## Features

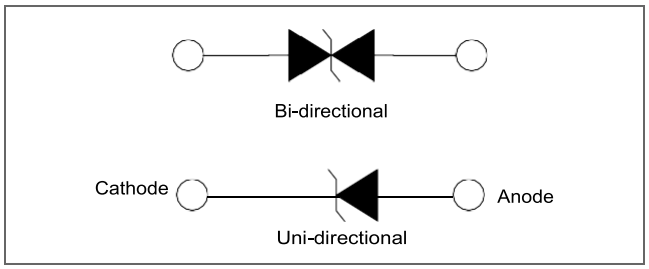
RoHS Compliant


- 600W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C

## Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

## Function Diagram




| Maximum Ratings and Thermal Characteristics ($T_A$=25°C unless otherwise noted) | | | |
|---|---|---|---|
| Parameter | Symbol | Value | Unit |
| Peak Pulse Power Dissipation at $T_A$=25°C by 10/1000μs Waveform (Fig.3) | $P_{PPM}$ | 600 | W |
| Power Dissipation on Infinite Heat Sink at $T_L$=50°C | $P_D$ | 5 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1) | $I_{FSM}$ | 100 | A |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2) | $V_F$ | 3.5 | V |
| Operating Temperature Range | $T_J$ | -55 to 150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to 150 | °C |

| AGENCY | AGENCY FILE NUMBER |
|---|---|
| ®RU | Pending |

**Notes:**

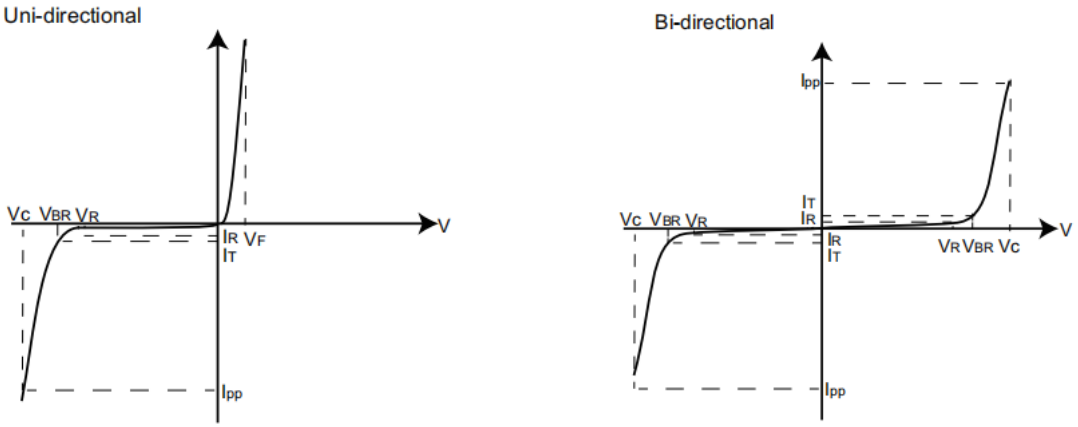
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

