

# SMD Transient Voltage Suppressor

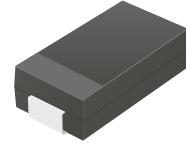


## TV30C5V0-G Thru. TV30C441-G

Working Peak Reverse Voltage: 5.0 to 440 Volts

Power Dissipation: 3000 Watts

RoHS Device

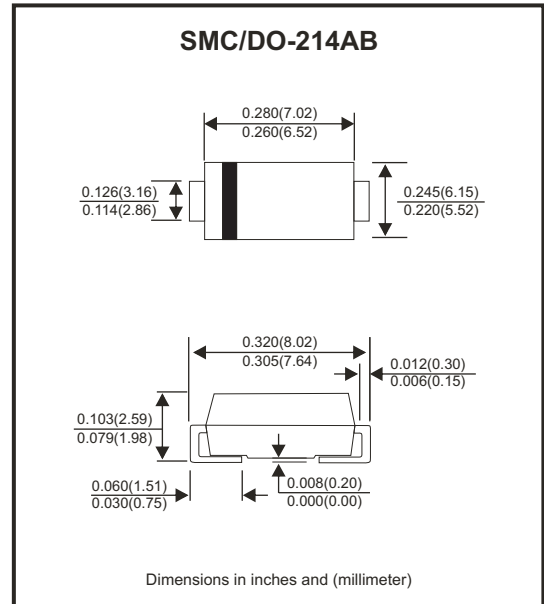


### Features

- Glass passivated chip.
- 3000W 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: TV30C5V0J(B) thru. TV30C171J(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 with a 10/1000 $\mu$ s waveform (Note 1)                      | P <sub>PP</sub>                   | 3000           | W     |
| Peak pulse current with a 10/1000 $\mu$ s 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>                    | 6.0            | W     |
| Peak forward surge current, 8.3ms single half sine-wave unidirectional only (Note 2) | I <sub>FSM</sub>                  | 300            | A     |
| Maximum instantaneous forward voltage at 100A for unidirectional only (Note 3)       | V <sub>F</sub>                    | 3.5/5.0        | V     |
| Operation 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.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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## RATING AND CHARACTERISTIC CURVES (TV30C5V0-G Thru. TV30C441-G)

