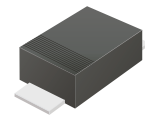


## TV02W5V0-G Thru. TV02W191-G

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

**Peak Pulse Power:200 Watts**

**RoHS Device**

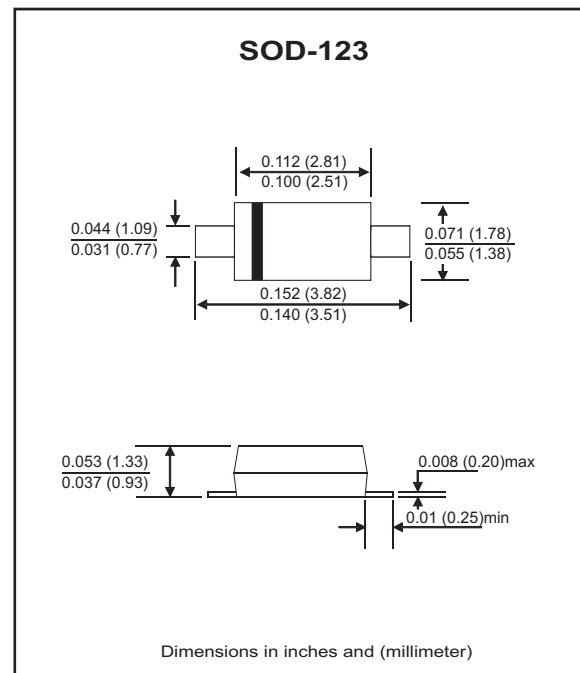


### Features

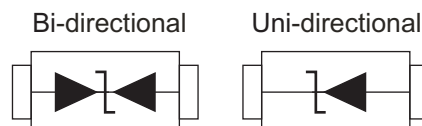
- Glass passivated chip.
- Low leakage current.
- 200W peak pulse power capility with a 10/1000us waveform,repitive rate (duty cycle):0.01%.
- Uni and bidirectional unit.
- Excellent clamping capability.
- Very fast response time.

### 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.



### 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)                               | P <sub>PP</sub>                  | 200            | W    |
| Peak power dissipation at 8/20μs waveform (Note 1)                                  | P <sub>PP</sub>                  | 1000           | W    |
| Peak pulse current with a 10/1000μs waveform (Note 1)                               | I <sub>PP</sub>                  | See next table | A    |
| Power dissipation on infinite heatsink at T <sub>L</sub> = 75°C                     | P <sub>D</sub>                   | 0.4            | W    |
| Peak forward surge current, 8.3ms single half sone-wave undirestional only (Note 2) | I <sub>FSM</sub>                 | 20             | A    |
| Max.instantaneous forward voltage at 25A for undirestional only                     | V <sub>F</sub>                   | 3.5            | V    |
| Operating junction and storage temperature range                                    | T <sub>J</sub> ,T <sub>STG</sub> | -55 to +150    | °C   |

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub>=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.
3. Company reserves the right to improve product design , functions and reliability without notice.

