



# SMFxx(C)A Series

Surface Mount Transient Voltage Suppressor Rectifiers

Reverse Voltage 3.3 ~ 440 V

200 Watt Peak Pulse Power



## Features

- Glass passivated chip
- 200 W peak pulse power capability with a 10/1000 us waveform, repetitive rate (duty cycle):0.01 %
- Excellent clamping capability
- Low reverse leakage
- Very fast response time
- Lead and body according with RoHS standard

## Mechanical Data

- Case: SOD-123FL Molded plastic
- Lead: Solderable per MIL-STD-750, method 2026
- Epoxy: UL 94V-0 rate flame retardant
- Polarity: Color band denotes cathode end except Bipolar
- Mounting position: Any

Maximum Ratings & Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter  | Symbols        | Value          | Unit |
|--|----------------|----------------|------|
| Peak power dissipation with a 10/1000 us waveform <sup>(1)</sup>                           | $P_{PP}$       | 200            | W    |
| Peak pulse current with a 10/1000 us waveform <sup>(1)</sup>                               | $I_{PP}$       | See Next Table | A    |
| Power dissipation on infinite heatsink at $T_L = 75\text{ }^\circ\text{C}$                 | $P_D$          | 1.0            | W    |
| Peak forward surge current, 8.3 ms single half sinewave unidirectional only <sup>(2)</sup> | $I_{FSM}$      | 30             | A    |
| Maximum instantaneous forward voltage at 10 A for unidirectional only <sup>(3)</sup>       | $V_F$          | 3.5/6.5        | V    |
| Operating junction and storage temperature range   | $T_J, T_{STG}$ | -55 to +150    | °C   |

Note:

- 1)Non-repetitive current pulse per Fig.5 and derated above  $T_A = 25\text{ }^\circ\text{C}$  per Fig.1 ;
- 2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum ;
- 3) $V_F < 3.5\text{V}$  for devices of  $V_{BR} < 200\text{V}$  and  $V_F < 6.5\text{V}$  for devices of  $V_{BR} > 201\text{V}$ .