## Characteristics (T =25°C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Key Marking UNI | Key Marking BI | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ MIN | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ MAX | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{pp}$ (V) | Maximum Peak Pulse Current $I_{pp}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ (μA) | Agency Approval |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SMBJ5.0A | SMBJ5.0CA | B005A | B005C | 5.0 | 6.40 | 7.00 | 10 | 9.2 | 65.3 | 800 | |
| SMBJ6.0A | SMBJ6.0CA | B006A | B006C | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 58.3 | 800 | |
| SMBJ6.5A | SMBJ6.5CA | B06FA | B06FC | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 53.6 | 500 | |
| SMBJ7.0A | SMBJ7.0CA | B007A | B007C | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 50.0 | 200 | |
| SMBJ7.5A | SMBJ7.5CA | B07FA | B07FC | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 46.6 | 100 | |
| | SMBJ8.0CA | B008A | B008C | 8.0 | 8.89 | 9.83 | 1 | 13.6 | 44.2 | 50 | |
| SMBJ8.5A | SMBJ8.5CA | B08FA | B08FC | 8.5 | 9.44 | 10.40 | 1 | 14.4 | 41.7 | 20 | |
| SMBJ9.0A | SMBJ9.0CA | B009A | B009C | 9.0 | 10.00 | 11.10 | 1 | 15.4 | 39.0 | 10 | |
| SMBJ10A | SMBJ10CA | B010A | B010C | 10.0 | 11.10 | 12.30 | 1 | 17.0 | 35.3 | 5 | |
| SMBJ11A | SMBJ11CA | B011A | B011C | 11.0 | 12.20 | 13.50 | 1 | 18.2 | 33.0 | 1 | |
| SMBJ12A | SMBJ12CA | B012A | B012C | 12.0 | 13.30 | 14.70 | 1 | 19.9 | 30.2 | 1 | |
| SMBJ13A | SMBJ13CA | B013A | B013C | 13.0 | 14.40 | 15.90 | 1 | 21.5 | 28.0 | 1 | |
| SMBJ14A | SMBJ14CA | B014A | B014C | 14.0 | 15.60 | 17.20 | 1 | 23.2 | 25.9 | 1 | |
| SMBJ15A | SMBJ15CA | B015A | B015C | 15.0 | 16.70 | 18.50 | 1 | 24.4 | 24.6 | 1 | |
| SMBJ16A | SMBJ16CA | B016A | B016C | 16.0 | 17.80 | 19.70 | 1 | 26.0 | 23.1 | 1 | |
| SMBJ17A | SMBJ17CA | B017A | B017C | 17.0 | 18.90 | 20.90 | 1 | 27.6 | 21.8 | 1 | |
| SMBJ18A | SMBJ18CA | B018A | B018C | 18.0 | 20.00 | 22.10 | 1 | 29.2 | 20.6 | 1 | |
| SMBJ20A | SMBJ20CA | B020A | B020C | 20.0 | 22.20 | 24.50 | 1 | 32.4 | 18.6 | 1 | |
| SMBJ22A | SMBJ22CA | B022A | B022C | 22.0 | 24.40 | 26.90 | 1 | 35.5 | 16.9 | 1 | |
| SMBJ24A | SMBJ24CA | B024A | B024C | 24.0 | 26.70 | 29.50 | 1 | 38.9 | 15.5 | 1 | |
| SMBJ26A | SMBJ26CA | B026A | B026C | 26.0 | 28.90 | 31.90 | 1 | 42.1 | 14.3 | 1 | |
| SMBJ28A | SMBJ28CA | B028A | B028C | 28.0 | 31.10 | 34.40 | 1 | 45.4 | 13.3 | 1 | |
| SMBJ30A | SMBJ30CA | B030A | B030C | 30.0 | 33.30 | 36.80 | 1 | 48.4 | 12.4 | 1 | |
| SMBJ33A | SMBJ33CA | B033A | B033C | 33.0 | 36.70 | 40.60 | 1 | 53.3 | 11.3 | 1 | |
| SMBJ36A | SMBJ36CA | B036A | B036C | 36.0 | 40.00 | 44.20 | 1 | 58.1 | 10.4 | 1 | |
| SMBJ40A | SMBJ40CA | B040A | B040C | 40.0 | 44.40 | 49.10 | 1 | 64.5 | 9.3 | 1 | |
| SMBJ43A | SMBJ43CA | B043A | B043C | 43.0 | 47.80 | 52.80 | 1 | 69.4 | 8.7 | 1 | |
| SMBJ45A | SMBJ45CA | B045A | B045C | 45.0 | 50.00 | 55.30 | 1 | 72.7 | 8.3 | 1 | |
| SMBJ48A | SMBJ48CA | B048A | B048C | 48.0 | 53.30 | 58.90 | 1 | 77.4 | 7.8 | 1 | |
| SMBJ51A | SMBJ51CA | B051A | B051C | 51.0 | 56.70 | 62.70 | 1 | 82.4 | 7.3 | 1 | |
| SMBJ54A | SMBJ54CA | B054A | B054C | 54.0 | 60.00 | 66.30 | 1 | 87.1 | 6.9 | 1 | |
| SMBJ58A | SMBJ58CA | B058A | B058C | 58.0 | 64.40 | 71.20 | 1 | 93.6 | 6.5 | 1 | |
| SMBJ60A | SMBJ60CA | B060A | B060C | 60.0 | 66.70 | 73.70 | 1 | 96.8 | 6.2 | 1 | |
| SMBJ64A | SMBJ64CA | B064A | B064C | 64.0 | 71.10 | 78.60 | 1 | 103.0 | 5.9 | 1 | |
| SMBJ70A | SMBJ70CA | B070A | B070C | 70.0 | 77.80 | 86.00 | 1 | 113.0 | 5.3 | 1 | |
| SMBJ75A | SMBJ75CA | B075A | B075C | 75.0 | 83.30 | 92.10 | 1 | 121.0 | 5.0 | 1 | |
| SMBJ78A | SMBJ78CA | B078A | B078C | 78.0 | 86.70 | 95.80 | 1 | 126.0 | 4.8 | 1 | |
| SMBJ85A | SMBJ85CA | B085A | B085C | 85.0 | 94.40 | 104.00 | 1 | 137.0 | 4.4 | 1 | |
| SMBJ90A | SMBJ90CA | B090A | B090C | 90.0 | 100.00 | 111.00 | 1 | 146.0 | 4.1 | 1 | |
| SMBJ100A | SMBJ100CA | B100A | B100C | 100.0 | 111.00 | 123.00 | 1 | 162.0 | 3.7 | 1 | |
| SMBJ110A | SMBJ110CA | B110A | B110C | 110.0 | 122.00 | 135.00 | 1 | 177.0 | 3.4 | 1 | |

