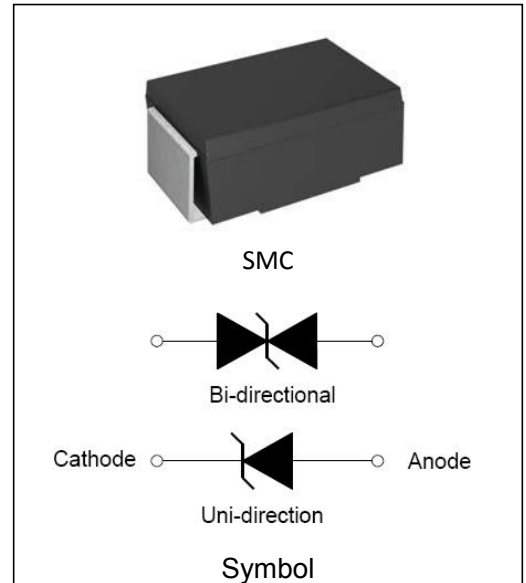


## DESCRIPTION:

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

## FEATURES:

- ✧ Glass passivated or planar junction.
- ✧ Excellent clamping capability.
- ✧ Repetition rate (duty cycle): 0.01%.
- ✧ Typical  $I_R$  less than  $1\mu A$  above 10V.
- ✧ Low profile package and low inductance.
- ✧ 1500W Peak Pulse power capability at  $10\times 1000\mu s$  waveform.
- ✧ Fast response time: typically less than 1.0ps from 0V to  $V_{BR}$  min.
- ✧ High temperature soldering:  $260^\circ C/10s$  at terminals.
- ✧ Plastic package has Underwriters Laboratory Flammability 94V-0.
- ✧ For surface mounted applications in order to optimize board space.



## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ C$ , RH=45%-75%, unless otherwise noted)

| Parameter   | Symbol      | Value       | Unit       |
|---|-------------|-------------|------------|
| Storage temperature range                                       | $T_{stg}$   | -55 to +150 | $^\circ C$ |
| Operating junction temperature range                            | $T_j$       | -55 to +150 | $^\circ C$ |
| Steady state power dissipation at $T_L=75^\circ C$              | $P_{M(AV)}$ | 8.0         | W          |
| Peak pulse power dissipation on 10/1000 $\mu s$ waveform        | $P_{PP}$    | 1500        | W          |
| Maximum Instantaneous Forward Voltage at 60A for Unidirectional | $V_F$       | 5.0         | V          |

