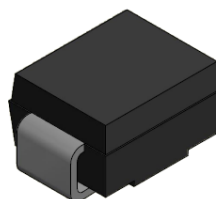


### Features

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

### Exterior



SMB

### Application Information

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

### Agency Approvals

| Icon        | Description                        |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | 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 $I_R@V_R$ (uA) |
|--------------|-------------|---------|------|------------------------------------|-------------------|-------------------|------------|---------------------------------------------|-------------------------------------------|------------------------------------|
| 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<br>Stand off<br>Voltage<br>$V_R(V)$ | $V_{BR}$<br>min.<br>(V) | $V_{BR}$<br>max.<br>(V) | $I_t$<br>(mA) | Max<br>Clampin<br>g<br>Voltage<br>$V_C@I_{PP}^{\oplus}$<br>(V) | Max Peak<br>Pulse<br>Current<br>$I_{PP}^{\oplus}$ (A) | Max Reverse<br>Leakage<br>$I_R@V_R$<br>(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°C RH = 45%-75% (unless otherwise noted).

①Surge Waveform: 10/1000  $\mu$  S

### Mark

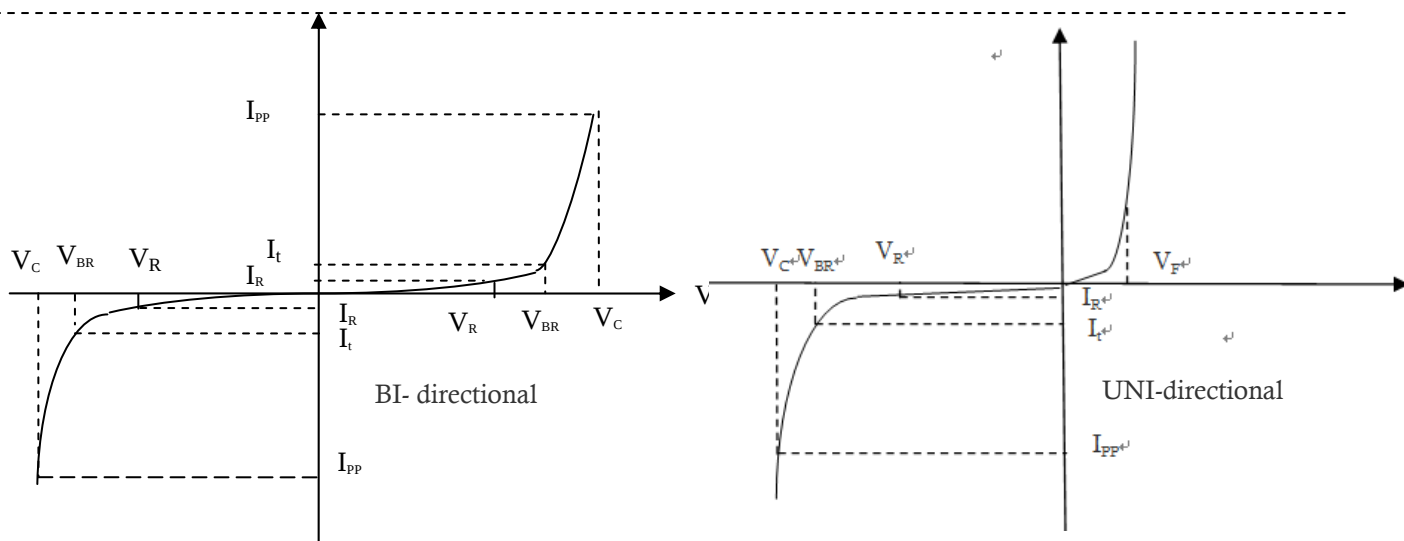


BI: BXXC



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 $\mu$ s           |
| $V_R$      | Stand-off Voltage                        |
| $V_{BR}$   | Breakdown Voltage                        |
| $I_R$      | Reverse Leakage Current                  |
| $I_t$      | Test Current                             |
| Ppp        | Peak Pulse Power Dissipation             |

## Thermal Considerations

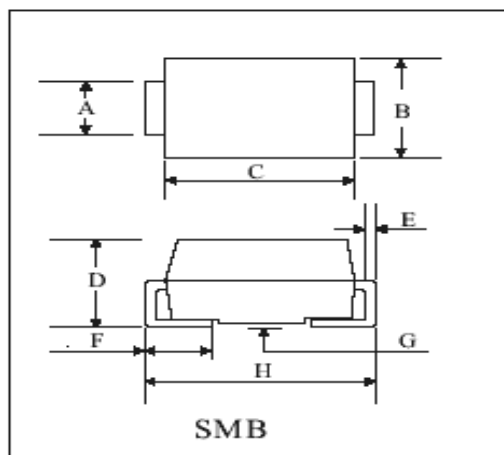
| symbol | Parameter                            | Value       | Unit               |
|--------|--------------------------------------|-------------|--------------------|
| $T_J$  | Operating Junction Temperature Range | -55 to +150 | $^{\circ}\text{C}$ |
| $T_S$  | Storage Temperature Range            | -55 to +150 | $^{\circ}\text{C}$ |