| Part Number (Uni) | Part Number (Bi) | Key Marking UNI | Key Marking BI | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ MIN | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ MAX | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{pp}$ (V) | Maximum Peak Pulse Current $I_{pp}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ (μA) | Agency Approval |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SMBJ120A | SMBJ120CA | B120A | B120C | 120.0 | 133.00 | 147.00 | 1 | 193.0 | 3.1 | 1 | |
| SMBJ130A | SMBJ130CA | B130A | B130C | 130.0 | 144.00 | 159.00 | 1 | 209.0 | 2.9 | 1 | |
| SMBJ140A | SMBJ140CA | B140A | B140C | 140 | 150.00 | 165.00 | 1 | 226.8 | 2.7 | 1 | |
| SMBJ150A | SMBJ150CA | B150A | B150C | 150.0 | 167.00 | 185.00 | 1 | 243.0 | 2.5 | 1 | |
| SMBJ160A | SMBJ160CA | B160A | B160C | 160.0 | 178.00 | 197.00 | 1 | 259.0 | 2.3 | 1 | |
| SMBJ170A | SMBJ170CA | B170A | B170C | 170.0 | 189.00 | 209.00 | 1 | 275.0 | 2.2 | 1 | |
| SMBJ180A | SMBJ180CA | B180A | B180C | 180.0 | 201.00 | 222.00 | 1 | 292.0 | 2.1 | 1 | |
| SMBJ190A | SMBJ190CA | B190A | B190C | 190.0 | 211.00 | 234.00 | 1 | 307.0 | 2.0 | 1 | |
| SMBJ200A | SMBJ200CA | B200A | B200C | 200.0 | 224.00 | 247.00 | 1 | 324.0 | 1.9 | 1 | |
| SMBJ210A | SMBJ210CA | B210A | B210C | 210 | 233.00 | 258.00 | 1 | 337.0 | 1.8 | 1 | |
| SMBJ220A | SMBJ220CA | B220A | B220C | 220.0 | 246.00 | 272.00 | 1 | 356.0 | 1.7 | 1 | |
| SMBJ250A | SMBJ250CA | B250A | B250C | 250.0 | 279.00 | 309.00 | 1 | 405.0 | 1.5 | 1 | |
| SMBJ300A | SMBJ300CA | B300A | B300C | 300.0 | 335.00 | 371.00 | 1 | 486.0 | 1.2 | 1 | |
| SMBJ350A | SMBJ350CA | B350A | B350C | 350.0 | 391.00 | 432.00 | 1 | 567.0 | 1.1 | 1 | |
| SMBJ400A | SMBJ400CA | B400A | B400C | 400.0 | 447.00 | 494.00 | 1 | 648.0 | 1.0 | 1 | |
| SMBJ440A | SMBJ440CA | B440A | B440C | 440.0 | 492.00 | 543.00 | 1 | 713.0 | 0.9 | 1 | |

