

## FEATURES

- | Low profile package
- | Ideal for automated placement
- | 1500 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> | 1500  | 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)               |
| SMCJ5.0A    | SMCJ5.0CA | GDE                 | BDE | 5.0                       | 6.40                                  | 7.00                                  | 10                  | 9.2                                       | 163.0               | 800                               |
| SMCJ6.0A    | SMCJ6.0CA | GDG                 | BDG | 6.0                       | 6.67                                  | 7.37                                  | 10                  | 10.3                                      | 145.7               | 800                               |
| SMCJ6.5A    | SMCJ6.5CA | GDK                 | BDK | 6.5                       | 7.22                                  | 7.98                                  | 10                  | 11.2                                      | 134.0               | 500                               |
| SMCJ7.0A    | SMCJ7.0CA | GDM                 | BDM | 7.0                       | 7.78                                  | 8.60                                  | 10                  | 12.0                                      | 125.0               | 200                               |
| SMCJ7.5A    | SMCJ7.5CA | GDP                 | BDP | 7.5                       | 8.33                                  | 9.21                                  | 1                   | 12.9                                      | 116.3               | 100                               |
| SMCJ8.0A    | SMCJ8.0CA | GDR                 | BDR | 8.0                       | 8.89                                  | 9.83                                  | 1                   | 13.6                                      | 110.3               | 50                                |
| SMCJ8.5A    | SMCJ8.5CA | GDT                 | BDT | 8.5                       | 9.44                                  | 10.40                                 | 1                   | 14.4                                      | 104.2               | 20                                |
| SMCJ9.0A    | SMCJ9.0CA | GDV                 | BDV | 9.0                       | 10.00                                 | 11.10                                 | 1                   | 15.4                                      | 97.4                | 10                                |
| SMCJ10A     | SMCJ10CA  | GDX                 | BDX | 10.0                      | 11.10                                 | 12.30                                 | 1                   | 17.0                                      | 88.3                | 5                                 |
| SMCJ11A     | SMCJ11CA  | GDZ                 | BDZ | 11.0                      | 12.20                                 | 13.50                                 | 1                   | 18.2                                      | 82.5                | 1                                 |
| SMCJ12A     | SMCJ12CA  | GEE                 | BEE | 12.0                      | 13.30                                 | 14.70                                 | 1                   | 19.9                                      | 75.4                | 1                                 |
| SMCJ13A     | SMCJ13CA  | GEG                 | BEG | 13.0                      | 14.40                                 | 15.90                                 | 1                   | 21.5                                      | 69.8                | 1                                 |
| SMCJ14A     | SMCJ14CA  | GEK                 | BEK | 14.0                      | 15.60                                 | 17.20                                 | 1                   | 23.2                                      | 64.7                | 1                                 |
| SMCJ15A     | SMCJ15CA  | GEM                 | BEM | 15.0                      | 16.70                                 | 18.50                                 | 1                   | 24.4                                      | 61.5                | 1                                 |
| SMCJ16A     | SMCJ16CA  | GEP                 | BEP | 16.0                      | 17.80                                 | 19.70                                 | 1                   | 26.0                                      | 57.7                | 1                                 |
| SMCJ17A     | SMCJ17CA  | GER                 | BER | 17.0                      | 18.90                                 | 20.90                                 | 1                   | 27.6                                      | 54.4                | 1                                 |
| SMCJ18A     | SMCJ18CA  | GET                 | BET | 18.0                      | 20.00                                 | 22.10                                 | 1                   | 29.2                                      | 51.4                | 1                                 |
| SMCJ20A     | SMCJ20CA  | GEV                 | BEV | 20.0                      | 22.20                                 | 24.50                                 | 1                   | 32.4                                      | 46.3                | 1                                 |
| SMCJ22A     | SMCJ22CA  | GEX                 | BEX | 22.0                      | 24.40                                 | 26.90                                 | 1                   | 35.5                                      | 42.3                | 1                                 |
| SMCJ24A     | SMCJ24CA  | GEZ                 | BEZ | 24.0                      | 26.70                                 | 29.50                                 | 1                   | 38.9                                      | 38.6                | 1                                 |
| SMCJ26A     | SMCJ26CA  | GFE                 | BFE | 26.0                      | 28.90                                 | 31.90                                 | 1                   | 42.1                                      | 35.7                | 1                                 |
| SMCJ28A     | SMCJ28CA  | GFG                 | BFG | 28.0                      | 31.10                                 | 34.40                                 | 1                   | 45.4                                      | 33.1                | 1                                 |
| SMCJ30A     | SMCJ30CA  | GFK                 | BFK | 30.0                      | 33.30                                 | 36.80                                 | 1                   | 48.4                                      | 31.0                | 1                                 |
| SMCJ33A     | SMCJ33CA  | GFM                 | BFM | 33.0                      | 36.70                                 | 40.60                                 | 1                   | 53.3                                      | 28.2                | 1                                 |
| SMCJ36A     | SMCJ36CA  | GFP                 | BFP | 36.0                      | 40.00                                 | 44.20                                 | 1                   | 58.1                                      | 25.9                | 1                                 |
| SMCJ40A     | SMCJ40CA  | GFR                 | BFR | 40.0                      | 44.40                                 | 49.10                                 | 1                   | 64.5                                      | 23.3                | 1                                 |
| SMCJ43A     | SMCJ43CA  | GFT                 | BFT | 43.0                      | 47.80                                 | 52.80                                 | 1                   | 69.4                                      | 21.7                | 1                                 |
| SMCJ45A     | SMCJ45CA  | GFV                 | BFV | 45.0                      | 50.00                                 | 55.30                                 | 1                   | 72.7                                      | 20.6                | 1                                 |
| SMCJ48A     | SMCJ48CA  | GFX                 | BFX | 48.0                      | 53.30                                 | 58.90                                 | 1                   | 77.4                                      | 19.4                | 1                                 |
| SMCJ51A     | SMCJ51CA  | GFZ                 | BFZ | 51.0                      | 56.70                                 | 62.70                                 | 1                   | 82.4                                      | 18.2                | 1                                 |
| SMCJ54A     | SMCJ54CA  | GGE                 | BGE | 54.0                      | 60.00                                 | 66.30                                 | 1                   | 87.1                                      | 17.3                | 1                                 |
| SMCJ58A     | SMCJ58CA  | GGG                 | BGG | 58.0                      | 64.40                                 | 71.20                                 | 1                   | 93.6                                      | 16.1                | 1                                 |

