

# SMD Transient Voltage Suppressor

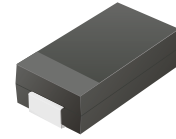


## TV04A5V0-G Thru. TV04A171-G

Working Peak Reverse Voltage: 5.0 to 170 Volts

Power Dissipation: 400 Watts

RoHS Device

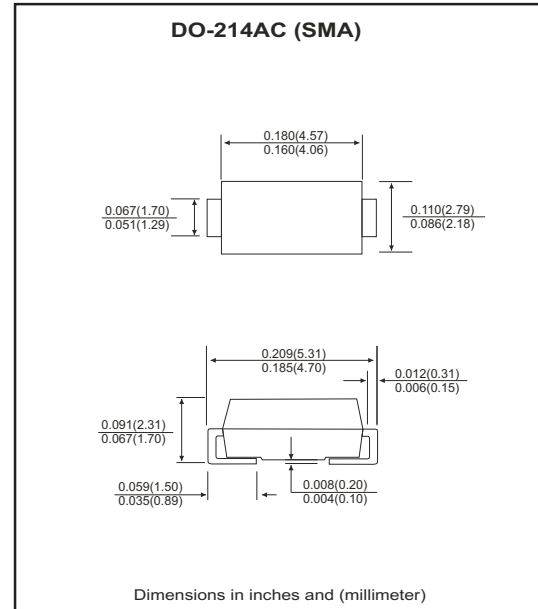


### Features

- Ideal for surface mount applications.
- Easy pick and place.
- Plastic package has Underwriters Lab. flammability classification 94V-0.
- Typical IR less than 1 $\mu$ A above 10V.
- Fast response time: typically less than 1nS for uni-direction, less than 5nS for bi-direction, from 0V to BV min.

### Mechanical data

- Case: JEDEC DO-214AC, molded plastic.
- Terminals: solderable per MIL-STD-750, method 2026.
- Polarity: Color band denotes cathode end.
- Approx. weight: 0.064 grams



### Maximum Ratings 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%.

| Characteristics   | Symbol             | Value       | Units |
|---|--------------------|-------------|-------|
| Peak power dissipation on 10/1000 $\mu$ S waveform (Note 1, Fig. 1)   | P <sub>PPM</sub>   | 400         | Watts |
| Peak pulse current on 10/1000 $\mu$ S waveform (Note 1, Fig. 3)   | I <sub>PPM</sub>   | See Table 1 | A     |
| Steady state power dissipation at T <sub>L</sub> =75 °C (Note 2)  | P <sub>M(AV)</sub> | 1.0         | Watts |
| Peak forward surge current, 8.3mS single half sine-wave superimposed on rated load, uni-directional only (Note 3) | I <sub>FSM</sub>   | 40          | A     |
| Maximum instantaneous forward voltage at 25.0A for uni-directional only (Note 3&4)                                | V <sub>F</sub>     | 3.5         | V     |
| Maximum operating junction temperature  | T <sub>J</sub>     | 150         | °C    |
| Storage temperature range   | 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. 2.
2. Mounted on 5.0x5.0mm copper pads to each terminal.
3. Lead temperature at T<sub>L</sub>=75 °C per Fig.5.
4. Measured on 8.3mS single half sine-wave for uni-directional devices only.
5. Peak pulse power waveform is 10/1000 $\mu$ S.

