

### FEATURES



- \* For surface mount application
- \* Built-in strain relief
- \* Excellent clamping capability
- \* Low profile package
- \* Fast response time: Typically less than 1.0ps from 0 volt to BV min.
- \* Typical I<sub>R</sub> less than 1 A above 10V
- \* High temperature soldering guaranteed: 260°C / 10 seconds at terminals

### MECHANICAL DATA

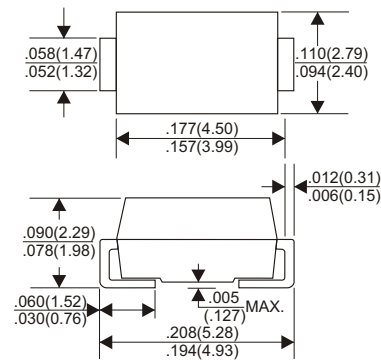
- \* Case: Molded plastic
- \* Epoxy: UL 94V-0 rate flame retardant
- \* Lead: Solderable per MIL-STD-202, method 208 guranteed
- \* Polarity: Color band denotes cathode end except Bidirectional
- \* Mounting position: Any
- \* Weight: 0.063 grams

### VOLTAGE RANGE

5.0 to 440 Volts

400 Watts Peak Power

DO-214AC(SMA)



Dimensions in inches and (millimeters)



- "GK" represents the brand name
- "XXX" represents the periodic code
- "YY" represents the product type marking

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating 25°C ambient temperature unieess otherwies specified.  
 Single phase half wave, 60Hz, resistive or inductive load.  
 For capacitive load, derate current by 20%.

| RATINGS                                                                                                      | SYMBOL                            | VALUE       | UNITS |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------|-------|
| Peak Power Dissipation at T <sub>A</sub> =25°C, T <sub>P</sub> =1ms(NOTE 1)                                  | P <sub>PK</sub>                   | Minimum 400 | Watts |
| Peak Forward Surge Current at 8.3ms Single Half Sine-Wave superimposed on rated load (JEDEC method) (NOTE 3) | I <sub>FSM</sub>                  | 60          | Amps  |
| Operating and Storage Temperature Range                                                                      | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

NOTES:

1. Non-repetitive current pulse per Fig. 3 and derated above T<sub>A</sub>=25°C per Fig. 2.
2. Mounted on Copper Pad area of 5.0mm<sup>2</sup>(.013mm Thick) to each terminal.
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minute maximum.

