

SMBJ 5.0 - 170A

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

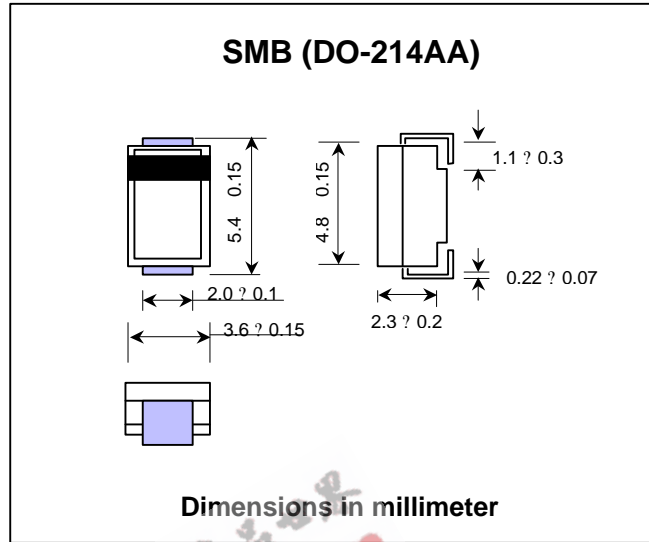
VBR : 6.8 - 200 Volts
PPK : 600 Watts

FEATURES :

- * 600W surge capability at 1ms
- * Excellent clamping capability
- * Low inductance
- * Response Time Typically < 1ns
- * Typical I_R less then $1\mu A$ above 10V

MECHANICAL DATA

- * Case : SMB Molded plastic
- * Epoxy : UL94V-O rate flame retardant
- * Lead : Lead Formed for Surface Mount
- * Polarity : Color band denotes cathode end
- * Mounting position : Any
- * Weight : 0.108 gram



MAXIMUM RATINGS

Rating at $T_a = 25\text{ }^\circ\text{C}$ ambient temperature unless otherwise specified.

| Rating | Symbol | Value | Units |
|--|-----------------------------------|---------------|------------------|
| Peak Pulse Power Dissipation on 10/1000 μs (1) waveform (Notes 1, 2, Fig. 3) | PPPM | Minimum 600 | Watts |
| Peak Pulse Current on 10/1000 μs waveform (Note 1, Fig. 5) | IPPM | See Table | Amps |
| Peak forward Surge Current 8.3 ms single half sine-wave superimposed on rated load (JEDEC Method)(Notes 2, 3) | | | |
| Maximum Instantaneous Forward Voltage at 50A (Note 3,4) | VFM | See Note 3, 4 | Volts |
| Operating Junction and Storage Temperature Range | T _J , T _{STG} | - 65 to + 150 | $^\circ\text{C}$ |

Note :

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above $T_a = 25\text{ }^\circ\text{C}$ per Fig. 1
- (2) Mounted on 5.0mm² (0.013mm thick) land areas.
- (3) Measured on 8.3ms. Single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minutes maximum.
- (4) $V_F=3.5\text{V}$ for SMBJ5.0 thru SMBJ90 devices and $V_F=5\text{V}$ for SMBJ100 thru SMBJ170 devices.



ELECTRONICS INDUSTRY (USA) CO., LTD.