## RATING AND CHARACTERISTIC CURVES (TV04A5V0-G thru TV04A171-G)

Fig.1 Reverse Characteristics

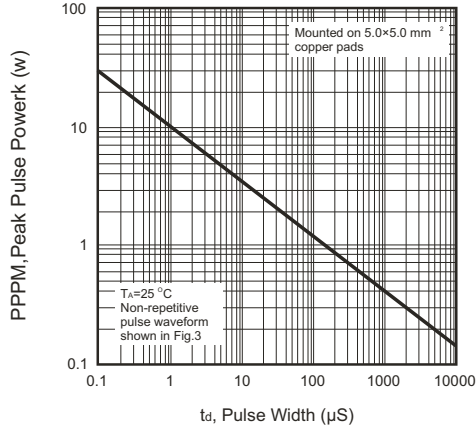


Fig.2 Pulse Derating Curve

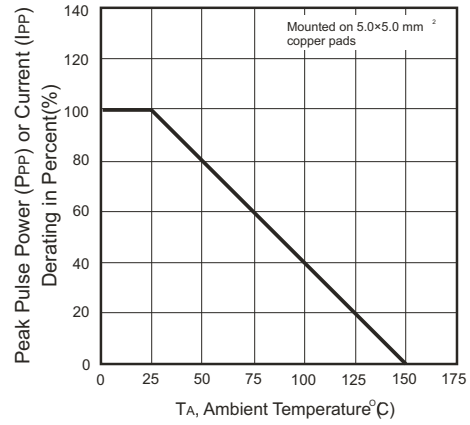


Fig.3 Pulse Waveform

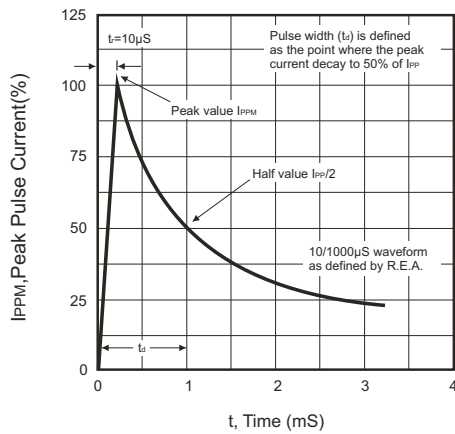


Fig.4 Typical Junction Capacitance

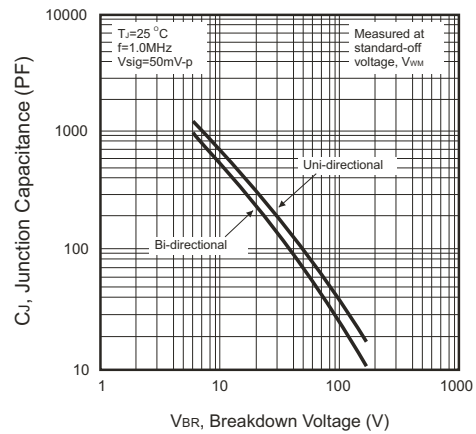


Fig.5 Steady State Power Derating Curve

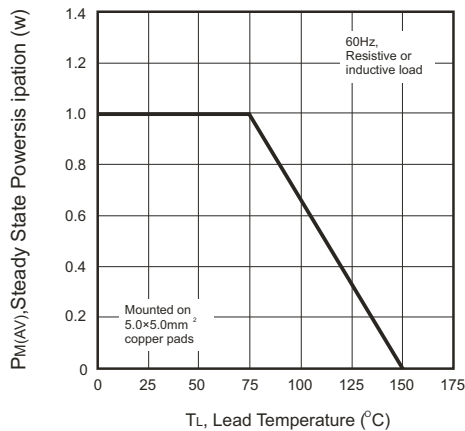
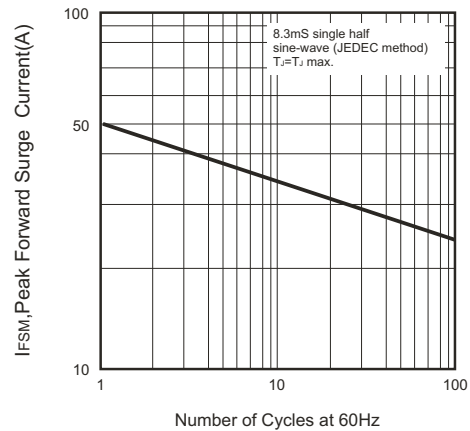


Fig.6 Max. Non-repetitive Forward Surge Current (Uni-directional only)