Fig.1 - Pulse Derating Curve

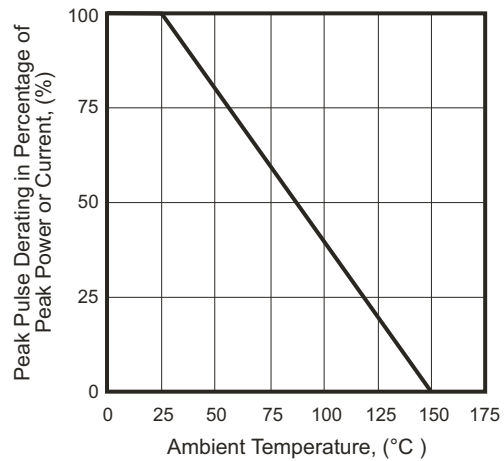


Fig.2 - Max. Non-Repetitive Surge Current

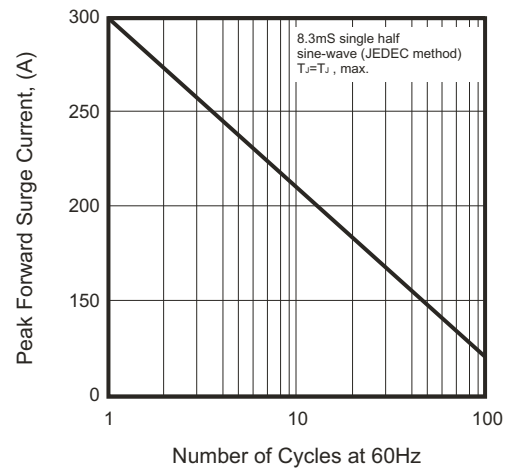


Fig.3 - Steady State Power Derating Curve

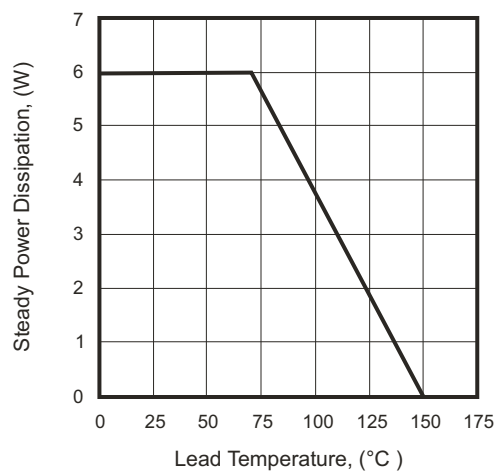


Fig.4 - Peak Pulse Power Rating Curve

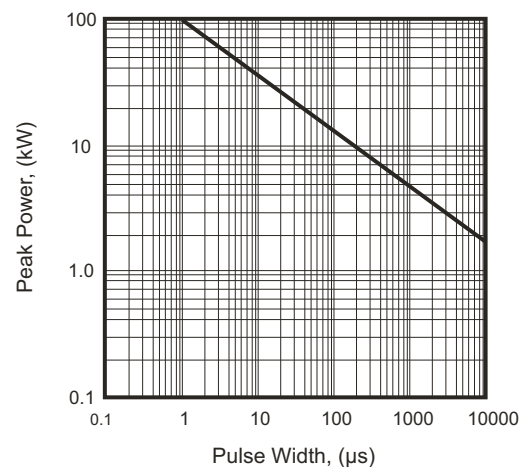


Fig.5 - Pulse Waveform

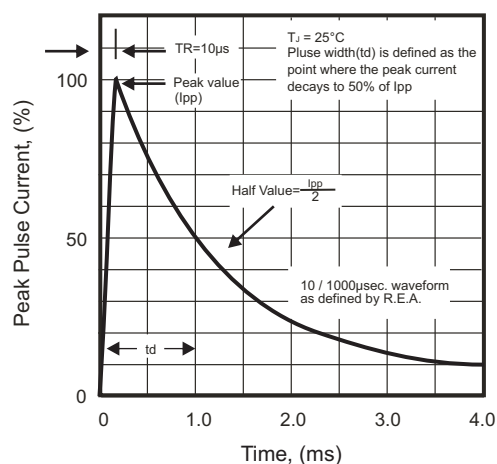
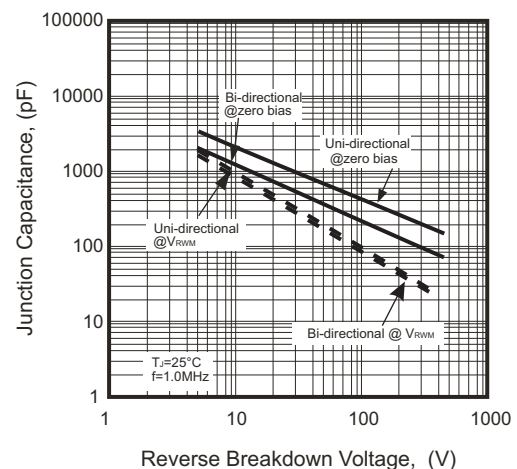