Certificate Number: Q10561



Certificate Number: E17276

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ELECTRICAL CHARACTERISTICS

Rating at Ta = 25 °C ambient temperature unless otherwise specified

| TYPE | Marking Code | Breakdown Voltage @ I _T (Note 1) | | | Reverse Stand-off Voltage V _{WM} (V) | Maximum Reverse Leakage @ V _{WM} I _R (μA) | Maximum Peak Pulse Surge Current (See Fig. 2) I _{PPM} (A) | Maximum Clamping Voltage @ I _{PPM} V _c (V) |
|----------|--------------|--|-------|------------------------|---|--|---|--|
| | | V _{BR} (V) | | I _T (mA) | | | | |
| | | Min. | Max. | | | | | |
| SMBJ5.0 | 606I | 6.40 | 7.55 | 10 | 5.0 | 800 | 62.5 | 9.6 |
| SMBJ5.0A | 656I | 6.40 | 7.25 | 10 | 5.0 | 800 | 65.2 | 9.2 |
| SMBJ6.0 | 607C | 6.67 | 8.45 | 10 | 6.0 | 800 | 52.6 | 11.4 |
| SMBJ6.0A | 657C | 6.67 | 7.67 | 10 | 6.0 | 800 | 58.3 | 10.3 |
| SMBJ6.5 | 607I | 7.22 | 9.14 | 10 | 6.5 | 500 | 48.7 | 12.3 |
| SMBJ6.5A | 657I | 7.22 | 8.30 | 10 | 6.5 | 500 | 53.6 | 11.2 |
| SMBJ7.0 | 608E | 7.78 | 9.86 | 10 | 7.0 | 200 | 45.1 | 13.3 |
| SMBJ7.0A | 658E | 7.78 | 8.95 | 10 | 7.0 | 200 | 50.0 | 12.0 |
| SMBJ7.5 | 609A | 8.33 | 10.67 | 1.0 | 7.5 | 100 | 42.0 | 14.3 |
| SMBJ7.5A | 659A | 8.33 | 9.58 | 1.0 | 7.5 | 100 | 46.5 | 12.9 |
| SMBJ8.0 | 609G | 8.89 | 11.3 | 1.0 | 8.0 | 50 | 40.0 | 15.0 |
| SMBJ8.0A | 659G | 8.89 | 10.23 | 1.0 | 8.0 | 50 | 44.1 | 13.6 |
| SMBJ8.5 | 6010 | 9.44 | 11.92 | 1.0 | 8.5 | 20 | 37.7 | 15.9 |
| SMBJ8.5A | 6510 | 9.44 | 10.82 | 1.0 | 8.5 | 20 | 41.7 | 14.4 |
| SMBJ9.0 | 6011 | 10.0 | 12.6 | 1.0 | 9.0 | 10 | 35.5 | 16.9 |
| SMBJ9.0A | 6511 | 10.0 | 11.5 | 1.0 | 9.0 | 10 | 39.0 | 15.4 |
| SMBJ10 | 6012 | 11.1 | 14.1 | 1.0 | 10 | 5.0 | 31.9 | 18.8 |
| SMBJ10A | 6512 | 11.1 | 12.8 | 1.0 | 10 | 5.0 | 35.3 | 17.0 |
