

# SMD Transient Voltage Suppressor



## TV15C5V0-G Thru. TV15C441-G

Working Peak Reverse Voltage: 5.0 to 440 Volts

Power Dissipation: 1500Watts

RoHS Device

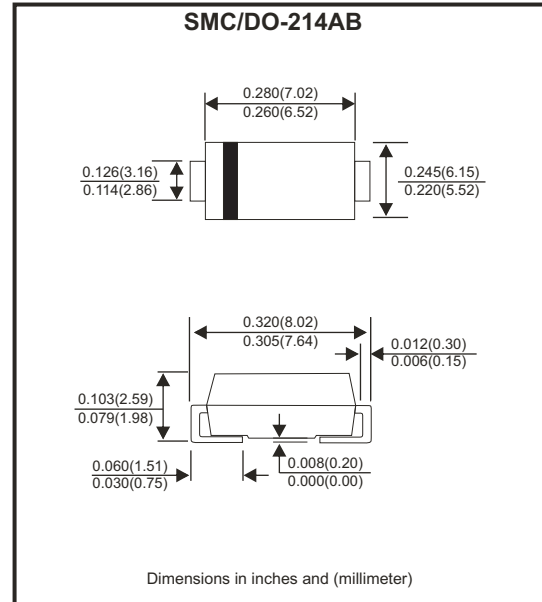


### Features

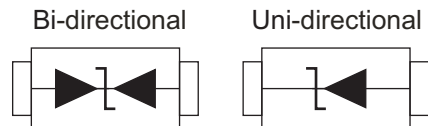
- Glass passivated chip.
- 1500W peak pulse power capability with a 10/1000 $\mu$ s waveform, repetitive rate (duty cycle):0.01%
- Low leakage.
- Uni and Bidirectional unit.
- Excellent clamping capability.
- Very fast response time.
- UL recognized file # E349157  Range: TV15C5V0J(B) thru. TV15C101J(B)

### Mechanical Data

- Case: DO-214AB/SMC molded plastic.
- Epoxy: UL 94V-0 rate flame retardant
- Terminals: Solderable per MIL-STD-750, method 2026.
- Polarity: Color band denoted cathode end except bipolar.
- Weight: 0.230 gram (approx.)



### Circuit Diagram



### Maximum Ratings and Electrical Characteristics

Rating 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 at 10/1000 $\mu$ S waveform (Notes.1)                                                       | P <sub>PPM</sub> | 1500        | W     |
| Peak pulse current at 10/1000 $\mu$ S waveform (Notes.1)                                                           | I <sub>PPM</sub> | See table 1 | A     |
| Steady state power dissipation at T <sub>L</sub> =75°C                                                             | P <sub>D</sub>   | 6.5         | W     |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, uni-directional only (Notes.2) | I <sub>FSM</sub> | 200         | A     |
| Maximum instantaneous forward voltage at 100A for uni-directional only (Note.3)                                    | V <sub>F</sub>   | 3.5/5.0     | V     |
| Operation junction temperature range                                                                               | T <sub>J</sub>   | -55 to +150 | °C    |
| Storage temperature range                                                                                          | T <sub>STG</sub> | -55 to +150 | °C    |

Notes:

1. Non-repetitive current pulse, per Fig. 5 and derated above T<sub>A</sub>=25 °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<sub>F</sub><3.5V for devices of V<sub>BR</sub><200V and V<sub>F</sub><5.0V for devices of V<sub>BR</sub>>201V

