

# SMBJ SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS



## FEATURES

- \* For surface mount application
- \* Built-in strain relief
- \* Excellent clamping capability
- \* Low profile package
- \* Fast response time: Typically less than 1.0ps from 0 volt to BV min.
- \* Typical  $I_R$  less than  $1\mu A$  above 10V
- \* High temperature soldering guaranteed:  $260^\circ C$  / 10 seconds at terminals

## MECHANICAL DATA

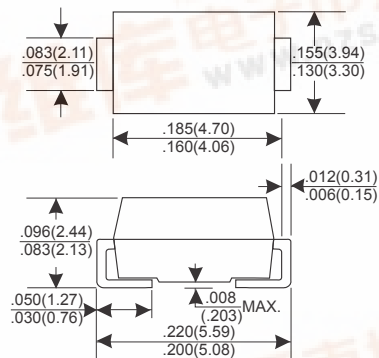
- \* Case: Molded plastic
- \* Epoxy: UL 94V-0 rate flame retardant
- \* Lead: Solderable per MIL-STD-202, method 208 guaranteed
- \* Polarity: Color band denotes cathode end except Bidirectional
- \* Mounting position: Any
- \* Weight: 0.093 grams

## VOLTAGE RANGE

5.0 to 170 Volts

600 Watts Peak Power

DO-214AA(SMB)



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating  $25^\circ C$  ambient temperature unless otherwise specified.  
Single phase half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

| RATINGS                                                                                                      | SYMBOL         | VALUE       | UNITS      |
|--------------------------------------------------------------------------------------------------------------|----------------|-------------|------------|
| Peak Power Dissipation at $T_A=25^\circ C$ , $T_P=1ms$ (NOTE 1)                                              | $P_{PK}$       | Minimum 600 | Watts      |
| Peak Forward Surge Current at 8.3ms Single Half Sine-Wave superimposed on rated load (JEDEC method) (NOTE 3) | $I_{FSM}$      | 100         | Amps       |
| Maximum Instantaneous Forward Voltage at 35.0A for Unidirectional only                                       | $V_F$          | 3.5         | Volts      |
| Operating and Storage Temperature Range                                                                      | $T_J, T_{STG}$ | -55 to +150 | $^\circ C$ |

### NOTES:

1. Non-repetitive current pulse per Fig. 3 and derated above  $T_A=25^\circ C$  per Fig. 2.
2. Mounted on Copper Pad area of  $5.0mm^2$  (.013mm Thick) to each terminal.
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minute maximum.

## DEVICES FOR BIPOLAR APPLICATIONS

1. For Bidirectional use C or CA Suffix for types SMBJ5.0 thru SMBJ170.
2. Electrical characteristics apply in both directions.