## RATING AND CHARACTERISTIC CURVES (SMAJ SERIES)

FIG.1-PEAK PULSE POWER DERATING CURVE

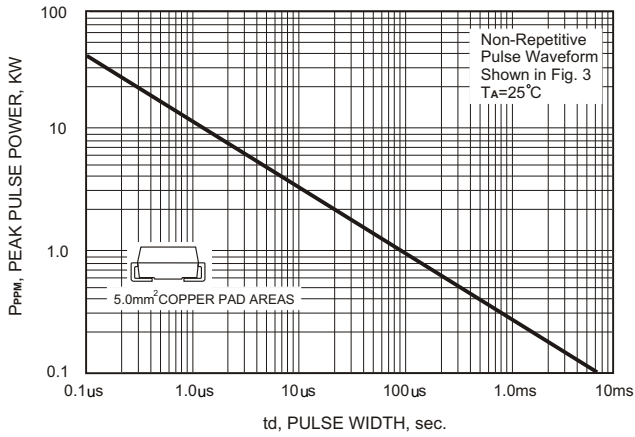


FIG.2-PULSE DERATING CURVE

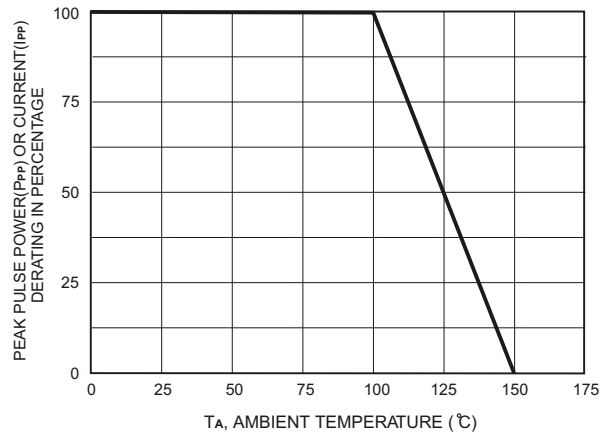


FIG.3-PULSE WAVE FORM

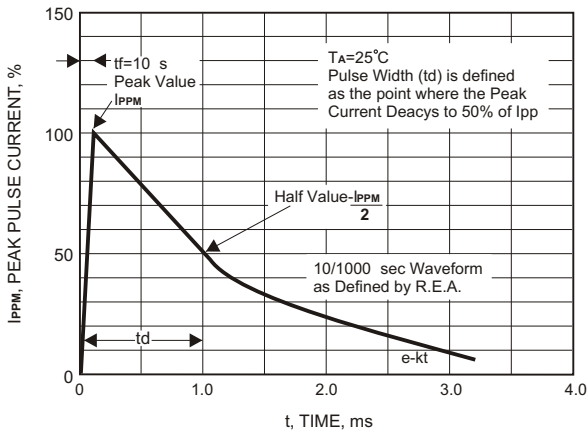
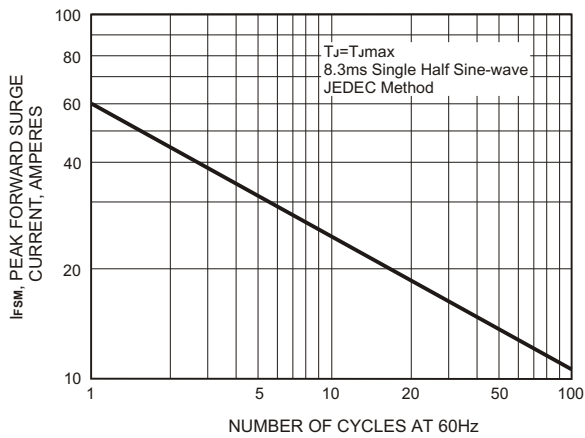