## Environmental Characteristics

| Testing Items                        | Technical Standards                                                                                  |
|--------------------------------------|------------------------------------------------------------------------------------------------------|
| High Temperature Reverse Bias Test   | Temperature: $150 \pm 3^{\circ}\text{C}$ , Bias=80% $V_{DRM}$<br>Time:96H                            |
| High Temperature Life Test           | Temperature: $150^{\circ}\text{C}$<br>Time:168H                                                      |
| High-low Temperature Cycle Test      | Temperature: From $-40^{\circ}\text{C}$ to $125^{\circ}\text{C}$<br>Dwell time: 30min, 10-100 cycles |
| High Temperature &High Humidity Test | Temperature: $85^{\circ}\text{C}$ Humidity:85%<br>Test time:168H                                     |
| Pressure Cooker Test                 | Temperature: $121^{\circ}\text{C}$ , 2atm. Humidity:100%<br>Test time: 24H to 168H                   |
| Resistance of Soldering Heat         | Temperature: $260 \pm 5^{\circ}\text{C}$<br>Time of dip soldering: 10s, 3times                       |

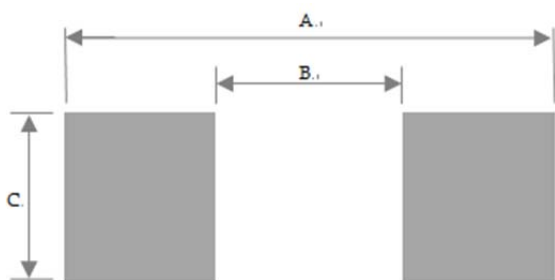
Note: The above testing items can be specified by customers by contacting Bencent service

## 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 |

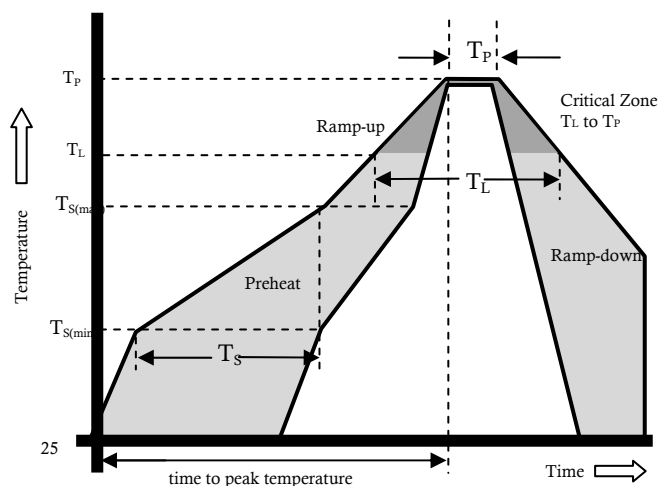
## Recommended Soldering Pad

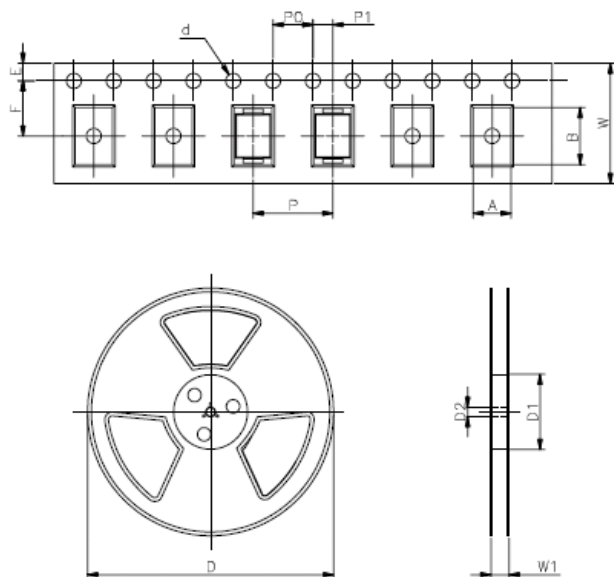


| REF | mm   | inch  |
|-----|------|-------|
| A   | 5.45 | 0.215 |
| B   | 2.45 | 0.097 |
| C   | 2.15 | 0.085 |

## 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 <sub>L</sub> ) to peak) |                                            | 3°C/sec. Max.    |
| Ts(max) to T <sub>L</sub> - Ramp-up Rate                     |                                            | 3°C/sec. Max.    |
| Reflow                                                       | - Temperature (T <sub>L</sub> ) (Liquidus) | +217°C           |
|                                                              | - Temperature (T <sub>L</sub> )            | 60 – 150 secs.   |
| Peak Temp (T <sub>P</sub> )                                  |                                            | +(260+0/-5)°C    |
| Time within 5°C of actual Peak Temp (T <sub>P</sub> )        |                                            | 30 secs.         |
| Ramp-down Rate                                               |                                            | 6°C/sec. Max.    |
| Time 25°C to peak Temp (T <sub>P</sub> )                     |                                            | 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 |