

### Features

- Peak power dissipation  
400W@10 x 1000 us Pluse
- Low incremental surge resistance
- Excellent clamping capability
- Fast response time
- Low leakage current
- Halogen free and RoHS compliant

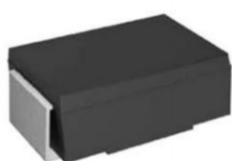
### Applications

- Personal digital assistants (PDA)
- Cellular handsets & Accessories
- Handhelds and notebooks
- Portable instrumentation

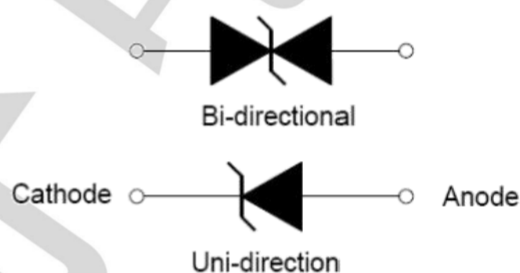
### Mechanical Characteristics

- DO-214AC(SMA) surface mount package

### Dimensions and Pin Configuration



**DO-214AC(SMA)**



**Pin Configuration**

### Maximum Ratings& Thermal Characteristics

(Tamb=25°C unless otherwise specified)

| Parameter                                              | Symbol                           | Value     | Unit |
|--------------------------------------------------------|----------------------------------|-----------|------|
| Peak pulse power (tp=10/1000μs waveform)               | P <sub>PPM</sub>                 | 400       | W    |
| Steady state power dissipation at T <sub>A</sub> =50°C | P <sub>M(AV)</sub>               | 3.0       | W    |
| Peak Pulse Current of on 10/1000us Waveform            | I <sub>PPM</sub>                 | See Table | A    |
| Typical thermal resistance junction to ambient         | R <sub>θJA</sub>                 | 120       | °C/W |
| Storage & operating temperature range                  | T <sub>STG</sub> ,T <sub>J</sub> | -55~+150  | °C   |