| SMBJ11 | 6013 | 12.2 | 15.4 | 1.0 | 11 | 5.0 | 29.9 | 20.1 |
| SMBJ11A | 6513 | 12.2 | 14.0 | 1.0 | 11 | 5.0 | 33.0 | 18.2 |
| SMBJ12 | 6014 | 13.3 | 16.9 | 1.0 | 12 | 5.0 | 27.3 | 22.0 |
| SMBJ12A | 6514 | 13.3 | 15.3 | 1.0 | 12 | 5.0 | 30.2 | 19.9 |
| SMBJ13 | 6015 | 14.4 | 18.2 | 1.0 | 13 | 5.0 | 25.2 | 23.8 |
| SMBJ13A | 6515 | 14.4 | 16.5 | 1.0 | 13 | 5.0 | 27.9 | 21.5 |
| SMBJ14 | 6017 | 15.6 | 19.8 | 1.0 | 14 | 5.0 | 23.3 | 25.8 |
| SMBJ14A | 6517 | 15.6 | 17.9 | 1.0 | 14 | 5.0 | 25.8 | 23.2 |
| SMBJ15 | 6018 | 16.7 | 21.1 | 1.0 | 15 | 5.0 | 22.3 | 26.9 |
| SMBJ15A | 6518 | 16.7 | 19.2 | 1.0 | 15 | 5.0 | 24.0 | 24.4 |
| SMBJ16 | 6019 | 17.8 | 22.6 | 1.0 | 16 | 5.0 | 20.8 | 28.8 |
| SMBJ16A | 6519 | 17.8 | 20.5 | 1.0 | 16 | 5.0 | 23.1 | 26.0 |
| SMBJ17 | 6020 | 18.9 | 23.9 | 1.0 | 17 | 5.0 | 19.7 | 30.5 |
| SMBJ17A | 6520 | 18.9 | 21.7 | 1.0 | 17 | 5.0 | 21.7 | 27.6 |
| SMBJ18 | 6022 | 20.0 | 25.3 | 1.0 | 18 | 5.0 | 18.6 | 32.2 |
| SMBJ18A | 6522 | 20.0 | 23.3 | 1.0 | 18 | 5.0 | 20.5 | 29.2 |
| SMBJ20 | 6024 | 22.2 | 28.1 | 1.0 | 20 | 5.0 | 16.7 | 35.8 |
| SMBJ20A | 6524 | 22.2 | 25.5 | 1.0 | 20 | 5.0 | 18.5 | 32.4 |
| SMBJ22 | 6026 | 24.4 | 30.9 | 1.0 | 22 | 5.0 | 15.2 | 39.4 |
| SMBJ22A | 6526 | 24.4 | 28.0 | 1.0 | 22 | 5.0 | 16.9 | 35.5 |
| SMBJ24 | 6029 | 26.7 | 33.8 | 1.0 | 24 | 5.0 | 14.0 | 43.0 |
| SMBJ24A | 6529 | 26.7 | 30.7 | 1.0 | 24 | 5.0 | 15.4 | 38.9 |
| SMBJ26 | 6031 | 28.9 | 36.6 | 1.0 | 26 | 5.0 | 12.4 | 46.6 |
| SMBJ26A | 6531 | 28.9 | 33.2 | 1.0 | 26 | 5.0 | 14.2 | 42.1 |
| SMBJ28 | 6033 | 31.1 | 39.4 | 1.0 | 28 | 5.0 | 12.0 | 50.0 |
| SMBJ28A | 6533 | 31.1 | 35.8 | 1.0 | 28 | 5.0 | 13.2 | 45.4 |
| SMBJ30 | 6036 | 33.3 | 42.2 | 1.0 | 30 | 5.0 | 11.2 | 53.5 |
| SMBJ30A | 6536 | 33.1 | 38.3 | 1.0 | 30 | 5.0 | 12.4 | 46.6 |

