# Surface Mount Transient Voltage Suppressor
# Stand-Off Voltage - 5.0 to 170 Volts
# 3000 Watt Peak Pulse Power

## Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Repetition Rate (duty cycle):0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to V(BR) for unidirectional types
- Typical IR less than 2μA above 10V
- High Temperature solderting: 260°C/10 seconds at terminals
- Plastic package has Underwriters Laboratory Flammability 94V-O
- Pb-free plated
- AEC-Q101




## Mechanical Data

- **Case:** JEDEC DO-214AB. Molded plastic over glass passivated junction
- **Terminals:** Solderable per MIL-STD-750,Method 2026
- **Polarity:** Color band denoted positive end (cathode) except Bidirectional
- **Standard Packaging:**16mm tape (EIA STD RS-481)

## Devices For Bipolar Application

- For Bidirectional use C or CA Suffix for types SMDJ5.0 thru types SMDJ170 (e.g. SMDJ5.0C , SMDJ170CA)
- Electrical characteristics apply in both directions

## Maximum Ratings And Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

| RATING | SYMBOL | VALUE | UNITS |
|---|---|---|---|
| Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1,2 ,FIG.1) | $P_{PPM}$ | 3000 | Watts |
| Peak Pulse Current of on 10/1000μs waveform (Note 1,FIG.3) | $I_{PPM}$ | SEE TABLE 1 | Amps |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load,(JEDEC Method) (Note2,3) | $I_{FSM}$ | 300 | Amps |
| Operating junction and Storage Temperature Range | $T_J$ , $T_{STG}$ | −55 to +150 | ℃ |

Notes :

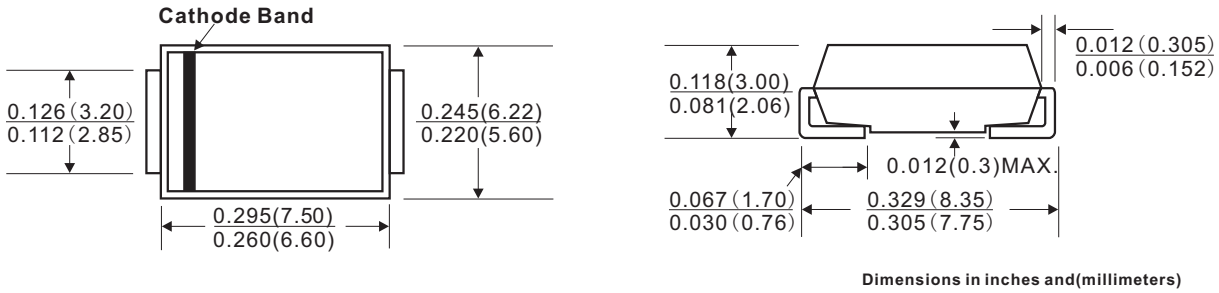
1.Non-repetitive current pulse , per Fig. 3 and derated above TA = 25℃ per Fig. 2 .

2.Mounted on 8.0mm x 8.0mm Copper Pads to each terminal

3.8.3ms single half sine-wave , or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

## Dimensions (DO-214AB)

**DO-214AB(SMC J-Bend)**




Dimensions in inches and(millimeters)

