

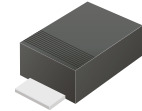
## TV02W5V0-HF Thru TV02W191-HF

**Working Peak Reverse Voltage:5.0-190 Volts**

**Peak Pulse Power:200 Watts**

**RoHS Device**

**Halogen Free**



### Features

- Glass passivated chip.
- Low leakage current.
- 200W peak pulse power capility with a 10/1000us waveform,repitive rate (duty cycle):0.01%.
- Uni and bidirectional unit.
- Excellent clamping capability.
- Very fast response time.

### Mechanical data

- Case: Molded plastic.
- Epoxy: UL 94V-0 rate flame retardant.
- Lead: Solderable per MIL-STD-750, method 2026.
- Polarity: Color band denotes cathode end except bipolar.
- Mounting position: Any.
- Weight: 0.016 grams(approx.).



### Circuit Diagram



### Maximum Rating and Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.  
Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

| Parameter   | Symbol  | Value          | Unit |
|---|---------|----------------|------|
| Peak power dissipation at 10/1000µs waveform (Note 1)                               | PPP     | 200            | W    |
| Peak power dissipation at 8/20µs waveform (Note 1)                                  | PPP     | 1000           | W    |
| Peak pulse current with a 10/1000µs waveform (Note 1)                               | IPP     | See next table | A    |
| Power dissipation on infinite heatsink at TL = 75°C                                 | PD      | 0.4            | W    |
| Peak forward surge current, 8.3ms single half sone-wave undirestional only (Note 2) | IFSM    | 20             | A    |
| Max.instantaneous forward voltage at 25A for undirestional only                     | VF      | 3.5            | V    |
| Operating junction and storage temperature range                                    | TJ,TSTG | -55 to +150    | °C   |

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above TA=25°C per Fig.1
2. Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.

Company reserves the right to improve product design , functions and reliability without notice.

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## Rating and Characteristic Curves (TV02W5V0-HF Thru. TV02W191-HF)

