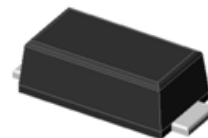


## 400W,5 - 90V Transient Voltage Suppressors

### Features

- Very fast response time
- Glass passivated junction
- Moisture sensitivity: level 1, per J-STD-020
- Plastic package has underwriters Laboratory Flammability Classification 94V-0
- Halogen-free according to IEC 61249-2-21 definition
- 400 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- AEC-Q101 qualified



eSGA (SOD-123FL)

### Applications

- SMPS
- Adapters
- Monitor

#### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter                                                          | Symbol         | Ratings        | Unit             |
|--------------------------------------------------------------------|----------------|----------------|------------------|
| Peak power dissipation with a 10/1000us waveform                   | $P_{PPM}$      | 400            | W                |
| Peak pulse current with a 10/1000us waveform                       | $I_{PPM}$      | See Next Table | A                |
| Power dissipation, on infinite heat sink at $T_L=75^\circ\text{C}$ | $P_D$          | 3.75           | W                |
| Peak forward surge current, 8.3ms single half-sine wave            | $I_{FSM}$      | 30             | A                |
| Operating junction and storage temperature range                   | $T_J, T_{STG}$ | -55 to +150    | $^\circ\text{C}$ |

#### Thermal-Mechanical Specifications ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter                               | Symbol     | Typ | Unit                        |
|-----------------------------------------|------------|-----|-----------------------------|
| Thermal Resistance, Junction to Ambient | $R_{thJA}$ | 100 | $^\circ\text{C} / \text{W}$ |
| Thermal Resistance, Junction to Case    | $R_{thJC}$ | 20  | $^\circ\text{C} / \text{W}$ |
| Thermal Resistance, Junction to Lead    | $R_{thJL}$ | 20  | $^\circ\text{C} / \text{W}$ |