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REV:F

## Ratings and Characteristics Curve (TV15C5V0-G Thru. TV15C441-G)

Fig.1 - Pulse Derating Curve



Fig.2 - Max. Non-Repetitive Surge Current



Fig.3 - Steady State Power Derating Curve

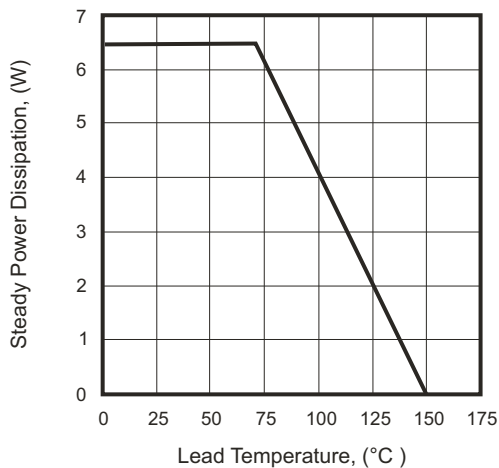


Fig.4 - Peak Pulse Power Rating Curve

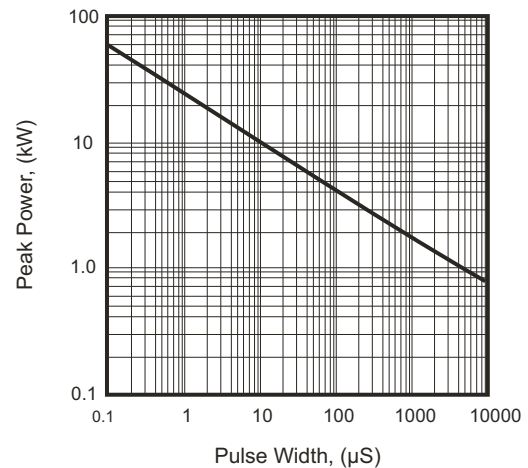


Fig.5 - Pulse Waveform

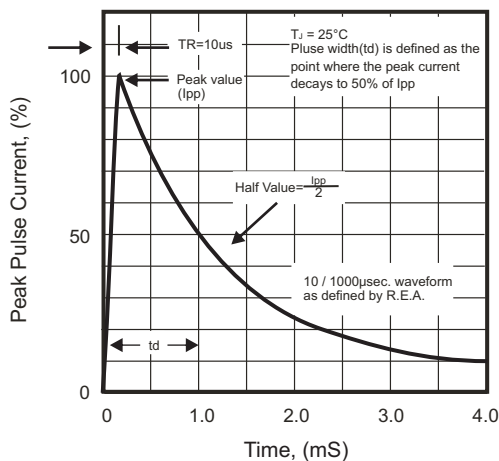


Fig.6 - Typical Junction Capacitance



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## Electrical Characteristics (TV15C5V0-G Thru. TV15C441-G)