Fig.6 - Typical Junction Capacitance



## Electrical Characteristics (TV30C5V0-G Thru. TV30C441-G)

| Part No.       | Breakdown voltage<br>V <sub>BR</sub> @ I <sub>T</sub> |             |                        | Maximum<br>Reverse<br>Leakage<br>@V <sub>RRM</sub><br>I <sub>R</sub> (uA) | Working<br>Peak<br>Reverse<br>Voltage<br>V <sub>RRM</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  |
| TV30C5V0J(B)-G | 6.40                                                  | 7.00        | 50                     | 5000                                                                      | 5.0                                                           | 326.09                                                        | 9.2                                                                      | RDE                       | DDE |
| TV30C6V0J(B)-G | 6.67                                                  | 7.37        | 50                     | 5000                                                                      | 6.0                                                           | 291.26                                                        | 10.3                                                                     | RDG                       | DDG |
| TV30C6V5J(B)-G | 7.22                                                  | 7.98        | 50                     | 2000                                                                      | 6.5                                                           | 267.86                                                        | 11.2                                                                     | RDK                       | DDK |
| TV30C7V0J(B)-G | 7.78                                                  | 8.60        | 50                     | 1000                                                                      | 7.0                                                           | 250.00                                                        | 12.0                                                                     | PDM                       | DDM |
| TV30C7V5J(B)-G | 8.33                                                  | 9.21        | 5                      | 250                                                                       | 7.5                                                           | 232.56                                                        | 12.9                                                                     | PDP                       | DDP |
| TV30C8V0J(B)-G | 8.89                                                  | 9.83        | 5                      | 150                                                                       | 8.0                                                           | 220.59                                                        | 13.6                                                                     | PDR                       | DDR |
| TV30C8V5J(B)-G | 9.44                                                  | 10.40       | 5                      | 50                                                                        | 8.5                                                           | 208.33                                                        | 14.4                                                                     | PDT                       | DDT |
| TV30C9V0J(B)-G | 10.00                                                 | 11.10       | 5                      | 20                                                                        | 9.0                                                           | 194.81                                                        | 15.4                                                                     | PDV                       | DDV |
| TV30C100J(B)-G | 11.10                                                 | 12.30       | 5                      | 15                                                                        | 10.0                                                          | 176.47                                                        | 17.0                                                                     | PDX                       | DDX |
| TV30C110J(B)-G | 12.20                                                 | 13.50       | 5                      | 2                                                                         | 11.0                                                          | 164.84                                                        | 18.2                                                                     | PDZ                       | DDZ |
| TV30C120J(B)-G | 13.30                                                 | 14.70       | 5                      | 2                                                                         | 12.0                                                          | 150.75                                                        | 19.9                                                                     | PEE                       | DEE |
| TV30C130J(B)-G | 14.40                                                 | 15.90       | 5                      | 2                                                                         | 13.0                                                          | 139.53                                                        | 21.5                                                                     | PEG                       | DEG |
| TV30C140J(B)-G | 15.60                                                 | 17.20       | 5                      | 2                                                                         | 14.0                                                          | 129.31                                                        | 23.2                                                                     | PEK                       | DEK |
| TV30C150J(B)-G | 16.70                                                 | 18.50       | 5                      | 2                                                                         | 15.0                                                          | 122.95                                                        | 24.4                                                                     | PEM                       | DEM |
| TV30C160J(B)-G | 17.80                                                 | 19.70       | 5                      | 2                                                                         | 16.0                                                          | 115.38                                                        | 26.0                                                                     | PEP                       | DEP |
| TV30C170J(B)-G | 18.90                                                 | 20.90       | 5                      | 2                                                                         | 17.0                                                          | 108.70                                                        | 27.6                                                                     | PER                       | DER |
| TV30C180J(B)-G | 20.00                                                 | 22.10       | 5                      | 2                                                                         | 18.0                                                          | 102.74                                                        | 29.2                                                                     | PET                       | DET |
| TV30C190J(B)-G | 21.10                                                 | 23.30       | 5                      | 2                                                                         | 19.0                                                          | 97.47                                                         | 30.8                                                                     | PEB                       | DEB |
| TV30C200J(B)-G | 22.20                                                 | 24.50       | 5                      | 2                                                                         | 20.0                                                          | 92.59                                                         | 32.4                                                                     | PEV                       | DEV |
| TV30C220J(B)-G | 24.40                                                 | 26.90       | 5                      | 2                                                                         | 22.0                                                          | 84.51                                                         | 35.5                                                                     | PEX                       | DEX |
| TV30C240J(B)-G | 26.70                                                 | 29.50       | 5                      | 2                                                                         | 24.0                                                          | 77.12                                                         | 38.9                                                                     | PEZ                       | DEZ |
| TV30C260J(B)-G | 28.90                                                 | 31.90       | 5                      | 2                                                                         | 26.0                                                          | 71.26                                                         | 42.1                                                                     | PFE                       | DFE |
| TV30C280J(B)-G | 31.10                                                 | 34.40       | 5                      | 2                                                                         | 28.0                                                          | 66.08                                                         | 45.4                                                                     | PFG                       | DFG |
| TV30C300J(B)-G | 33.30                                                 | 36.80       | 5                      | 2                                                                         | 30.0                                                          | 61.98                                                         | 48.4                                                                     | PFK                       | DFK |
| TV30C330J(B)-G | 36.70                                                 | 40.60       | 5                      | 2                                                                         | 33.0                                                          | 56.29                                                         | 53.3                                                                     | PFM                       | DFM |
| TV30C360J(B)-G | 40.00                                                 | 44.20       | 5                      | 2                                                                         | 36.0                                                          | 51.64                                                         | 58.1                                                                     | PFP                       | DFP |
| TV30C400J(B)-G | 44.40                                                 | 49.10       | 5                      | 2                                                                         | 40.0                                                          | 46.51                                                         | 64.5                                                                     | PFR                       | DFR |
| TV30C430J(B)-G | 47.80                                                 | 52.80       | 5                      | 2                                                                         | 43.0                                                          | 43.23                                                         | 69.4                                                                     | PFT                       | DFT |
| TV30C450J(B)-G | 50.00                                                 | 55.30       | 5                      | 2                                                                         | 45.0                                                          | 41.27                                                         | 72.7                                                                     | PFV                       | DFV |
| TV30C480J(B)-G | 53.30                                                 | 58.90       | 5                      | 2                                                                         | 48.0                                                          | 38.76                                                         | 77.4                                                                     | PFX                       | DFX |
| TV30C510J(B)-G | 56.70                                                 | 62.70       | 5                      | 2                                                                         | 51.0                                                          | 36.41                                                         | 82.4                                                                     | PFZ                       | DFZ |
| TV30C540J(B)-G | 60.00                                                 | 66.30       | 5                      | 2                                                                         | 54.0                                                          | 34.44                                                         | 87.1                                                                     | RGE                       | DGE |
| TV30C580J(B)-G | 64.40                                                 | 71.20       | 5                      | 2                                                                         | 58.0                                                          | 32.05                                                         | 93.6                                                                     | PGG                       | DGG |
| TV30C600J(B)-G | 66.70                                                 | 73.70       | 5                      | 2                                                                         | 60.0                                                          | 30.99                                                         | 96.8                                                                     | PGK                       | DGK |
| TV30C640J(B)-G | 71.10                                                 | 78.60       | 5                      | 2                                                                         | 64.0                                                          | 29.13                                                         | 103.0                                                                    | PGM                       | DGM |
| TV30C700J(B)-G | 77.80                                                 | 86.00       | 5                      | 2                                                                         | 70.0                                                          | 26.55                                                         | 113.0                                                                    | PGP                       | DGP |
| TV30C750J(B)-G | 83.30                                                 | 92.10       | 5                      | 2                                                                         | 75.0                                                          | 24.79                                                         | 121.0                                                                    | PGR                       | DGR |
| TV30C780J(B)-G | 86.70                                                 | 95.80       | 5                      | 2                                                                         | 78.0                                                          | 23.81                                                         | 126.0                                                                    | PGT                       | DGT |
| TV30C800J(B)-G | 88.80                                                 | 97.60       | 5                      | 2                                                                         | 80.0                                                          | 23.15                                                         | 129.6                                                                    | PGB                       | DGB |
| TV30C850J(B)-G | 94.40                                                 | 104.00      | 5                      | 2                                                                         | 85.0                                                          | 21.90                                                         | 137.0                                                                    | PGV                       | DGV |
| TV30C900J(B)-G | 100.00                                                | 111.00      | 5                      | 2                                                                         | 90.0                                                          | 20.55                                                         | 146.0                                                                    | PGX                       | DGX |
| TV30C101J(B)-G | 111.00                                                | 123.00      | 5                      | 2                                                                         | 100.0                                                         | 18.52                                                         | 162.0                                                                    | PGZ                       | DGZ |
| TV30C111J(B)-G | 122.00                                                | 135.00      | 5                      | 2                                                                         | 110.0                                                         | 16.95                                                         | 177.0                                                                    | PHE                       | DHE |
| TV30C121J(B)-G | 133.00                                                | 147.00      | 5                      | 2                                                                         | 120.0                                                         | 15.54                                                         | 193.0                                                                    | PHG                       | DHG |