REV:D

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

Fig. 1 - Pulse Derating Curve

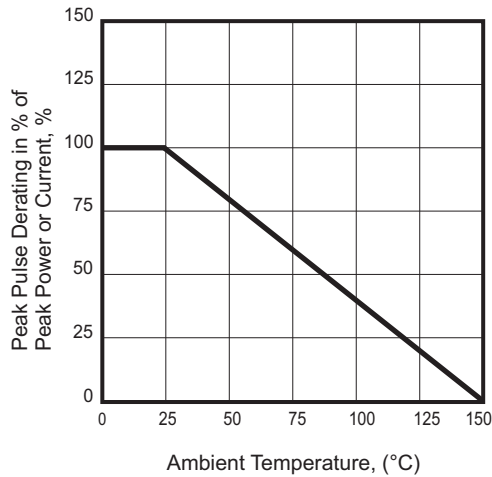


Fig.2 - Steady State Power Derating Curve

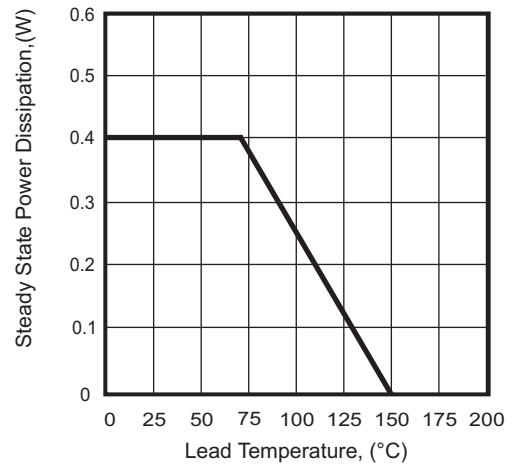


Fig. 3 - Pulse Waveform

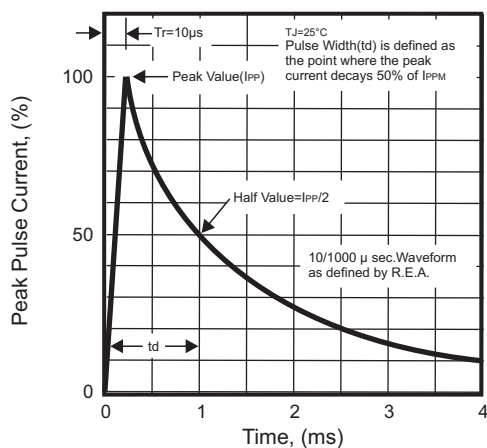


Fig. 4 - Peak Pulse Power Rating Curve

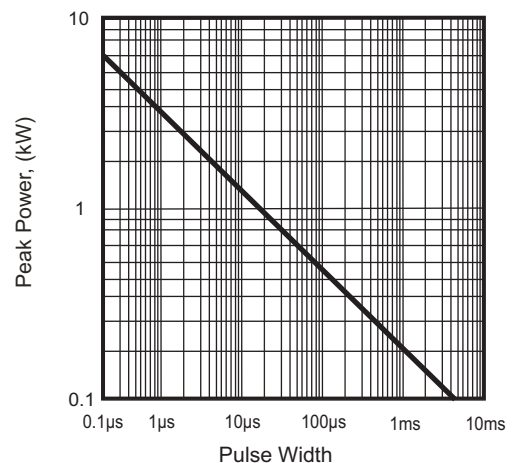


Fig. 5 - Maximum non-repetitive surge current

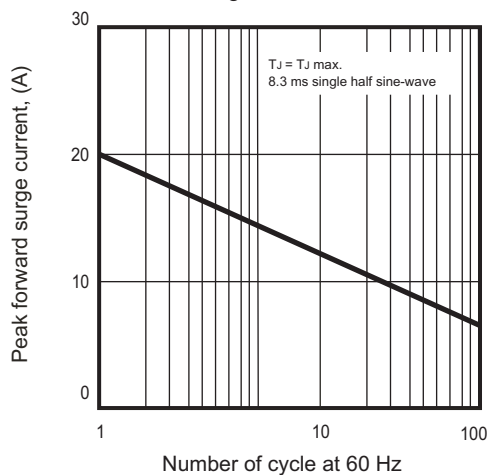
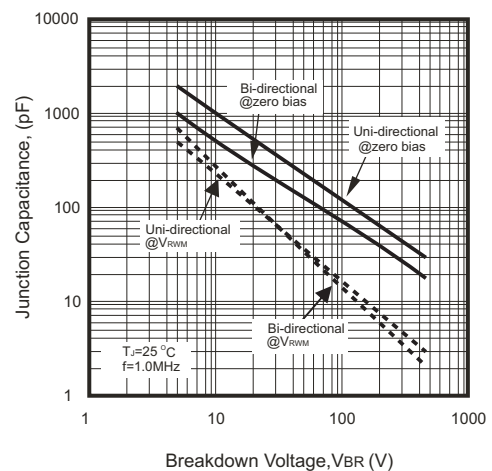