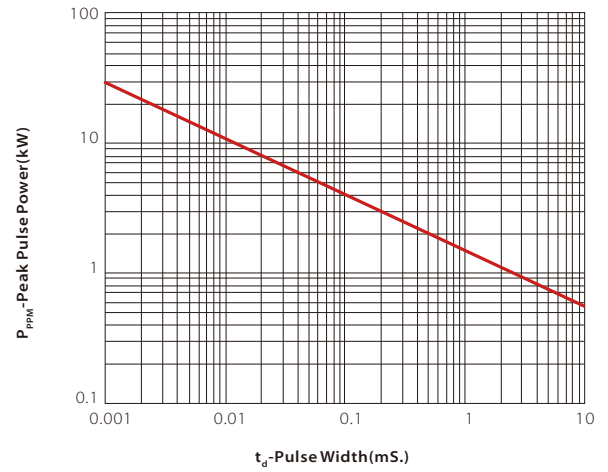
| Part Number |           | Device Marking Code |     | Reverse Stand-off Voltage | Breakdown Voltage Min.@I <sub>T</sub> | Breakdown Voltage Max.@I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|-------------|-----------|---------------------|-----|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| 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)               |
| SMCJ60A     | SMCJ60CA  | GGK                 | BGK | 60.0                      | 66.7                                  | 73.7                                  | 1                   | 96.8                                      | 15.5                | 1                                 |
| SMCJ64A     | SMCJ64CA  | GGM                 | BGM | 64.0                      | 71.1                                  | 78.6                                  | 1                   | 103.0                                     | 14.6                | 1                                 |
| SMCJ70A     | SMCJ70CA  | GGP                 | BGP | 70.0                      | 77.8                                  | 86.0                                  | 1                   | 113.0                                     | 13.3                | 1                                 |
| SMCJ75A     | SMCJ75CA  | GGR                 | BGR | 75.0                      | 83.3                                  | 92.1                                  | 1                   | 121.0                                     | 12.4                | 1                                 |
| SMCJ78A     | SMCJ78CA  | GGT                 | BGT | 78.0                      | 86.7                                  | 95.8                                  | 1                   | 126.0                                     | 11.9                | 1                                 |
| SMCJ85A     | SMCJ85CA  | GGV                 | BGV | 85.0                      | 94.4                                  | 104.0                                 | 1                   | 137.0                                     | 11.0                | 1                                 |
| SMCJ90A     | SMCJ90CA  | GGX                 | BGX | 90.0                      | 100.0                                 | 111.0                                 | 1                   | 146.0                                     | 10.3                | 1                                 |
| SMCJ100A    | SMCJ100CA | GGZ                 | BGZ | 100.0                     | 111.0                                 | 123.0                                 | 1                   | 162.0                                     | 9.3                 | 1                                 |
| SMCJ110A    | SMCJ110CA | GHE                 | BHE | 110.0                     | 122.0                                 | 135.0                                 | 1                   | 177.0                                     | 8.5                 | 1                                 |
| SMCJ120A    | SMCJ120CA | GHG                 | BHG | 120.0                     | 133.0                                 | 147.0                                 | 1                   | 193.0                                     | 7.8                 | 1                                 |
| SMCJ130A    | SMCJ130CA | GHK                 | BHK | 130.0                     | 144.0                                 | 159.0                                 | 1                   | 209.0                                     | 7.2                 | 1                                 |
| SMCJ150A    | SMCJ150CA | GHM                 | BHM | 150.0                     | 167.0                                 | 185.0                                 | 1                   | 243.0                                     | 6.2                 | 1                                 |
| SMCJ160A    | SMCJ160CA | GHP                 | BHP | 160.0                     | 178.0                                 | 197.0                                 | 1                   | 259.0                                     | 5.8                 | 1                                 |
| SMCJ170A    | SMCJ170CA | GHR                 | BHR | 170.0                     | 189.0                                 | 209.0                                 | 1                   | 275.0                                     | 5.5                 | 1                                 |
| SMCJ180A    | SMCJ180CA | GHT                 | BHT | 180.0                     | 201.0                                 | 222.0                                 | 1                   | 292.0                                     | 5.1                 | 1                                 |
| SMCJ200A    | SMCJ200CA | GHV                 | BHV | 200.0                     | 224.0                                 | 247.0                                 | 1                   | 324.0                                     | 4.6                 | 1                                 |
| SMCJ220A    | SMCJ220CA | GHX                 | BHX | 220.0                     | 246.0                                 | 272.0                                 | 1                   | 356.0                                     | 4.2                 | 1                                 |
| SMCJ250A    | SMCJ250CA | GHZ                 | BHZ | 250.0                     | 279.0                                 | 309.0                                 | 1                   | 405.0                                     | 3.7                 | 1                                 |
| SMCJ300A    | SMCJ300CA | GJE                 | BJE | 300.0                     | 335.0                                 | 371.0                                 | 1                   | 486.0                                     | 3.1                 | 1                                 |
| SMCJ350A    | SMCJ350CA | GJG                 | BJG | 350.0                     | 391.0                                 | 432.0                                 | 1                   | 567.0                                     | 2.6                 | 1                                 |
| SMCJ400A    | SMCJ400CA | GJK                 | BJK | 400.0                     | 447.0                                 | 494.0                                 | 1                   | 648.0                                     | 2.3                 | 1                                 |
| SMCJ440A    | SMCJ440CA | GJM                 | BJM | 440.0                     | 492.0                                 | 543.0                                 | 1                   | 713.0                                     | 2.1                 | 1                                 |
| SMCJ480A    | SMCJ480CA | GJP                 | BJP | 480.0                     | 536.0                                 | 593.0                                 | 1                   | 750.0                                     | 2.0                 | 1                                 |
| SMCJ520A    | SMCJ520CA | GJR                 | BJR | 520.0                     | 578.0                                 | 640.0                                 | 1                   | 762.0                                     | 2.0                 | 1                                 |
| SMCJ550A    | SMCJ550CA | GJT                 | BJT | 550.0                     | 615.0                                 | 680.0                                 | 1                   | 860.0                                     | 1.7                 | 1                                 |

