

# SMBJ5.0-SMBJ440

Surface mount transient voltage suppressor power 600 watts

Stand-Off Voltage : 5.0V~440V

## FEATURES

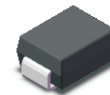
- For surface mounted applications in order to optimize board space.
- Low profile package
- Glass passivated junction
- Low inductance
- Plastic package has Underwriters Laboratory Flammability

## MECHANICAL DATA

- Case: SMB
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.055g / 0.002oz

## PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | Cathode     |
| 2   | Anode       |



Simplified outline SMB and symbol

## Maximum Ratings and Electrical characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

| Parameter                                                                                                         | Symbol                                     | Value                | Unit |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------|------|
| Peak Pulse Power Dissipation on 10/1000 s waveform (Note1,Note2, Fig.1).                                          | $P_{PPM}$                                  | 600                  | W    |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 3, Fig4). | $I_{FSM}$<br>(UNI)                         | 100                  | A    |
| Peak Pulse Current on 10/1000 us waveform (Note 1, Fig 3)                                                         | $I_{PPM}$                                  | see Table 1          | A    |
| Typical Junction capacitance at VR=4V, f=1MHz                                                                     | $C_J$                                      | 390                  | pF   |
| ESD Voltage per IEC6100-4-2                                                                                       | Contact<br>Air<br>$V_{ESD1}$<br>$V_{ESD2}$ | $\pm 30$<br>$\pm 30$ | kV   |
| Typical Thermal Resistance Junction to Ambient(Note 2)                                                            | $R_{\theta JA}$                            | 100                  | °C/W |
| Operating Junction Temperature and Storage Temperature Range                                                      | $T_j, T_{stg}$                             | -65 ~ +150           | °C   |

## NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2.
2. Mounted on 5 mm<sup>2</sup> (0.13mm thick) land areas.
3. Measured on 8.3ms, single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
4. Peak pulse power waveform is 10/1000μS.

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Characteristics at Ta = 25°C