## I-V Curve Characteristics




$P_{PPM}$ Peak Pulse Power Dissipation -- Max power dissipation

$V_R$ Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

$V_{BR}$ Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current ($I_T$)

$V_C$ Clamping Voltage -- Peak voltage measured across the TVS at a specified $I_{PPM}$ (peak impulse current)

$I_R$ Reverse Leakage Current -- Current measured at $V_R$

$V_F$ Forward Voltage Drop for Uni-directional

## Ratings and Characteristic Curves (T =25°C unless otherwise noted)

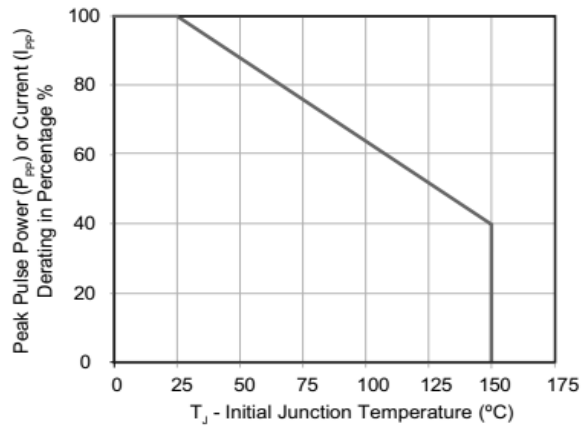



Figure 1. Peak pulse power derating curve

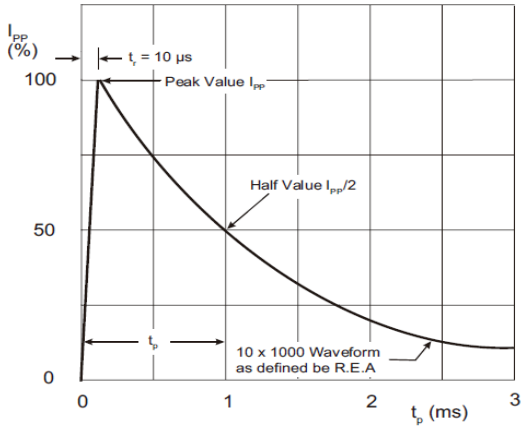



Figure2. Pulse waveform

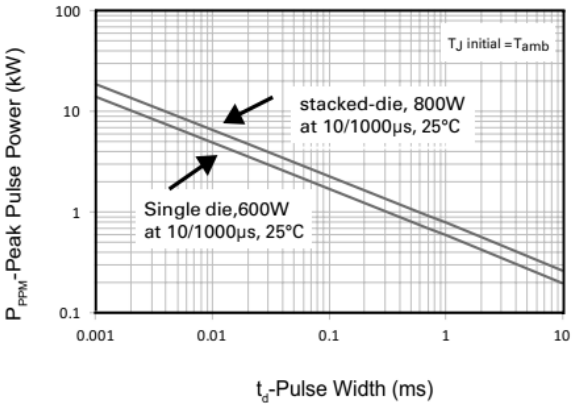



Figure 3. Peak pulse power rating curve

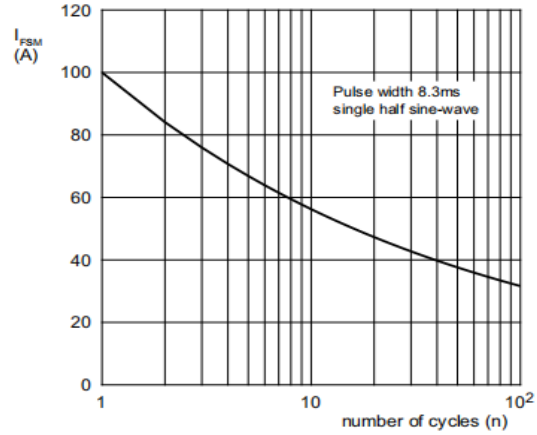