## RATING AND CHARACTERISTIC CURVES (SMBJ SERIES)

FIG.1-PEAK PULSE POWER DERATING CURVE

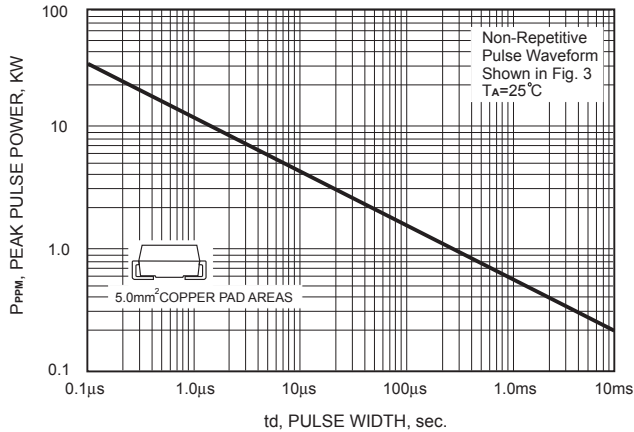


FIG.2-PULSE DERATING CURVE

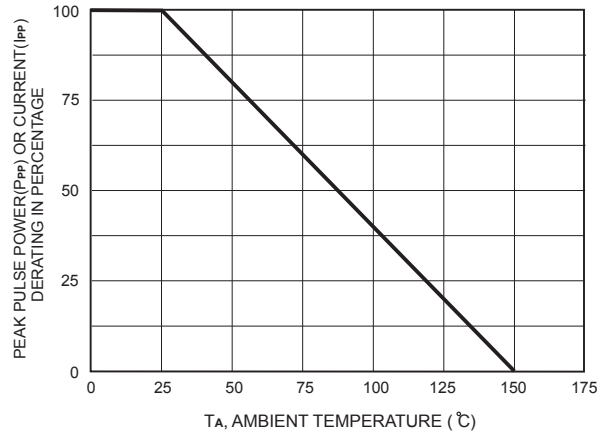


FIG.3-PULSE WAVE FORM

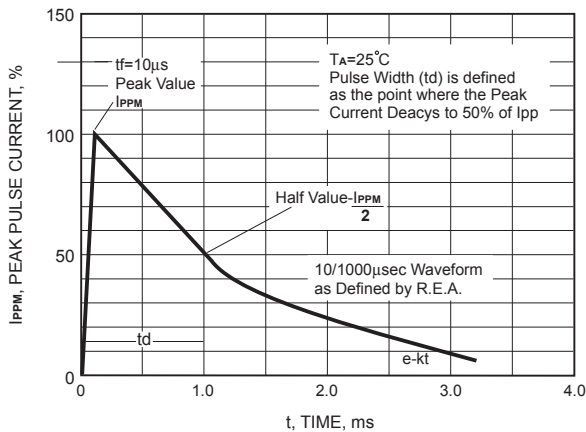


FIG.4-TYPICAL JUNCTION CAPACITANCE

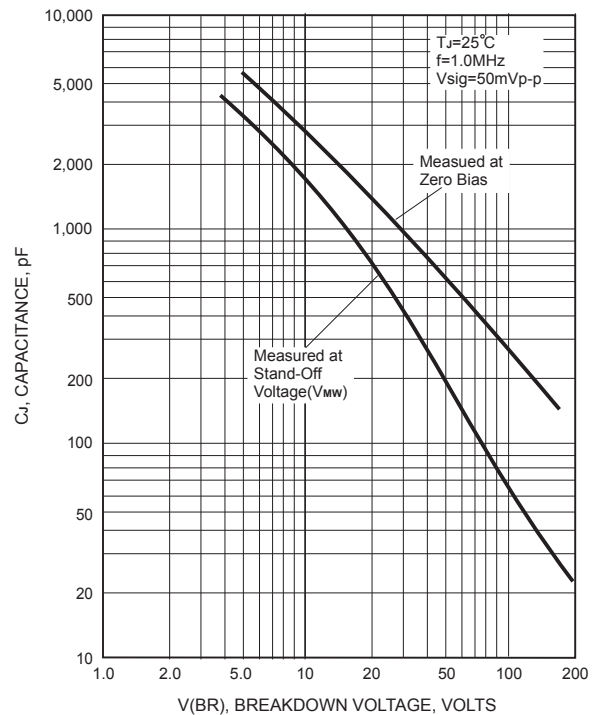
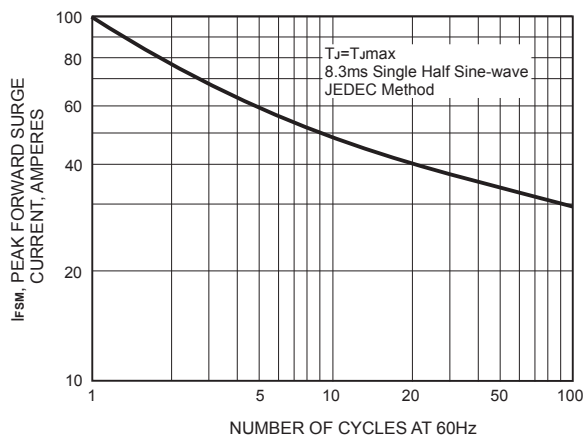