| Type     |           | Reverse Stand-off Voltage | Breakdown Voltage                |      | Test Current   | Maximum         | Max. Clamp Voltage               | Peak Pulse Current | Package              |    |
|----------|-----------|---------------------------|----------------------------------|------|----------------|-----------------|----------------------------------|--------------------|----------------------|----|
|          |           |                           | V <sub>BR</sub> @ I <sub>T</sub> |      |                |                 |                                  |                    | SMB                  |    |
|          |           | V <sub>RMW</sub>          | Min                              | Max  | I <sub>T</sub> | Reverse Leakage | V <sub>C</sub> @ I <sub>PP</sub> | I <sub>PP</sub>    | Device Marking Ccode |    |
| UNI      | BI        | V                         | V                                | V    | mA             | μA              | V                                | A                  | UNI                  | BI |
| SMBJ5.0A | SMBJ5.0CA | 5                         | 6.4                              | 7    | 10             | 800             | 9.2                              | 65.3               | KE                   | AE |
| SMBJ6.0A | SMBJ6.0CA | 6                         | 6.67                             | 7.37 | 10             | 800             | 10.3                             | 58.3               | KG                   | AG |
| SMBJ6.5A | SMBJ6.5CA | 6.5                       | 7.22                             | 7.98 | 10             | 500             | 11.2                             | 53.6               | KK                   | AK |
| SMBJ7.0A | SMBJ7.0CA | 7                         | 7.78                             | 8.6  | 10             | 200             | 12.0                             | 50.0               | KM                   | AM |
| SMBJ7.5A | SMBJ7.5CA | 7.5                       | 8.33                             | 9.21 | 1              | 100             | 12.9                             | 46.6               | KP                   | AP |
| SMBJ8.0A | SMBJ8.0CA | 8                         | 8.89                             | 9.83 | 1              | 50              | 13.6                             | 44.2               | KR                   | AR |
| SMBJ8.5A | SMBJ8.5CA | 8.5                       | 9.44                             | 10.4 | 1              | 20              | 14.4                             | 41.7               | KT                   | AT |
| SMBJ9.0A | SMBJ9.0CA | 9                         | 10                               | 11.1 | 1              | 10              | 15.4                             | 39.0               | KV                   | AV |
| SMBJ10A  | SMBJ10CA  | 10                        | 11.1                             | 12.3 | 1              | 5               | 17.0                             | 35.3               | KX                   | AX |
| SMBJ11A  | SMBJ11CA  | 11                        | 12.2                             | 13.5 | 1              | 1               | 18.2                             | 33.0               | KZ                   | AZ |
| SMBJ12A  | SMBJ12CA  | 12                        | 13.3                             | 14.7 | 1              | 1               | 19.9                             | 30.2               | LE                   | BE |
| SMBJ13A  | SMBJ13CA  | 13                        | 14.4                             | 15.9 | 1              | 1               | 21.5                             | 28.0               | LG                   | BG |
| SMBJ14A  | SMBJ14CA  | 14                        | 15.6                             | 17.2 | 1              | 1               | 23.2                             | 25.9               | LK                   | BK |
| SMBJ15A  | SMBJ15CA  | 15                        | 16.7                             | 18.5 | 1              | 1               | 24.4                             | 24.6               | LM                   | BM |
| SMBJ16A  | SMBJ16CA  | 16                        | 17.8                             | 19.7 | 1              | 1               | 26.0                             | 23.1               | LP                   | BP |
| SMBJ17A  | SMBJ17CA  | 17                        | 18.9                             | 20.9 | 1              | 1               | 27.6                             | 21.8               | LR                   | BR |
| SMBJ18A  | SMBJ18CA  | 18                        | 20                               | 22.1 | 1              | 1               | 29.2                             | 20.6               | LT                   | BT |
| SMBJ20A  | SMBJ20CA  | 20                        | 22.2                             | 24.5 | 1              | 1               | 32.4                             | 18.6               | LV                   | BV |
| SMBJ22A  | SMBJ22CA  | 22                        | 24.4                             | 26.9 | 1              | 1               | 35.5                             | 16.9               | LX                   | BX |
| SMBJ24A  | SMBJ24CA  | 24                        | 26.7                             | 29.5 | 1              | 1               | 38.9                             | 15.5               | LZ                   | BZ |
| SMBJ26A  | SMBJ26CA  | 26                        | 28.9                             | 31.9 | 1              | 1               | 42.1                             | 14.3               | ME                   | CE |
| SMBJ28A  | SMBJ28CA  | 28                        | 31.1                             | 34.4 | 1              | 1               | 45.4                             | 13.3               | MG                   | CG |
| SMBJ30A  | SMBJ30CA  | 30                        | 33.3                             | 36.8 | 1              | 1               | 48.4                             | 12.4               | MK                   | CK |
| SMBJ33A  | SMBJ33CA  | 33                        | 36.7                             | 40.6 | 1              | 1               | 53.3                             | 11.3               | MM                   | CM |
| SMBJ36A  | SMBJ36CA  | 36                        | 40                               | 44.2 | 1              | 1               | 58.1                             | 10.4               | MP                   | CP |
| SMBJ40A  | SMBJ40CA  | 40                        | 44.4                             | 49.1 | 1              | 1               | 64.5                             | 9.3                | MR                   | CR |
| SMBJ43A  | SMBJ43CA  | 43                        | 47.8                             | 52.8 | 1              | 1               | 69.4                             | 8.7                | MT                   | CT |
| SMBJ45A  | SMBJ45CA  | 45                        | 50                               | 55.3 | 1              | 1               | 72.7                             | 8.3                | MV                   | CV |
| SMBJ48A  | SMBJ48CA  | 48                        | 53.3                             | 58.9 | 1              | 1               | 77.4                             | 7.8                | MX                   | CX |
| SMBJ51A  | SMBJ51CA  | 51                        | 56.7                             | 62.7 | 1              | 1               | 82.4                             | 7.3                | MZ                   | CZ |
| SMBJ54A  | SMBJ54CA  | 54                        | 60                               | 66.3 | 1              | 1               | 87.1                             | 6.9                | NE                   | DE |
| SMBJ58A  | SMBJ58CA  | 58                        | 64.4                             | 71.2 | 1              | 1               | 93.6                             | 6.5                | NG                   | DG |
| SMBJ60A  | SMBJ60CA  | 60                        | 66.7                             | 73.7 | 1              | 1               | 96.8                             | 6.2                | NK                   | DK |
| SMBJ64A  | SMBJ64CA  | 64                        | 71.1                             | 78.6 | 1              | 1               | 103.0                            | 5.9                | NM                   | DM |
| SMBJ70A  | SMBJ70CA  | 70                        | 77.8                             | 86   | 1              | 1               | 113.0                            | 5.3                | NP                   | DP |
| SMBJ75A  | SMBJ75CA  | 75                        | 83.3                             | 92.1 | 1              | 1               | 121.0                            | 5.0                | NR                   | DR |
| SMBJ78A  | SMBJ78CA  | 78                        | 86.7                             | 95.8 | 1              | 1               | 126.0                            | 4.8                | NT                   | DT |
| SMBJ85A  | SMBJ85CA  | 85                        | 94.4                             | 104  | 1              | 1               | 137.0                            | 4.4                | NV                   | DV |
| SMBJ90A  | SMBJ90CA  | 90                        | 100                              | 111  | 1              | 1               | 146.0                            | 4.1                | NX                   | DX |
| SMBJ100A | SMBJ100CA | 100                       | 111                              | 123  | 1              | 1               | 162.0                            | 3.7                | NZ                   | DZ |
| SMBJ110A | SMBJ110CA | 110                       | 122                              | 135  | 1              | 1               | 177.0                            | 3.4                | PE                   | EE |
| SMBJ120A | SMBJ120CA | 120                       | 133                              | 147  | 1              | 1               | 193.0                            | 3.1                | PG                   | EG |