## MARKING



GDE : Device Marking Code  
 1409: In ninth week, 2014

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

| Part Number |           | Marking |     | V <sub>R</sub> | I <sub>R</sub> @V <sub>R</sub> | V <sub>BR</sub> @I <sub>T</sub> |        | I <sub>T</sub> | V <sub>C</sub> @I <sub>PP</sub> | I <sub>PP</sub> <sup>⊙</sup> |
|-------------|-----------|---------|-----|----------------|--------------------------------|---------------------------------|--------|----------------|---------------------------------|------------------------------|
| Uni-Polar   | Bi-Polar  | Uni     | Bi  | V              | μA                             | min(V)                          | max(V) | mA             | max(V)                          | A                            |
| SMCJ5.0A    | SMCJ5.0CA | GDE     | BDE | 5.0            | 1000                           | 6.40                            | 7.00   | 10             | 9.2                             | 163.0                        |
| SMCJ6.0A    | SMCJ6.0CA | GDG     | BDG | 6.0            | 1000                           | 6.67                            | 7.37   | 10             | 10.3                            | 145.6                        |
| SMCJ6.5A    | SMCJ6.5CA | GDK     | BDK | 6.5            | 500                            | 7.22                            | 7.98   | 10             | 11.2                            | 134.0                        |
| SMCJ7.0A    | SMCJ7.0CA | GDM     | BDM | 7.0            | 200                            | 7.78                            | 8.60   | 10             | 12.0                            | 125.0                        |
| SMCJ7.5A    | SMCJ7.5CA | GDP     | BDP | 7.5            | 100                            | 8.33                            | 9.21   | 1              | 12.9                            | 116.3                        |
| SMCJ8.0A    | SMCJ8.0CA | GDR     | BDR | 8.0            | 50                             | 8.89                            | 9.83   | 1              | 13.6                            | 110.3                        |
| SMCJ8.5A    | SMCJ8.5CA | GDT     | BDT | 8.5            | 20                             | 9.44                            | 10.40  | 1              | 14.4                            | 104.2                        |
| SMCJ9.0A    | SMCJ9.0CA | GDV     | BDV | 9.0            | 10                             | 10.00                           | 11.10  | 1              | 15.4                            | 97.4                         |
| SMCJ10A     | SMCJ10CA  | GDX     | BDX | 10             | 5                              | 11.10                           | 12.30  | 1              | 17.0                            | 88.2                         |
| SMCJ11A     | SMCJ11CA  | GDZ     | BDZ | 11             | 5                              | 12.20                           | 13.50  | 1              | 18.2                            | 82.4                         |
| SMCJ12A     | SMCJ12CA  | GEE     | BEE | 12             | 5                              | 13.30                           | 14.70  | 1              | 19.9                            | 75.4                         |
| SMCJ13A     | SMCJ13CA  | GEG     | BEG | 13             | 1                              | 14.40                           | 15.90  | 1              | 21.5                            | 69.8                         |
| SMCJ14A     | SMCJ14CA  | GEK     | BEK | 14             | 1                              | 15.60                           | 17.20  | 1              | 23.2                            | 64.7                         |
| SMCJ15A     | SMCJ15CA  | GEM     | BEM | 15             | 1                              | 16.70                           | 18.50  | 1              | 24.4                            | 61.5                         |
| SMCJ16A     | SMCJ16CA  | GEP     | BEP | 16             | 1                              | 17.80                           | 19.70  | 1              | 26.0                            | 57.7                         |
| SMCJ17A     | SMCJ17CA  | GER     | BER | 17             | 1                              | 18.90                           | 20.90  | 1              | 27.6                            | 54.4                         |
| SMCJ18A     | SMCJ18CA  | GET     | BET | 18             | 1                              | 20.00                           | 22.10  | 1              | 29.2                            | 51.4                         |
| SMCJ20A     | SMCJ20CA  | GEV     | BEV | 20             | 1                              | 22.20                           | 24.50  | 1              | 32.4                            | 46.3                         |
| SMCJ22A     | SMCJ22CA  | GEX     | BEX | 22             | 1                              | 24.40                           | 26.90  | 1              | 35.5                            | 42.3                         |
| SMCJ24A     | SMCJ24CA  | GEZ     | BEZ | 24             | 1                              | 26.70                           | 29.50  | 1              | 38.9                            | 38.6                         |
| SMCJ26A     | SMCJ26CA  | GFE     | BFE | 26             | 1                              | 28.90                           | 31.90  | 1              | 42.1                            | 35.6                         |
| SMCJ28A     | SMCJ28CA  | GFG     | BFG | 28             | 1                              | 31.10                           | 34.40  | 1              | 45.4                            | 33.1                         |
| SMCJ30A     | SMCJ30CA  | GFK     | BFK | 30             | 1                              | 33.30                           | 36.80  | 1              | 48.4                            | 31.0                         |
| SMCJ33A     | SMCJ33CA  | GFM     | BFM | 33             | 1                              | 36.70                           | 40.60  | 1              | 53.3                            | 28.2                         |
| SMCJ36A     | SMCJ36CA  | GFP     | BFP | 36             | 1                              | 40.00                           | 44.20  | 1              | 58.1                            | 25.8                         |
| SMCJ40A     | SMCJ40CA  | GFR     | BFR | 40             | 1                              | 44.40                           | 49.10  | 1              | 64.5                            | 23.3                         |
| SMCJ43A     | SMCJ43CA  | GFT     | BFT | 43             | 1                              | 47.80                           | 52.80  | 1              | 69.4                            | 21.6                         |
| SMCJ45A     | SMCJ45CA  | GFV     | BFV | 45             | 1                              | 50.00                           | 55.30  | 1              | 72.7                            | 20.6                         |
| SMCJ48A     | SMCJ48CA  | GFX     | BFX | 48             | 1                              | 53.30                           | 58.90  | 1              | 77.4                            | 19.4                         |
| SMCJ51A     | SMCJ51CA  | GFZ     | BFZ | 51             | 1                              | 56.70                           | 62.70  | 1              | 82.4                            | 18.2                         |