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

| Part Number |              | Marking |      | Breakdown Voltage VBR (V) |      | Test Current IT (mA) | Stand off Voltage VWM (V) | Maximum reverse leakage at VWM ID (μA) | Maximum Peak Pulse Current IPPM (A) | Maximum Clamping Voltage at IPPM VC(V) |
|-------------|--------------|---------|------|---------------------------|------|----------------------|---------------------------|----------------------------------------|-------------------------------------|----------------------------------------|
| UNI         | BI           | UNI     | BI   | Min                       | Max  |                      |                           |                                        |                                     |                                        |
| AF4TVS5.0AS | AF4TVS5.0CAS | AAES    | AHES | 6.40                      | 7.07 | 10                   | 5.0                       | 800                                    | 43.5                                | 9.2                                    |
| AF4TVS6.0AS | AF4TVS6.0CAS | AAGS    | AHGS | 6.67                      | 7.37 | 10                   | 6.0                       | 800                                    | 38.3                                | 10.3                                   |
| AF4TVS6.5AS | AF4TVS6.5CAS | AAKS    | AHKS | 7.22                      | 7.98 | 10                   | 6.5                       | 500                                    | 35.7                                | 11.2                                   |
| AF4TVS7.0AS | AF4TVS7.0CAS | AAMS    | AHMS | 7.78                      | 8.60 | 10                   | 7.0                       | 200                                    | 33.3                                | 12.0                                   |
| AF4TVS7.5AS | AF4TVS7.5CAS | AAPS    | AHPS | 8.33                      | 9.21 | 1.0                  | 7.5                       | 100                                    | 31.0                                | 12.9                                   |
| AF4TVS8.0AS | AF4TVS8.0CAS | AARS    | AHRS | 8.89                      | 9.83 | 1.0                  | 8.0                       | 50                                     | 29.4                                | 13.6                                   |
| AF4TVS8.5AS | AF4TVS8.5CAS | AATS    | AHTS | 9.44                      | 10.4 | 1.0                  | 8.5                       | 20                                     | 27.8                                | 14.4                                   |
| AF4TVS9.0AS | AF4TVS9.0CAS | AAVS    | AHVS | 10.0                      | 11.1 | 1.0                  | 9.0                       | 5                                      | 16.0                                | 15.4                                   |
| AF4TVS10AS  | AF4TVS10CAS  | AAXS    | AHXS | 11.1                      | 12.3 | 1.0                  | 10                        | 1.0                                    | 23.5                                | 17.0                                   |
| AF4TVS11AS  | AF4TVS11CAS  | AAZS    | AHZS | 12.2                      | 13.5 | 1.0                  | 11                        | 1.0                                    | 22.0                                | 18.2                                   |
| AF4TVS12AS  | AF4TVS12CAS  | ABES    | AIES | 13.3                      | 14.7 | 1.0                  | 12                        | 1.0                                    | 20.1                                | 19.9                                   |
| AF4TVS13AS  | AF4TVS13CAS  | ABGS    | AIGS | 14.4                      | 15.9 | 1.0                  | 13                        | 1.0                                    | 18.6                                | 21.5                                   |
| AF4TVS14AS  | AF4TVS14CAS  | ABKS    | AIKS | 15.6                      | 17.2 | 1.0                  | 14                        | 1.0                                    | 17.2                                | 23.2                                   |
| AF4TVS15AS  | AF4TVS15CAS  | ABMS    | AIMS | 16.7                      | 18.5 | 1.0                  | 15                        | 1.0                                    | 16.4                                | 24.4                                   |
| AF4TVS16AS  | AF4TVS16CAS  | ABPS    | AIPS | 17.8                      | 19.7 | 1.0                  | 16                        | 1.0                                    | 15.4                                | 26.0                                   |
| AF4TVS17AS  | AF4TVS17CAS  | ABRS    | AIRS | 18.9                      | 20.9 | 1.0                  | 17                        | 1.0                                    | 14.5                                | 27.6                                   |
| AF4TVS18AS  | AF4TVS18CAS  | ABTS    | AITS | 20.0                      | 22.1 | 1.0                  | 18                        | 1.0                                    | 13.7                                | 29.2                                   |
| AF4TVS20AS  | AF4TVS20CAS  | ABVS    | AIVS | 22.2                      | 24.5 | 1.0                  | 20                        | 1.0                                    | 12.3                                | 32.4                                   |
| AF4TVS22AS  | AF4TVS22CAS  | ABXS    | AIXS | 24.4                      | 26.9 | 1.0                  | 22                        | 1.0                                    | 11.3                                | 35.5                                   |
| AF4TVS24AS  | AF4TVS24CAS  | ABZS    | AIZS | 26.7                      | 29.5 | 1.0                  | 24                        | 1.0                                    | 10.3                                | 38.9                                   |
| AF4TVS26AS  | AF4TVS26CAS  | ACES    | AJES | 28.9                      | 31.9 | 1.0                  | 26                        | 1.0                                    | 9.5                                 | 42.1                                   |
| AF4TVS28AS  | AF4TVS28CAS  | ACGS    | AJGS | 31.1                      | 34.4 | 1.0                  | 28                        | 1.0                                    | 8.8                                 | 45.4                                   |
| AF4TVS30AS  | AF4TVS30CAS  | ACKS    | AJKS | 33.3                      | 36.8 | 1.0                  | 30                        | 1.0                                    | 8.3                                 | 48.4                                   |
| AF4TVS33AS  | AF4TVS33CAS  | ACMS    | AJMS | 36.7                      | 40.6 | 1.0                  | 33                        | 1.0                                    | 7.5                                 | 53.3                                   |
| AF4TVS36AS  | AF4TVS36CAS  | ACPS    | AJPS | 40.0                      | 44.4 | 1.0                  | 36                        | 1.0                                    | 6.9                                 | 58.1                                   |
| AF4TVS40AS  | AF4TVS40CAS  | ACRS    | AJRS | 44.4                      | 49.1 | 1.0                  | 40                        | 1.0                                    | 6.2                                 | 64.5                                   |
| AF4TVS43AS  | AF4TVS43CAS  | ACTS    | AJTS | 47.8                      | 52.8 | 1.0                  | 43                        | 1.0                                    | 5.8                                 | 69.4                                   |
| AF4TVS45AS  | AF4TVS45CAS  | ACVS    | AJVS | 50.0                      | 55.3 | 1.0                  | 45                        | 1.0                                    | 5.5                                 | 72.7                                   |
| AF4TVS48AS  | AF4TVS48CAS  | ACXS    | AJXS | 53.3                      | 58.9 | 1.0                  | 48                        | 1.0                                    | 5.2                                 | 77.4                                   |
| AF4TVS51AS  | AF4TVS51CAS  | ACZS    | AJZS | 56.7                      | 62.7 | 1.0                  | 51                        | 1.0                                    | 4.9                                 | 82.4                                   |
| AF4TVS54AS  | AF4TVS54CAS  | ARES    | AKES | 60.0                      | 66.3 | 1.0                  | 54                        | 1.0                                    | 4.6                                 | 87.1                                   |
| AF4TVS58AS  | AF4TVS58CAS  | ARGS    | AKGS | 64.4                      | 71.2 | 1.0                  | 58                        | 1.0                                    | 4.3                                 | 93.6                                   |
| AF4TVS60AS  | AF4TVS60CAS  | ARKS    | AKKS | 66.7                      | 73.7 | 1.0                  | 60                        | 1.0                                    | 4.1                                 | 96.8                                   |
| AF4TVS64AS  | AF4TVS64CAS  | ARMS    | AKMS | 71.1                      | 78.6 | 1.0                  | 64                        | 1.0                                    | 3.9                                 | 103                                    |

