

### 200W Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors Diodes- 5.0V- 170V

#### Features

- For surface mounted applications in order to optimize board space.
- Low profile package.
- Excellent clamping capability.
- IEC61000-4-2 ESD 15kV Air, 8kV contact compliance
- Protects one I/O line
- Lead-free parts meet RoHS requirements.
- Meet HF requirements.

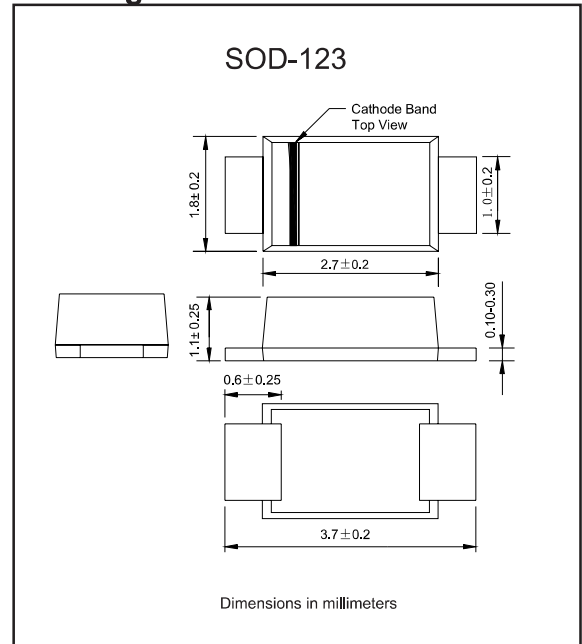
#### Applications

- Personal digital assistants (PDA)
- Cellular handsets & Accessories
- Portable devices
- Portable instrumentation
- Handhelds and notebooks
- Digital cameras

#### Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-123
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.02 gram

#### Package outline



#### Maximum ratings and Electrical Characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER                            | CONDITIONS                                                                     | Symbol    | Value       | UNIT               |
|--------------------------------------|--------------------------------------------------------------------------------|-----------|-------------|--------------------|
| Peak Power Dissipation               | Peak Pulse Power Dissipation at $T_A=25^{\circ}\text{C}$ by 10x1000us (Note 1) | $P_{PPM}$ | 200         | W                  |
| Operating junction temperature range |                                                                                | $T_J$     | -55 to +150 | $^{\circ}\text{C}$ |
| Storage temperature range            |                                                                                | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