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, continued)**

| Part Number |           | Marking |     | V <sub>R</sub> | I <sub>R@V<sub>R</sub></sub> | V <sub>BR@I<sub>T</sub></sub> |        | I <sub>T</sub> | V <sub>C@I<sub>PP</sub></sub> | I <sub>PP</sub> <sup>①</sup> |
|-------------|-----------|---------|-----|----------------|------------------------------|-------------------------------|--------|----------------|-------------------------------|------------------------------|
| Uni-Polar   | Bi-Polar  | Uni     | Bi  | V              | μA                           | min(V)                        | max(V) | mA             | max(V)                        | A                            |
| SMCJ54A     | SMCJ54CA  | GGE     | BGE | 54             | 1                            | 60.00                         | 66.30  | 1              | 87.1                          | 17.2                         |
| SMCJ58A     | SMCJ58CA  | GGG     | BGG | 58             | 1                            | 64.40                         | 71.20  | 1              | 93.6                          | 16.1                         |
| SMCJ60A     | SMCJ60CA  | GGK     | BGK | 60             | 1                            | 66.70                         | 73.70  | 1              | 96.8                          | 15.5                         |
| SMCJ64A     | SMCJ64CA  | GGM     | BGM | 64             | 1                            | 71.10                         | 78.60  | 1              | 103.0                         | 14.6                         |
| SMCJ70A     | SMCJ70CA  | GGP     | BGP | 70             | 1                            | 77.80                         | 86.00  | 1              | 113.0                         | 13.3                         |
| SMCJ75A     | SMCJ75CA  | GGR     | BGR | 75             | 1                            | 83.30                         | 92.10  | 1              | 121.0                         | 12.4                         |
| SMCJ78A     | SMCJ78CA  | GGT     | BGT | 78             | 1                            | 86.70                         | 95.80  | 1              | 126.0                         | 11.9                         |
| SMCJ85A     | SMCJ85CA  | GGV     | BGV | 85             | 1                            | 94.40                         | 104.0  | 1              | 137.0                         | 11.0                         |
| SMCJ90A     | SMCJ90CA  | GGX     | BGX | 90             | 1                            | 100.0                         | 111.0  | 1              | 146.0                         | 10.3                         |
| SMCJ100A    | SMCJ100CA | GGZ     | BGZ | 100            | 1                            | 111.0                         | 123.0  | 1              | 162.0                         | 9.3                          |
| SMCJ110A    | SMCJ110CA | GHE     | BHE | 110            | 1                            | 122.0                         | 135.0  | 1              | 177.0                         | 8.5                          |
| SMCJ120A    | SMCJ120CA | GHG     | BHG | 120            | 1                            | 133.0                         | 147.0  | 1              | 193.0                         | 7.8                          |
| SMCJ130A    | SMCJ130CA | GHK     | BHK | 130            | 1                            | 144.0                         | 159.0  | 1              | 209.0                         | 7.2                          |
| SMCJ150A    | SMCJ150CA | GHM     | BHM | 150            | 1                            | 167.0                         | 185.0  | 1              | 243.0                         | 6.2                          |
| SMCJ160A    | SMCJ160CA | GHP     | BHP | 160            | 1                            | 178.0                         | 197.0  | 1              | 259.0                         | 5.8                          |
| SMCJ170A    | SMCJ170CA | GHR     | BHR | 170            | 1                            | 189.0                         | 209.0  | 1              | 275.0                         | 5.5                          |
| SMCJ180A    | SMCJ180CA | GHT     | BHT | 180            | 1                            | 201.0                         | 222.0  | 1              | 292.0                         | 5.2                          |
| SMCJ190A    | SMCJ190CA | GHU     | BHU | 190            | 1                            | 211.0                         | 234.0  | 1              | 307.0                         | 4.9                          |
| SMCJ200A    | SMCJ200CA | GHV     | BHV | 200            | 1                            | 224.0                         | 247.0  | 1              | 324.0                         | 4.7                          |
| SMCJ210A    | SMCJ210CA | GHW     | BHW | 210            | 1                            | 233.0                         | 258.0  | 1              | 337.0                         | 4.5                          |
| SMCJ220A    | SMCJ220CA | GHX     | BHX | 220            | 1                            | 246.0                         | 272.0  | 1              | 356.0                         | 4.2                          |
| SMCJ250A    | SMCJ250CA | GJG     | BJG | 250            | 1                            | 279.0                         | 309.0  | 1              | 405.0                         | 3.7                          |
| SMCJ300A    | SMCJ300CA | GJK     | BJK | 300            | 1                            | 335.0                         | 371.0  | 1              | 486.0                         | 3.1                          |
| SMCJ350A    | SMCJ350CA | GJM     | BJM | 350            | 1                            | 391.0                         | 432.0  | 1              | 567.0                         | 2.7                          |
| SMCJ400A    | SMCJ400CA | GJP     | BJP | 400            | 1                            | 447.0                         | 494.0  | 1              | 648.0                         | 2.3                          |
| SMCJ440A    | SMCJ440CA | GJR     | BJR | 440            | 1                            | 492.0                         | 543.0  | 1              | 713.0                         | 2.1                          |