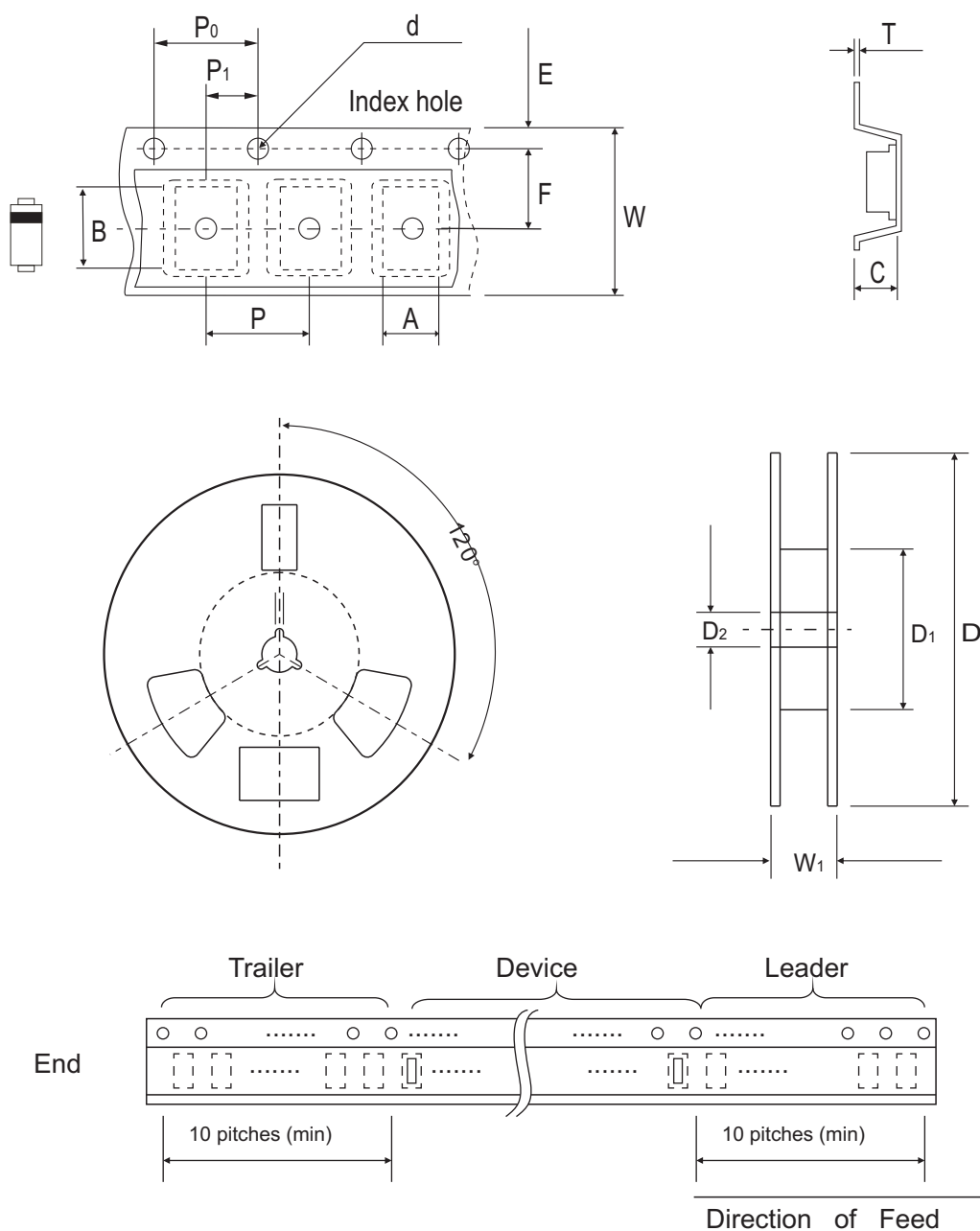
## Electrical Characteristics (TV30C5V0-G Thru. TV30C441-G)