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Table 1. Specification

| Part No        | Absolute Maximum Rating (Ta=25°C) |                      |                      |                |                  | Electrical Characteristic (Ta=25°C) |                     |                                  |              |    |
|----------------|-----------------------------------|----------------------|----------------------|----------------|------------------|-------------------------------------|---------------------|----------------------------------|--------------|----|
|                | V <sub>RWM</sub>                  | V <sub>BR</sub> Min. | V <sub>BR</sub> Max. | I <sub>T</sub> | I <sub>FSM</sub> | Max. V <sub>C</sub>                 |                     | I <sub>R</sub> @V <sub>RWM</sub> | Marking Code |    |
|                | (V)                               | (V)                  | (V)                  | (mA)           | (A)@8.3mS        | (V)                                 | I <sub>PP</sub> (A) | ( $\mu$ A)                       | Uni          | Bi |
| TV04A5V0K(B)-G | 5.00                              | 6.40                 | 7.82                 | 10             | 40               | 9.60                                | 41.6                | 800                              | AD           | WD |
| TV04A5V0J(B)-G | 5.00                              | 6.46                 | 7.07                 | 10             | 40               | 9.20                                | 43.5                | 800                              | AE           | WE |
| TV04A6V0K(B)-G | 6.00                              | 6.67                 | 8.15                 | 10             | 40               | 11.4                                | 35.1                | 800                              | AF           | WF |
| TV04A6V0J(B)-G | 6.00                              | 6.67                 | 7.37                 | 10             | 40               | 10.3                                | 38.0                | 800                              | AG           | WG |
| TV04A6V5K(B)-G | 6.50                              | 7.22                 | 8.82                 | 10             | 40               | 12.3                                | 32.5                | 500                              | AH           | WH |
| TV04A6V5J(B)-G | 6.50                              | 7.22                 | 7.98                 | 10             | 40               | 11.2                                | 35.7                | 500                              | AK           | WK |
| TV04A7V0K(B)-G | 7.00                              | 7.78                 | 9.51                 | 1              | 40               | 13.3                                | 30.1                | 200                              | AL           | WL |
| TV04A7V0J(B)-G | 7.00                              | 7.78                 | 8.60                 | 1              | 40               | 12.0                                | 33.3                | 200                              | AM           | WM |
| TV04A7V5K(B)-G | 7.50                              | 8.33                 | 10.2                 | 1              | 40               | 14.3                                | 28.0                | 100                              | AN           | WN |
| TV04A7V5J(B)-G | 7.50                              | 8.33                 | 9.21                 | 1              | 40               | 12.9                                | 31.0                | 100                              | AP           | WP |
| TV04A8V0K(B)-G | 8.00                              | 8.89                 | 10.9                 | 1              | 40               | 15.0                                | 26.5                | 50                               | AQ           | WQ |
| TV04A8V0J(B)-G | 8.00                              | 8.89                 | 9.83                 | 1              | 40               | 13.6                                | 29.4                | 50                               | AR           | WR |
| TV04A8V5K(B)-G | 8.55                              | 9.44                 | 11.5                 | 1              | 40               | 15.9                                | 25.1                | 10                               | AS           | WS |
| TV04A8V5J(B)-G | 8.55                              | 9.44                 | 10.4                 | 1              | 40               | 14.4                                | 27.7                | 10                               | AT           | ST |
| TV04A9V0K(B)-G | 9.00                              | 10.0                 | 12.2                 | 1              | 40               | 16.9                                | 23.6                | 5                                | AU           | WU |
| TV04A9V0J(B)-G | 9.00                              | 10.0                 | 11.1                 | 1              | 40               | 15.4                                | 26.0                | 5                                | AV           | WV |
| TV04A100K(B)-G | 10.0                              | 11.1                 | 13.6                 | 1              | 40               | 18.8                                | 21.1                | 5                                | AW           | WW |
| TV04A100J(B)-G | 10.0                              | 11.1                 | 12.3                 | 1              | 40               | 17.0                                | 23.5                | 5                                | AX           | WX |
| TV04A110K(B)-G | 11.0                              | 12.2                 | 14.9                 | 1              | 40               | 20.1                                | 20.0                | 5                                | AY           | WY |
| TV04A110J(B)-G | 11.0                              | 12.2                 | 13.5                 | 1              | 40               | 18.2                                | 22.0                | 5                                | AZ           | WZ |
| TV04A120K(B)-G | 12.0                              | 13.3                 | 16.3                 | 1              | 40               | 22.0                                | 18.1                | 5                                | BD           | XD |
| TV04A120J(B)-G | 12.0                              | 13.3                 | 14.7                 | 1              | 40               | 19.9                                | 20.1                | 5                                | BE           | XE |
