

# SMF5.0(C)A THRU SMF170(C)A

## 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.

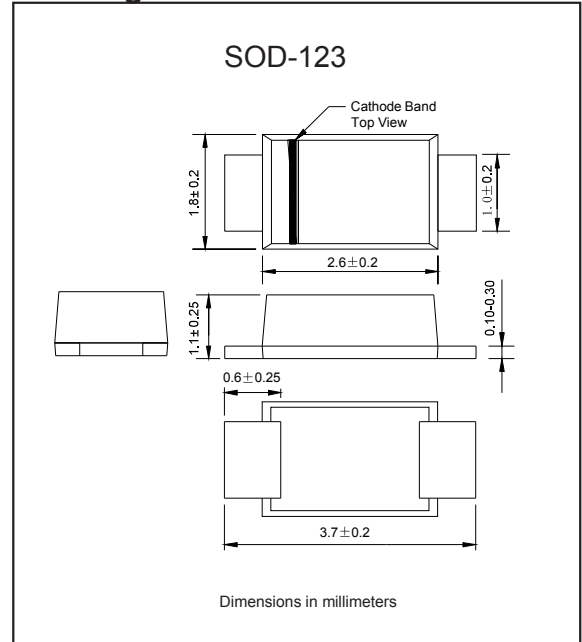
### Applications

- 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 $10 \times 1000 \mu\text{s}$ (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

## SMF5.0(C)A THRU SMF170(C)A

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<br>$V_{RWM}$ (V) | Breakdown<br>Voltage<br>$V_{BR}$ @ $I_T$ (Note 5) |         | Test<br>Current<br>$I_T$ (mA) | Max. Reverse<br>Leakage @<br>$V_{RWM}$ (Note 6)<br>$I_R$ ( $\mu$ A) | Max. Clamping<br>Voltage @ $I_{pp}$<br>$V_C$ (V) | Max. Peak Pulse<br>Current<br>$I_{pp}$<br>(A) | Marking Code |      |
|--|---|---|---------|-------------------------------|---|--|---|--------------|------|
|  |   | Min (V)   | Max (V) |                               |   |  |   | 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: 4. Suffix C denotes Bi-directional device.  
5.  $V_{BR}$  measured with  $I_T$  current pulse = 300 $\mu$ s  
6. For Bi-Directional devices having  $V_{RWM}$  of 10V and under, the  $I_R$  is doubled.