① Surge waveform: 10/1000μs

V<sub>R</sub>: Stand-off Voltage -- Maximum voltage that can be applied

V<sub>BR</sub>: Breakdown Voltage

V<sub>C</sub>: Clamping Voltage -- Peak voltage measured across the suppressor at a specified I<sub>pp</sub>

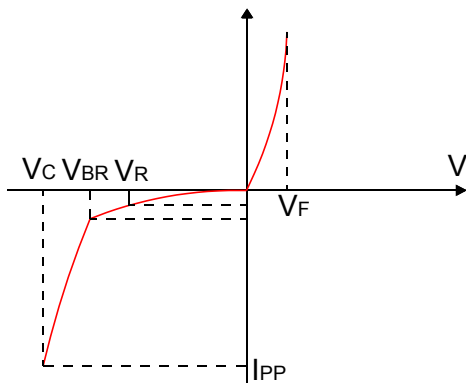
I<sub>R</sub>: Reverse Leakage Current

**ORDERING INFORMATION**

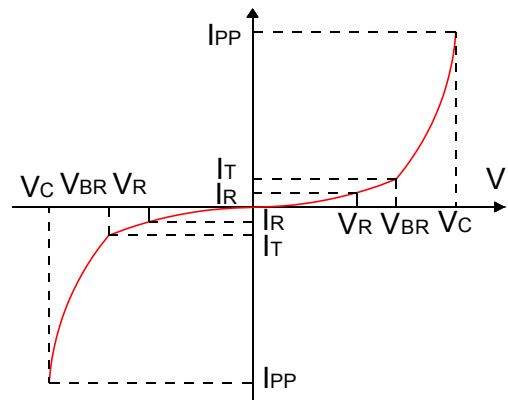
|  |                  |  |   |
|--|------------------|--|---|
| <p><b>SMCJ</b></p> <p>1500W SMC Series</p> <p><math>V_R</math> Voltage</p> | <p><b>xx</b></p> | <p><b>C</b></p> <p>C: Bi-directional</p> | <p><b>A</b></p> <p>5% <math>V_{BR}</math> Voltage tolerance</p> |
|--|------------------|--|---|

**RATINGS AND V-I CHARACTERISTICS CURVES ( $T_A=25^\circ\text{C}$ , unless otherwise noted)**

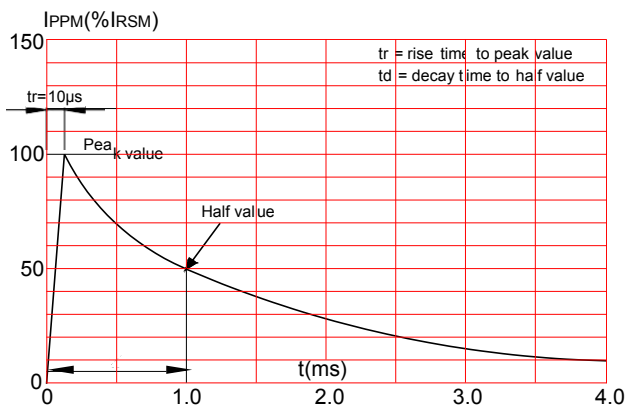
**FIG.1:V- I curve characteristics (Uni-directional)**



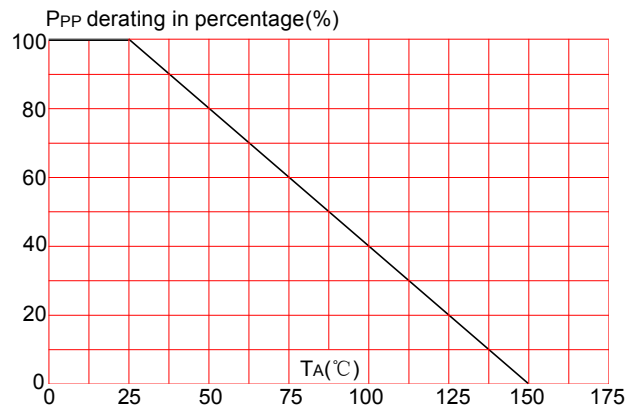
**FIG.2:V- I curve characteristics (Bi-directional)**