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| Type      |            | Reverse<br>Stand-off<br>Voltage | Breakdown<br>Voltage |     | Test<br>Current | Maximum<br><br>Reverse<br>Leakage | Max. Clamp<br>Voltage<br><br>$V_C @ I_{PP}$ | Peak Pulse<br>Current<br><br>$I_{PP}$ | Package |    |
|-----------|------------|---------------------------------|----------------------|-----|-----------------|-----------------------------------|---------------------------------------------|---------------------------------------|---------|----|
|           |            |                                 | $V_{BR} @ I_T$       |     |                 |                                   |                                             |                                       | SMB     |    |
|           |            | $V_{RMW}$                       | Min                  | Max | $I_T$           | $V_C @ I_{PP}$                    | $I_{PP}$                                    | Device Marking Ccode                  |         |    |
| UNI       | BI         | V                               | V                    | V   | mA              | μA                                | V                                           | A                                     | UNI     | BI |
| SMBJ130A  | SMBJ130CA  | 130                             | 144                  | 159 | 1               | 1                                 | 209.0                                       | 2.9                                   | PK      | EK |
| SMBJ150A  | SMBJ150CA  | 150                             | 167                  | 185 | 1               | 1                                 | 243.0                                       | 2.5                                   | PM      | EM |
| SMBJ160A  | SMBJ160CA  | 160                             | 178                  | 197 | 1               | 1                                 | 259.0                                       | 2.3                                   | PP      | EP |
| SMBJ170A  | SMBJ170CA  | 170                             | 189                  | 209 | 1               | 1                                 | 275.0                                       | 2.2                                   | PR      | ER |
| SMBJ180A  | SMBJ180CA  | 180                             | 201                  | 222 | 1               | 1                                 | 292.0                                       | 2.1                                   | PT      | ET |
| SMBJ188A  | SMBJ188CA  | 188                             | 209                  | 231 | 1               | 1                                 | 304.0                                       | 2.0                                   | PB      | EB |
| SMBJ200A  | SMBJ200CA  | 200                             | 224                  | 247 | 1               | 1                                 | 324.0                                       | 1.9                                   | PV      | EV |
| SMBJ220A  | SMBJ220CA  | 220                             | 246                  | 272 | 1               | 1                                 | 356.0                                       | 1.7                                   | PX      | EX |
| SMBJ250A  | SMBJ250CA  | 250                             | 279                  | 309 | 1               | 1                                 | 405.0                                       | 1.5                                   | PZ      | EZ |
| SMBJ300A* | SMBJ300CA* | 300                             | 335                  | 371 | 1               | 1                                 | 486.0                                       | 1.3                                   | QE      | FE |
| SMBJ350A* | SMBJ350CA* | 350                             | 391                  | 432 | 1               | 1                                 | 567.0                                       | 1.1                                   | QG      | FG |
| SMBJ400A* | SMBJ400CA* | 400                             | 447                  | 494 | 1               | 1                                 | 648.0                                       | 0.9                                   | QK      | FK |
| SMBJ440A* | SMBJ440CA* | 440                             | 492                  | 543 | 1               | 1                                 | 713.0                                       | 0.9                                   | QM      | FM |

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Fig.1 Peak Pulse Power Rating Curve