Fig.6 - Typical Junction Capacitance



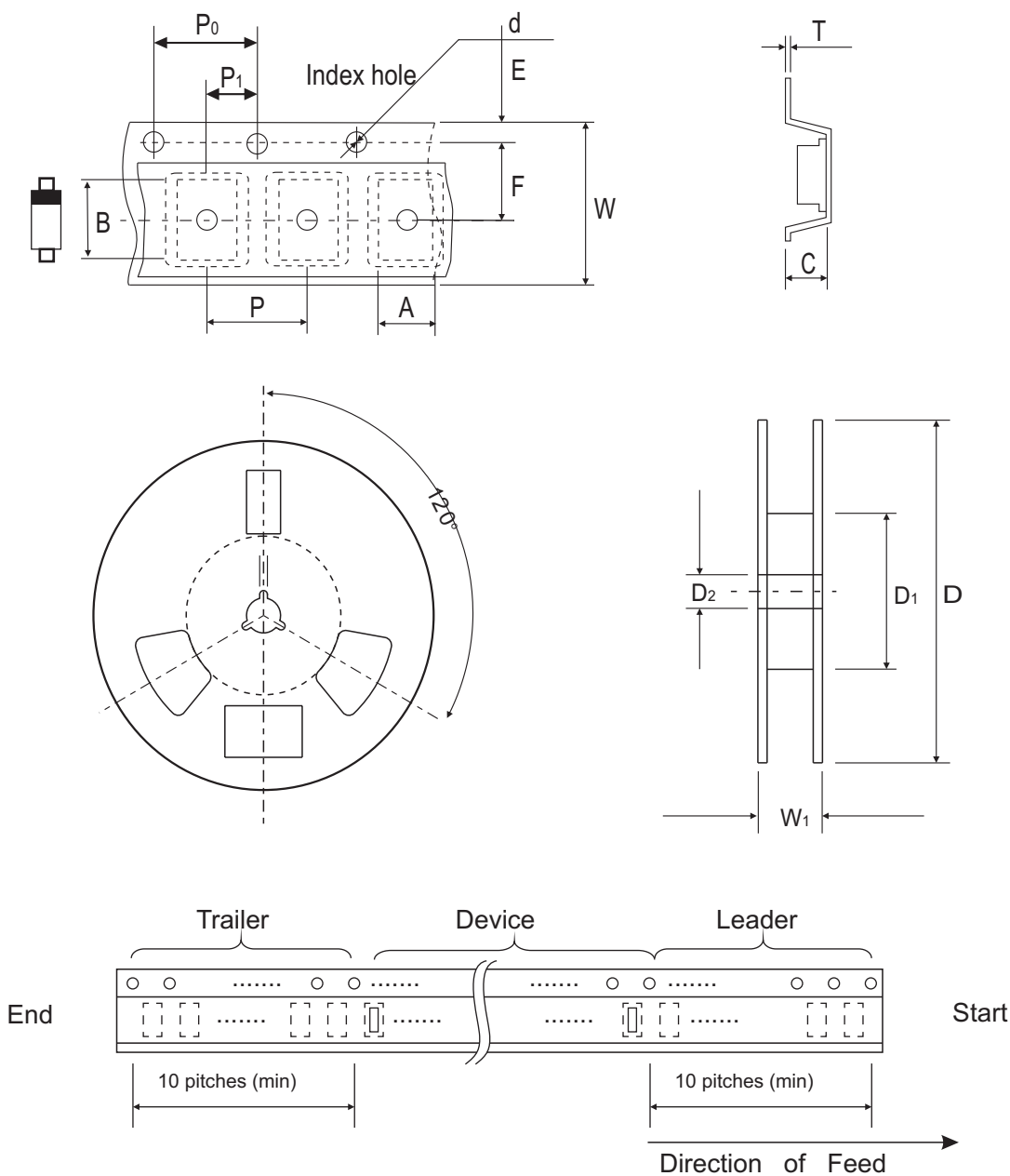
## Electrical Characteristics (TV02W5V0-G Thru. TV02W191-G)