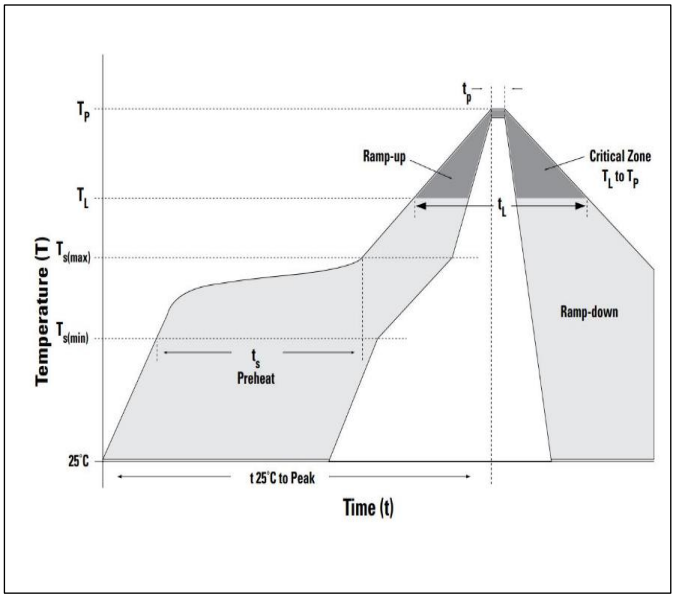



Figure 4. Maximum non-repetitive surge current

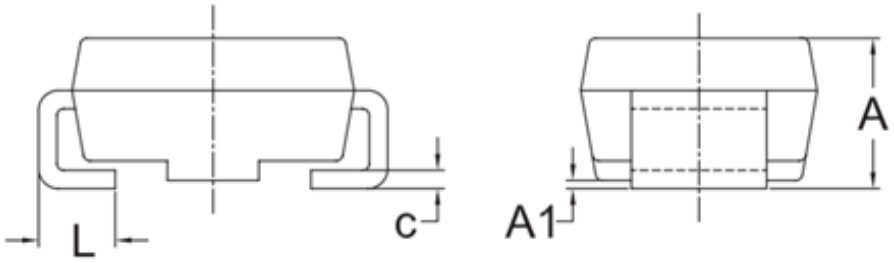
## Soldering Parameters

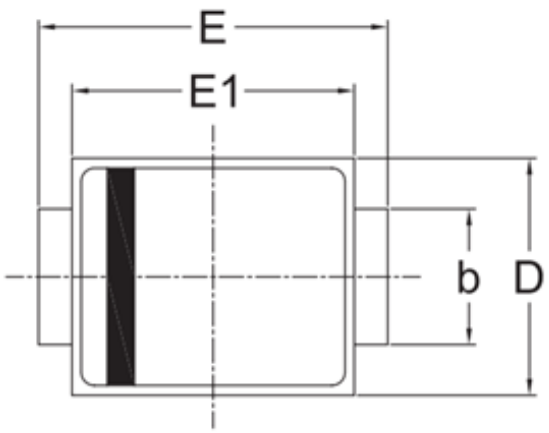
| Reflow Condition | | Lead–free assembly |
|---|---|---|
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (min to max) ($t_s$) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp ($T_A$) to peak | | 3°C/second max |
| $T_{S(max)}$ to $T_A$ - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature ($T_A$) (Liquidus) | 217°C |
| | - Time (min to max) ($t_s$) | 60 – 150 seconds |
| Peak Temperature ($T_P$) | | $260^{+0/-5}$ °C |
| Time within 5°C of actual peak Temperature ($t_p$) | | 20 – 40 seconds |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature ($T_P$) | | 8 minutes Max. |
| Do not exceed | | 260°C |