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| TYPE | Marking Code | Breakdown Voltage @ I_T (Note 1) | | I_T (mA) | Reverse Stand-off Voltage V_{WM} (V) | Maximum Reverse Leakage @ V_{WM} I_R (μ A) | Maximum Peak Pulse Surge Current (See Fig. 2) I_{PPM} (A) | Maximum Clamping Voltage @ I_{PPM} V_C (V) |
|----------|--------------|---|-------|---------------|--|--|--|--|
| | | V_{BR} (V) | | | | | | |
| | | Min. | Max. | | | | | |
| SMBJ33 | 6040 | 36.7 | 46.5 | 1.0 | 33 | 5.0 | 10.2 | 59.0 |
| SMBJ33A | 6540 | 36.7 | 42.2 | 1.0 | 33 | 5.0 | 11.3 | 53.3 |
| SMBJ36 | 6043 | 40.0 | 50.7 | 1.0 | 36 | 5.0 | 9.3 | 64.3 |
| SMBJ36A | 6543 | 40.0 | 46.0 | 1.0 | 36 | 5.0 | 10.3 | 58.1 |
| SMBJ40 | 6048 | 44.4 | 56.3 | 1.0 | 40 | 5.0 | 8.4 | 71.4 |
| SMBJ40A | 6548 | 44.4 | 51.1 | 1.0 | 40 | 5.0 | 9.3 | 64.5 |
| SMBJ43 | 6051 | 47.8 | 60.5 | 1.0 | 43 | 5.0 | 7.8 | 76.7 |
| SMBJ43A | 6551 | 47.8 | 54.9 | 1.0 | 43 | 5.0 | 8.6 | 69.4 |
| SMBJ45 | 6054 | 50.0 | 63.3 | 1.0 | 45 | 5.0 | 7.5 | 80.3 |
| SMBJ45A | 6554 | 50.0 | 57.5 | 1.0 | 45 | 5.0 | 8.3 | 72.7 |
| SMBJ48 | 6057 | 53.3 | 67.5 | 1.0 | 48 | 5.0 | 7.0 | 85.5 |
| SMBJ48A | 6557 | 53.3 | 61.3 | 1.0 | 48 | 5.0 | 7.7 | 77.4 |
| SMBJ51 | 6061 | 56.7 | 71.8 | 1.0 | 51 | 5.0 | 6.6 | 91.1 |
| SMBJ51A | 6561 | 56.7 | 65.2 | 1.0 | 51 | 5.0 | 7.3 | 82.4 |
| SMBJ54 | 6065 | 60.0 | 76.0 | 1.0 | 54 | 5.0 | 6.2 | 96.3 |
| SMBJ54A | 6565 | 60.0 | 69.0 | 1.0 | 54 | 5.0 | 6.9 | 87.1 |
| SMBJ58 | 6070 | 64.4 | 81.6 | 1.0 | 58 | 5.0 | 5.8 | 103.0 |
| SMBJ58A | 6570 | 64.4 | 74.1 | 1.0 | 58 | 5.0 | 6.4 | 93.6 |
| SMBJ60 | 6072 | 66.7 | 84.5 | 1.0 | 60 | 5.0 | 5.6 | 107 |
| SMBJ60A | 6572 | 66.7 | 76.7 | 1.0 | 60 | 5.0 | 6.2 | 96.8 |
| SMBJ64 | 6076 | 71.1 | 90.1 | 1.0 | 64 | 5.0 | 5.3 | 114 |
| SMBJ64A | 6576 | 71.1 | 81.8 | 1.0 | 64 | 5.0 | 5.8 | 103 |
| SMBJ70 | 6084 | 77.8 | 98.6 | 1.0 | 70 | 5.0 | 4.8 | 125 |
| SMBJ70A | 6584 | 77.8 | 89.5 | 1.0 | 70 | 5.0 | 5.3 | 113 |
| SMBJ75 | 6090 | 83.3 | 105.7 | 1.0 | 75 | 5.0 | 4.5 | 134 |
| SMBJ75A | 6590 | 83.3 | 95.8 | 1.0 | 75 | 5.0 | 4.9 | 121 |
| SMBJ78 | 6093 | 86.7 | 109.8 | 1.0 | 78 | 5.0 | 4.3 | 139 |
| SMBJ78A | 6593 | 86.7 | 99.7 | 1.0 | 78 | 5.0 | 4.7 | 126 |
| SMBJ85 | 60B0 | 94.4 | 119.2 | 1.0 | 85 | 5.0 | 3.9 | 151 |
| SMBJ85A | 65B0 | 94.4 | 108.2 | 1.0 | 85 | 5.0 | 4.4 | 137 |
| SMBJ90 | 60B1 | 100 | 126.5 | 1.0 | 90 | 5.0 | 3.8 | 160 |
| SMBJ90A | 65B1 | 100 | 115.5 | 1.0 | 90 | 5.0 | 4.1 | 146 |
| SMBJ100 | 60B2 | 111 | 141.0 | 1.0 | 100 | 5.0 | 3.4 | 179 |
| SMBJ100A | 65B2 | 111 | 128.0 | 1.0 | 100 | 5.0 | 3.7 | 162 |
| SMBJ110 | 60B3 | 122 | 154.5 | 1.0 | 110 | 5.0 | 3.0 | 196 |
| SMBJ110A | 65B3 | 122 | 140.5 | 1.0 | 110 | 5.0 | 3.4 | 177 |
| SMBJ120 | 60B4 | 133 | 169.0 | 1.0 | 120 | 5.0 | 2.8 | 214 |
| SMBJ120A | 65B4 | 133 | 153.0 | 1.0 | 120 | 5.0 | 3.1 | 193 |
| SMBJ130 | 60B5 | 144 | 182.5 | 1.0 | 130 | 5.0 | 2.6 | 231 |
| SMBJ130A | 65B5 | 144 | 165.5 | 1.0 | 130 | 5.0 | 2.9 | 209 |
| SMBJ150 | 60B8 | 167 | 211.5 | 1.0 | 150 | 5.0 | 2.2 | 268 |
| SMBJ150A | 65B8 | 167 | 192.5 | 1.0 | 150 | 5.0 | 2.5 | 243 |
| SMBJ160 | 60B9 | 178 | 226.0 | 1.0 | 160 | 5.0 | 2.1 | 287 |
| SMBJ160A | 65B9 | 178 | 205.0 | 1.0 | 160 | 5.0 | 2.3 | 259 |
| SMBJ170 | 60D0 | 189 | 239.5 | 1.0 | 170 | 5.0 | 2.0 | 304 |
| SMBJ170A | 65D0 | 189 | 217.5 | 1.0 | 170 | 5.0 | 2.2 | 275 |