# SMFxx(C)A Series

| Part Number |          | Device Marking Code |    | Reverse Stand-off Voltage | Breakdown Voltage $V_{BR}$ @ $I_T$ |         | Test Current | Max. Clamping Voltage @ $I_{PP}$ | Max. Peak Pulse Current | Max. Reverse Leakage @ $V_{RWM}$ |
|-------------|----------|---------------------|----|---------------------------|------------------------------------|---------|--------------|----------------------------------|-------------------------|----------------------------------|
| UNI-POLAR   | BI-POLAR | UNI                 | BI | $V_{RWM}(V)$              | Min.(V)                            | Max.(V) | $I_T(mA)$    | $V_{C MAX.}(V)$                  | $I_{PP}(A)$             | $I_R(\mu A)$                     |
| SMF3.3A     | SMF3.3CA | HZ                  | GZ | 3.3                       | 4.30                               | 5.30    | 10           | 7.3                              | 27.40                   | 800                              |
| SMF5.0A     | SMF5.0CA | KE                  | AE | 5.0                       | 6.40                               | 7.00    | 10           | 9.2                              | 21.74                   | 800                              |
| SMF6.0A     | SMF6.0CA | KG                  | AG | 6.0                       | 6.67                               | 7.37    | 10           | 10.3                             | 19.42                   | 800                              |
| SMF6.5A     | SMF6.5CA | KK                  | AK | 6.5                       | 7.22                               | 7.98    | 10           | 11.2                             | 17.86                   | 500                              |
| SMF7.0A     | SMF7.0CA | KM                  | AM | 7.0                       | 7.78                               | 8.60    | 10           | 12.0                             | 16.67                   | 200                              |
| SMF7.5A     | SMF7.5CA | KP                  | AP | 7.5                       | 8.33                               | 9.21    | 1            | 12.9                             | 15.50                   | 100                              |
| SMF8.0A     | SMF8.0CA | KR                  | AR | 8.0                       | 8.89                               | 9.83    | 1            | 13.6                             | 14.71                   | 50                               |
| SMF8.5A     | SMF8.5CA | KT                  | AT | 8.5                       | 9.44                               | 10.40   | 1            | 14.4                             | 13.89                   | 20                               |
| SMF9.0A     | SMF9.0CA | KV                  | AV | 9.0                       | 10.00                              | 11.10   | 1            | 15.4                             | 12.99                   | 10                               |
| SMF10A      | SMF10CA  | KX                  | AX | 10.0                      | 11.10                              | 12.30   | 1            | 17.0                             | 11.76                   | 5                                |
| SMF11A      | SMF11CA  | KZ                  | AZ | 11.0                      | 12.20                              | 13.50   | 1            | 18.2                             | 10.99                   | 1                                |
| SMF12A      | SMF12CA  | LE                  | BE | 12.0                      | 13.30                              | 14.70   | 1            | 19.9                             | 10.05                   | 1                                |
| SMF13A      | SMF13CA  | LG                  | BG | 13.0                      | 14.40                              | 15.90   | 1            | 21.5                             | 9.30                    | 1                                |
| SMF14A      | SMF14CA  | LK                  | BK | 14.0                      | 15.60                              | 17.20   | 1            | 23.2                             | 8.62                    | 1                                |
| SMF15A      | SMF15CA  | LM                  | BM | 15.0                      | 16.70                              | 18.50   | 1            | 24.4                             | 8.20                    | 1                                |
| SMF16A      | SMF16CA  | LP                  | BP | 16.0                      | 17.80                              | 19.70   | 1            | 26.0                             | 7.69                    | 1                                |
| SMF17A      | SMF17CA  | LR                  | BR | 17.0                      | 18.90                              | 20.90   | 1            | 27.6                             | 7.25                    | 1                                |
| SMF18A      | SMF18CA  | LT                  | BT | 18.0                      | 20.00                              | 22.10   | 1            | 29.2                             | 6.85                    | 1                                |
| SMF20A      | SMF20CA  | LV                  | BV | 20.0                      | 22.20                              | 24.50   | 1            | 32.4                             | 6.17                    | 1                                |
| SMF22A      | SMF22CA  | LX                  | BX | 22.0                      | 24.40                              | 26.90   | 1            | 35.5                             | 5.63                    | 1                                |
| SMF24A      | SMF24CA  | LZ                  | BZ | 24.0                      | 26.70                              | 29.50   | 1            | 38.9                             | 5.14                    | 1                                |
| SMF26A      | SMF26CA  | ME                  | CE | 26.0                      | 28.90                              | 31.90   | 1            | 42.1                             | 4.75                    | 1                                |
| SMF28A      | SMF28CA  | MG                  | CG | 28.0                      | 31.10                              | 34.40   | 1            | 45.4                             | 4.41                    | 1                                |
| SMF30A      | SMF30CA  | MK                  | CK | 30.0                      | 33.50                              | 36.80   | 1            | 48.4                             | 4.13                    | 1                                |
| SMF33A      | SMF33CA  | MM                  | CM | 33.0                      | 36.70                              | 40.60   | 1            | 53.3                             | 3.75                    | 1                                |
| SMF36A      | SMF36CA  | MP                  | CP | 36.0                      | 40.00                              | 44.20   | 1            | 58.1                             | 3.44                    | 1                                |
| SMF40A      | SMF40CA  | MR                  | CR | 40.0                      | 44.40                              | 49.10   | 1            | 64.5                             | 3.10                    | 1                                |
| SMF43A      | SMF43CA  | MT                  | CT | 43.0                      | 47.80                              | 52.80   | 1            | 69.4                             | 2.88                    | 1                                |
| SMF45A      | SMF45CA  | MV                  | CV | 45.0                      | 50.00                              | 55.30   | 1            | 72.7                             | 2.75                    | 1                                |
| SMF48A      | SMF48CA  | MX                  | CX | 48.0                      | 53.30                              | 58.90   | 1            | 77.4                             | 2.58                    | 1                                |
| SMF51A      | SMF51CA  | MZ                  | CZ | 51.0                      | 56.70                              | 62.70   | 1            | 82.4                             | 2.43                    | 1                                |
| SMF54A      | SMF54CA  | NE                  | DE | 54.0                      | 60.00                              | 66.30   | 1            | 87.1                             | 2.30                    | 1                                |
| SMF58A      | SMF58CA  | NG                  | DG | 58.0                      | 64.40                              | 71.20   | 1            | 93.6                             | 2.14                    | 1                                |
| SMF60A      | SMF60CA  | NK                  | DK | 60.0                      | 66.70                              | 73.70   | 1            | 96.8                             | 2.07                    | 1                                |
| SMF64A      | SMF64CA  | NM                  | DM | 64.0                      | 71.10                              | 78.60   | 1            | 103.0                            | 1.94                    | 1                                |
| SMF70A      | SMF70CA  | NP                  | DP | 70.0                      | 77.80                              | 86.00   | 1            | 113.0                            | 1.77                    | 1                                |
| SMF75A      | SMF75CA  | NR                  | DR | 75.0                      | 83.30                              | 92.10   | 1            | 121.0                            | 1.65                    | 1                                |
| SMF78A      | SMF78CA  | NT                  | DT | 78.0                      | 86.70                              | 95.80   | 1            | 126.0                            | 1.59                    | 1                                |
| SMF85A      | SMF85CA  | NV                  | DV | 85.0                      | 94.4                               | 104.0   | 1            | 137.0                            | 1.46                    | 1                                |
| SMF90A      | SMF90CA  | NX                  | DX | 90.0                      | 100.0                              | 111.0   | 1            | 146.0                            | 1.37                    | 1                                |
| SMF100A     | SMF100CA | NZ                  | DZ | 100.0                     | 111.0                              | 123.0   | 1            | 162.0                            | 1.23                    | 1                                |
| SMF110A     | SMF110CA | PE                  | EE | 110.0                     | 122.0                              | 135.0   | 1            | 177.0                            | 1.13                    | 1                                |
| SMF120A     | SMF120CA | PG                  | EG | 120.0                     | 133.0                              | 147.0   | 1            | 193.0                            | 1.04                    | 1                                |
| SMF130A     | SMF130CA | PK                  | EK | 130.0                     | 144.0                              | 159.0   | 1            | 209.0                            | 0.96                    | 1                                |
| SMF150A     | SMF150CA | PM                  | EM | 150.0                     | 167.0                              | 185.0   | 1            | 243.0                            | 0.82                    | 1                                |
| SMF160A     | SMF160CA | PP                  | EP | 160.0                     | 178.0                              | 197.0   | 1            | 259.0                            | 0.77                    | 1                                |
| SMF170A     | SMF170CA | PR                  | ER | 170.0                     | 189.0                              | 209.0   | 1            | 275.0                            | 0.73                    | 1                                |
| SMF180A     | SMF180CA | PT                  | ET | 180.0                     | 201.0                              | 222.0   | 1            | 292.0                            | 0.68                    | 1                                |
| SMF190A     | SMF190CA | PV                  | EV | 190.0                     | 209.0                              | 243.0   | 1            | 308.0                            | 0.65                    | 1                                |
| SMF200A     | SMF200CA | PX                  | EX | 200.0                     | 224.0                              | 247.0   | 1            | 324.0                            | 0.62                    | 1                                |
| SMF210A     | SMF210CA | PZ                  | EZ | 210.0                     | 231.0                              | 268.0   | 1            | 340.0                            | 0.59                    | 1                                |
| SMF220A     | SMF220CA | QE                  | FE | 220.0                     | 246.0                              | 272.0   | 1            | 356.0                            | 0.56                    | 1                                |
| SMF250A     | SMF250CA | QG                  | FG | 250.0                     | 279.0                              | 309.0   | 1            | 405.0                            | 0.49                    | 1                                |
| SMF300A     |          | QK                  |    | 300.0                     | 335.0                              | 371.0   | 1            | 486.0                            | 0.41                    | 1                                |
| SMF350A     |          | QM                  |    | 350.0                     | 391.0                              | 432.0   | 1            | 567.0                            | 0.35                    | 1                                |
| SMF400A     |          | QP                  |    | 400.0                     | 447.0                              | 494.0   | 1            | 648.0                            | 0.31                    | 1                                |
| SMF440A     |          | QR                  |    | 440.0                     | 492.0                              | 543.0   | 1            | 713.0                            | 0.28                    | 1                                |