FIG.4-TYPICAL JUNCTION CAPACITANCE



FIG.5-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT



# 400 Watt Surface Mount TVS

| PART NUMBER<br>ADD C FOR BI-<br>DIRECTIONAL<br>See Note 1 | REVERSE<br>STAND-OFF<br>VOLTAGE<br>VRWM (V) | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MIN. @IT | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MAX. @IT | TEST<br>CURRENT<br>IT<br>(mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@Ipp Vc (V) | PEAK<br>PULSE<br>CURRENT<br>Ipp (A) | REVERSE<br>LEAKAGE<br>@ VRWM<br>IR(μA) | MARKING<br>CODE |    |
|-----------------------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------|-----------------------------------------------|-------------------------------------|----------------------------------------|-----------------|----|
|                                                           |                                             |                                             |                                             |                               |                                               |                                     |                                        | UNI             | BI |
| SMAJ5.0(C)A                                               | 5.0                                         | 6.40                                        | 7.25                                        | 10                            | 9.2                                           | 43.5                                | 800                                    | AE              | WE |
| SMAJ6.0(C)A                                               | 6.0                                         | 6.67                                        | 7.67                                        | 10                            | 10.3                                          | 38.8                                | 800                                    | AG              | WG |
| SMAJ6.5(C)A                                               | 6.5                                         | 7.22                                        | 8.30                                        | 10                            | 11.2                                          | 35.7                                | 500                                    | AK              | WK |
| SMAJ7.0(C)A                                               | 7.0                                         | 7.78                                        | 8.95                                        | 10                            | 12.0                                          | 33.3                                | 200                                    | AM              | WM |
| SMAJ7.5(C)A                                               | 7.5                                         | 8.33                                        | 9.58                                        | 1                             | 12.9                                          | 31.0                                | 100                                    | AP              | WP |
| SMAJ8.0(C)A                                               | 8.0                                         | 8.89                                        | 10.23                                       | 1                             | 13.6                                          | 29.4                                | 50                                     | AR              | WR |
| SMAJ8.5(C)A                                               | 8.5                                         | 9.44                                        | 10.82                                       | 1                             | 14.4                                          | 27.7                                | 10                                     | AT              | WT |
| SMAJ9.0(C)A                                               | 9.0                                         | 10.0                                        | 11.50                                       | 1                             | 15.4                                          | 26.0                                | 5                                      | AV              | WV |
| SMAJ10(C)A                                                | 10                                          | 11.1                                        | 12.80                                       | 1                             | 17.0                                          | 23.5                                | 5                                      | AX              | WX |
| SMAJ11(C)A                                                | 11                                          | 12.2                                        | 14.00                                       | 1                             | 18.2                                          | 22.0                                | 5                                      | AZ              | WZ |
| SMAJ12(C)A                                                | 12                                          | 13.3                                        | 15.30                                       | 1                             | 19.9                                          | 20.1                                | 5                                      | BE              | XE |
| SMAJ13(C)A                                                | 13                                          | 14.4                                        | 16.50                                       | 1                             | 21.5                                          | 18.6                                | 5                                      | BG              | XG |
| SMAJ14(C)A                                                | 14                                          | 15.6                                        | 17.90                                       | 1                             | 23.2                                          | 17.2                                | 5                                      | BK              | XK |
| SMAJ15(C)A                                                | 15                                          | 16.7                                        | 19.20                                       | 1                             | 24.4                                          | 16.4                                | 5                                      | BM              | XM |
| SMAJ16(C)A                                                | 16                                          | 17.8                                        | 20.50                                       | 1                             | 26.0                                          | 15.3                                | 5                                      | BP              | XP |
| SMAJ17(C)A                                                | 17                                          | 18.9                                        | 21.70                                       | 1                             | 27.6                                          | 14.5                                | 5                                      | BR              | XR |
| SMAJ18(C)A                                                | 18                                          | 20.0                                        | 23.30                                       | 1                             | 29.2                                          | 13.7                                | 5                                      | BT              | XT |
| SMAJ20(C)A                                                | 20                                          | 22.2                                        | 25.50                                       | 1                             | 32.4                                          | 12.3                                | 5                                      | BV              | XV |
| SMAJ22(C)A                                                | 22                                          | 24.4                                        | 28.00                                       | 1                             | 35.5                                          | 11.2                                | 5                                      | BX              | XX |
| SMAJ24(C)A                                                | 24                                          | 26.7                                        | 30.70                                       | 1                             | 38.9                                          | 10.3                                | 5                                      | BZ              | XZ |
| SMAJ26(C)A                                                | 26                                          | 28.9                                        | 33.20                                       | 1                             | 42.1                                          | 9.5                                 | 5                                      | CE              | YE |
| SMAJ28(C)A                                                | 28                                          | 31.1                                        | 35.80                                       | 1                             | 45.4                                          | 8.8                                 | 5                                      | CG              | YG |
| SMAJ30(C)A                                                | 30                                          | 33.3                                        | 38.30                                       | 1                             | 48.4                                          | 8.3                                 | 5                                      | CK              | YK |
| SMAJ33(C)A                                                | 33                                          | 36.7                                        | 42.20                                       | 1                             | 53.3                                          | 7.5                                 | 5                                      | CM              | YM |
| SMAJ36(C)A                                                | 36                                          | 40.0                                        | 46.00                                       | 1                             | 58.1                                          | 6.9                                 | 5                                      | CP              | YP |
| SMAJ40(C)A                                                | 40                                          | 44.4                                        | 51.10                                       | 1                             | 64.5                                          | 6.2                                 | 5                                      | CR              | YR |
| SMAJ43(C)A                                                | 43                                          | 47.8                                        | 54.90                                       | 1                             | 69.4                                          | 5.7                                 | 5                                      | CT              | YT |
| SMAJ45(C)A                                                | 45                                          | 50.0                                        | 57.50                                       | 1                             | 72.7                                          | 5.5                                 | 5                                      | CV              | YV |
| SMAJ48(C)A                                                | 48                                          | 53.3                                        | 61.30                                       | 1                             | 77.4                                          | 5.2                                 | 5                                      | CX              | YX |
| SMAJ51(C)A                                                | 51                                          | 56.7                                        | 65.20                                       | 1                             | 82.4                                          | 4.9                                 | 5                                      | CZ              | YZ |
| SMAJ54(C)A                                                | 54                                          | 60.0                                        | 69.00                                       | 1                             | 87.1                                          | 4.6                                 | 5                                      | RE              | ZE |
| SMAJ58(C)A                                                | 58                                          | 64.4                                        | 74.10                                       | 1                             | 93.6                                          | 4.3                                 | 5                                      | RG              | ZG |