| Part No       | Absolute Maximum Rating (Ta=25°C) |                      |                      |                | V <sub>C</sub> (Max.)<br>@ IPP | IPP<br>@ 10/1000us | I <sub>R</sub><br>@ V <sub>RWM</sub> | Marking Code |    |
|---------------|-----------------------------------|----------------------|----------------------|----------------|--------------------------------|--------------------|--------------------------------------|--------------|----|
|               | V <sub>RWM</sub>                  | V <sub>BR</sub> Min. | V <sub>BR</sub> Max. | I <sub>T</sub> |                                |                    |                                      |              |    |
|               | (V)                               | (V)                  | (V)                  | (mA)           |                                |                    |                                      | Uni          | Bi |
| TV02W5V0(B)-G | 5.0                               | 6.40                 | 7.00                 | 10             | 9.20                           | 21.74              | 400                                  | FE           | KE |
| TV02W6V0(B)-G | 6.0                               | 6.67                 | 7.37                 | 10             | 10.3                           | 19.42              | 400                                  | FG           | KG |
| TV02W6V5(B)-G | 6.5                               | 7.22                 | 7.98                 | 10             | 11.2                           | 17.86              | 250                                  | FK           | KK |
| TV02W7V0(B)-G | 7.0                               | 7.78                 | 8.60                 | 10             | 12.0                           | 16.67              | 100                                  | FM           | KM |
| TV02W7V5(B)-G | 7.5                               | 8.33                 | 9.21                 | 1              | 12.9                           | 15.50              | 50                                   | FP           | KP |
| TV02W8V0(B)-G | 8.0                               | 8.89                 | 9.83                 | 1              | 13.6                           | 14.71              | 25                                   | FR           | KR |
| TV02W8V5(B)-G | 8.5                               | 9.44                 | 10.40                | 1              | 14.4                           | 13.89              | 10                                   | FT           | KT |
| TV02W9V0(B)-G | 9.0                               | 10.00                | 11.10                | 1              | 15.4                           | 12.99              | 5                                    | FV           | KV |
| TV02W100(B)-G | 10.0                              | 11.10                | 12.30                | 1              | 17.0                           | 11.76              | 2.5                                  | FX           | KX |
| TV02W110(B)-G | 11.0                              | 12.20                | 13.50                | 1              | 18.2                           | 10.99              | 2.5                                  | FZ           | KZ |
| TV02W120(B)-G | 12.0                              | 13.30                | 14.70                | 1              | 19.9                           | 10.05              | 2.5                                  | HE           | LE |
| TV02W130(B)-G | 13.0                              | 14.40                | 15.90                | 1              | 21.5                           | 9.30               | 1                                    | HG           | LG |
| TV02W140(B)-G | 14.0                              | 15.60                | 17.20                | 1              | 23.2                           | 8.62               | 1                                    | HK           | LK |
| TV02W150(B)-G | 15.0                              | 16.70                | 18.50                | 1              | 24.4                           | 8.20               | 1                                    | HM           | LM |
| TV02W160(B)-G | 16.0                              | 17.80                | 19.70                | 1              | 26.0                           | 7.69               | 1                                    | HP           | LP |
| TV02W170(B)-G | 17.0                              | 18.90                | 20.90                | 1              | 27.6                           | 7.25               | 1                                    | HR           | LR |
| TV02W180(B)-G | 18.0                              | 20.00                | 22.10                | 1              | 29.2                           | 6.85               | 1                                    | HT           | LT |
| TV02W190(B)-G | 19.0                              | 21.10                | 23.30                | 1              | 30.6                           | 6.54               | 1                                    | HB           | LB |
| TV02W200(B)-G | 20.0                              | 22.20                | 24.50                | 1              | 32.4                           | 6.17               | 1                                    | HV           | LV |
| TV02W220(B)-G | 22.0                              | 24.4                 | 26.90                | 1              | 35.5                           | 5.63               | 1                                    | HX           | LX |
| TV02W240(B)-G | 24.0                              | 26.70                | 29.50                | 1              | 38.9                           | 5.14               | 1                                    | HZ           | LZ |
| TV02W260(B)-G | 26.0                              | 28.90                | 31.90                | 1              | 42.1                           | 4.75               | 1                                    | JE           | ME |
| TV02W280(B)-G | 28.0                              | 31.10                | 34.40                | 1              | 45.4                           | 4.41               | 1                                    | JG           | MG |
| TV02W300(B)-G | 30.0                              | 33.30                | 36.80                | 1              | 48.4                           | 4.13               | 1                                    | JK           | MK |