| TV04A130K(B)-G | 13.0                              | 14.4                 | 17.6                 | 1              | 40               | 23.8                                | 16.8                | 5                                | BF           | XF |
| TV04A130J(B)-G | 13.0                              | 14.4                 | 15.9                 | 1              | 40               | 21.5                                | 18.6                | 5                                | BG           | XG |
| TV04A140K(B)-G | 14.0                              | 15.6                 | 19.1                 | 1              | 40               | 25.8                                | 15.5                | 5                                | BH           | XH |
| TV04A140J(B)-G | 14.0                              | 15.6                 | 17.2                 | 1              | 40               | 23.2                                | 17.2                | 5                                | BK           | XK |
| TV04A150K(B)-G | 15.0                              | 16.7                 | 20.4                 | 1              | 40               | 26.9                                | 14.8                | 5                                | BL           | XL |
| TV04A150J(B)-G | 15.0                              | 16.7                 | 18.5                 | 1              | 40               | 24.4                                | 16.4                | 5                                | BM           | XM |
| TV04A160K(B)-G | 16.0                              | 17.8                 | 21.8                 | 1              | 40               | 28.8                                | 13.8                | 5                                | BN           | XN |
| TV04A160J(B)-G | 16.0                              | 17.8                 | 19.7                 | 1              | 40               | 26.0                                | 15.3                | 5                                | BP           | XP |
| TV04A170K(B)-G | 17.0                              | 18.9                 | 23.1                 | 1              | 40               | 30.5                                | 13.1                | 5                                | BQ           | XQ |
| TV04A170J(B)-G | 17.0                              | 18.9                 | 20.9                 | 1              | 40               | 27.6                                | 14.5                | 5                                | BR           | XR |
| TV04A180K(B)-G | 18.0                              | 20.0                 | 24.4                 | 1              | 40               | 32.2                                | 12.4                | 5                                | BS           | XS |
| TV04A180J(B)-G | 18.0                              | 20.0                 | 22.1                 | 1              | 40               | 29.2                                | 13.7                | 5                                | BT           | XT |
| TV04A200K(B)-G | 20.0                              | 22.2                 | 27.1                 | 1              | 40               | 35.8                                | 11.1                | 5                                | BU           | XU |
| TV04A200J(B)-G | 20.0                              | 22.2                 | 24.5                 | 1              | 40               | 32.4                                | 12.3                | 5                                | BV           | XV |
| TV04A220K(B)-G | 22.0                              | 24.4                 | 29.8                 | 1              | 40               | 39.4                                | 10.0                | 5                                | BW           | XW |
| TV04A220J(B)-G | 22.0                              | 24.4                 | 26.9                 | 1              | 40               | 35.5                                | 11.2                | 5                                | BX           | XX |
| TV04A240K(B)-G | 24.0                              | 26.7                 | 32.6                 | 1              | 40               | 43.0                                | 9.3                 | 5                                | BY           | XY |
| TV04A240J(B)-G | 24.0                              | 26.7                 | 29.5                 | 1              | 40               | 38.9                                | 10.3                | 5                                | BZ           | XZ |
| TV04A260K(B)-G | 26.0                              | 28.9                 | 35.3                 | 1              | 40               | 46.6                                | 8.6                 | 5                                | CD           | YD |
| TV04A260J(B)-G | 26.0                              | 28.9                 | 31.9                 | 1              | 40               | 42.1                                | 9.5                 | 5                                | CE           | YE |
| TV04A280K(B)-G | 28.0                              | 31.1                 | 38.0                 | 1              | 40               | 50.0                                | 8.0                 | 5                                | CF           | YF |
| TV04A280J(B)-G | 28.0                              | 31.1                 | 34.4                 | 1              | 40               | 45.4                                | 8.8                 | 5                                | CG           | YG |
| TV04A300K(B)-G | 30.0                              | 33.3                 | 40.7                 | 1              | 40               | 53.5                                | 7.5                 | 5                                | CH           | YH |
| TV04A300J(B)-G | 30.0                              | 33.3                 | 36.8                 | 1              | 40               | 48.4                                | 8.3                 | 5                                | CK           | YK |
| TV04A330K(B)-G | 33.0                              | 36.7                 | 44.9                 | 1              | 40               | 59.0                                | 6.8                 | 5                                | CL           | YL |
| TV04A330J(B)-G | 33.0                              | 36.7                 | 40.6                 | 1              | 40               | 53.3                                | 7.5                 | 5                                | CM           | YM |