FIG.5-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT



## 600 Watt Surface Mount TVS

| PART NUMBER<br>ADD C FOR BI-DIRECTIONAL | REVERSE<br>STAND-OFF<br>VOLTAGE<br>VRWM (V) | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MIN. @IT | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MAX. @IT | TEST<br>CURRENT<br>IT<br>(mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@Ipp Vc (V) | PEAK<br>PULSE<br>CURRENT<br>Ipp (A) | REVERSE<br>LEAKAGE<br>@ VRWM<br>IR(μA) | MARKING<br>CODE |    |
|-----------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------|-----------------------------------------------|-------------------------------------|----------------------------------------|-----------------|----|
|                                         |                                             |                                             |                                             |                               |                                               |                                     |                                        | UNI             | BI |
| See Note 1                              |                                             |                                             |                                             |                               |                                               |                                     |                                        |                 |    |
| SMBJ5.0(C)                              | 5.0                                         | 6.40                                        | 7.55                                        | 10                            | 9.6                                           | 62.5                                | 800                                    | KD              | AD |
| SMBJ5.0(C)A                             | 5.0                                         | 6.40                                        | 7.25                                        | 10                            | 9.2                                           | 65.2                                | 800                                    | KE              | AE |
| SMBJ6.0(C)                              | 6.0                                         | 6.67                                        | 8.45                                        | 10                            | 11.4                                          | 52.6                                | 800                                    | KF              | AF |
| SMBJ6.0(C)A                             | 6.0                                         | 6.67                                        | 7.67                                        | 10                            | 10.3                                          | 58.3                                | 800                                    | KG              | AD |
| SMBJ6.5(C)                              | 6.5                                         | 7.22                                        | 9.14                                        | 10                            | 12.3                                          | 48.7                                | 500                                    | KH              | AH |
| SMBJ6.5(C)A                             | 6.5                                         | 7.22                                        | 8.30                                        | 10                            | 11.2                                          | 53.6                                | 500                                    | KK              | AK |
| SMBJ7.0(C)                              | 7.0                                         | 7.78                                        | 9.86                                        | 10                            | 13.3                                          | 45.1                                | 200                                    | KL              | AL |
| SMBJ7.0(C)A                             | 7.0                                         | 7.78                                        | 8.95                                        | 10                            | 12.0                                          | 50.0                                | 200                                    | KM              | AM |
| SMBJ7.5(C)                              | 7.5                                         | 8.33                                        | 10.67                                       | 1                             | 14.3                                          | 42.0                                | 100                                    | KN              | AN |
| SMBJ7.5(C)A                             | 7.5                                         | 8.33                                        | 9.58                                        | 1                             | 12.9                                          | 46.5                                | 100                                    | KP              | AP |
| SMBJ8.0(C)                              | 8.0                                         | 8.89                                        | 11.30                                       | 1                             | 15.0                                          | 40.0                                | 50                                     | KQ              | AQ |
| SMBJ8.0(C)A                             | 8.0                                         | 8.89                                        | 10.23                                       | 1                             | 13.6                                          | 44.1                                | 50                                     | KR              | AR |
| SMBJ8.5(C)                              | 8.5                                         | 9.44                                        | 11.92                                       | 1                             | 15.9                                          | 37.7                                | 10                                     | KS              | AS |
| SMBJ8.5(C)A                             | 8.5                                         | 9.44                                        | 10.82                                       | 1                             | 14.4                                          | 41.7                                | 10                                     | KT              | AT |
| SMBJ9.0(C)                              | 9.0                                         | 10.0                                        | 12.60                                       | 1                             | 16.9                                          | 35.5                                | 5                                      | KU              | AU |
| SMBJ9.0(C)A                             | 9.0                                         | 10.0                                        | 11.50                                       | 1                             | 15.4                                          | 39.0                                | 5                                      | KV              | AV |
| SMBJ10(C)                               | 10                                          | 11.1                                        | 14.10                                       | 1                             | 18.8                                          | 31.9                                | 5                                      | KW              | AW |
| SMBJ10(C)A                              | 10                                          | 11.1                                        | 12.80                                       | 1                             | 17.0                                          | 35.3                                | 5                                      | KX              | AX |
| SMBJ11(C)                               | 11                                          | 12.2                                        | 15.40                                       | 1                             | 20.1                                          | 29.9                                | 5                                      | KY              | AY |