## Electrical Characteristics

"*"Stand for commonly used models

TABLE1

| SMDJ Part Number | | Device Marking Code | | Reverse Stand-Off Voltage | Breakdown Voltage @IT | Breakdown Voltage @IT | Test Current | Maximum Clamping Voltage @Ipp | Peak Pulse Current | Reverse Leakage @VRWM |
|---|---|---|---|---|---|---|---|---|---|---|
| UNI-Polar | BI-Polar | UNI | BI | VRWM(V) | VBR(V)Min. | VBR(V)Max. | IT(mA) | Vc(V) | Ipp(A) | IR(μA) |
| SMDJ5.0A | * SMDJ5.0CA | RDE | DDE | 5.0 | 6.40 | 7.00 | 10 | 9.2 | 326.1 | 800 |
| SMDJ6.0A | * SMDJ6.0CA | RDG | DDG | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 291.3 | 800 |
| SMDJ6.5A | SMDJ6.5CA | RDK | DDK | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 267.9 | 500 |
| SMDJ7.0A | SMDJ7.0CA | PDM | DDM | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 250.0 | 200 |
| SMDJ7.5A | SMDJ7.5CA | PDP | DDP | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 232.6 | 100 |
| SMDJ8.0A | SMDJ8.0CA | PDR | DDR | 8.0 | 8.89 | 9.83 | 1 | 13.6 | 220.6 | 50 |
| SMDJ8.5A | SMDJ8.5CA | PDT | DDT | 8.5 | 9.44 | 10.40 | 1 | 14.4 | 208.3 | 20 |
| SMDJ9.0A | SMDJ9.0CA | PDV | DDV | 9.0 | 10.00 | 11.10 | 1 | 15.4 | 194.8 | 10 |
| SMDJ10A | SMDJ10CA | PDX | DDX | 10.0 | 11.10 | 12.30 | 1 | 17.0 | 176.5 | 5 |
| SMDJ11A | SMDJ11CA | PDZ | DDZ | 11.0 | 12.20 | 13.50 | 1 | 18.2 | 164.8 | 2 |
| SMDJ12A | SMDJ12CA | PEE | DEE | 12.0 | 13.30 | 14.70 | 1 | 19.9 | 150.8 | 2 |
| SMDJ13A | SMDJ13CA | PEG | DEG | 13.0 | 14.40 | 15.90 | 1 | 21.5 | 139.5 | 2 |
| SMDJ14A | SMDJ14CA | PEK | DEK | 14.0 | 15.60 | 17.20 | 1 | 23.2 | 129.3 | 2 |
| SMDJ15A | SMDJ15CA | PEM | DEM | 15.0 | 16.70 | 18.50 | 1 | 24.4 | 123.0 | 2 |
| SMDJ16A | SMDJ16CA | PEP | DEP | 16.0 | 17.80 | 19.70 | 1 | 26.0 | 115.4 | 2 |
| SMDJ17A | SMDJ17CA | PER | DER | 17.0 | 18.90 | 20.90 | 1 | 27.6 | 108.7 | 2 |
| SMDJ18A | SMDJ18CA | PET | DET | 18.0 | 20.00 | 22.10 | 1 | 29.2 | 102.7 | 2 |
| SMDJ20A | SMDJ20CA | PEV | DEV | 20.0 | 22.20 | 24.50 | 1 | 32.4 | 92.6 | 2 |
| SMDJ22A | SMDJ22CA | PEX | DEX | 22.0 | 24.40 | 26.90 | 1 | 35.5 | 84.5 | 2 |
| SMDJ24A | * SMDJ24CA | PEZ | DEZ | 24.0 | 26.70 | 29.50 | 1 | 38.9 | 77.1 | 2 |
| SMDJ26A | SMDJ26CA | PFE | DFE | 26.0 | 28.90 | 31.90 | 1 | 42.1 | 71.3 | 2 |
| SMDJ28A | SMDJ28CA | PFG | DFG | 28.0 | 31.10 | 34.40 | 1 | 45.4 | 66.1 | 2 |

Notes :

1.For bidirectional type having VRWM of 10 volts and less, the IR limit is double

