

## FEATURES

- | Low profile package
- | Ideal for automated placement
- | 3000 Watt peak pulse power capability with a 10/1000µs waveform
- | For surface mounted applications to optimize board space
- | Excellent clamping capability
- | Very fast response time
- | Low incremental surge resistance



DO-214AB(SMC)



Uni-directional



Bi-directional

## APPLICATIONS

- | Power supply protection
- | Automotive application
- | Industrial application
- | Power management

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## MAXIMUM RATINGS (T<sub>A</sub>=25°C)

| Parameter   | Symbo            | Value | Unit  |
|---|------------------|-------|-------|
| Peak Pulse Power Dissipation on 10/1000us waveform (Note1, Note2).                        | P <sub>PPM</sub> | 3000  | Watts |
| Steady State Power Dissipation at T <sub>L</sub> =50°C, Lead lengths.375"(9.5mm) ( Note2) | P <sub>D</sub>   | 6.5   | Watts |

- Notes :** 1.Non-repetitive current pulse,T<sub>A</sub>=25°C.  
 2.Mounted on 5.0mm\*5.0mm (0.03mm thick) Copper Pads to each terminal.

## THERMAL CONSIDERATIONS

| Parameter                              | Symbol           | Value       | Unit |
|--|------------------|-------------|------|
| Operating Junction Temperature         | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage Temperature Range              | T <sub>STG</sub> | -55 to +150 | °C   |
| Junction to Ambient on printed circuit | R <sub>θJA</sub> | 75          | °C/W |

