30A | B30C | B30 | 30 | 33.3 | 36.8 | 1 | 48.4 | 12.4 | 1 |
| BV-SMBJ33CA | BV-SMBJ33A | B33C | B33 | 33 | 36.7 | 40.6 | 1 | 53.3 | 11.3 | 1 |
| BV-SMBJ36CA | BV-SMBJ36A | B36C | B36 | 36 | 40 | 44.2 | 1 | 58.1 | 10.4 | 1 |
| BV-SMBJ40CA | BV-SMBJ40A | B40C | B40 | 40 | 44.4 | 49.1 | 1 | 64.5 | 9.3 | 1 |
| BV-SMBJ43CA | BV-SMBJ43A | B43C | B43 | 43 | 47.8 | 52.8 | 1 | 69.4 | 8.7 | 1 |
| BV-SMBJ45CA | BV-SMBJ45A | B45C | B45 | 45 | 50 | 55.3 | 1 | 72.7 | 8.3 | 1 |
| BV-SMBJ48CA | BV-SMBJ48A | B48C | B48 | 48 | 53.3 | 58.9 | 1 | 77.4 | 7.8 | 1 |
| BV-SMBJ51CA | BV-SMBJ51A | B51C | B51 | 51 | 56.7 | 62.7 | 1 | 82.4 | 7.3 | 1 |
| BV-SMBJ54CA | BV-SMBJ54A | B54C | B54 | 54 | 60 | 66.3 | 1 | 87.1 | 6.9 | 1 |
| BV-SMBJ58CA | BV-SMBJ58A | B58C | B58 | 58 | 64.4 | 71.2 | 1 | 93.6 | 6.5 | 1 |
| BV-SMBJ60CA | BV-SMBJ60A | B60C | B60 | 60 | 66.7 | 73.7 | 1 | 96.8 | 6.2 | 1 |
| BV-SMBJ64CA | BV-SMBJ64A | B64C | B64 | 64 | 71.1 | 78.6 | 1 | 103 | 5.9 | 1 |
| BV-SMBJ70CA | BV-SMBJ70A | B70C | B70 | 70 | 77.8 | 86 | 1 | 113 | 5.3 | 1 |
| BV-SMBJ75CA | BV-SMBJ75A | B75C | B75 | 75 | 83.3 | 92.1 | 1 | 121 | 5 | 1 |
| BV-SMBJ78CA | BV-SMBJ78A | B78C | B78 | 78 | 86.7 | 95.8 | 1 | 126 | 4.8 | 1 |
| BV-SMBJ85CA | BV-SMBJ85A | B85C | B85 | 85 | 94.4 | 104 | 1 | 137 | 4.4 | 1 |
| BV-SMBJ90CA | BV-SMBJ90A | B90C | B90 | 90 | 100 | 111 | 1 | 146 | 4.1 | 1 |
| BV-SMBJ100CA | BV-SMBJ100A | B100C | B100 | 100 | 111 | 123 | 1 | 162 | 3.7 | 1 |
| BV-SMBJ110CA | BV-SMBJ110A | B110C | B110 | 110 | 122 | 135 | 1 | 177 | 3.4 | 1 |