## Ratings and Characteristics Curves (TA=25°C unless otherwise noted)



Fig. 1-Pulse Derating Curve



Fig. 2-Maximum Non-Repetitive Surge Current

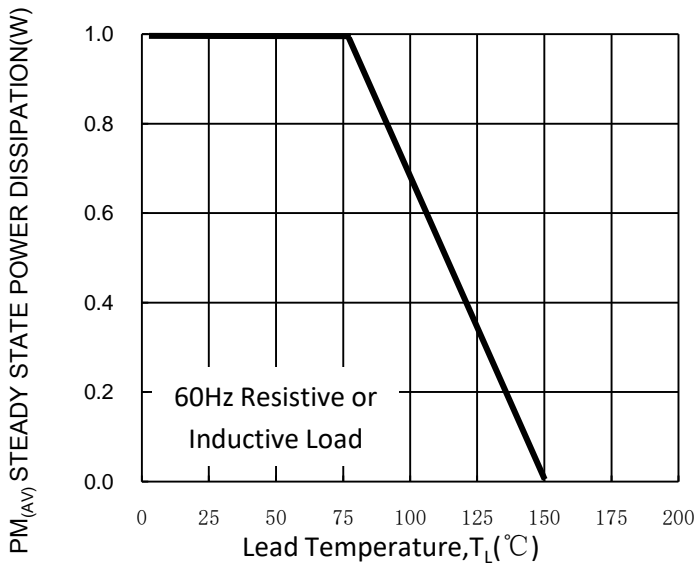


Fig. 3-Steady State Power Derating Curve



Fig. 4-Peak Pulse Power Rating Curve



Fig. 5-Pulse Waveform



Fig. 6-Typical Junction Capacitance

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