## Rating and characteristic curves (SMF SERIES)

FIG.1 - PULSE DERATING CURVE

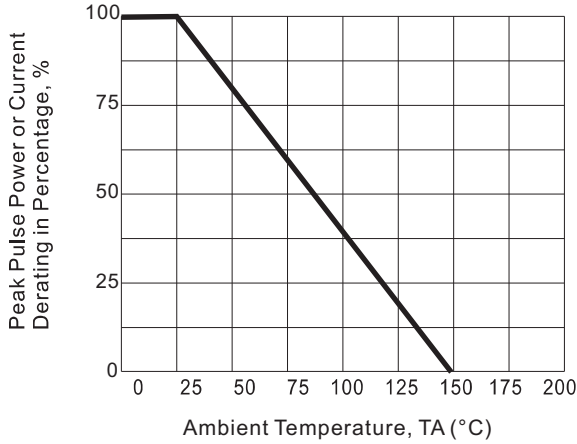


FIG.2 - 10X1000us PULSE WAVEFORM

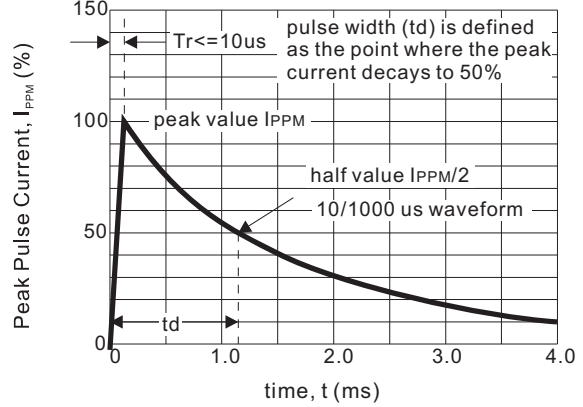


FIG.3 - 8X20us PULSE WAVEFORM

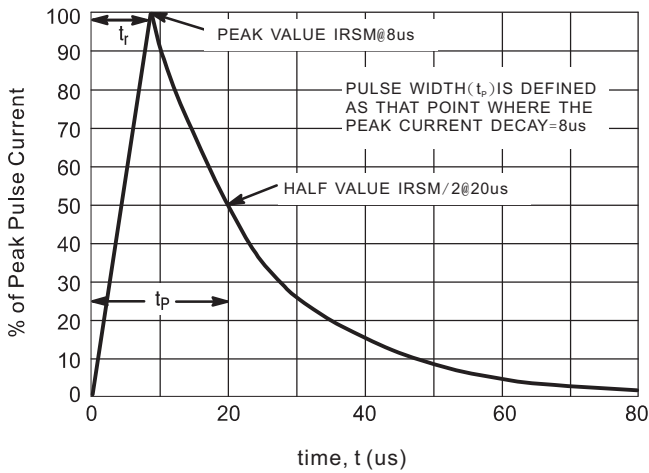


FIG.4 - PEAK PULSE POWER RATING CURVE

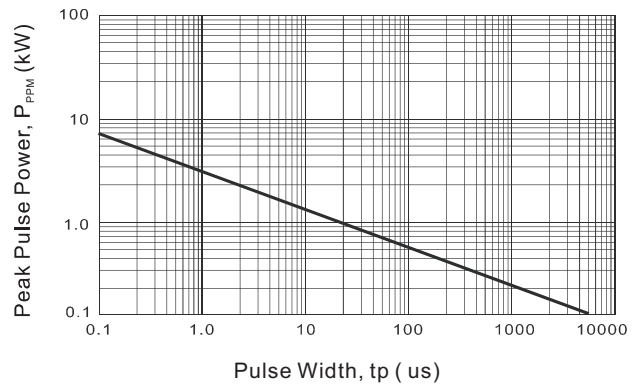
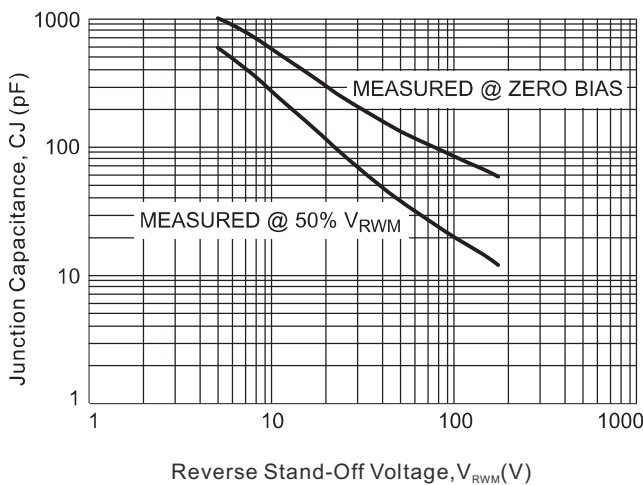






FIG.5 - TYPICAL JUNCTION CAPACITANCE

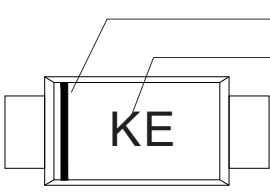



# SMF5.0(C)A THRU SMF170(C)A

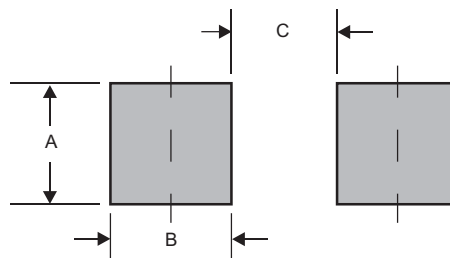
## Pinning information

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

## Marking

| Type number     | Example  |
|-----------------|--|
| Uni-Directional |  <p>Cathode band</p> <p>Marking code (see page 3)</p> |
| Bi-Directional  |  <p>Marking code (see page 3)</p>                     |

## 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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