2.For parts with A , the VBR is ± 5%

# Electrical Characteristics

"*"Stand for commonly used models

TABLE1

| SMDJ Part Number | | Device Marking Code | | Reverse Stand-Off Voltage | Breakdown Voltage @IT | Breakdown Voltage @IT | Test Current | Maximum Clamping Voltage @Ipp | Peak Pulse Current | Reverse Leakage @VRWM |
|---|---|---|---|---|---|---|---|---|---|---|
| UNI-Polar | BI-Polar | UNI | BI | VRWM(V) | VBR(V)Min. | VBR(V)Max. | IT(mA) | Vc(V) | Ipp(A) | IR(μA) |
| SMDJ30A | SMDJ30CA | PFK | DFK | 30.0 | 33.30 | 36.80 | 1 | 48.4 | 62.0 | 2 |
| SMDJ33A | * SMDJ33CA | PFM | DFM | 33.0 | 36.70 | 40.60 | 1 | 53.3 | 56.3 | 2 |
| * SMDJ36A | * SMDJ36CA | PFP | DFP | 36.0 | 40.00 | 44.20 | 1 | 58.1 | 51.6 | 2 |
| SMDJ40A | SMDJ40CA | PFR | DFR | 40.0 | 44.40 | 49.10 | 1 | 64.5 | 46.5 | 2 |
| SMDJ43A | SMDJ43CA | PFT | DFT | 43.0 | 47.80 | 52.80 | 1 | 69.4 | 43.2 | 2 |
| SMDJ45A | SMDJ45CA | PFV | DFV | 45.0 | 50.00 | 55.30 | 1 | 72.7 | 41.3 | 2 |
| SMDJ48A | SMDJ48CA | PFX | DFX | 48.0 | 53.30 | 58.90 | 1 | 77.4 | 38.8 | 2 |
| SMDJ51A | SMDJ51CA | PFZ | DFZ | 51.0 | 56.70 | 62.70 | 1 | 82.4 | 36.4 | 2 |
| SMDJ54A | SMDJ54CA | RGE | DGE | 54.0 | 60.00 | 66.30 | 1 | 87.1 | 34.4 | 2 |
| SMDJ58A | SMDJ58CA | PGG | DGG | 58.0 | 64.40 | 71.20 | 1 | 93.6 | 32.1 | 2 |
| SMDJ60A | SMDJ60CA | PGK | DGK | 60.0 | 66.70 | 73.70 | 1 | 96.8 | 31.0 | 2 |
| SMDJ64A | SMDJ64CA | PGM | DGM | 64.0 | 71.10 | 78.60 | 1 | 103.0 | 29.1 | 2 |
| SMDJ70A | SMDJ70CA | PGP | DGP | 70.0 | 77.80 | 86.00 | 1 | 113.0 | 26.5 | 2 |
| SMDJ75A | SMDJ75CA | PGR | DGR | 75.0 | 83.30 | 92.10 | 1 | 121.0 | 24.8 | 2 |
| SMDJ78A | SMDJ78CA | PGT | DGT | 78.0 | 86.70 | 95.80 | 1 | 126.0 | 23.8 | 2 |
| SMDJ85A | SMDJ85CA | PGV | DGV | 85.0 | 94.40 | 104.00 | 1 | 137.0 | 21.9 | 2 |
| SMDJ90A | SMDJ90CA | PGX | DGX | 90.0 | 100.00 | 111.00 | 1 | 146.0 | 20.5 | 2 |
| SMDJ100A | SMDJ100CA | PGZ | DGZ | 100.0 | 111.00 | 123.00 | 1 | 162.0 | 18.5 | 2 |
| SMDJ110A | SMDJ110CA | PHE | DHE | 110.0 | 122.00 | 135.00 | 1 | 177.0 | 16.9 | 2 |
| SMDJ120A | SMDJ120CA | PHG | DHG | 120.0 | 133.00 | 147.00 | 1 | 193.0 | 15.5 | 2 |
| SMDJ130A | SMDJ130CA | PHK | DHK | 130.0 | 144.00 | 159.00 | 1 | 209.0 | 14.4 | 2 |
| SMDJ150A | SMDJ150CA | PHM | DHM | 150.0 | 167.00 | 185.00 | 1 | 243.0 | 12.3 | 2 |
| SMDJ160A | SMDJ160CA | PHP | DHP | 160.0 | 178.00 | 197.00 | 1 | 259.0 | 11.6 | 2 |
| SMDJ170A | SMDJ170CA | PHR | DHR | 170.0 | 189.00 | 209.00 | 1 | 275.0 | 10.9 | 2 |
| SMDJ220A | SMDJ220CA | PHX | DHX | 220.0 | 244.00 | 270.00 | 1 | 356.0 | 8.4 | 2 |
| SMDJ400A | SMDJ400CA | PJK | DJK | 400.0 | 447.00 | 494.00 | 1 | 648.0 | 4.6 | 2 |
| SMDJ440A | SMDJ440CA | PJM | DJM | 440.0 | 492.00 | 543.00 | 1 | 713.0 | 4.2 | 2 |

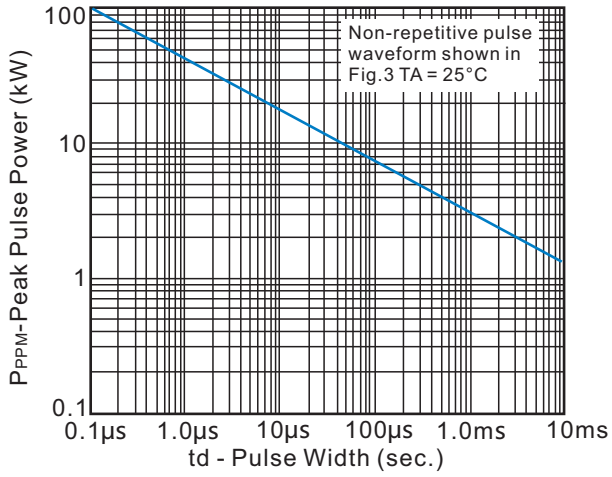
Notes :