# CHARACTERISTIC CURVES

TVS Transients Clamping Waveform



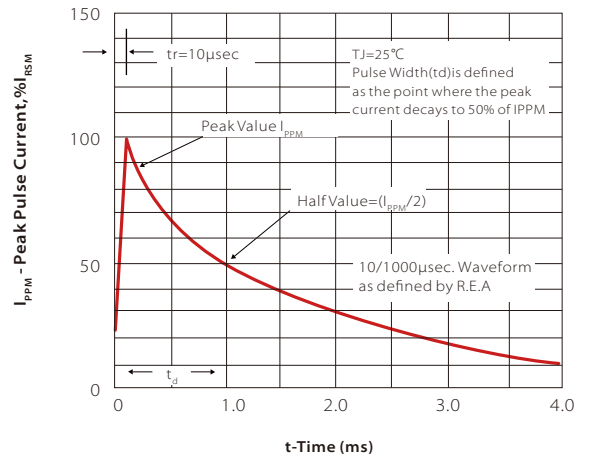
Peak Pulse Power Rating Curve

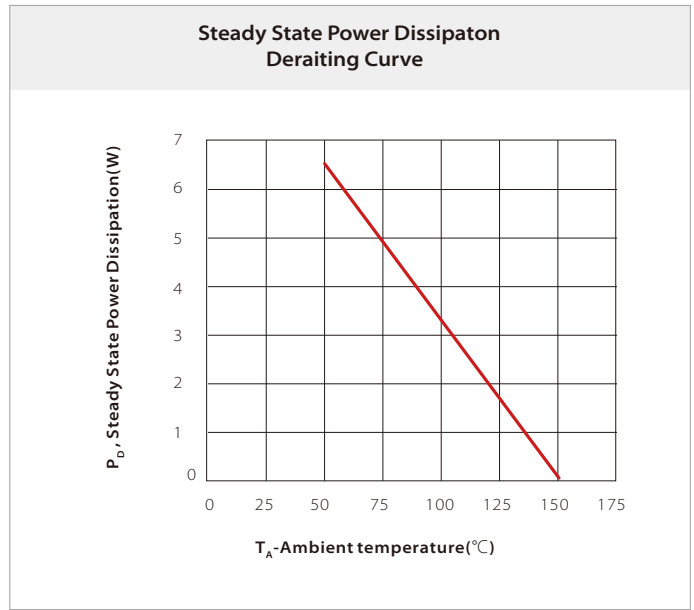


Pulse Derating Curve



Pulse Waveform





## SOLDERING PARAMETERS

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



## 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 |
|-------------|-------------------|----------|-----------|
| SMCJxx(C)A  | DO-214AB(SMC)     | 3000PCS  | 13"       |

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