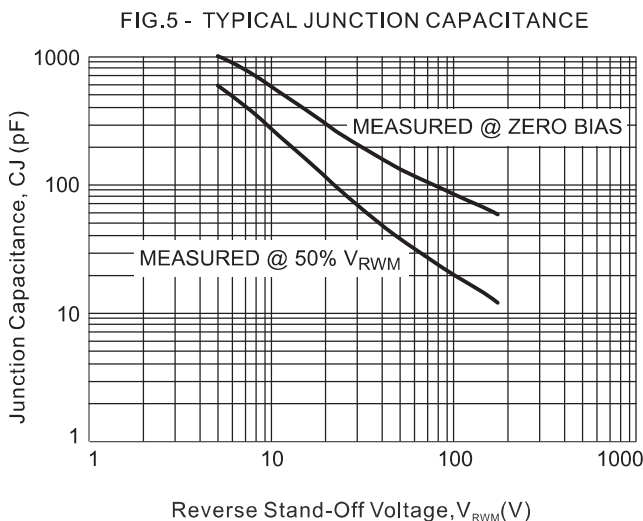
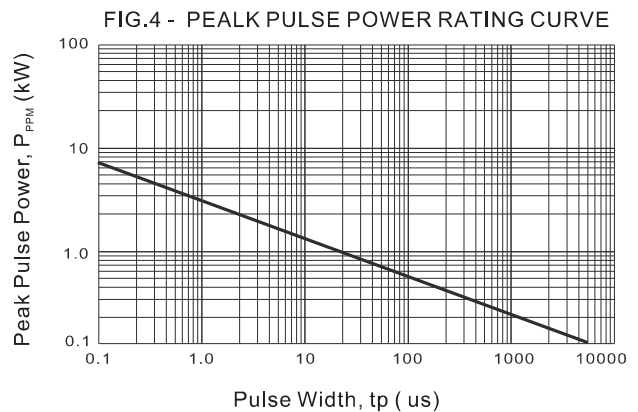
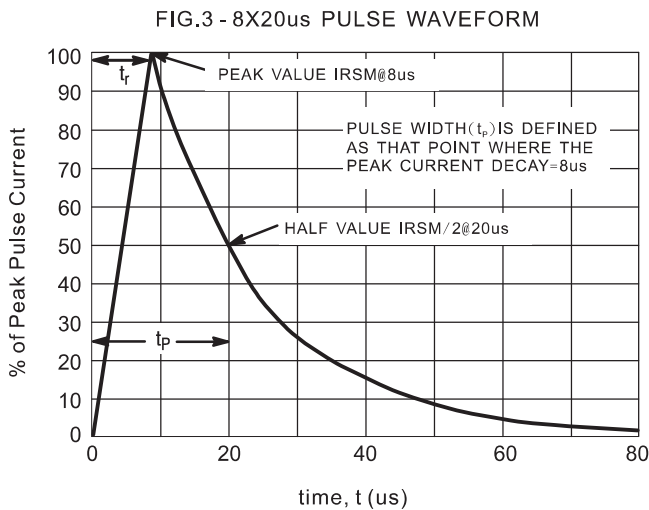
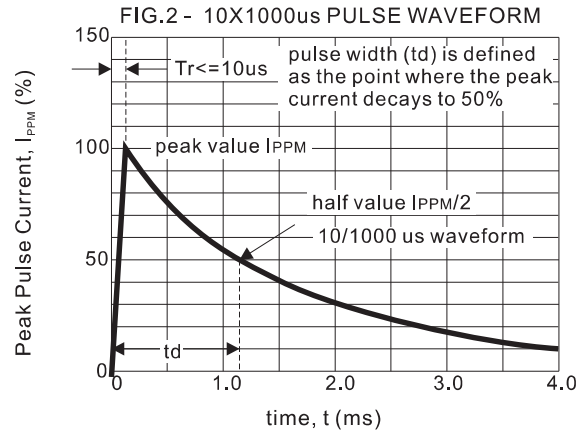
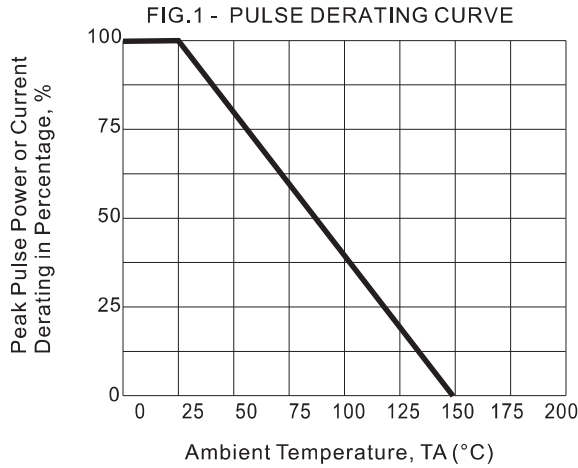
Note: 1. Non-repetitive current pulse, per Fig. 2 and derated above  $T_A=25^{\circ}\text{C}$  per Fig. 1