| TV02W330(B)-G | 33.0                              | 36.70                | 40.60                | 1              | 53.3                           | 3.75               | 1                                    | JM           | MM |
| TV02W360(B)-G | 36.0                              | 40.00                | 44.20                | 1              | 58.1                           | 3.44               | 1                                    | JP           | MP |
| TV02W400(B)-G | 40.0                              | 44.40                | 49.10                | 1              | 64.5                           | 3.10               | 1                                    | JR           | MR |
| TV02W430(B)-G | 43.0                              | 47.80                | 52.80                | 1              | 69.4                           | 2.88               | 1                                    | JT           | MT |
| TV02W450(B)-G | 45.0                              | 50.00                | 55.30                | 1              | 72.7                           | 2.75               | 1                                    | JV           | MV |
| TV02W480(B)-G | 48.0                              | 53.30                | 58.90                | 1              | 77.4                           | 2.58               | 1                                    | JX           | MX |
| TV02W510(B)-G | 51.0                              | 56.70                | 62.70                | 1              | 82.4                           | 2.43               | 1                                    | JZ           | MZ |
| TV02W540(B)-G | 54.0                              | 60.00                | 66.30                | 1              | 87.1                           | 2.30               | 1                                    | XE           | NE |
| TV02W580(B)-G | 58.0                              | 64.40                | 71.20                | 1              | 93.6                           | 2.14               | 1                                    | XG           | NG |
| TV02W600(B)-G | 60.0                              | 66.70                | 73.70                | 1              | 96.8                           | 2.07               | 1                                    | XK           | NK |
| TV02W640(B)-G | 64.0                              | 71.10                | 78.60                | 1              | 103.0                          | 1.94               | 1                                    | XM           | NM |
| TV02W700(B)-G | 70.0                              | 77.80                | 86.00                | 1              | 113.0                          | 1.77               | 1                                    | XP           | NP |
| TV02W750(B)-G | 75.0                              | 83.30                | 92.10                | 1              | 121.0                          | 1.65               | 1                                    | XR           | NR |
| TV02W780(B)-G | 78.0                              | 86.70                | 95.80                | 1              | 126.0                          | 1.59               | 1                                    | XT           | NT |
| TV02W800(B)-G | 80.0                              | 88.80                | 97.60                | 1              | 129.0                          | 1.55               | 1                                    | XB           | NB |
| TV02W850(B)-G | 85.0                              | 94.40                | 104.00               | 1              | 137.0                          | 1.46               | 1                                    | XV           | NV |
| TV02W900(B)-G | 90.0                              | 100.00               | 111.00               | 1              | 146.0                          | 1.37               | 1                                    | XX           | NX |
| TV02W101(B)-G | 100.0                             | 111.00               | 123.00               | 1              | 162.0                          | 1.23               | 1                                    | XZ           | NZ |
| TV02W111(B)-G | 110.0                             | 122.00               | 135.00               | 1              | 177.0                          | 1.13               | 1                                    | TE           | PE |
| TV02W121(B)-G | 120.0                             | 133.00               | 147.00               | 1              | 193.0                          | 1.04               | 1                                    | TG           | PG |
| TV02W131(B)-G | 130.0                             | 144.00               | 159.00               | 1              | 209.0                          | 0.96               | 1                                    | TK           | PK |
| TV02W141(B)-G | 140.0                             | 155.00               | 171.00               | 1              | 224.0                          | 0.89               | 1                                    | TB           | PB |
| TV02W151(B)-G | 150.0                             | 167.00               | 185.00               | 1              | 243.0                          | 0.82               | 1                                    | TM           | PM |
| TV02W161(B)-G | 160.0                             | 178.00               | 197.00               | 1              | 259.0                          | 0.77               | 1                                    | TP           | PP |
| TV02W171(B)-G | 170.0                             | 189.00               | 209.00               | 1              | 275.0                          | 0.73               | 1                                    | TR           | PR |
| TV02W181(B)-G | 180.0                             | 200.00               | 220.00               | 1              | 292.0                          | 0.69               | 1                                    | TT           | PT |
| TV02W191(B)-G | 190.0                             | 211.00               | 232.00               | 1              | 308.0                          | 0.69               | 1                                    | TV           | PV |