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

①Surge Waveform: 10/1000 μ S

Mark

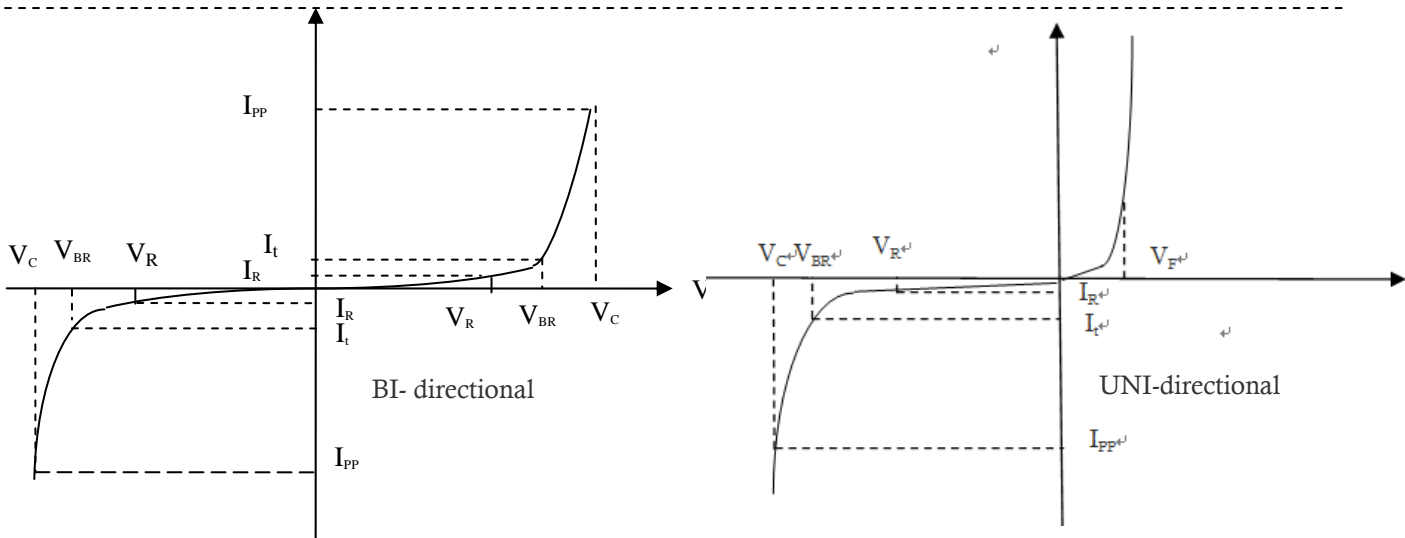


BI: BXXC



UNI: BXX

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 |

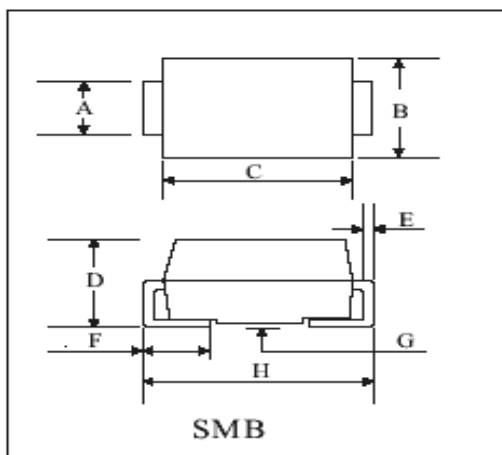
Thermal Considerations

| 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 |

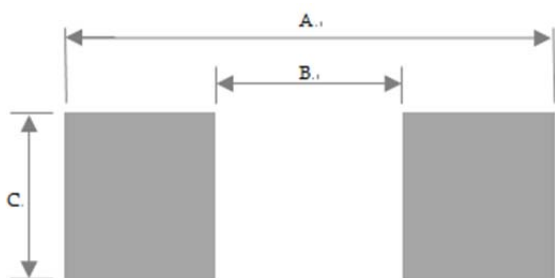
Environmental Characteristics

| Testing Items | Technical Standards |
|---------------------------------------|--|
| High Temperature Reverse Bias Test | Temperature: $150 \pm 3^{\circ}$ C, Bias= $80\%V_{DRM}$ Time:96H |
| High Temperature Life Test | Temperature: 150° C Time:168H |
| High-low Temperature Cycle Test | Temperature: From -40° C to 125° C Dwell time: 30min, 10-100 cycles |
| High Temperature & High Humidity Test | Temperature: 85° C Humidity:85% Test time:168H |
| Pressure Cooker Test | Temperature: 121° C, 2atm. Humidity:100% Test time: 24H to 168H |
| 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 customers by contacting Bencent service