### Electrical characteristics (at T = 25°C unless otherwise noted)

| Part Number<br>Add C For<br>Bi-Directional<br>(Note 4) | Reverse<br>Standoff<br>Voltage | Breakdown<br>Voltage<br>V <sub>BR</sub> @ I <sub>T</sub> (Note 5) |         | Test<br>Current     | Max. Reverse<br>Leakage @<br>V <sub>RWM</sub> (Note 6) | Max. Clamping<br>Voltage @ I <sub>pp</sub> | Max. Peak Pulse<br>Current<br>I <sub>pp</sub> | Marking Code |      |
|--------------------------------------------------------|--------------------------------|-------------------------------------------------------------------|---------|---------------------|--------------------------------------------------------|--------------------------------------------|-----------------------------------------------|--------------|------|
|                                                        | V <sub>RWM</sub> (V)           | Min (V)                                                           | Max (V) | I <sub>T</sub> (mA) | I <sub>R</sub> (μA)                                    | V <sub>C</sub> (V)                         | (A)                                           | BI-          | UNI- |
| SMF5.0(C)A                                             | 5.0                            | 6.40                                                              | 7.25    | 10                  | 800                                                    | 9.2                                        | 21.7                                          | TE           | KE   |
| SMF6.0(C)A                                             | 6.0                            | 6.67                                                              | 7.37    | 10                  | 800                                                    | 10.3                                       | 19.4                                          | TG           | KG   |
| SMF6.5(C)A                                             | 6.5                            | 7.22                                                              | 7.98    | 10                  | 500                                                    | 11.2                                       | 17.9                                          | TK           | KK   |
| SMF7.0(C)A                                             | 7.0                            | 7.78                                                              | 8.60    | 10                  | 200                                                    | 12.0                                       | 16.7                                          | TM           | KM   |
| SMF7.5(C)A                                             | 7.5                            | 8.33                                                              | 9.21    | 1.0                 | 100                                                    | 12.9                                       | 15.5                                          | TP           | KP   |
| SMF8.0(C)A                                             | 8.0                            | 8.89                                                              | 9.83    | 1.0                 | 50                                                     | 13.6                                       | 14.7                                          | TR           | KR   |
| SMF8.5(C)A                                             | 8.5                            | 9.44                                                              | 10.4    | 1.0                 | 10                                                     | 14.4                                       | 13.9                                          | TT           | KT   |
| SMF9.0(C)A                                             | 9.0                            | 10.0                                                              | 11.1    | 1.0                 | 5.0                                                    | 15.4                                       | 13.0                                          | TV           | KV   |
| SMF10(C)A                                              | 10                             | 11.1                                                              | 12.3    | 1.0                 | 5.0                                                    | 17.0                                       | 11.8                                          | TX           | KX   |
| SMF11(C)A                                              | 11                             | 12.2                                                              | 13.5    | 1.0                 | 5.0                                                    | 18.2                                       | 11.0                                          | TZ           | KZ   |
| SMF12(C)A                                              | 12                             | 13.3                                                              | 14.7    | 1.0                 | 5.0                                                    | 19.9                                       | 10.1                                          | UE           | LE   |
| SMF13(C)A                                              | 13                             | 14.4                                                              | 15.9    | 1.0                 | 5.0                                                    | 21.5                                       | 9.3                                           | UG           | LG   |
| SMF14(C)A                                              | 14                             | 15.6                                                              | 17.2    | 1.0                 | 5.0                                                    | 23.2                                       | 8.6                                           | UK           | LK   |
| SMF15(C)A                                              | 15                             | 16.7                                                              | 18.5    | 1.0                 | 5.0                                                    | 24.4                                       | 8.2                                           | UM           | LM   |
| SMF16(C)A                                              | 16                             | 17.8                                                              | 19.7    | 1.0                 | 5.0                                                    | 26.0                                       | 7.7                                           | UP           | LP   |
| SMF17(C)A                                              | 17                             | 18.9                                                              | 20.9    | 1.0                 | 5.0                                                    | 27.6                                       | 7.2                                           | UR           | LR   |
| SMF18(C)A                                              | 18                             | 20.0                                                              | 22.1    | 1.0                 | 5.0                                                    | 29.2                                       | 6.8                                           | UT           | LT   |
| SMF20(C)A                                              | 20                             | 22.2                                                              | 24.5    | 1.0                 | 5.0                                                    | 32.4                                       | 6.2                                           | UV           | LV   |
| SMF22(C)A                                              | 22                             | 24.4                                                              | 26.9    | 1.0                 | 5.0                                                    | 35.5                                       | 5.6                                           | UX           | LX   |
| SMF24(C)A                                              | 24                             | 26.7                                                              | 29.5    | 1.0                 | 5.0                                                    | 38.9                                       | 5.1                                           | UZ           | LZ   |
| SMF26(C)A                                              | 26                             | 28.9                                                              | 31.9    | 1.0                 | 5.0                                                    | 42.1                                       | 4.8                                           | VE           | ME   |
| SMF28(C)A                                              | 28                             | 31.1                                                              | 34.4    | 1.0                 | 5.0                                                    | 45.4                                       | 4.4                                           | VG           | MG   |
| SMF30(C)A                                              | 30                             | 33.3                                                              | 36.8    | 1.0                 | 5.0                                                    | 48.4                                       | 4.2                                           | VK           | MK   |
| SMF33(C)A                                              | 33                             | 36.7                                                              | 40.6    | 1.0                 | 5.0                                                    | 53.3                                       | 3.8                                           | VM           | MM   |
| SMF36(C)A                                              | 36                             | 40.0                                                              | 44.2    | 1.0                 | 5.0                                                    | 58.1                                       | 3.5                                           | VP           | MP   |
| SMF40(C)A                                              | 40                             | 44.4                                                              | 49.1    | 1.0                 | 5.0                                                    | 64.5                                       | 3.1                                           | VR           | MR   |
| SMF43(C)A                                              | 43                             | 47.8                                                              | 52.8    | 1.0                 | 5.0                                                    | 69.4                                       | 2.9                                           | VT           | MT   |
| SMF45(C)A                                              | 45                             | 50.0                                                              | 55.3    | 1.0                 | 5.0                                                    | 72.7                                       | 2.8                                           | VV           | MV   |
| SMF48(C)A                                              | 48                             | 53.3                                                              | 58.9    | 1.0                 | 5.0                                                    | 77.4                                       | 2.6                                           | VX           | MX   |
| SMF51(C)A                                              | 51                             | 56.7                                                              | 62.7    | 1.0                 | 5.0                                                    | 82.4                                       | 2.5                                           | VZ           | MZ   |
| SMF54(C)A                                              | 54                             | 60.0                                                              | 66.3    | 1.0                 | 5.0                                                    | 87.1                                       | 2.3                                           | WE           | NE   |
| SMF58(C)A                                              | 58                             | 64.4                                                              | 71.2    | 1.0                 | 5.0                                                    | 93.6                                       | 2.3                                           | WG           | NG   |
| SMF60(C)A                                              | 60                             | 66.7                                                              | 73.7    | 1.0                 | 5.0                                                    | 96.8                                       | 2.1                                           | WK           | NK   |
| SMF64(C)A                                              | 64                             | 71.1                                                              | 78.6    | 1.0                 | 5.0                                                    | 103                                        | 2.0                                           | WM           | NM   |
| SMF70(C)A                                              | 70                             | 77.8                                                              | 86.0    | 1.0                 | 5.0                                                    | 113                                        | 1.8                                           | WP           | NP   |
| SMF75(C)A                                              | 75                             | 83.3                                                              | 92.1    | 1.0                 | 5.0                                                    | 121                                        | 1.7                                           | WR           | NR   |
| SMF78(C)A                                              | 78                             | 86.7                                                              | 95.8    | 1.0                 | 5.0                                                    | 126                                        | 1.6                                           | WT           | NT   |
| SMF85(C)A                                              | 85                             | 94.4                                                              | 104     | 1.0                 | 5.0                                                    | 137                                        | 1.5                                           | WV           | NV   |
| SMF90(C)A                                              | 90                             | 100                                                               | 111     | 1.0                 | 5.0                                                    | 146                                        | 1.4                                           | WX           | NX   |
| SMF100(C)A                                             | 100                            | 111                                                               | 123     | 1.0                 | 5.0                                                    | 162                                        | 1.3                                           | WZ           | NZ   |
| SMF110(C)A                                             | 110                            | 122                                                               | 135     | 1.0                 | 5.0                                                    | 177                                        | 1.2                                           | XE           | PE   |
| SMF120(C)A                                             | 120                            | 133                                                               | 147     | 1.0                 | 5.0                                                    | 193                                        | 1.1                                           | XG           | PG   |
| SMF130(C)A                                             | 130                            | 144                                                               | 159     | 1.0                 | 5.0                                                    | 209                                        | 1.0                                           | XK           | PK   |
| SMF150(C)A                                             | 150                            | 167                                                               | 185     | 1.0                 | 5.0                                                    | 243                                        | 0.8                                           | XM           | PM   |
| SMF160(C)A                                             | 160                            | 178                                                               | 197     | 1.0                 | 5.0                                                    | 259                                        | 0.8                                           | XP           | PP   |
| SMF170(C)A                                             | 170                            | 189                                                               | 209     | 1.0                 | 5.0                                                    | 275                                        | 0.8                                           | XR           | PR   |