# 400 Watt Surface Mount TVS

| PART NUMBER<br>ADD C FOR BI-<br>DIRECTIONAL | REVERSE<br>STAND-OFF<br>VOLTAGE<br>VRWM (V) | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MIN. @IT | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MAX. @IT | TEST<br>CURRENT<br>IT<br>(mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@Ipp Vc (V) | PEAK<br>PULSE<br>CURRENT<br>Ipp (A) | REVERSE<br>LEAKAGE<br>@ VRWM<br>IR(μA) | MARKING<br>CODE |    |
|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------|-----------------------------------------------|-------------------------------------|----------------------------------------|-----------------|----|
|                                             |                                             |                                             |                                             |                               |                                               |                                     |                                        | UNI             | BI |
| See Note 1                                  |                                             |                                             |                                             |                               |                                               |                                     |                                        |                 |    |
| SMAJ60(C)A                                  | 60                                          | 66.7                                        | 76.7                                        | 1                             | 96.8                                          | 4.1                                 | 5                                      | RK              | ZK |
| SMAJ64(C)A                                  | 64                                          | 71.1                                        | 81.8                                        | 1                             | 103                                           | 3.9                                 | 5                                      | RM              | ZM |
| SMAJ70(C)A                                  | 70                                          | 77.8                                        | 89.5                                        | 1                             | 113                                           | 3.5                                 | 5                                      | RP              | ZP |
| SMAJ75(C)A                                  | 75                                          | 83.3                                        | 95.8                                        | 1                             | 121                                           | 3.3                                 | 5                                      | RR              | ZR |
| SMAJ78(C)A                                  | 78                                          | 86.7                                        | 99.7                                        | 1                             | 126                                           | 3.2                                 | 5                                      | RT              | ZT |
| SMAJ85(C)A                                  | 85                                          | 94.4                                        | 108.2                                       | 1                             | 137                                           | 2.2                                 | 5                                      | RV              | ZV |
| SMAJ90(C)A                                  | 90                                          | 100                                         | 115.5                                       | 1                             | 146                                           | 2.1                                 | 5                                      | RX              | ZX |
| SMAJ100(C)A                                 | 100                                         | 111                                         | 128.0                                       | 1                             | 162                                           | 1.9                                 | 5                                      | RZ              | ZZ |
| SMAJ110(C)A                                 | 110                                         | 122                                         | 140.5                                       | 1                             | 177                                           | 1.7                                 | 5                                      | SE              | VE |
| SMAJ120(C)A                                 | 120                                         | 133                                         | 153.0                                       | 1                             | 193                                           | 1.6                                 | 5                                      | VG              | VG |
| SMAJ130(C)A                                 | 130                                         | 144                                         | 165.5                                       | 1                             | 209                                           | 1.4                                 | 5                                      | VK              | VK |
| SMAJ150(C)A                                 | 150                                         | 167                                         | 192.5                                       | 1                             | 243                                           | 1.2                                 | 5                                      | VM              | VM |
| SMAJ160(C)A                                 | 160                                         | 178                                         | 205.0                                       | 1                             | 259                                           | 1.2                                 | 5                                      | SP              | VP |
| SMAJ170(C)A                                 | 170                                         | 189                                         | 217.5                                       | 1                             | 275                                           | 1.09                                | 5                                      | SR              | VR |
| SMAJ188(C)A                                 | 188                                         | 209                                         | 231.0                                       | 1                             | 328                                           | 0.91                                | 5                                      | SS              | VS |
| SMAJ200(C)A                                 | 200                                         | 224                                         | 247.0                                       | 1                             | 332                                           | 0.89                                | 5                                      | SV              | VV |
| SMAJ210(C)A                                 | 210                                         | 237                                         | 263.0                                       | 1                             | 340                                           | 0.86                                | 5                                      | SW              | VW |
| SMAJ220(C)A                                 | 220                                         | 246                                         | 272                                         | 1                             | 352                                           | 0.8                                 | 5                                      | SZ              | VZ |
| SMAJ250(C)A                                 | 250                                         | 279                                         | 309                                         | 1                             | 405                                           | 0.75                                | 5                                      | VM              | VM |
| SMAJ300(C)A                                 | 300                                         | 335                                         | 371                                         | 1                             | 486                                           | 0.7                                 | 5                                      | TE              | UE |
| SMAJ400(C)A                                 | 400                                         | 447                                         | 494                                         | 1                             | 648                                           | 0.6                                 | 5                                      | TK              | UK |
| SMAJ440(C)A                                 | 440                                         | 492                                         | 543                                         | 1                             | 713                                           | 0.6                                 | 5                                      | TM              | UM |

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