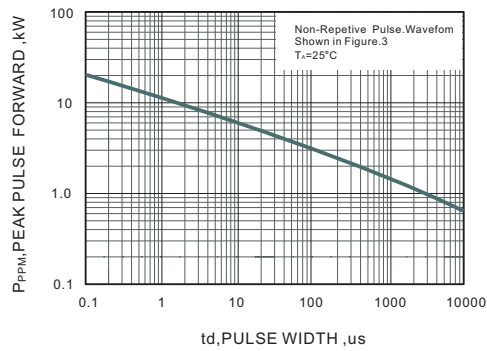


Fig.2 Forward Current Derating Curve

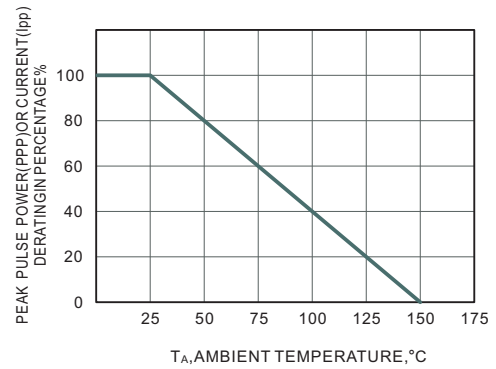


Fig.3 Pulse Waveform

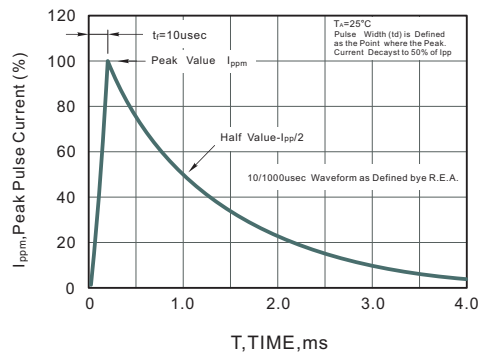
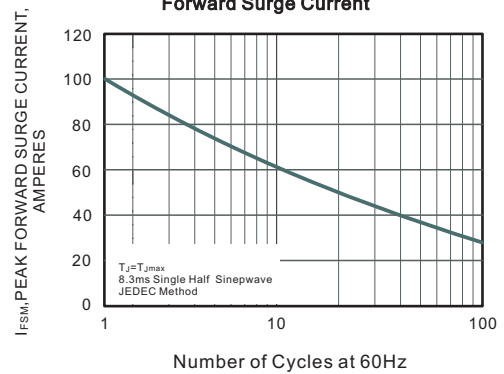


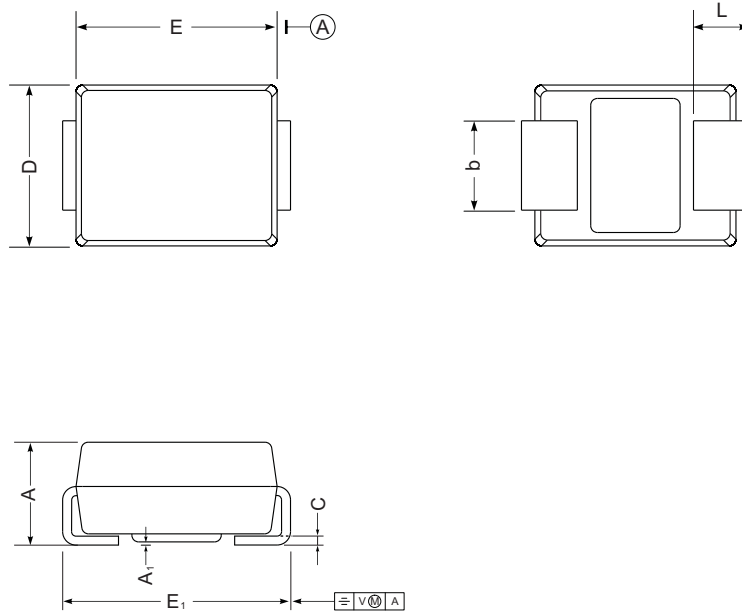
Fig.4 Maximum Non-Repetitive Peak Forward Surge Current



## SMBJ5.0-SMBJ440

### PACKAGE OUTLINE

Plastic surface mounted package; 2 leads SMB



SMB mechanical data

| UNIT |     | A    | E    | D    | E <sub>1</sub> | A <sub>1</sub> | L   | C     | b    |
|------|-----|------|------|------|----------------|----------------|-----|-------|------|
| mm   | max | 2.44 | 4.70 | 3.94 | 5.59           | 0.20           | 1.5 | 0.305 | 2.11 |
|      | min | 2.13 | 4.06 | 3.3  | 5.08           | 0.05           | 0.8 | 0.152 | 1.91 |
| mil  | max | 96   | 185  | 155  | 220            | 7.9            | 59  | 12    | 83   |
|      | min | 84   | 160  | 130  | 200            | 2.0            | 32  | 6     | 75   |

### The recommended mounting pad size