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

| Part Number |           | Device Marking Code |     | Reverse Stand-off Voltage | Breakdown Voltage Min.@I <sub>T</sub> | Breakdown Voltage Max.@I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|-------------|-----------|---------------------|-----|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| Uni-Polar   | Bi-Polar  | Uni                 | Bi  | V <sub>RWM</sub> (V)      | V <sub>BR</sub> (V)                   | V <sub>BR</sub> (V)                   | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (uA)               |
| SMDJ5.0A    | SMDJ5.0CA | RDE                 | DDE | 5.0                       | 6.4                                   | 7.0                                   | 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                                  | 10.4                                  | 1                   | 14.4                                      | 208.3               | 20                                |
| SMDJ9.0A    | SMDJ9.0CA | PDV                 | DDV | 9.0                       | 10.0                                  | 11.1                                  | 1                   | 15.4                                      | 194.8               | 10                                |
| SMDJ10A     | SMDJ10CA  | PDX                 | DDX | 10.0                      | 11.1                                  | 12.3                                  | 1                   | 17.0                                      | 176.5               | 5                                 |
| SMDJ11A     | SMDJ11CA  | PDZ                 | DDZ | 11.0                      | 12.2                                  | 13.5                                  | 1                   | 18.2                                      | 164.8               | 2                                 |
| SMDJ12A     | SMDJ12CA  | PEE                 | DEE | 12.0                      | 13.3                                  | 14.7                                  | 1                   | 19.9                                      | 150.8               | 2                                 |
| SMDJ13A     | SMDJ13CA  | PEG                 | DEG | 13.0                      | 14.4                                  | 15.9                                  | 1                   | 21.5                                      | 139.5               | 2                                 |
| SMDJ14A     | SMDJ14CA  | PEK                 | DEK | 14.0                      | 15.6                                  | 17.2                                  | 1                   | 23.2                                      | 129.3               | 2                                 |
| SMDJ15A     | SMDJ15CA  | PEM                 | DEM | 15.0                      | 16.7                                  | 18.5                                  | 1                   | 24.4                                      | 123.0               | 2                                 |
| SMDJ16A     | SMDJ16CA  | PEP                 | DEP | 16.0                      | 17.8                                  | 19.7                                  | 1                   | 26.0                                      | 115.4               | 2                                 |
| SMDJ17A     | SMDJ17CA  | PER                 | DER | 17.0                      | 18.9                                  | 20.9                                  | 1                   | 27.6                                      | 108.7               | 2                                 |
| SMDJ18A     | SMDJ18CA  | PET                 | DET | 18.0                      | 20.0                                  | 22.1                                  | 1                   | 29.2                                      | 102.7               | 2                                 |
| SMDJ20A     | SMDJ20CA  | PEV                 | DEV | 20.0                      | 22.2                                  | 24.5                                  | 1                   | 32.4                                      | 92.6                | 2                                 |
| SMDJ22A     | SMDJ22CA  | PEX                 | DEX | 22.0                      | 24.4                                  | 26.9                                  | 1                   | 35.5                                      | 84.5                | 2                                 |
| SMDJ24A     | SMDJ24CA  | PEZ                 | DEZ | 24.0                      | 26.7                                  | 29.5                                  | 1                   | 38.9                                      | 77.1                | 2                                 |
| SMDJ26A     | SMDJ26CA  | PFE                 | DFE | 26.0                      | 28.9                                  | 31.9                                  | 1                   | 42.1                                      | 71.3                | 2                                 |
| SMDJ28A     | SMDJ28CA  | PFG                 | DFG | 28.0                      | 31.1                                  | 34.4                                  | 1                   | 45.4                                      | 66.1                | 2                                 |
| SMDJ30A     | SMDJ30CA  | PFK                 | DFK | 30.0                      | 33.3                                  | 36.8                                  | 1                   | 48.4                                      | 62.0                | 2                                 |
| SMDJ33A     | SMDJ33CA  | PFM                 | DFM | 33.0                      | 36.7                                  | 40.6                                  | 1                   | 53.3                                      | 56.3                | 2                                 |
| SMDJ36A     | SMDJ36CA  | PFP                 | DFP | 36.0                      | 40.0                                  | 44.2                                  | 1                   | 58.1                                      | 51.6                | 2                                 |
| SMDJ40A     | SMDJ40CA  | PFR                 | DFR | 40.0                      | 44.4                                  | 49.1                                  | 1                   | 64.5                                      | 46.5                | 2                                 |
| SMDJ43A     | SMDJ43CA  | PFT                 | DFT | 43.0                      | 47.8                                  | 52.8                                  | 1                   | 69.4                                      | 43.2                | 2                                 |
| SMDJ45A     | SMDJ45CA  | PFV                 | DFV | 45.0                      | 50.0                                  | 55.3                                  | 1                   | 72.7                                      | 41.3                | 2                                 |
| SMDJ48A     | SMDJ48CA  | PFX                 | DFX | 48.0                      | 53.3                                  | 58.9                                  | 1                   | 77.4                                      | 38.8                | 2                                 |
| SMDJ51A     | SMDJ51CA  | PFZ                 | DFZ | 51.0                      | 56.7                                  | 62.7                                  | 1                   | 82.4                                      | 36.4                | 2                                 |
| SMDJ54A     | SMDJ54CA  | RGE                 | DGE | 54.0                      | 60.0                                  | 66.3                                  | 1                   | 87.1                                      | 34.4                | 2                                 |
| SMDJ58A     | SMDJ58CA  | PGG                 | DGG | 58.0                      | 64.4                                  | 71.2                                  | 1                   | 93.6                                      | 32.1                | 2                                 |