| SMBJ11(C)A                              | 11                                          | 12.2                                        | 14.00                                       | 1                             | 18.2                                          | 33.0                                | 5                                      | KZ              | AZ |
| SMBJ12(C)                               | 12                                          | 13.3                                        | 16.90                                       | 1                             | 22.0                                          | 27.3                                | 5                                      | LD              | BD |
| SMBJ12(C)A                              | 12                                          | 13.3                                        | 15.30                                       | 1                             | 19.9                                          | 30.2                                | 5                                      | LE              | BE |
| SMBJ13(C)                               | 13                                          | 14.4                                        | 18.20                                       | 1                             | 23.8                                          | 25.2                                | 5                                      | LF              | BF |
| SMBJ13(C)A                              | 13                                          | 14.4                                        | 16.50                                       | 1                             | 21.5                                          | 27.9                                | 5                                      | LG              | BG |
| SMBJ14(C)                               | 14                                          | 15.6                                        | 19.80                                       | 1                             | 25.8                                          | 23.3                                | 5                                      | LH              | BH |
| SMBJ14(C)A                              | 14                                          | 15.6                                        | 17.90                                       | 1                             | 23.2                                          | 25.8                                | 5                                      | LK              | BK |
| SMBJ15(C)                               | 15                                          | 16.7                                        | 21.10                                       | 1                             | 26.9                                          | 22.3                                | 5                                      | LL              | BL |
| SMBJ15(C)A                              | 15                                          | 16.7                                        | 19.20                                       | 1                             | 24.4                                          | 24.0                                | 5                                      | LM              | BM |
| SMBJ16(C)                               | 16                                          | 17.8                                        | 22.60                                       | 1                             | 28.8                                          | 20.8                                | 5                                      | LN              | BN |
| SMBJ16(C)A                              | 16                                          | 17.8                                        | 20.50                                       | 1                             | 26.0                                          | 23.1                                | 5                                      | LP              | BP |
| SMBJ17(C)                               | 17                                          | 18.9                                        | 23.90                                       | 1                             | 30.5                                          | 19.7                                | 5                                      | LQ              | BQ |
| SMBJ17(C)A                              | 17                                          | 18.9                                        | 21.70                                       | 1                             | 27.6                                          | 21.7                                | 5                                      | LR              | BR |
| SMBJ18(C)                               | 18                                          | 20.0                                        | 25.30                                       | 1                             | 32.2                                          | 18.6                                | 5                                      | LS              | BS |
| SMBJ18(C)A                              | 18                                          | 20.0                                        | 23.30                                       | 1                             | 29.2                                          | 20.5                                | 5                                      | LT              | BT |
| SMBJ20(C)                               | 20                                          | 22.2                                        | 28.10                                       | 1                             | 35.8                                          | 16.7                                | 5                                      | LU              | BU |
| SMBJ20(C)A                              | 20                                          | 22.2                                        | 25.50                                       | 1                             | 32.4                                          | 18.5                                | 5                                      | LV              | BV |
| SMBJ22(C)                               | 22                                          | 24.4                                        | 30.90                                       | 1                             | 39.4                                          | 15.2                                | 5                                      | LW              | BW |
| SMBJ22(C)A                              | 22                                          | 24.4                                        | 28.00                                       | 1                             | 35.5                                          | 16.9                                | 5                                      | LX              | BX |
| SMBJ24(C)                               | 24                                          | 26.7                                        | 33.80                                       | 1                             | 43.0                                          | 14.0                                | 5                                      | LY              | BY |
| SMBJ24(C)A                              | 24                                          | 26.7                                        | 30.70                                       | 1                             | 38.9                                          | 15.4                                | 5                                      | LZ              | BZ |
| SMBJ26(C)                               | 26                                          | 28.9                                        | 36.60                                       | 1                             | 46.6                                          | 12.4                                | 5                                      | MD              | CD |