| Part No.       | Breakdown voltage<br>V <sub>BR</sub> @ I <sub>T</sub> |             |                        | Maximum<br>Reverse<br>Leakage<br>@V <sub>RWM</sub><br>I <sub>R</sub> (uA) | Working<br>Peak<br>Reverse<br>Voltage<br>V <sub>RWM</sub> (V) | Maximum<br>Reverse<br>Surge<br>Current<br>I <sub>PP</sub> (A) | Maximum<br>Clamping<br>Voltage<br>@I <sub>PP</sub><br>V <sub>C</sub> (V) | Device<br>Marking<br>Code |     |
|----------------|-------------------------------------------------------|-------------|------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------|-----|
|                | Min.<br>(V)                                           | Max.<br>(V) | I <sub>T</sub><br>(mA) |                                                                           |                                                               |                                                               |                                                                          | UNI                       | BI  |
| TV15C5V0J(B)-G | 6.40                                                  | 7.00        | 10                     | 800                                                                       | 5.0                                                           | 163.04                                                        | 9.2                                                                      | GDE                       | BDE |
| TV15C6V0J(B)-G | 6.67                                                  | 7.37        | 10                     | 800                                                                       | 6.0                                                           | 145.63                                                        | 10.3                                                                     | GDG                       | BDG |
| TV15C6V5J(B)-G | 7.22                                                  | 7.98        | 10                     | 500                                                                       | 6.5                                                           | 133.93                                                        | 11.2                                                                     | GDK                       | BDK |
| TV15C7V0J(B)-G | 7.78                                                  | 8.60        | 10                     | 200                                                                       | 7.0                                                           | 125.00                                                        | 12.0                                                                     | GDM                       | BDM |
| TV15C7V5J(B)-G | 8.33                                                  | 9.21        | 1                      | 100                                                                       | 7.5                                                           | 116.28                                                        | 12.9                                                                     | GDP                       | BDP |
| TV15C8V0J(B)-G | 8.89                                                  | 9.83        | 1                      | 50                                                                        | 8.0                                                           | 110.29                                                        | 13.6                                                                     | GDR                       | BDR |
| TV15C8V5J(B)-G | 9.44                                                  | 10.40       | 1                      | 20                                                                        | 8.5                                                           | 104.17                                                        | 14.4                                                                     | GDT                       | BDT |
| TV15C9V0J(B)-G | 10.00                                                 | 11.10       | 1                      | 10                                                                        | 9.0                                                           | 97.40                                                         | 15.4                                                                     | GDV                       | BDV |
| TV15C100J(B)-G | 11.10                                                 | 12.30       | 1                      | 5.0                                                                       | 10.0                                                          | 88.24                                                         | 17.0                                                                     | GDX                       | BDX |
| TV15C110J(B)-G | 12.20                                                 | 13.50       | 1                      | 1.0                                                                       | 11.0                                                          | 82.42                                                         | 18.2                                                                     | GDZ                       | BDZ |
| TV15C120J(B)-G | 13.30                                                 | 14.70       | 1                      | 1.0                                                                       | 12.0                                                          | 75.38                                                         | 19.9                                                                     | GEE                       | BEE |
| TV15C130J(B)-G | 14.40                                                 | 15.90       | 1                      | 1.0                                                                       | 13.0                                                          | 69.77                                                         | 21.5                                                                     | GEG                       | BEG |
| TV15C140J(B)-G | 15.60                                                 | 17.20       | 1                      | 1.0                                                                       | 14.0                                                          | 64.66                                                         | 23.2                                                                     | GEK                       | BEK |
| TV15C150J(B)-G | 16.70                                                 | 18.50       | 1                      | 1.0                                                                       | 15.0                                                          | 61.48                                                         | 24.4                                                                     | GEM                       | BEM |
| TV15C160J(B)-G | 17.80                                                 | 19.70       | 1                      | 1.0                                                                       | 16.0                                                          | 57.69                                                         | 26.0                                                                     | GEP                       | BEP |
| TV15C170J(B)-G | 18.90                                                 | 20.90       | 1                      | 1.0                                                                       | 17.0                                                          | 54.35                                                         | 27.6                                                                     | GER                       | BER |
| TV15C180J(B)-G | 20.00                                                 | 22.10       | 1                      | 1.0                                                                       | 18.0                                                          | 51.37                                                         | 29.2                                                                     | GET                       | BET |
| TV15C190J(B)-G | 21.10                                                 | 23.30       | 1                      | 1.0                                                                       | 19.0                                                          | 48.73                                                         | 30.8                                                                     | GEB                       | BEB |
| TV15C200J(B)-G | 22.20                                                 | 24.50       | 1                      | 1.0                                                                       | 20.0                                                          | 46.30                                                         | 32.4                                                                     | GEV                       | BEV |
| TV15C220J(B)-G | 24.40                                                 | 26.90       | 1                      | 1.0                                                                       | 22.0                                                          | 42.25                                                         | 35.5                                                                     | GEX                       | BEX |
| TV15C240J(B)-G | 26.70                                                 | 29.50       | 1                      | 1.0                                                                       | 24.0                                                          | 38.56                                                         | 38.9                                                                     | GEZ                       | BEZ |