### Electrical Characteristics (TA=25°C unless otherwise specified)

| MCC PART NUMBER |           | REVERSE STAND-OFF VOLTAGE $V_{WM}$ | BREAKDOWN VOLTAGE $V_{(BR)}$ @ $I_T$ (VOLTS) |      |            | MAXIMUM CLAMPING VOLTAGE @ $I_{PP}$ | PEAK PULSE CURRENT $I_{PP}$ | MAXIMUM REVERSE LEAKAGE @ $V_{WM}$ $I_D$ |
|-----------------|-----------|------------------------------------|----------------------------------------------|------|------------|-------------------------------------|-----------------------------|------------------------------------------|
| UNI-POLAR       | BI-POLAR  | (VOLTS)                            | MIN                                          | MAX  | $I_T$ (mA) | (VOLTS)                             | (AMPS)                      | ( $\mu A$ )                              |
| SMAJ5.0A        | SMAJ5.0CA | 5.0                                | 6.40                                         | 7.00 | 10         | 9.2                                 | 43.5                        | 800                                      |
| SMAJ6.0A        | SMAJ6.0CA | 6.0                                | 6.67                                         | 7.37 | 10         | 10.3                                | 38.8                        | 800                                      |
| SMAJ6.5A        | SMAJ6.5CA | 6.5                                | 7.22                                         | 7.98 | 10         | 11.2                                | 35.7                        | 500                                      |
| SMAJ7.0A        | SMAJ7.0CA | 7.0                                | 7.78                                         | 8.60 | 10         | 12.0                                | 33.3                        | 200                                      |
| SMAJ7.5A        | SMAJ7.5CA | 7.5                                | 8.33                                         | 9.21 | 1          | 12.9                                | 31.0                        | 100                                      |
| SMAJ8.0A        | SMAJ8.0CA | 8.0                                | 8.89                                         | 9.83 | 1          | 13.6                                | 29.4                        | 50                                       |
| SMAJ8.5A        | SMAJ8.5CA | 8.5                                | 9.44                                         | 10.4 | 1          | 14.4                                | 27.7                        | 20                                       |
| SMAJ9.0A        | SMAJ9.0CA | 9.0                                | 10.0                                         | 11.1 | 1          | 15.4                                | 26.0                        | 10                                       |
| SMAJ10A         | SMAJ10CA  | 10                                 | 11.1                                         | 12.3 | 1          | 17.0                                | 23.5                        | 5                                        |
| SMAJ11A         | SMAJ11CA  | 11                                 | 12.2                                         | 13.5 | 1          | 18.2                                | 22.0                        | 1                                        |
| SMAJ12A         | SMAJ12CA  | 12                                 | 13.3                                         | 14.7 | 1          | 19.9                                | 20.1                        | 1                                        |
| SMAJ13A         | SMAJ13CA  | 13                                 | 14.4                                         | 15.9 | 1          | 21.5                                | 18.6                        | 1                                        |
| SMAJ14A         | SMAJ14CA  | 14                                 | 15.6                                         | 17.2 | 1          | 23.2                                | 17.2                        | 1                                        |
| SMAJ15A         | SMAJ15CA  | 15                                 | 16.7                                         | 18.5 | 1          | 24.4                                | 16.4                        | 1                                        |
| SMAJ16A         | SMAJ16CA  | 16                                 | 17.8                                         | 19.7 | 1          | 26.0                                | 15.3                        | 1                                        |
| SMAJ17A         | SMAJ17CA  | 17                                 | 18.9                                         | 20.9 | 1          | 27.6                                | 14.5                        | 1                                        |
| SMAJ18A         | SMAJ18CA  | 18                                 | 20.0                                         | 22.1 | 1          | 29.2                                | 13.7                        | 1                                        |
| SMAJ20A         | SMAJ20CA  | 20                                 | 22.2                                         | 24.5 | 1          | 32.4                                | 12.3                        | 1                                        |
| SMAJ22A         | SMAJ22CA  | 22                                 | 24.4                                         | 26.9 | 1          | 35.5                                | 11.2                        | 1                                        |
| SMAJ24A         | SMAJ24CA  | 24                                 | 26.7                                         | 29.5 | 1          | 38.9                                | 10.3                        | 1                                        |
| SMAJ26A         | SMAJ26CA  | 26                                 | 28.9                                         | 31.9 | 1          | 42.1                                | 9.5                         | 1                                        |
| SMAJ28A         | SMAJ28CA  | 28                                 | 31.1                                         | 34.4 | 1          | 45.4                                | 8.8                         | 1                                        |
| SMAJ30A         | SMAJ30CA  | 30                                 | 33.3                                         | 36.8 | 1          | 48.4                                | 8.3                         | 1                                        |
| SMAJ33A         | SMAJ33CA  | 33                                 | 36.7                                         | 40.6 | 1          | 53.3                                | 7.5                         | 1                                        |
| SMAJ36A         | SMAJ36CA  | 36                                 | 40.0                                         | 44.2 | 1          | 58.1                                | 6.9                         | 1                                        |
| SMAJ40A         | SMAJ40CA  | 40                                 | 44.4                                         | 49.1 | 1          | 64.5                                | 6.2                         | 1                                        |
| SMAJ43A         | SMAJ43CA  | 43                                 | 47.8                                         | 52.8 | 1          | 69.4                                | 5.7                         | 1                                        |
| SMAJ45A         | SMAJ45CA  | 45                                 | 50.0                                         | 55.3 | 1          | 72.7                                | 5.5                         | 1                                        |
| SMAJ48A         | SMAJ48CA  | 48                                 | 53.3                                         | 58.9 | 1          | 77.4                                | 5.2                         | 1                                        |