- Notes:
- Suffix C denotes Bi-directional device.
  - V<sub>BR</sub> measured with I<sub>T</sub> current pulse = 300μs
  - For Bi-Directional devices having V<sub>RWM</sub> of 10V and under, the I<sub>R</sub> is doubled.

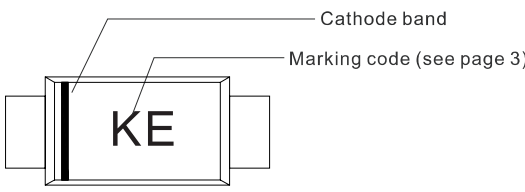
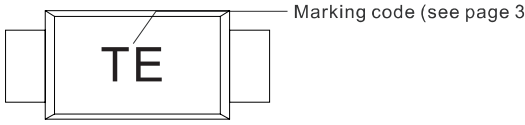
### Rating and characteristic curves (SMF SERIES)



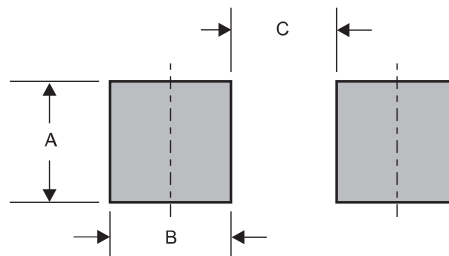
### Pinning information

| Pin                                           | Simplified outline                                                                | Symbol                                                                              |
|-----------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Uni-Directional<br>Pin1 cathode<br>Pin2 anode |  |  |
| Bi-Directional                                |  |  |

### Marking

| Type number     | Example                                                                              |
|-----------------|--------------------------------------------------------------------------------------|
| Uni-Directional |  |
| Bi-Directional  |  |

### Suggested solder pad layout



Dimensions in inches and (millimeters)

| PACKAGE | A            | B            | C            |
|---------|--------------|--------------|--------------|
| SOD-123 | 0.044 (1.10) | 0.040 (1.00) | 0.079 (2.00) |

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