REV:B

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Table 1. Specification

| Part No        | Absolute Maximum Rating (Ta=25°C) |          |          |      |           | Electrical Characteristic (Ta=25°C) |         |         |              |    |
|----------------|-----------------------------------|----------|----------|------|-----------|-------------------------------------|---------|---------|--------------|----|
|                | VRWM                              | VBR Min. | VBR Max. | IT   | IFSM      | Max. V C                            |         | IR@VRWM | Marking Code |    |
|                | (V)                               | (V)      | (V)      | (mA) | (A)@8.3mS | (V)                                 | IPP (A) | (uA)    | Uni          | Bi |
| TV04A360K(B)-G | 36.0                              | 40.0     | 48.9     | 1    | 40        | 64.3                                | 6.2     | 5       | CN           | YN |
| TV04A360J(B)-G | 36.0                              | 40.0     | 44.2     | 1    | 40        | 58.1                                | 6.9     | 5       | CP           | YP |
| TV04A400K(B)-G | 40.0                              | 44.4     | 54.3     | 1    | 40        | 71.4                                | 5.6     | 5       | CQ           | YQ |
| TV04A400J(B)-G | 40.0                              | 44.4     | 49.1     | 1    | 40        | 64.5                                | 6.2     | 5       | CR           | YR |
| TV04A430K(B)-G | 43.0                              | 47.8     | 58.4     | 1    | 40        | 76.7                                | 5.2     | 5       | CS           | YS |
| TV04A430J(B)-G | 43.0                              | 47.8     | 52.8     | 1    | 40        | 69.4                                | 5.7     | 5       | CT           | YT |
| TV04A450K(B)-G | 45.0                              | 50.0     | 61.1     | 1    | 40        | 80.3                                | 5.0     | 5       | CU           | YU |
| TV04A450J(B)-G | 45.0                              | 50.0     | 55.3     | 1    | 40        | 72.7                                | 5.5     | 5       | CV           | YV |
| TV04A480K(B)-G | 48.0                              | 53.3     | 65.1     | 1    | 40        | 85.5                                | 4.7     | 5       | CW           | YW |
| TV04A480J(B)-G | 48.0                              | 53.3     | 58.9     | 1    | 40        | 77.4                                | 5.2     | 5       | CX           | YX |
| TV04A510K(B)-G | 51.0                              | 56.7     | 69.3     | 1    | 40        | 91.1                                | 4.4     | 5       | CY           | YY |
| TV04A510J(B)-G | 51.0                              | 56.7     | 62.7     | 1    | 40        | 82.4                                | 4.9     | 5       | CZ           | YZ |
| TV04A540K(B)-G | 54.0                              | 60.0     | 73.3     | 1    | 40        | 96.3                                | 4.2     | 5       | RD           | ZD |
| TV04A540J(B)-G | 54.0                              | 60.0     | 66.3     | 1    | 40        | 87.1                                | 4.6     | 5       | RE           | ZE |
| TV04A580K(B)-G | 58.0                              | 64.4     | 78.7     | 1    | 40        | 103                                 | 3.9     | 5       | RF           | ZF |
| TV04A580J(B)-G | 58.0                              | 64.4     | 71.2     | 1    | 40        | 93.6                                | 4.3     | 5       | RG           | ZG |
| TV04A600K(B)-G | 60.0                              | 66.7     | 81.5     | 1    | 40        | 107                                 | 3.7     | 5       | RH           | ZH |
| TV04A600J(B)-G | 60.0                              | 66.7     | 73.7     | 1    | 40        | 96.8                                | 4.1     | 5       | RK           | ZK |
| TV04A640K(B)-G | 64.0                              | 71.1     | 86.9     | 1    | 40        | 114                                 | 4.5     | 5       | RL           | ZL |
| TV04A640J(B)-G | 64.0                              | 71.1     | 78.6     | 1    | 40        | 103                                 | 3.9     | 5       | RM           | ZM |