| SMBJ26(C)A                              | 26                                          | 28.9                                        | 33.20                                       | 1                             | 42.1                                          | 14.2                                | 5                                      | ME              | CE |
| SMBJ28(C)                               | 28                                          | 31.1                                        | 39.40                                       | 1                             | 50.0                                          | 12.0                                | 5                                      | MF              | CF |
| SMBJ28(C)A                              | 28                                          | 31.1                                        | 35.80                                       | 1                             | 45.4                                          | 13.2                                | 5                                      | MG              | CG |
| SMBJ30(C)                               | 30                                          | 33.3                                        | 42.20                                       | 1                             | 53.5                                          | 11.2                                | 5                                      | MH              | CH |
| SMBJ30(C)A                              | 30                                          | 33.3                                        | 38.30                                       | 1                             | 48.4                                          | 12.4                                | 5                                      | MK              | CK |
| SMBJ33(C)                               | 33                                          | 36.7                                        | 46.50                                       | 1                             | 59.0                                          | 10.2                                | 5                                      | ML              | CL |
| SMBJ33(C)A                              | 33                                          | 36.7                                        | 42.20                                       | 1                             | 53.3                                          | 11.3                                | 5                                      | MM              | CM |
| SMBJ36(C)                               | 36                                          | 40.0                                        | 50.70                                       | 1                             | 64.3                                          | 9.3                                 | 5                                      | MN              | CN |
| SMBJ36(C)A                              | 36                                          | 40.0                                        | 46.00                                       | 1                             | 58.1                                          | 10.3                                | 5                                      | MP              | CP |
| SMBJ40(C)                               | 40                                          | 44.4                                        | 56.30                                       | 1                             | 71.4                                          | 8.4                                 | 5                                      | MQ              | CQ |
| SMBJ40(C)A                              | 40                                          | 44.4                                        | 51.10                                       | 1                             | 64.5                                          | 9.3                                 | 5                                      | MR              | CR |
| SMBJ43(C)                               | 43                                          | 47.8                                        | 60.50                                       | 1                             | 76.7                                          | 7.8                                 | 5                                      | MS              | CS |
| SMBJ43(C)A                              | 43                                          | 47.8                                        | 54.90                                       | 1                             | 69.4                                          | 8.6                                 | 5                                      | MT              | CT |
| SMBJ45(C)                               | 45                                          | 50.0                                        | 63.30                                       | 1                             | 80.3                                          | 7.5                                 | 5                                      | MU              | CU |
| SMBJ45(C)A                              | 45                                          | 50.0                                        | 57.50                                       | 1                             | 72.7                                          | 8.3                                 | 5                                      | MV              | CV |
| SMBJ48(C)                               | 48                                          | 53.3                                        | 67.50                                       | 1                             | 85.5                                          | 7.0                                 | 5                                      | MW              | CW |
| SMBJ48(C)A                              | 48                                          | 53.3                                        | 61.30                                       | 1                             | 77.4                                          | 7.7                                 | 5                                      | MX              | CX |
| SMBJ51(C)                               | 51                                          | 56.7                                        | 71.80                                       | 1                             | 91.1                                          | 6.6                                 | 5                                      | MY              | CY |
| SMBJ51(C)A                              | 51                                          | 56.7                                        | 65.20                                       | 1                             | 82.4                                          | 7.3                                 | 5                                      | MZ              | CZ |
| SMBJ54(C)                               | 54                                          | 60.0                                        | 76.00                                       | 1                             | 96.3                                          | 6.2                                 | 5                                      | ND              | DD |
| SMBJ54(C)A                              | 54                                          | 60.0                                        | 69.00                                       | 1                             | 87.1                                          | 6.9                                 | 5                                      | NE              | DE |
| SMBJ58(C)                               | 58                                          | 64.4                                        | 81.60                                       | 1                             | 103                                           | 5.8                                 | 5                                      | NF              | DF |
| SMBJ58(C)A                              | 58                                          | 64.4                                        | 74.10                                       | 1                             | 93.6                                          | 6.4                                 | 5                                      | NG              | DG |