Fig. 1 - Pulse Derating Curve

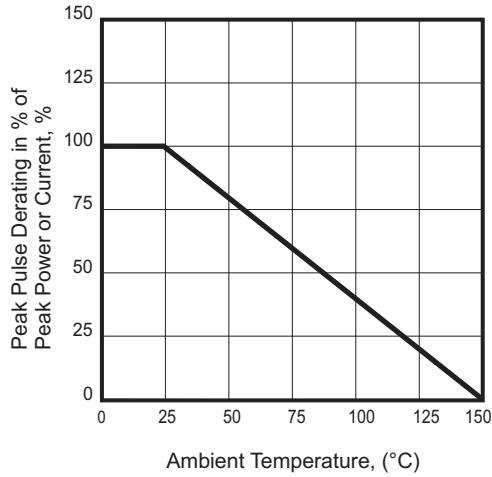


Fig.2 - Steady State Power Derating Curve



Fig. 3 - Pulse Waveform

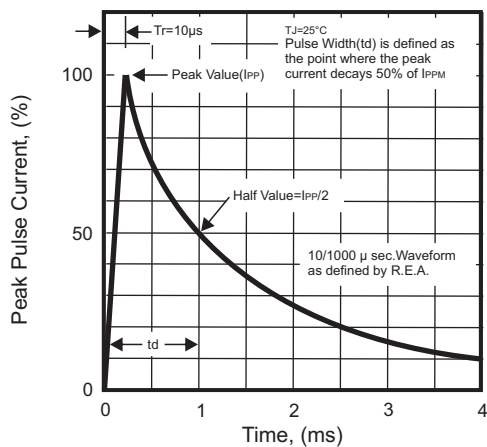


Fig. 4 - Peak Pulse Power Rating Curve



Fig. 5 - Maximum Non-Repetitive Surge Current

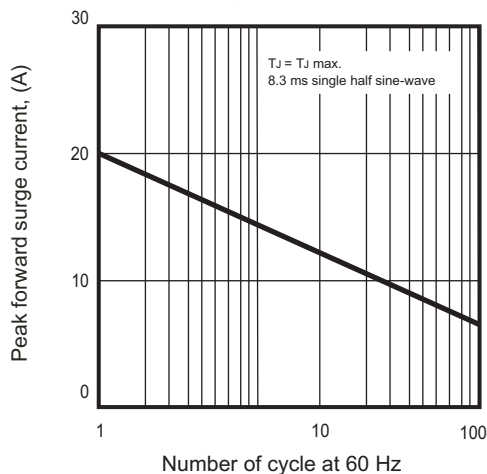


Fig.6 - Typical Junction Capacitance



# SMD Transient Voltage Suppressor



## Electrical Characteristics (TV02W5V0-HF Thru. TV02W191-HF)

| Part No        | Absolute Maximum Rating (Ta=25°C) |          |          |      | Vc (Max.)<br>@ IPP | IPP (Max.)<br>@ 10/1000us | IR (Max.)<br>@ VRWM | Marking Code |    |
|----------------|-----------------------------------|----------|----------|------|--------------------|---------------------------|---------------------|--------------|----|
|                | VRWM                              | VBR Min. | VBR Max. | IT   |                    |                           |                     | Uni          | Bi |
|                | (V)                               | (V)      | (V)      | (mA) | (V)                | (A)                       | (uA)                |              |    |
| TV02W5V0(B)-HF | 5.0                               | 6.40     | 7.00     | 10   | 9.20               | 21.74                     | 400                 | FE           | KE |
| TV02W6V0(B)-HF | 6.0                               | 6.67     | 7.37     | 10   | 10.3               | 19.42                     | 400                 | FG           | KG |
| TV02W6V5(B)-HF | 6.5                               | 7.22     | 7.98     | 10   | 11.2               | 17.86                     | 250                 | FK           | KK |
| TV02W7V0(B)-HF | 7.0                               | 7.78     | 8.60     | 10   | 12.0               | 16.67                     | 100                 | FM           | KM |
| TV02W7V5(B)-HF | 7.5                               | 8.33     | 9.21     | 1    | 12.9               | 15.50                     | 50                  | FP           | KP |
| TV02W8V0(B)-HF | 8.0                               | 8.89     | 9.83     | 1    | 13.6               | 14.71                     | 25                  | FR           | KR |
| TV02W8V5(B)-HF | 8.5                               | 9.44     | 10.40    | 1    | 14.4               | 13.89                     | 10                  | FT           | KT |
| TV02W9V0(B)-HF | 9.0                               | 10.00    | 11.10    | 1    | 15.4               | 12.99                     | 5                   | FV           | KV |
| TV02W100(B)-HF | 10.0                              | 11.10    | 12.30    | 1    | 17.0               | 11.76                     | 2.5                 | FX           | KX |
| TV02W110(B)-HF | 11.0                              | 12.20    | 13.50    | 1    | 18.2               | 10.99                     | 2.5                 | FZ           | KZ |
| TV02W120(B)-HF | 12.0                              | 13.30    | 14.70    | 1    | 19.9               | 10.05                     | 2.5                 | HE           | LE |
| TV02W130(B)-HF | 13.0                              | 14.40    | 15.90    | 1    | 21.5               | 9.30                      | 1                   | HG           | LG |
| TV02W140(B)-HF | 14.0                              | 15.60    | 17.20    | 1    | 23.2               | 8.62                      | 1                   | HK           | LK |
| TV02W150(B)-HF | 15.0                              | 16.70    | 18.50    | 1    | 24.4               | 8.20                      | 1                   | HM           | LM |
| TV02W160(B)-HF | 16.0                              | 17.80    | 19.70    | 1    | 26.0               | 7.69                      | 1                   | HP           | LP |
| TV02W170(B)-HF | 17.0                              | 18.90    | 20.90    | 1    | 27.6               | 7.25                      | 1                   | HR           | LR |
| TV02W180(B)-HF | 18.0                              | 20.00    | 22.10    | 1    | 29.2               | 6.85                      | 1                   | HT           | LT |
| TV02W190(B)-HF | 19.0                              | 21.10    | 23.30    | 1    | 30.6               | 6.54                      | 1                   | HB           | LB |
| TV02W200(B)-HF | 20.0                              | 22.20    | 24.50    | 1    | 32.4               | 6.17                      | 1                   | HV           | LV |
| TV02W220(B)-HF | 22.0                              | 24.40    | 26.90    | 1    | 35.5               | 5.63                      | 1                   | HX           | LX |
| TV02W240(B)-HF | 24.0                              | 26.70    | 29.50    | 1    | 38.9               | 5.14                      | 1                   | HZ           | LZ |
| TV02W260(B)-HF | 26.0                              | 28.90    | 31.90    | 1    | 42.1               | 4.75                      | 1                   | JE           | ME |