| TV15C260J(B)-G | 28.90                                                 | 31.90       | 1                      | 1.0                                                                       | 26.0                                                          | 35.63                                                         | 42.1                                                                     | GFE                       | BFE |
| TV15C280J(B)-G | 31.10                                                 | 34.40       | 1                      | 1.0                                                                       | 28.0                                                          | 33.04                                                         | 45.4                                                                     | GFG                       | BFG |
| TV15C300J(B)-G | 33.30                                                 | 36.80       | 1                      | 1.0                                                                       | 30.0                                                          | 30.99                                                         | 48.4                                                                     | GFK                       | BFK |
| TV15C330J(B)-G | 36.70                                                 | 40.60       | 1                      | 1.0                                                                       | 33.0                                                          | 28.14                                                         | 53.3                                                                     | GFM                       | BFM |
| TV15C360J(B)-G | 40.00                                                 | 44.20       | 1                      | 1.0                                                                       | 36.0                                                          | 25.82                                                         | 58.1                                                                     | GFP                       | BFP |
| TV15C400J(B)-G | 44.40                                                 | 49.10       | 1                      | 1.0                                                                       | 40.0                                                          | 23.26                                                         | 64.5                                                                     | GFR                       | BFR |
| TV15C430J(B)-G | 47.80                                                 | 52.80       | 1                      | 1.0                                                                       | 43.0                                                          | 21.61                                                         | 69.4                                                                     | GFT                       | BFT |
| TV15C450J(B)-G | 50.00                                                 | 55.30       | 1                      | 1.0                                                                       | 45.0                                                          | 20.63                                                         | 72.7                                                                     | GFV                       | BFV |
| TV15C480J(B)-G | 53.30                                                 | 58.90       | 1                      | 1.0                                                                       | 48.0                                                          | 19.38                                                         | 77.4                                                                     | GFX                       | BFX |
| TV15C510J(B)-G | 56.70                                                 | 62.70       | 1                      | 1.0                                                                       | 51.0                                                          | 18.20                                                         | 82.4                                                                     | GFZ                       | BFZ |
| TV15C540J(B)-G | 60.00                                                 | 66.30       | 1                      | 1.0                                                                       | 54.0                                                          | 17.22                                                         | 87.1                                                                     | GGE                       | BGE |
| TV15C580J(B)-G | 64.40                                                 | 71.20       | 1                      | 1.0                                                                       | 58.0                                                          | 16.03                                                         | 93.6                                                                     | GGG                       | BGG |
| TV15C600J(B)-G | 66.70                                                 | 73.70       | 1                      | 1.0                                                                       | 60.0                                                          | 15.50                                                         | 96.8                                                                     | GGK                       | BGK |
| TV15C640J(B)-G | 71.10                                                 | 78.60       | 1                      | 1.0                                                                       | 64.0                                                          | 14.56                                                         | 103.0                                                                    | GGM                       | BGM |
| TV15C700J(B)-G | 77.80                                                 | 86.00       | 1                      | 1.0                                                                       | 70.0                                                          | 13.27                                                         | 113.0                                                                    | GGP                       | BGP |
| TV15C750J(B)-G | 83.30                                                 | 92.10       | 1                      | 1.0                                                                       | 75.0                                                          | 12.40                                                         | 121.0                                                                    | GGR                       | BGR |
| TV15C780J(B)-G | 86.70                                                 | 95.80       | 1                      | 1.0                                                                       | 78.0                                                          | 11.90                                                         | 126.0                                                                    | GGT                       | BGT |
| TV15C800J(B)-G | 88.80                                                 | 97.60       | 1                      | 1.0                                                                       | 80.0                                                          | 11.57                                                         | 129.6                                                                    | GGB                       | BGB |
| TV15C850J(B)-G | 94.40                                                 | 104.00      | 1                      | 1.0                                                                       | 85.0                                                          | 10.95                                                         | 137.0                                                                    | GGV                       | BGV |
| TV15C900J(B)-G | 100.00                                                | 111.00      | 1                      | 1.0                                                                       | 90.0                                                          | 10.27                                                         | 146.0                                                                    | GGX                       | BGX |
| TV15C101J(B)-G | 111.00                                                | 123.00      | 1                      | 1.0                                                                       | 100.0                                                         | 9.26                                                          | 162.0                                                                    | GGZ                       | BGZ |
| TV15C111J(B)-G | 122.00                                                | 135.00      | 1                      | 1.0                                                                       | 110.0                                                         | 8.47                                                          | 177.0                                                                    | GHE                       | BHE |
| TV15C121J(B)-G | 133.00                                                | 147.00      | 1                      | 1.0                                                                       | 120.0                                                         | 7.77                                                          | 193.0                                                                    | GHG                       | BHG |