### Electrical Characteristics (TA=25°C unless otherwise specified)

| MCC PART NUMBER |           | REVERSE STAND-OFF VOLTAGE<br>$V_{WM}$ | BREAKDOWN VOLTAGE<br>$V_{(BR)} @ I_T$<br>(VOLTS) |      |            | MAXIMUM CLAMPING VOLTAGE @<br>$I_{PP}$ | PEAK PULSE CURRENT<br>$I_{PP}$ | MAXIMUM REVERSE LEAKAGE<br>@ $V_{WM}$<br>$I_D$ |
|-----------------|-----------|---------------------------------------|--------------------------------------------------|------|------------|----------------------------------------|--------------------------------|------------------------------------------------|
| UNI-POLAR       | BI-POLAR  | (VOLTS)                               | MIN                                              | MAX  | $I_T$ (mA) | (VOLTS)                                | (AMPS)                         | ( $\mu A$ )                                    |
| SMAJ51A         | SMAJ51CA  | 51                                    | 56.7                                             | 62.7 | 1          | 82.4                                   | 4.9                            | 1                                              |
| SMAJ54A         | SMAJ54CA  | 54                                    | 60.0                                             | 66.3 | 1          | 87.1                                   | 4.6                            | 1                                              |
| SMAJ58A         | SMAJ58CA  | 58                                    | 64.4                                             | 71.2 | 1          | 93.6                                   | 4.3                            | 1                                              |
| SMAJ60A         | SMAJ60CA  | 60                                    | 66.7                                             | 73.7 | 1          | 96.8                                   | 4.1                            | 1                                              |
| SMAJ64A         | SMAJ64CA  | 64                                    | 71.1                                             | 78.6 | 1          | 103                                    | 3.9                            | 1                                              |
| SMAJ70A         | SMAJ70CA  | 70                                    | 77.8                                             | 86.0 | 1          | 113                                    | 3.5                            | 1                                              |
| SMAJ75A         | SMAJ75CA  | 75                                    | 83.3                                             | 92.1 | 1          | 121                                    | 3.3                            | 1                                              |
| SMAJ78A         | SMAJ78CA  | 78                                    | 86.7                                             | 95.8 | 1          | 126                                    | 2.2                            | 1                                              |
| SMAJ85A         | SMAJ85CA  | 85                                    | 94.4                                             | 104  | 1          | 137                                    | 2.9                            | 1                                              |
| SMAJ90A         | SMAJ90CA  | 90                                    | 100                                              | 111  | 1          | 146                                    | 2.7                            | 1                                              |
| SMAJ100A        | SMAJ100CA | 100                                   | 111                                              | 123  | 1          | 162                                    | 2.5                            | 1                                              |
| SMAJ110A        | SMAJ110CA | 110                                   | 122                                              | 135  | 1          | 177                                    | 2.3                            | 1                                              |
| SMAJ120A        | SMAJ120CA | 120                                   | 133                                              | 147  | 1          | 193                                    | 2.1                            | 1                                              |
| SMAJ130A        | SMAJ130CA | 130                                   | 144                                              | 159  | 1          | 209                                    | 1.9                            | 1                                              |
| SMAJ150A        | SMAJ150CA | 150                                   | 167                                              | 185  | 1          | 243                                    | 1.6                            | 1                                              |
| SMAJ160A        | SMAJ160CA | 160                                   | 178                                              | 197  | 1          | 259                                    | 1.5                            | 1                                              |
| SMAJ170A        | SMAJ170CA | 170                                   | 189                                              | 209  | 1          | 275                                    | 1.5                            | 1                                              |
| SMAJ180A        | SMAJ180CA | 180                                   | 201                                              | 222  | 1          | 292                                    | 1.4                            | 1                                              |
| SMAJ200A        | SMAJ200CA | 200                                   | 224                                              | 247  | 1          | 324                                    | 1.2                            | 1                                              |
| SMAJ220A        | SMAJ220CA | 220                                   | 246                                              | 272  | 1          | 356                                    | 1.1                            | 1                                              |
| SMAJ250A        | SMAJ250CA | 250                                   | 279                                              | 309  | 1          | 405                                    | 1.0                            | 1                                              |
| SMAJ300A        | SMAJ300CA | 300                                   | 335                                              | 371  | 1          | 486                                    | 0.8                            | 1                                              |
| SMAJ350A        | SMAJ350CA | 350                                   | 391                                              | 432  | 1          | 567                                    | 0.7                            | 1                                              |
| SMAJ400A        | SMAJ400CA | 400                                   | 447                                              | 494  | 1          | 648                                    | 0.6                            | 1                                              |
| SMAJ440A        | SMAJ440CA | 440                                   | 492                                              | 543  | 1          | 713                                    | 0.6                            | 1                                              |

For bi-directional type having  $V_{WM}$  of 10 Volts and less, the IR limit is double.