### Notes:

1. Suffix B after part number to specify bi-directional devices.
2. For Bi-Directional devices having V<sub>R</sub> of 10 volts and under, the I<sub>R</sub> limit is double.
3. Company reserves the right to improve product design , functions and reliability without notice.

## Reel Taping Specification

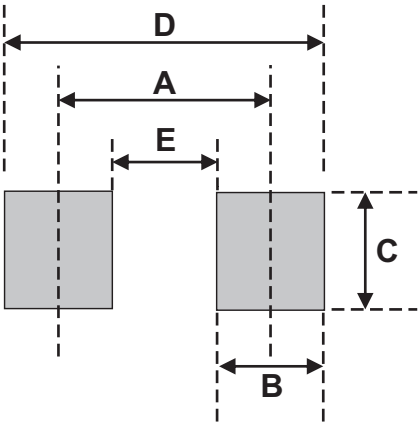


| SOD-123 | SYMBOL | A                 | B                 | C                 | d                 | D                 | D1                | D2                |
|---------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|         | (mm)   | $1.85 \pm 0.10$   | $3.94 \pm 0.10$   | $1.57 \pm 0.10$   | $1.55 \pm 0.10$   | $178 \pm 1.00$    | $54.40 \pm 0.40$  | $13.0 \pm 0.20$   |
|         | (inch) | $0.073 \pm 0.004$ | $0.155 \pm 0.004$ | $0.062 \pm 0.004$ | $0.061 \pm 0.004$ | $7.008 \pm 0.039$ | $2.142 \pm 0.016$ | $0.512 \pm 0.008$ |

| SOD-123 | SYMBOL | E                 | F                 | P                 | $P_0$             | $P_1$             | W                        | $W_1$             |
|---------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------------|-------------------|
|         | (mm)   | $1.75 \pm 0.10$   | $3.50 \pm 0.05$   | $4.00 \pm 0.10$   | $4.00 \pm 0.10$   | $2.00 \pm 0.10$   | $8.00 \pm 0.30/-0.10$    | $9.50 \pm 1.00$   |
|         | (inch) | $0.069 \pm 0.004$ | $0.138 \pm 0.002$ | $0.158 \pm 0.004$ | $0.158 \pm 0.004$ | $0.079 \pm 0.004$ | $0.315 \pm 0.012/-0.004$ | $0.374 \pm 0.039$ |

## Suggested PAD Layout

| SIZE | SOD-123 |        |
|------|---------|--------|
|      | (mm)    | (inch) |
| A    | 3.35    | 0.132  |
| B    | 0.80    | 0.032  |
| C    | 1.00    | 0.039  |
| D    | 4.15    | 0.163  |
| E    | 2.55    | 0.100  |



## Standard Packaging

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