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## Electrical Characteristics (TV15C5V0-G Thru. TV15C441-G)

| Part No.       | Breakdown voltage<br>V <sub>BR</sub> @ I <sub>T</sub> |             |                        | Maximum<br>Reverse<br>Leakage<br>@V <sub>RWM</sub><br>I <sub>R</sub> (uA) | Working<br>Peak<br>Reverse<br>Voltage<br>V <sub>RWM</sub> (V) | Maximum<br>Reverse<br>Surge<br>Current<br>I <sub>PP</sub> (A) | Maximum<br>Clamping<br>Voltage<br>@I <sub>PP</sub><br>V <sub>C</sub> (V) | Device<br>Marking<br>Code |     |
|----------------|-------------------------------------------------------|-------------|------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------|-----|
|                | Min.<br>(V)                                           | Max.<br>(V) | I <sub>T</sub><br>(mA) |                                                                           |                                                               |                                                               |                                                                          | UNI                       | BI  |
| TV15C131J(B)-G | 144.0                                                 | 159.0       | 1                      | 1.0                                                                       | 130.0                                                         | 7.18                                                          | 209.0                                                                    | GHK                       | BHK |
| TV15C141J(B)-G | 155.0                                                 | 171.0       | 1                      | 1.0                                                                       | 140.0                                                         | 6.61                                                          | 226.8                                                                    | GHB                       | BHB |
| TV15C151J(B)-G | 167.0                                                 | 185.0       | 1                      | 1.0                                                                       | 150.0                                                         | 6.17                                                          | 243.0                                                                    | GHM                       | BHM |
| TV15C161J(B)-G | 178.0                                                 | 197.0       | 1                      | 1.0                                                                       | 160.0                                                         | 5.79                                                          | 259.0                                                                    | GHP                       | BHP |
| TV15C171J(B)-G | 189.0                                                 | 209.0       | 1                      | 1.0                                                                       | 170.0                                                         | 5.45                                                          | 275.0                                                                    | GHR                       | BHR |
| TV15C181J(B)-G | 200.0                                                 | 220.0       | 1                      | 1.0                                                                       | 180.0                                                         | 5.14                                                          | 291.6                                                                    | GHT                       | BHT |
| TV15C191J(B)-G | 211.0                                                 | 232.0       | 1                      | 1.0                                                                       | 190.0                                                         | 4.87                                                          | 307.8                                                                    | GHV                       | BHV |
| TV15C201J(B)-G | 224.0                                                 | 247.0       | 1                      | 1.0                                                                       | 200.0                                                         | 4.60                                                          | 324.0                                                                    | GHW                       | BHW |
| TV15C221J(B)-G | 246.0                                                 | 272.0       | 1                      | 1.0                                                                       | 220.0                                                         | 4.20                                                          | 356.0                                                                    | GHX                       | BHX |
| TV15C251J(B)-G | 279.0                                                 | 309.0       | 1                      | 1.0                                                                       | 250.0                                                         | 3.70                                                          | 405.0                                                                    | GHZ                       | BHZ |
| TV15C301J(B)-G | 335.0                                                 | 371.0       | 1                      | 1.0                                                                       | 300.0                                                         | 3.10                                                          | 486.0                                                                    | GJE                       | BJE |
| TV15C351J(B)-G | 391.0                                                 | 432.0       | 1                      | 1.0                                                                       | 350.0                                                         | 2.60                                                          | 567.0                                                                    | GJG                       | BJG |
| TV15C401J(B)-G | 447.0                                                 | 494.0       | 1                      | 1.0                                                                       | 400.0                                                         | 2.30                                                          | 648.0                                                                    | GJK                       | BJK |
| TV15C441J(B)-G | 492.0                                                 | 543.0       | 1                      | 1.0                                                                       | 440.0                                                         | 2.10                                                          | 713.0                                                                    | GJM                       | BJM |

Note:

- 1) Suffix J denotes 5% tolerance devices.
- 2) Suffix B after part number to specify Bi-directional devices.
- 3) For Bi-Directional devices having V<sub>R</sub> of 10 volts and under, the I<sub>R</sub> limit is double.

## Reel Taping Specification



| DO-214AB<br>(SMC) | SYMBOL | A                 | B                 | C           | d                 | D      | D1          | D2                |
|-------------------|--------|-------------------|-------------------|-------------|-------------------|--------|-------------|-------------------|
|                   | (mm)   | $6.05 \pm 0.10$   | $8.31 \pm 0.10$   | 3.29 (max)  | $1.55 \pm 0.10$   | 330.00 | 50.00 (min) | $13.00 \pm 0.20$  |
|                   | (inch) | $0.238 \pm 0.004$ | $0.327 \pm 0.004$ | 0.130 (max) | $0.061 \pm 0.004$ | 13.000 | 1.969 (min) | $0.512 \pm 0.008$ |

| DO-214AB<br>(SMC) | SYMBOL | E                 | F                 | P                 | $P_0$             | $P_1$             | W                 | $W_1$       |
|-------------------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------|
|                   | (mm)   | $1.75 \pm 0.10$   | $7.50 \pm 0.10$   | $8.00 \pm 0.10$   | $4.00 \pm 0.10$   | $2.00 \pm 0.10$   | $16.00 \pm 0.30$  | 22.40 (max) |
|                   | (inch) | $0.069 \pm 0.004$ | $0.295 \pm 0.004$ | $0.315 \pm 0.004$ | $0.157 \pm 0.004$ | $0.079 \pm 0.004$ | $0.630 \pm 0.012$ | 0.882 (max) |

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

REV:F

## Marking Code

1. **C**: COMCHIP

2. ○: Package

|   |     |
|---|-----|
| ○ | PKG |
| A | SMA |
| B | SMB |
| C | SMC |

3. XXX: Marking code (see Page. 3~4)

4. : Cathod Band



## Suggested PAD Layout

| SIZE | DO-214AB(SMC) |           |
|------|---------------|-----------|
|      | (mm)          | (inch)    |
| A    | 8.13          | 0.320     |
| B    | 4.69 MAX      | 0.185 MAX |
| C    | 1.52 MIN      | 0.06 MIN  |
| D    | 3.20 MIN      | 0.126 MIN |



## Standard Packaging

| Case Type         | REEL PACK       |                     |
|-------------------|-----------------|---------------------|
|                   | REEL<br>( pcs ) | Reel Size<br>(inch) |
| DO-214AB<br>(SMC) | 3,000           | 13                  |