| TV02W280(B)-HF | 28.0                              | 31.10    | 34.40    | 1    | 45.4               | 4.41                      | 1                   | JG           | MG |
| TV02W300(B)-HF | 30.0                              | 33.30    | 36.80    | 1    | 48.4               | 4.13                      | 1                   | JK           | MK |
| TV02W330(B)-HF | 33.0                              | 36.70    | 40.60    | 1    | 53.3               | 3.75                      | 1                   | JM           | MM |
| TV02W360(B)-HF | 36.0                              | 40.00    | 44.20    | 1    | 58.1               | 3.44                      | 1                   | JP           | MP |
| TV02W400(B)-HF | 40.0                              | 44.40    | 49.10    | 1    | 64.5               | 3.10                      | 1                   | JR           | MR |
| TV02W430(B)-HF | 43.0                              | 47.80    | 52.80    | 1    | 69.4               | 2.88                      | 1                   | JT           | MT |
| TV02W450(B)-HF | 45.0                              | 50.00    | 55.30    | 1    | 72.7               | 2.75                      | 1                   | JV           | MV |
| TV02W480(B)-HF | 48.0                              | 53.30    | 58.90    | 1    | 77.4               | 2.58                      | 1                   | JX           | MX |
| TV02W510(B)-HF | 51.0                              | 56.70    | 62.70    | 1    | 82.4               | 2.43                      | 1                   | JZ           | MZ |
| TV02W540(B)-HF | 54.0                              | 60.00    | 66.30    | 1    | 87.1               | 2.30                      | 1                   | XE           | NE |
| TV02W580(B)-HF | 58.0                              | 64.40    | 71.20    | 1    | 93.6               | 2.14                      | 1                   | XG           | NG |
| TV02W600(B)-HF | 60.0                              | 66.70    | 73.70    | 1    | 96.8               | 2.07                      | 1                   | XK           | NK |
| TV02W640(B)-HF | 64.0                              | 71.10    | 78.60    | 1    | 103.0              | 1.94                      | 1                   | XM           | NM |
| TV02W700(B)-HF | 70.0                              | 77.80    | 86.00    | 1    | 113.0              | 1.77                      | 1                   | XP           | NP |
| TV02W750(B)-HF | 75.0                              | 83.30    | 92.10    | 1    | 121.0              | 1.65                      | 1                   | XR           | NR |
| TV02W780(B)-HF | 78.0                              | 86.70    | 95.80    | 1    | 126.0              | 1.59                      | 1                   | XT           | NT |
| TV02W800(B)-HF | 80.0                              | 88.80    | 97.60    | 1    | 129.0              | 1.55                      | 1                   | XB           | NB |
| TV02W850(B)-HF | 85.0                              | 94.40    | 104.00   | 1    | 137.0              | 1.46                      | 1                   | XV           | NV |
| TV02W900(B)-HF | 90.0                              | 100.00   | 111.00   | 1    | 146.0              | 1.37                      | 1                   | XX           | NX |
| TV02W101(B)-HF | 100.0                             | 111.00   | 123.00   | 1    | 162.0              | 1.23                      | 1                   | XZ           | NZ |
| TV02W111(B)-HF | 110.0                             | 122.00   | 135.00   | 1    | 177.0              | 1.13                      | 1                   | TE           | PE |
| TV02W121(B)-HF | 120.0                             | 133.00   | 147.00   | 1    | 193.0              | 1.04                      | 1                   | TG           | PG |
| TV02W131(B)-HF | 130.0                             | 144.00   | 159.00   | 1    | 209.0              | 0.96                      | 1                   | TK           | PK |
| TV02W141(B)-HF | 140.0                             | 155.00   | 171.00   | 1    | 224.0              | 0.89                      | 1                   | TB           | PB |
| TV02W151(B)-HF | 150.0                             | 167.00   | 185.00   | 1    | 243.0              | 0.82                      | 1                   | TM           | PM |
| TV02W161(B)-HF | 160.0                             | 178.00   | 197.00   | 1    | 259.0              | 0.77                      | 1                   | TP           | PP |
| TV02W171(B)-HF | 170.0                             | 189.00   | 209.00   | 1    | 275.0              | 0.73                      | 1                   | TR           | PR |
| TV02W181(B)-HF | 180.0                             | 200.00   | 220.00   | 1    | 292.0              | 0.68                      | 1                   | TT           | PT |
| TV02W191(B)-HF | 190.0                             | 211.00   | 232.00   | 1    | 308.0              | 0.65                      | 1                   | TV           | PV |