**FIG.3: Pulse waveform**

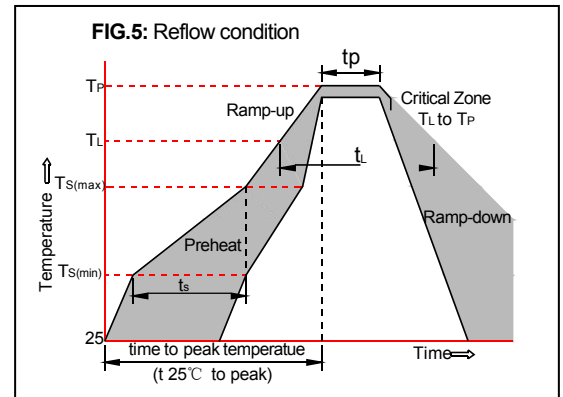
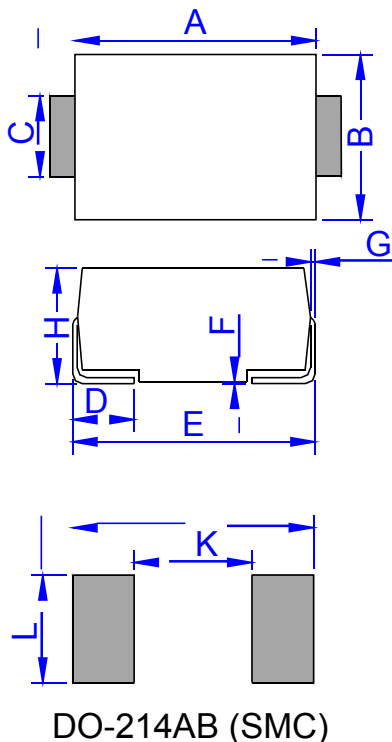


**FIG.4: Pulse derating curve**



**SOLDERING PARAMETERS**

|   |                                   |                                 |
|---|-----------------------------------|---------------------------------|
| Reflow Condition  |                                   | Pb-Free assembly<br>(see FIG.5) |
| Pre Heat  | -Temperature Min ( $T_{s(min)}$ ) | +150°C                          |
|   | -Temperature Max( $T_{s(max)}$ )  | +200°C                          |
|   | -Time (Min to Max) ( $t_s$ )      | 60-180 secs.                    |
| Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak) |                                   | 3°C/sec. Max                    |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                    |                                   | 3°C/sec. Max                    |
| Reflow  | -Temperature( $T_L$ )(Liquid us)  | +217°C                          |
|   | -Temperature( $t_L$ )             | 60-150 secs.                    |
| Peak Temp ( $T_p$ )                                     |                                   | +260(+0/-5)°C                   |
| Time within 5°C of actual Peak Temp ( $t_p$ )           |                                   | 30 secs. Max                    |
| Ramp-down Rate  |                                   | 6°C/sec. Max                    |
| Time 25°C to Peak Temp ( $T_p$ )                        |                                   | 8 min. Max                      |
| Do not exceed   |                                   | +260°C                          |


**PACKAGE MECHANICAL DATA**


| Ref. | Dimensions  |       |        |       |
|------|-------------|-------|--------|-------|
|      | Millimeters |       | Inches |       |
|      | Min.        | Max.  | Min.   | Max.  |
| A    | 6.60        | 7.11  | 0.260  | 0.280 |
| B    | 5.59        | 6.20  | 0.220  | 0.244 |
| C    | 2.75        | 3.20  | 0.108  | 0.126 |
| D    | 0.76        | 1.52  | 0.030  | 0.060 |
| E    | 7.74        | 8.13  | 0.305  | 0.320 |
| F    | 0.051       | 0.203 | 0.002  | 0.008 |
| G    | 0.15        | 0.31  | 0.006  | 0.012 |
| H    | 2.15        | 2.62  | 0.085  | 0.103 |
| J    | 8.12        |       | 0.320  |       |
| K    |             | 4.69  |        | 0.185 |
| L    | 3.07        |       | 0.121  |       |

**TAPE AND REEL SPECIFICATION-SMC**

| PART No.   | PACKAGE      | QUANTITY | TAPE & REEL |
|------------|--------------|----------|-------------|
| SMCJxxCA/A | SMC(DO214AB) | 3,000    | 13inch      |

Website: <http://www.jksemit.com>

For additional information, please contact your local Sales Representative.

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