| Part No.       | Breakdown voltage<br>VBR @ IT |             |            | Maximum<br>Reverse<br>Leakage<br>@VRWM<br>IR (uA) | Working<br>Peak<br>Reverse<br>Voltage<br>VRWM (V) | Maximum<br>Reverse<br>Surge<br>Current<br>IPP (A) | Maximum<br>Clamping<br>Voltage<br>@IPP<br>VC (V) | Device<br>Marking<br>Code |     |
|----------------|-------------------------------|-------------|------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|--------------------------------------------------|---------------------------|-----|
|                | Min.<br>(V)                   | Max.<br>(V) | IT<br>(mA) |                                                   |                                                   |                                                   |                                                  | UNI                       | BI  |
| TV30C131J(B)-G | 144.0                         | 159.0       | 5          | 2                                                 | 130.0                                             | 14.35                                             | 209.0                                            | PHK                       | DHK |
| TV30C141J(B)-G | 155.0                         | 171.0       | 5          | 2                                                 | 140.0                                             | 13.23                                             | 226.8                                            | PHB                       | DHB |
| TV30C151J(B)-G | 167.0                         | 185.0       | 5          | 2                                                 | 150.0                                             | 12.35                                             | 243.0                                            | PHM                       | DHM |
| TV30C161J(B)-G | 178.0                         | 197.0       | 5          | 2                                                 | 160.0                                             | 11.58                                             | 259.0                                            | PHP                       | DHP |
| TV30C171J(B)-G | 189.0                         | 209.0       | 5          | 2                                                 | 170.0                                             | 10.91                                             | 275.0                                            | PHR                       | DHR |
| TV30C181J(B)-G | 200.0                         | 220.0       | 5          | 2                                                 | 180.0                                             | 10.29                                             | 291.6                                            | PHT                       | DHT |
| TV30C191J(B)-G | 211.0                         | 232.0       | 5          | 2                                                 | 190.0                                             | 9.75                                              | 307.8                                            | PHV                       | DHV |
| TV30C201J(B)-G | 224.0                         | 247.0       | 5          | 2                                                 | 200.0                                             | 9.26                                              | 324.0                                            | PHW                       | DHW |
| TV30C221J(B)-G | 246.0                         | 272.0       | 5          | 2                                                 | 220.0                                             | 8.43                                              | 356.0                                            | PHX                       | DHX |
| TV30C251J(B)-G | 279.0                         | 309.0       | 5          | 2                                                 | 250.0                                             | 7.41                                              | 405.0                                            | PHZ                       | DHZ |
| TV30C301J(B)-G | 335.0                         | 371.0       | 5          | 2                                                 | 300.0                                             | 6.17                                              | 486.0                                            | PJE                       | DJE |
| TV30C351J(B)-G | 391.0                         | 432.0       | 5          | 2                                                 | 350.0                                             | 5.29                                              | 567.0                                            | PJG                       | DJG |
| TV30C401J(B)-G | 447.0                         | 494.0       | 5          | 2                                                 | 400.0                                             | 4.63                                              | 648.0                                            | PJK                       | DJK |
| TV30C441J(B)-G | 492.0                         | 543.0       | 5          | 2                                                 | 440.0                                             | 4.21                                              | 713.0                                            | PJM                       | DJM |