Note:

- (1) V_{BR} measured after I_T applied for 300 μ s., I_T = square wave pulse or equivalent.
- (2) Surge Current Waveform per Figure 5 and Derate per Figure 1
- (3) A Transient suppressor is normally selected according to the reverse " Stand-off Voltage " (V_{WM}) which should be equal to or greater then the D.C. or continuous peak operating voltage level.

RATING AND CHARACTERISTIC CURVES (SMBJ5.0 - SMBJ170A)

FIG.1 - PULSE DERATING CURVE

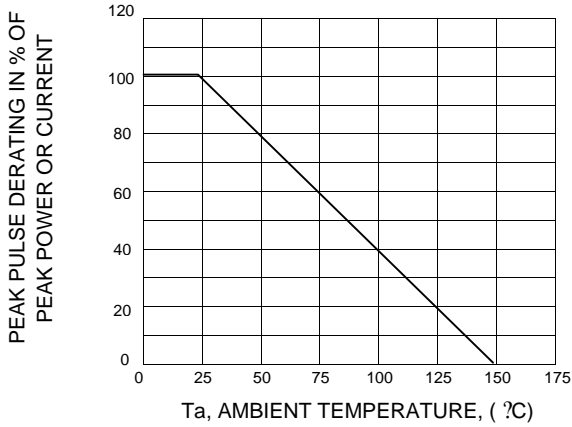


FIG.2 - MAXIMUM NON-REPETITIVE PERK FORWARD SURGE CURRENT

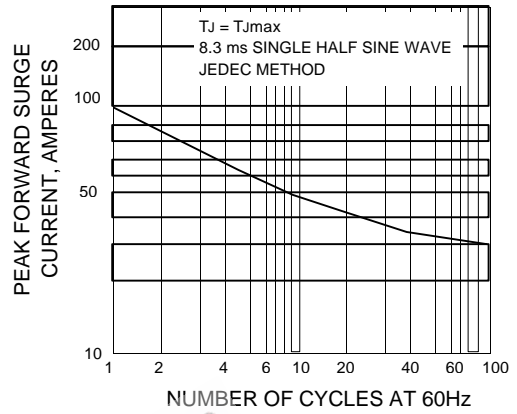


FIG.3 - TYPICAL JUNCTION CAPACITANCE

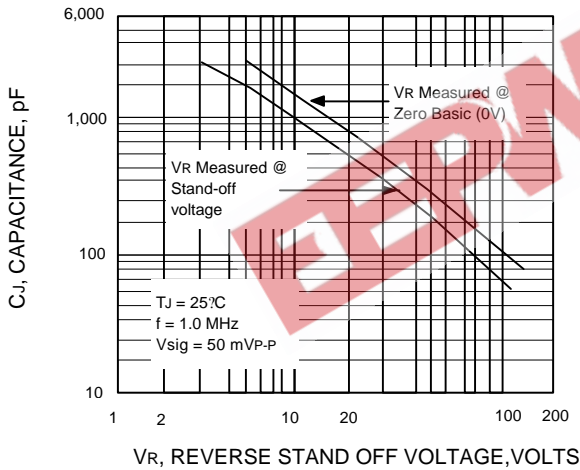


FIG.4 - PEAK PULSE POWER RATING CURVE

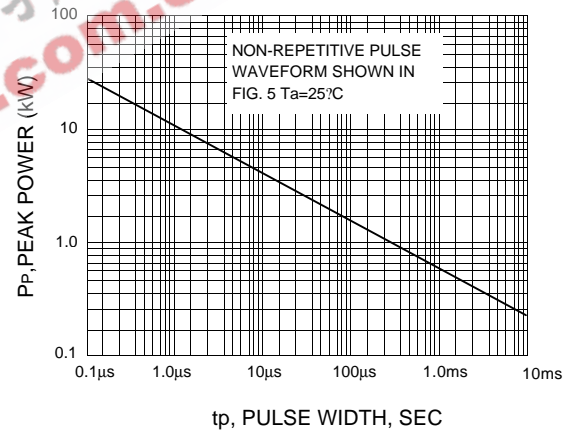


FIG.5 - PULSE WAVEFORM