1.For bidirectional type having VRWM of 10 volts and less, the IR limit is double

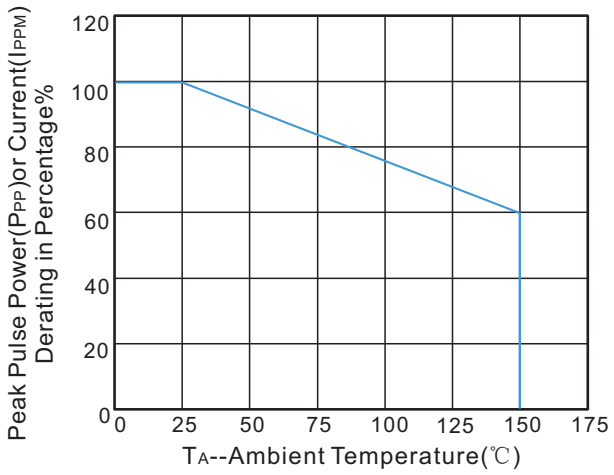
2.For parts with A , the VBR is ± 5%

# Characteristic Curves (TA=25 ℃ unless otherwise noted)

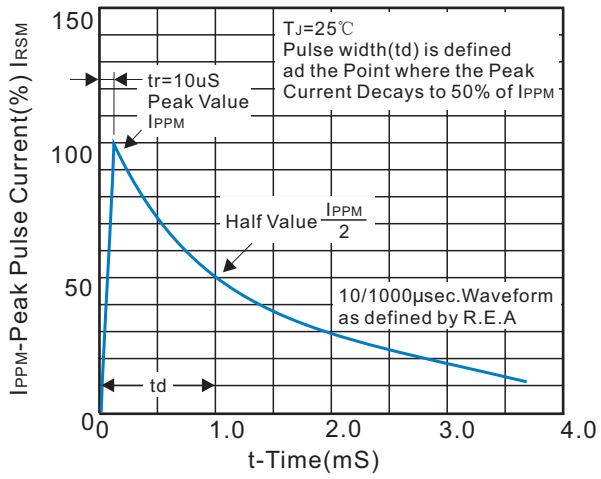
## Fig.1 Peak Pulse Power Rating



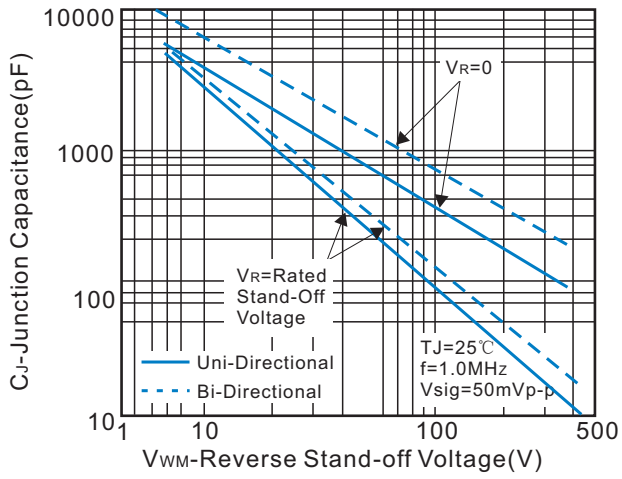

## Fig.2 Pulse Derating Cruve



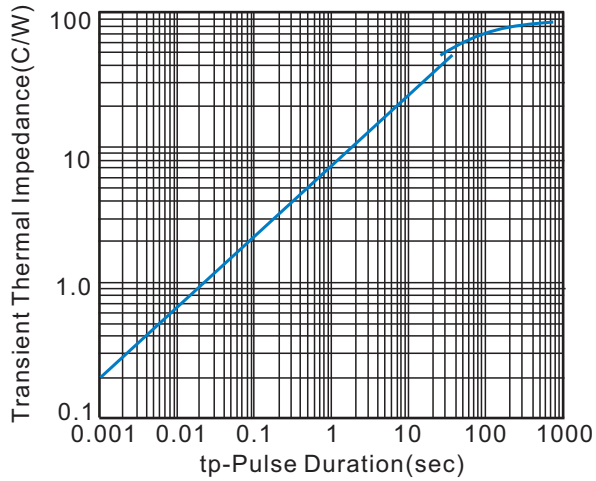

## Fig.3 Pulse Waveform



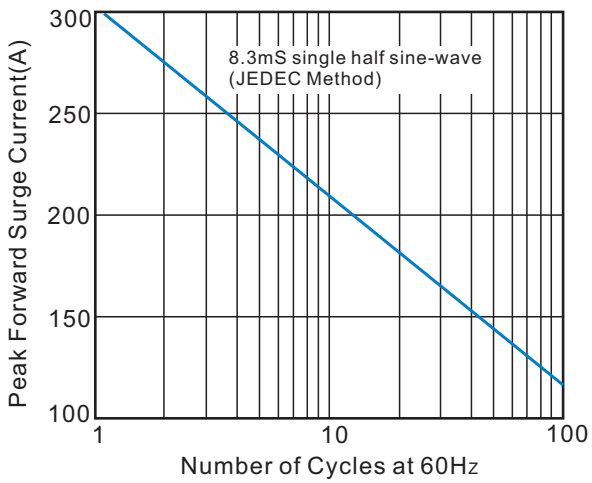

## Fig.4 Typical Junction Capacitance




## Fig.5 Typ.Transient Thermal Impedance




## Fig.6 Maximum Non-Repetitive Forward Surge Current

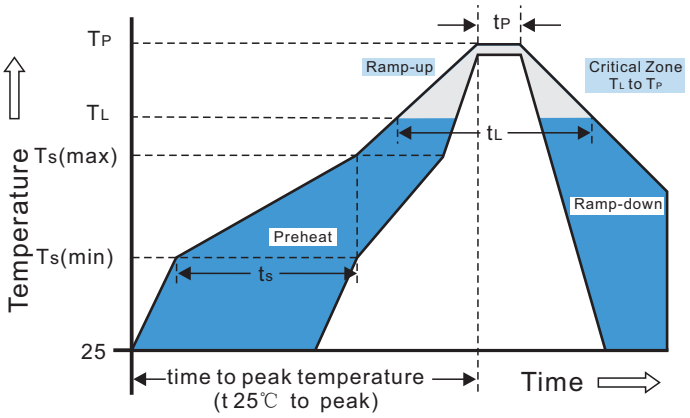


# Recommended Soldering Conditions

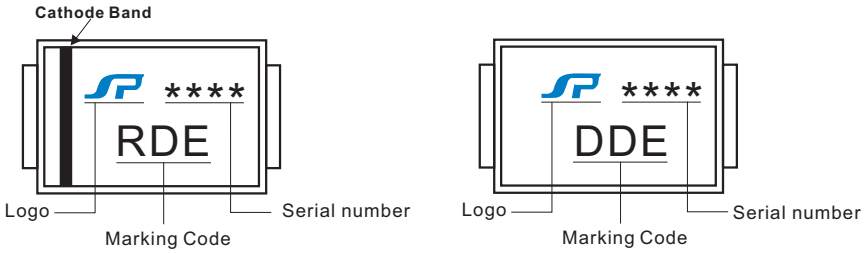
## Recommended Conditions

| Re"ow Condition | | Pb-Free assembly (see Fig.1) |
|---|---|---|
| Pre Heat | -Temperature Min($T_{s(min)}$) | +150℃ |
| | -Temperature Max($T_{s(max)}$) | +200℃ |
| | -Time(Min to Max)($t_s$) | 60-180secs |
| Average ramp up rate (Liquidus Temp($T_L$) to peak) | | 3℃/sec.Max. |
| $T_{s(max)}$ to $T_L$ -Ramp-up Rate | | 3℃/sec.Max. |
| Re"ow | -Temperature($T_L$)(Liquidus) | +217℃ |
| | -Temperature($t_L$) | 60-150secs |
| Peak Temp($T_P$) | | +260(+0/-5)℃ |
| Time within 5℃ of actual Peak Temp($t_P$) | | 30 secs.Max. |
| Ramp-down Rate | | 6℃/sec.Max. |
| Time 25℃ to Peak Temp($T_P$) | | 8 min.Max. |
| Do not exceed | | +260℃ |

## Reflow Soldering




# Marking Code




# Tape And Reel Specification

| Symbol | Ea Per Reel | REEL DIA (mm) | Industry Standard |
|---|---|---|---|
| SMDJ*** | 500/3000 | 178/330 | EIA RS-481 |