| Part Number |           | Device Marking Code |     | Reverse Stand-off Voltage | Breakdown Voltage Min.@I <sub>T</sub> | Breakdown Voltage Max.@I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|-------------|-----------|---------------------|-----|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| Uni-Polar   | Bi-Polar  | Uni                 | Bi  | V <sub>RWM</sub> (V)      | V <sub>BR</sub> (V)                   | V <sub>BR</sub> (V)                   | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (uA)               |
| SMDJ60A     | SMDJ60CA  | PGK                 | DGK | 60.0                      | 66.7                                  | 73.7                                  | 1                   | 96.8                                      | 31.0                | 2                                 |
| SMDJ64A     | SMDJ64CA  | PGM                 | DGM | 64.0                      | 71.1                                  | 78.6                                  | 1                   | 103.0                                     | 29.1                | 2                                 |
| SMDJ70A     | SMDJ70CA  | PGP                 | DGP | 70.0                      | 77.8                                  | 86.0                                  | 1                   | 113.0                                     | 26.5                | 2                                 |
| SMDJ75A     | SMDJ75CA  | PGR                 | DGR | 75.0                      | 83.3                                  | 92.1                                  | 1                   | 121.0                                     | 24.8                | 2                                 |
| SMDJ78A     | SMDJ78CA  | PGT                 | DGT | 78.0                      | 86.7                                  | 95.8                                  | 1                   | 126.0                                     | 23.8                | 2                                 |
| SMDJ85A     | SMDJ85CA  | PGV                 | DGV | 85.0                      | 94.4                                  | 104.0                                 | 1                   | 137.0                                     | 21.9                | 2                                 |
| SMDJ90A     | SMDJ90CA  | PGX                 | DGX | 90.0                      | 100.0                                 | 111.0                                 | 1                   | 146.0                                     | 20.5                | 2                                 |
| SMDJ100A    | SMDJ100CA | PGZ                 | DGZ | 100.0                     | 111.0                                 | 123.0                                 | 1                   | 162.0                                     | 18.5                | 2                                 |
| SMDJ110A    | SMDJ110CA | PHE                 | DHE | 110.0                     | 122.0                                 | 135.0                                 | 1                   | 177.0                                     | 16.9                | 2                                 |
| SMDJ120A    | SMDJ120CA | PHG                 | DHG | 120.0                     | 133.0                                 | 147.0                                 | 1                   | 193.0                                     | 15.5                | 2                                 |
| SMDJ130A    | SMDJ130CA | PHK                 | DHK | 130.0                     | 144.0                                 | 159.0                                 | 1                   | 209.0                                     | 14.4                | 2                                 |
| SMDJ150A    | SMDJ150CA | PHM                 | DHM | 150.0                     | 167.0                                 | 185.0                                 | 1                   | 243.0                                     | 12.3                | 2                                 |
| SMDJ160A    | SMDJ160CA | PHP                 | DHP | 160.0                     | 178.0                                 | 197.0                                 | 1                   | 259.0                                     | 11.6                | 2                                 |
| SMDJ170A    | SMDJ170CA | PHR                 | DHR | 170.0                     | 189.0                                 | 209.0                                 | 1                   | 275.0                                     | 10.9                | 2                                 |
| SMDJ180A    | SMDJ180CA | PHT                 | DHT | 180.0                     | 201.0                                 | 222.0                                 | 1                   | 292.0                                     | 10.3                | 2                                 |
| SMDJ190A    | SMDJ190CA | PHU                 | DHU | 190.0                     | 209.0                                 | 243.0                                 | 1                   | 308.0                                     | 9.7                 | 2                                 |
| SMDJ200A    | SMDJ200CA | PHV                 | DHV | 200.0                     | 224.0                                 | 247.0                                 | 1                   | 324.0                                     | 9.3                 | 2                                 |
| SMDJ210A    | SMDJ210CA | PHW                 | DHW | 210.0                     | 231.0                                 | 269.0                                 | 1                   | 340.0                                     | 8.8                 | 2                                 |
| SMDJ220A    | SMDJ220CA | PKE                 | DKE | 220.0                     | 246.0                                 | 272.0                                 | 1                   | 356.0                                     | 8.4                 | 2                                 |
| SMDJ250A    | SMDJ250CA | PKG                 | DKG | 250.0                     | 279.0                                 | 309.0                                 | 1                   | 405.0                                     | 7.4                 | 2                                 |
| SMDJ300A    | SMDJ300CA | PKK                 | DKK | 300.0                     | 335.0                                 | 371.0                                 | 1                   | 486.0                                     | 6.2                 | 2                                 |
| SMDJ350A    | SMDJ350CA | PKM                 | DKM | 350.0                     | 391.0                                 | 432.0                                 | 1                   | 567.0                                     | 5.3                 | 2                                 |
| SMDJ400A    | SMDJ400CA | PKP                 | DKP | 400.0                     | 447.0                                 | 494.0                                 | 1                   | 648.0                                     | 4.6                 | 2                                 |
| SMDJ440A    | SMDJ440CA | PKR                 | DKR | 440.0                     | 492.0                                 | 543.0                                 | 1                   | 713.0                                     | 4.2                 | 2                                 |