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 VR of 10 volts and under, the IR limit is double.

## Reel Taping Specification



| DO-214AB<br>(SMC) | SYMBOL | A             | B             | C           | d             | D      | D <sub>1</sub> | D <sub>2</sub> |
|-------------------|--------|---------------|---------------|-------------|---------------|--------|----------------|----------------|
|                   | (mm)   | 6.05 ± 0.10   | 8.31 ± 0.10   | 3.29 (max)  | 1.55 ± 0.10   | 330.00 | 50.00 (min)    | 13.00 ± 0.20   |
|                   | (inch) | 0.238 ± 0.004 | 0.327 ± 0.004 | 0.130 (max) | 0.061 ± 0.004 | 13.000 | 1.969 (min)    | 0.512 ± 0.008  |

| DO-214AB<br>(SMC) | SYMBOL | E             | F             | P             | P <sub>0</sub> | P <sub>1</sub> | W             | W <sub>1</sub> |
|-------------------|--------|---------------|---------------|---------------|----------------|----------------|---------------|----------------|
|                   | (mm)   | 1.75 ± 0.10   | 7.50 ± 0.10   | 8.00 ± 0.10   | 4.00 ± 0.10    | 2.00 ± 0.10    | 16.00 ± 0.30  | 22.40 (max)    |
|                   | (inch) | 0.069 ± 0.004 | 0.295 ± 0.004 | 0.315 ± 0.004 | 0.157 ± 0.004  | 0.079 ± 0.004  | 0.630 ± 0.012 | 0.882 (max)    |

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REV:H

## Marking Code

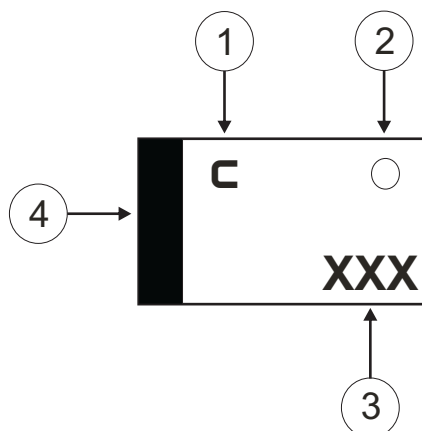
1. **C**: COMCHIP

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                  |