Product Dimensions


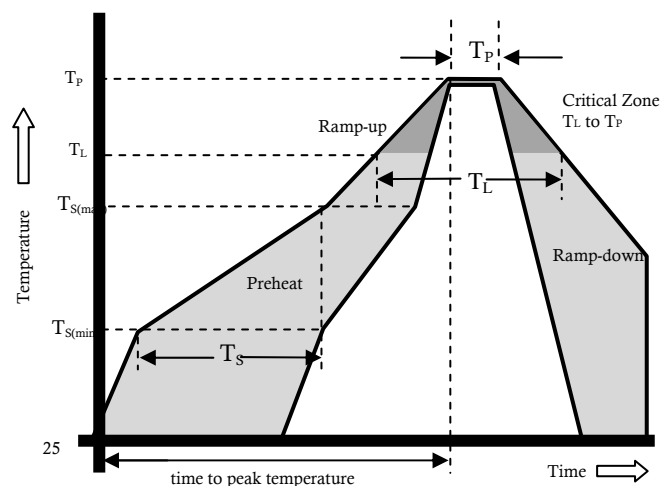
| REF. | mm | inch |
|------|------------|--------------|
| A | 1.85--2.15 | 0.073--0.085 |
| B | 3.45--3.75 | 0.138--0.148 |
| C | 4.35--4.65 | 0.171--0.183 |
| D | 2.10--2.60 | 0.083--0.102 |
| E | 0.15--0.25 | 0.006--0.010 |
| F | 0.80--1.50 | 0.031--0.059 |
| G | 0.00--0.40 | 0.000--0.016 |
| H | 4.95--5.45 | 0.195--0.215 |

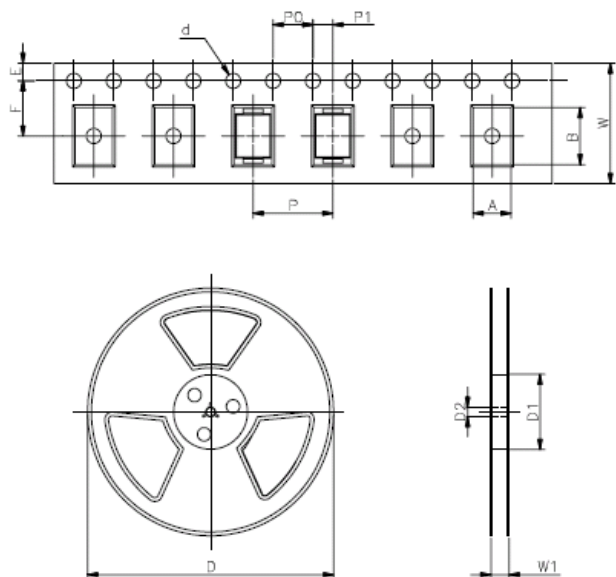
Recommended Soldering Pad


| REF | mm | inch |
|-----|------|-------|
| A | 5.45 | 0.215 |
| B | 2.45 | 0.097 |
| C | 2.15 | 0.085 |

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 Temp(T_L) to peak) | | 3°C/sec. Max. |
| Ts(max) to T_L - Ramp-up Rate | | 3°C/sec. Max. |
| Reflow | - Temperature (T_L) (Liquidus) | +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. |
| Ramp-down Rate | | 6°C/sec. Max. |
| Time 25°C to peak Temp (T_P) | | 8 min. Max. |
| Do not exceed | | +260°C |



Package Reel Information


| REF | mm | inch |
|-----|------------|---------------|
| A | 3.8+/-0.3 | 0.150+/-0.012 |
| B | 5.5+/-0.3 | 0.217+/-0.012 |
| d | 1.5+/-0.1 | 0.059+/-0.004 |
| D | 330+/-1 | 13+/-0.039 |
| D1 | 72+/-3 | 2.835+/-0.118 |
| D2 | 13+/-0.3 | 0.512+/-0.012 |
| E | 1.75+/-0.2 | 0.069+/-0.008 |
| F | 5.5+/-0.02 | 0.217+/-0.008 |
| P | 8.0+/-0.2 | 0.315+/-0.008 |
| P0 | 4.0+/-0.2 | 0.157+/-0.008 |
| P1 | 2.0+/-0.2 | 0.079+/-0.008 |
| W | 12.0+/-0.2 | 0.472+/-0.008 |
| W1 | 18+/-2.0 | 0.709+/-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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