# CHARACTERISTIC CURVES

TVS Transients Clamping Waveform



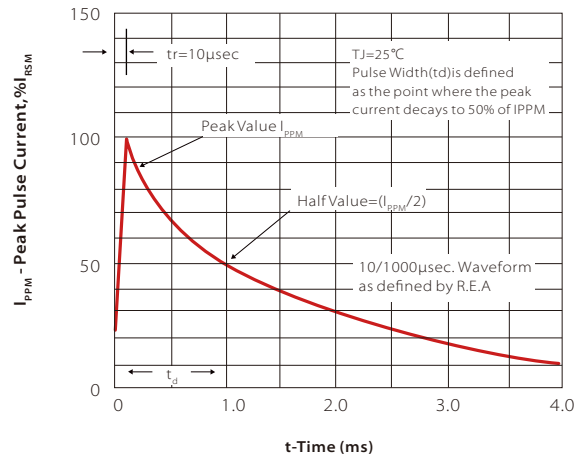
Peak Pulse Power Rating Curve

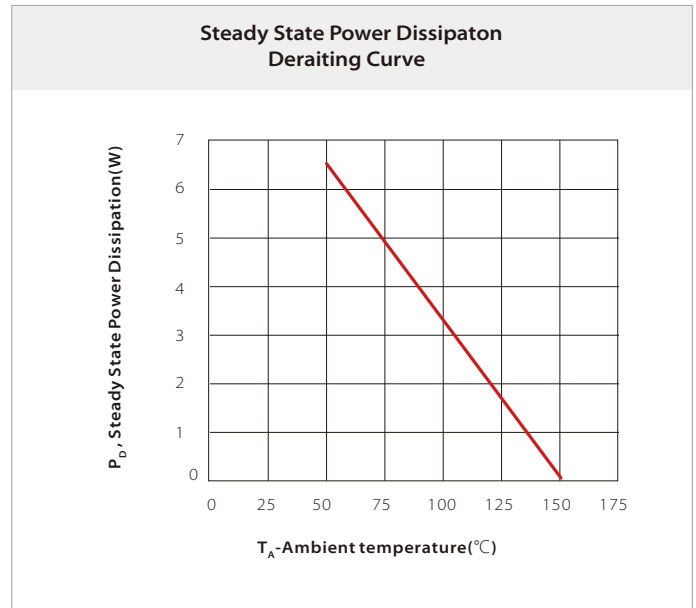


Pulse Derating Curve



Pulse Waveform





## SOLDERING PARAMETERS

| Reflow Condition                                       |                                  | Lead-free assembly |
|--|----------------------------------|--------------------|
| Pre Heat   | Temperature Max ( $T_{s(min)}$ ) | 150°C              |
|  | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|  | Time (min to max) ( $t_2$ )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak) |                                  | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                   |                                  | 3°C/second max     |
| Reflow   | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|  | Time (min to max) ( $t_1$ )      | 60 – 150 seconds   |
| Peak Temperature ( $T_p$ )                             |                                  | 260°C              |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                  | 20 – 40 seconds    |
| Ramp-down Rate   |                                  | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_p$ )                |                                  | 8 minutes max.     |
| Do not exceed  |                                  | 260°C              |



## DO-214AB(SMC) PACKAGE INFORMATION



| Ref. | Millimeters |      | Inches |       |
|------|-------------|------|--------|-------|
|      | Min.        | Max. | Min.   | Max.  |
| A    | 2.80        | 3.20 | 0.110  | 0.126 |
| B    | 6.60        | 7.20 | 0.260  | 0.283 |
| C    | 5.70        | 6.10 | 0.224  | 0.240 |
| D    | 2.15        | 2.75 | 0.085  | 0.108 |
| E    | 1.00        | 1.60 | 0.039  | 0.063 |
| F    | 0.02        | 0.20 | 0.000  | 0.008 |
| G    | 7.60        | 8.00 | 0.299  | 0.315 |
| H    | 0.15        | 0.30 | 0.006  | 0.012 |

## RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Millimeters |      | Inches   |       |
|------|-------------|------|----------|-------|
|      | Min.        | Max. | Min.     | Max.  |
| A    | 3.30        | -    | 0.129    | -     |
| B    | 2.40        | -    | 0.094    | -     |
| C    | -           | 4.20 | -        | 0.165 |
| D    | 2.40        | -    | 0.094    | -     |
| E    | 8.20REF     |      | 0.323REF |       |

## ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| SMDJxx(C)A  | DO-214AB(SMC)     | 3000PCS  | 13"       |

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