For parts without A, the VBR is +10%.

### Typical Characteristics Curves

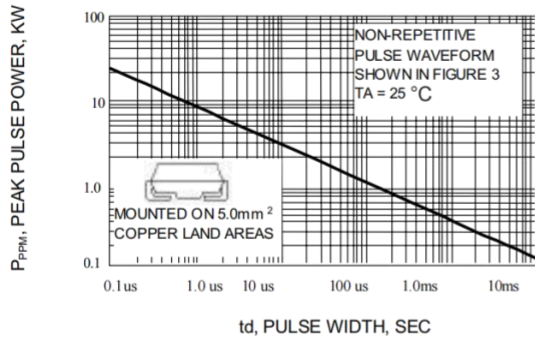


Fig. 1-PEAK PULSE POWER RATING CURVE

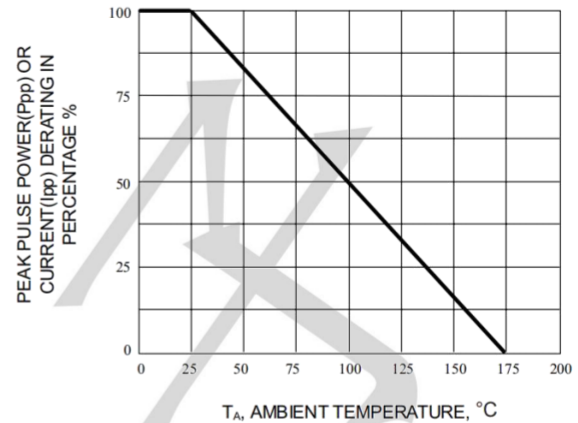


Fig. 2-PULSE RATING CURVE