## Soldering profile



## Dimensions




| unit | | A | A1 | b | c | D | E | E1 | L |
|---|---|---|---|---|---|---|---|---|---|
| mm | max | 2.61 | 0.3 | 2.3 | 0.305 | 3.94 | 5.7 | 4.7 | 1.52 |
| | min | 1.99 | 0.1 | 1.7 | 0.15 | 3.3 | 5.05 | 4.06 | 0.76 |

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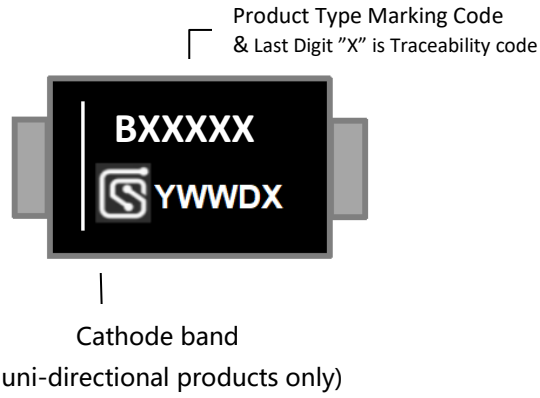
## Part Numbering

SMBJ xx xx

- A: Uni-directional
  CA: Bi-directional
- Reverse Standard off Voltage $V_R$
- Product series

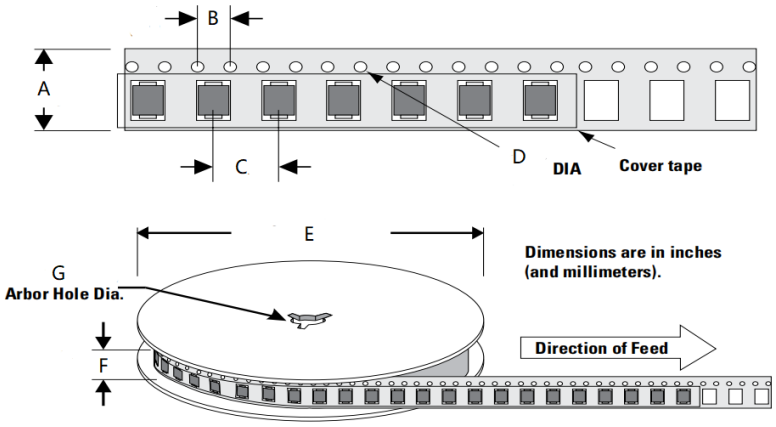
## Part Marking

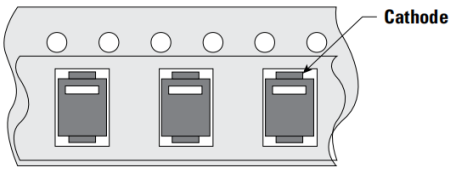



## Packing

| Part number | Package name | Small packing quantity | Packing method |
|---|---|---|---|
| SMBJXXXX | DO-214AA | 3000 | Tape & Reel |

## Tape and Reel Specification




| Symbol | Millimeter |
|---|---|
| A | 12.00±0.10 |
| B | 4.00±0.10 |
| C | 8.00±0.10 |
| D | 1.55±0.05 |
| E | 330.20±2.00 |
| F | 15.70±2.00 |
| G | 13.30±0.30 |

## Revision history of Specification

| Version | Change Items | Effective Date |
|---|---|---|
| 1.0 | Initial Release | 13-Jul-2021 |
| 1.1 | Modified Temperature Range & Details | 16-Aug-2021 |
| 1.2 | Update Package Sizes | 12-Dec-2023 |
| 1.3 | Add Remark For Marking Last Digit | 31-Mar-2024 |
| 1.4 | Update Package Series | 26-May-2025 |