Notes:

1. Suffix B after part number to specify bi-directional devices.
2. For Bi-Directional devices having Vr of 10 volts and under, the Ir limit is double.

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REV:C

## Reel Taping Specification

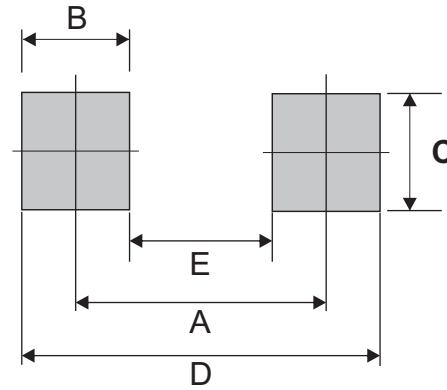


| SOD-123 | SYMBOL | A             | B             | C             | d             | D             | D1         | D2            |
|---------|--------|---------------|---------------|---------------|---------------|---------------|------------|---------------|
|         | (mm)   | 1.85 ± 0.10   | 3.94 ± 0.10   | 1.57 ± 0.10   | 1.55 ± 0.05   | 178.00 ± 1.00 | 50.00 Min. | 13.00 ± 0.20  |
|         | (inch) | 0.073 ± 0.004 | 0.155 ± 0.004 | 0.062 ± 0.004 | 0.061 ± 0.002 | 7.008 ± 0.039 | 1.969 Min. | 0.512 ± 0.008 |

| SOD-123 | SYMBOL | E             | F             | P             | P0            | P1            | W             | W1         |
|---------|--------|---------------|---------------|---------------|---------------|---------------|---------------|------------|
|         | (mm)   | 1.75 ± 0.10   | 3.50 ± 0.05   | 4.00 ± 0.10   | 4.00 ± 0.10   | 2.00 ± 0.05   | 8.00 ± 0.10   | 11.40 Max. |
|         | (inch) | 0.069 ± 0.004 | 0.138 ± 0.002 | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.315 ± 0.004 | 0.449 Max. |

## Suggested PAD Layout

| SIZE | SOD-123 |        |
|------|---------|--------|
|      | (mm)    | (inch) |
| A    | 2.90    | 0.114  |
| B    | 1.30    | 0.051  |
| C    | 1.40    | 0.055  |
| D    | 4.20    | 0.165  |
| E    | 1.60    | 0.063  |



## Standard Packaging

| Case Type | REEL PACK       |                     |
|-----------|-----------------|---------------------|
|           | REEL<br>( pcs ) | Reel Size<br>(inch) |
| SOD-123   | 3,000           | 7                   |

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