| TV04A700K(B)-G | 70.0                              | 77.8     | 95.1     | 1    | 40        | 125                                 | 3.2     | 5       | RN           | ZN |
| TV04A700J(B)-G | 70.0                              | 77.8     | 86.0     | 1    | 40        | 113                                 | 3.5     | 5       | RP           | ZP |
| TV04A750K(B)-G | 75.0                              | 83.3     | 102      | 1    | 40        | 134                                 | 3.0     | 5       | RQ           | ZQ |
| TV04A750J(B)-G | 75.0                              | 83.3     | 92.1     | 1    | 40        | 121                                 | 3.3     | 5       | RR           | ZR |
| TV04A780K(B)-G | 78.0                              | 86.7     | 106      | 1    | 40        | 139                                 | 2.9     | 5       | RS           | ZS |
| TV04A780J(B)-G | 78.0                              | 86.7     | 95.8     | 1    | 40        | 126                                 | 3.2     | 5       | RT           | ZT |
| TV04A850K(B)-G | 85.0                              | 94.4     | 115      | 1    | 40        | 151                                 | 2.6     | 5       | RU           | ZU |
| TV04A850J(B)-G | 85.0                              | 94.4     | 104      | 1    | 40        | 137                                 | 2.9     | 5       | RV           | ZV |
| TV04A900K(B)-G | 90.0                              | 100      | 122      | 1    | 40        | 160                                 | 2.5     | 5       | RW           | ZW |
| TV04A900J(B)-G | 90.0                              | 100      | 111      | 1    | 40        | 146                                 | 2.7     | 5       | RX           | ZX |
| TV04A101K(B)-G | 100                               | 111      | 136      | 1    | 40        | 179                                 | 2.2     | 5       | RY           | ZY |
| TV04A101J(B)-G | 100                               | 111      | 123      | 1    | 40        | 162                                 | 2.5     | 5       | RZ           | ZZ |
| TV04A111K(B)-G | 110                               | 122      | 149      | 1    | 40        | 196                                 | 2.0     | 5       | SD           | VD |
| TV04A111J(B)-G | 110                               | 122      | 135      | 1    | 40        | 177                                 | 2.3     | 5       | SE           | VE |
| TV04A121K(B)-G | 120                               | 133      | 163      | 1    | 40        | 214                                 | 1.9     | 5       | SF           | VF |
| TV04A121J(B)-G | 120                               | 133      | 147      | 1    | 40        | 193                                 | 2.0     | 5       | SG           | VG |
| TV04A131K(B)-G | 130                               | 144      | 176      | 1    | 40        | 231                                 | 1.7     | 5       | SH           | VH |
| TV04A131J(B)-G | 130                               | 144      | 159      | 1    | 40        | 209                                 | 1.9     | 5       | SK           | VK |
| TV04A151K(B)-G | 150                               | 167      | 204      | 1    | 40        | 268                                 | 1.5     | 5       | SL           | VL |
| TV04A151J(B)-G | 150                               | 167      | 185      | 1    | 40        | 243                                 | 1.6     | 5       | SM           | VM |
| TV04A161K(B)-G | 160                               | 178      | 218      | 1    | 40        | 287                                 | 1.4     | 5       | SN           | VN |
| TV04A161J(B)-G | 160                               | 178      | 197      | 1    | 40        | 259                                 | 1.5     | 5       | SP           | VP |
| TV04A171K(B)-G | 170                               | 189      | 231      | 1    | 40        | 304                                 | 1.3     | 5       | SQ           | VQ |
| TV04A171J(B)-G | 170                               | 189      | 209      | 1    | 40        | 275                                 | 1.4     | 5       | SR           | VR |

Notes:

1. Suffix K denotes 10% tolerance devices, suffix J denotes 5% tolerance devices.
2. Suffix B after part number to specify bi-directional devices.
3. For bi-directional devices having VR of 10 volts and under, the IR limit is double.

REV:B