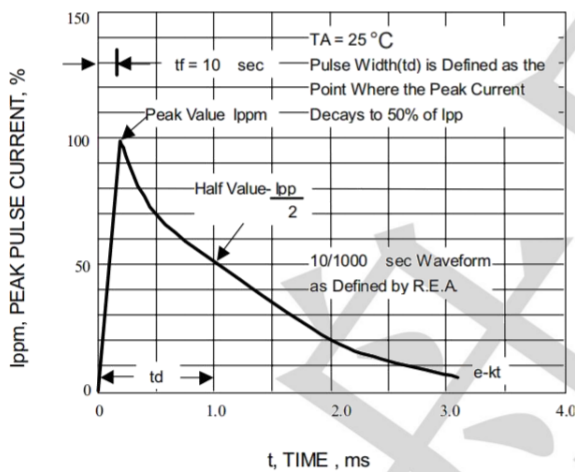


Fig. 3-PULSE WAVEFORM

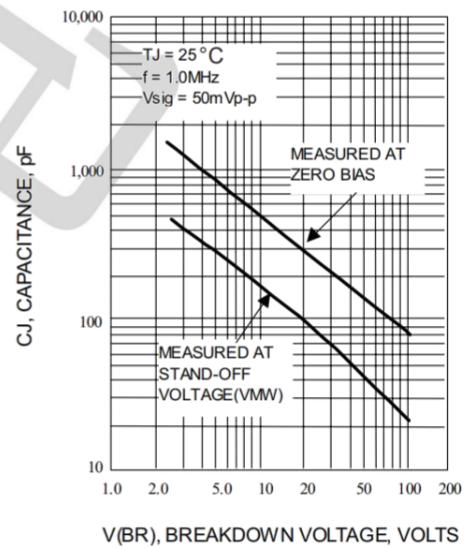


Fig. 4-TYPICAL JUNCTION CAPACITANCE

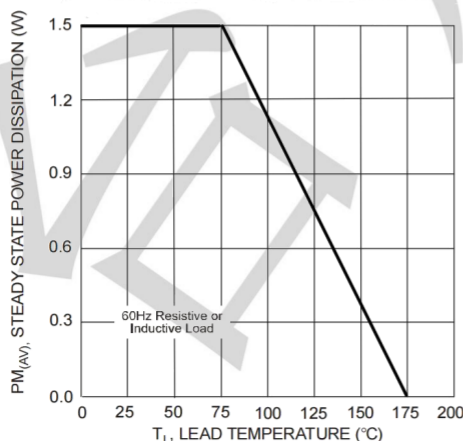
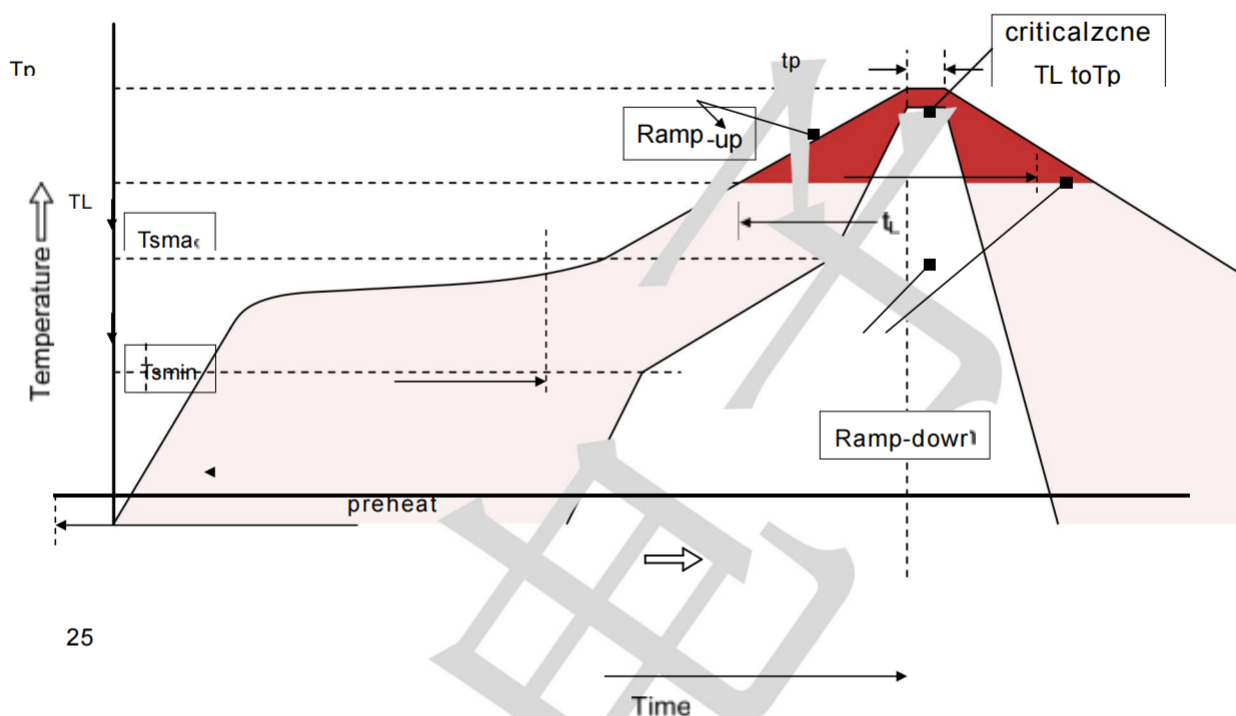