## 600 Watt Surface Mount TVS

| PART NUMBER<br>ADD C FOR BI-DIRECTIONAL<br>See Note 1 | REVERSE<br>STAND-OFF<br>VOLTAGE<br>VRWM (V) | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MIN. @IT | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MAX. @IT | TEST<br>CURRENT<br>IT<br>(mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@Ipp Vc (V) | PEAK<br>PULSE<br>CURRENT<br>Ipp (A) | REVERSE<br>LEAKAGE<br>@ VRWM<br>IR(μA) | MARKING<br>CODE |    |
|-------------------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------|-----------------------------------------------|-------------------------------------|----------------------------------------|-----------------|----|
|                                                       |                                             |                                             |                                             |                               |                                               |                                     |                                        | UNI             | BI |
| SMBJ60(C)                                             | 60                                          | 66.7                                        | 84.5                                        | 1                             | 107                                           | 5.6                                 | 5                                      | NH              | DH |
| SMBJ60(C)A                                            | 60                                          | 66.7                                        | 76.7                                        | 1                             | 96.8                                          | 6.2                                 | 5                                      | NK              | DK |
| SMBJ64(C)                                             | 64                                          | 71.1                                        | 90.1                                        | 1                             | 114                                           | 5.3                                 | 5                                      | NL              | DL |
| SMBJ64(C)A                                            | 64                                          | 71.1                                        | 81.8                                        | 1                             | 103                                           | 5.8                                 | 5                                      | NM              | DM |
| SMBJ70(C)                                             | 70                                          | 77.8                                        | 98.6                                        | 1                             | 125                                           | 4.8                                 | 5                                      | NN              | DN |
| SMBJ70(C)A                                            | 70                                          | 77.8                                        | 89.5                                        | 1                             | 113                                           | 5.3                                 | 5                                      | NP              | DP |
| SMBJ75(C)                                             | 75                                          | 83.3                                        | 105.7                                       | 1                             | 134                                           | 4.5                                 | 5                                      | NQ              | DQ |
| SMBJ75(C)A                                            | 75                                          | 83.3                                        | 95.8                                        | 1                             | 121                                           | 4.9                                 | 5                                      | NR              | DR |
| SMBJ78(C)                                             | 78                                          | 86.7                                        | 109.8                                       | 1                             | 139                                           | 4.3                                 | 5                                      | NS              | DS |
| SMBJ78(C)A                                            | 78                                          | 86.7                                        | 99.7                                        | 1                             | 126                                           | 4.7                                 | 5                                      | NT              | DT |
| SMBJ85(C)                                             | 85                                          | 94.4                                        | 119.2                                       | 1                             | 151                                           | 3.9                                 | 5                                      | NU              | DU |
| SMBJ85(C)A                                            | 85                                          | 94.4                                        | 108.2                                       | 1                             | 137                                           | 4.4                                 | 5                                      | NV              | DV |
| SMBJ90(C)                                             | 90                                          | 100                                         | 126.5                                       | 1                             | 160                                           | 3.8                                 | 5                                      | NW              | DW |
| SMBJ90(C)A                                            | 90                                          | 100                                         | 115.5                                       | 1                             | 146                                           | 4.1                                 | 5                                      | NX              | DX |
| SMBJ100(C)                                            | 100                                         | 111                                         | 141.0                                       | 1                             | 179                                           | 3.4                                 | 5                                      | NY              | DY |
| SMBJ100(C)A                                           | 100                                         | 111                                         | 128.0                                       | 1                             | 162                                           | 3.7                                 | 5                                      | NZ              | DZ |
| SMBJ110(C)                                            | 110                                         | 122                                         | 154.5                                       | 1                             | 196                                           | 3.0                                 | 5                                      | PD              | ED |
| SMBJ110(C)A                                           | 110                                         | 122                                         | 140.5                                       | 1                             | 177                                           | 3.4                                 | 5                                      | PE              | EE |
| SMBJ120(C)                                            | 120                                         | 133                                         | 169.0                                       | 1                             | 214                                           | 2.8                                 | 5                                      | PF              | EF |
| SMBJ120(C)A                                           | 120                                         | 133                                         | 153.0                                       | 1                             | 193                                           | 3.1                                 | 5                                      | PG              | EG |
| SMBJ130(C)                                            | 130                                         | 144                                         | 182.5                                       | 1                             | 231                                           | 2.6                                 | 5                                      | PH              | EH |
| SMBJ130(C)A                                           | 130                                         | 144                                         | 165.5                                       | 1                             | 209                                           | 2.9                                 | 5                                      | PK              | EK |
| SMBJ150(C)                                            | 150                                         | 167                                         | 211.5                                       | 1                             | 268                                           | 2.2                                 | 5                                      | PL              | EL |
| SMBJ150(C)A                                           | 150                                         | 167                                         | 192.5                                       | 1                             | 243                                           | 2.5                                 | 5                                      | PM              | EM |
| SMBJ160(C)                                            | 160                                         | 178                                         | 226.0                                       | 1                             | 287                                           | 2.1                                 | 5                                      | PN              | EN |
| SMBJ160(C)A                                           | 160                                         | 178                                         | 205.0                                       | 1                             | 259                                           | 2.3                                 | 5                                      | PP              | EP |
| SMBJ170(C)                                            | 160                                         | 189                                         | 239.5                                       | 1                             | 304                                           | 2.0                                 | 5                                      | PQ              | EQ |
| SMBJ170(C)A                                           | 170                                         | 189                                         | 217.5                                       | 1                             | 275                                           | 2.2                                 | 5                                      | PR              | ER |