Fig. 5-Steady State Power Derating Curve

## Recommended Soldering Conditions

## Reflow Soldering



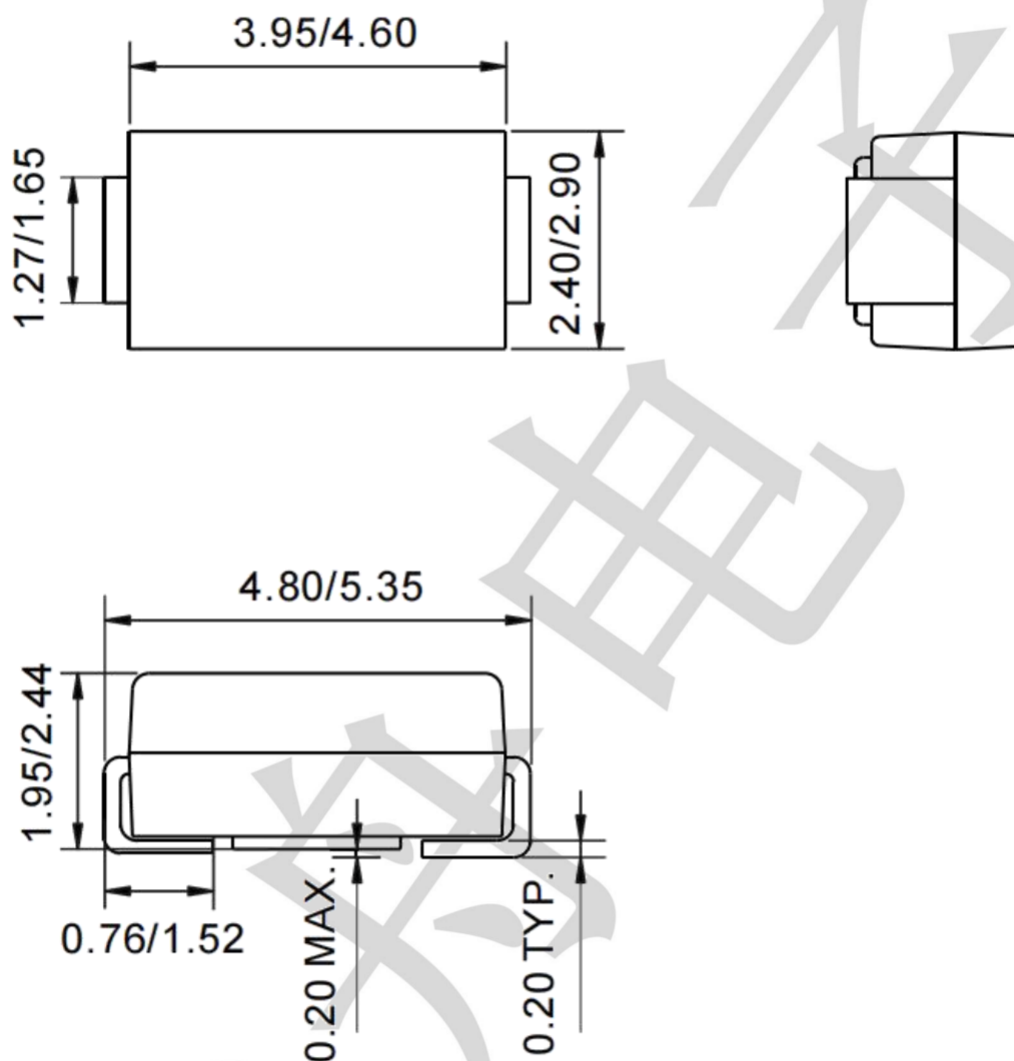
### Recommended Conditions

| Profile Feature                                                                                             | Pb-Free Assembly                 |
|-------------------------------------------------------------------------------------------------------------|----------------------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )                                                                     | 3°C/second max.                  |
| Preheat<br>-Temperature Min ( $T_{S\ min}$ )<br>-Temperature Max ( $T_{S\ max}$ )<br>-Time (minto max) (ts) | 150°C<br>200°C<br>60-180 seconds |
| $T_{S\ max}$ to $T_L$<br>-Ramp-up Rate                                                                      | 3°C/second max.                  |
| Time maintained above:<br>-Temperature ( $T_L$ )<br>-Time ( $t_L$ )                                         | 217°C<br>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                                                                               | 8 minutes max.                   |



### Package Outline Dimensions (unit: mm)

#### SMA



### Mounting Pad Layout (unit: mm)