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

| Part Number |             | Marking |      | Breakdown Voltage VBR (V) |      | Test Current I <sub>T</sub> (mA) | Stand off Voltage V <sub>WM</sub> (V) | Maximum reverse leakage at V <sub>WM</sub> I <sub>D</sub> (μA) | Maximum Peak Pulse Current I <sub>ppM</sub> (A) | Maximum Clamping Voltage at I <sub>ppM</sub> V <sub>C</sub> (V) |
|-------------|-------------|---------|------|---------------------------|------|----------------------------------|---------------------------------------|----------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------|
|             |             |         |      | Min                       | Max  |                                  |                                       |                                                                |                                                 |                                                                 |
| AF4TVS70AS  | AF4TVS70CAS | ARPS    | AKPS | 77.8                      | 86.0 | 1.0                              | 70                                    | 1.0                                                            | 3.5                                             | 113                                                             |
| AF4TVS75AS  | AF4TVS75CAS | ARRS    | AKRS | 83.3                      | 92.1 | 1.0                              | 75                                    | 1.0                                                            | 3.3                                             | 121                                                             |
| AF4TVS78AS  | AF4TVS78CAS | ARTS    | AKTS | 86.7                      | 95.8 | 1.0                              | 78                                    | 1.0                                                            | 3.2                                             | 126                                                             |
| AF4TVS80AS  | AF4TVS80CAS | ARWS    | AKWS | 88.8                      | 97.6 | 1.0                              | 80                                    | 1.0                                                            | 3.1                                             | 129                                                             |
| AF4TVS85AS  | AF4TVS85CAS | ARVS    | AKVS | 94.4                      | 104  | 1.0                              | 85                                    | 1.0                                                            | 2.2                                             | 137                                                             |
| AF4TVS90AS  | AF4TVS90CAS | ARXS    | AKXS | 100                       | 111  | 1.0                              | 90                                    | 1.0                                                            | 2.1                                             | 146                                                             |

### Note:

- 1.The thermal resistance from junction to ambient, case or lead, mounted on P.C.B with 5×5mm copper pads

## Ratings and Characteristics Curves (T<sub>A</sub> = 25°C unless otherwise noted)

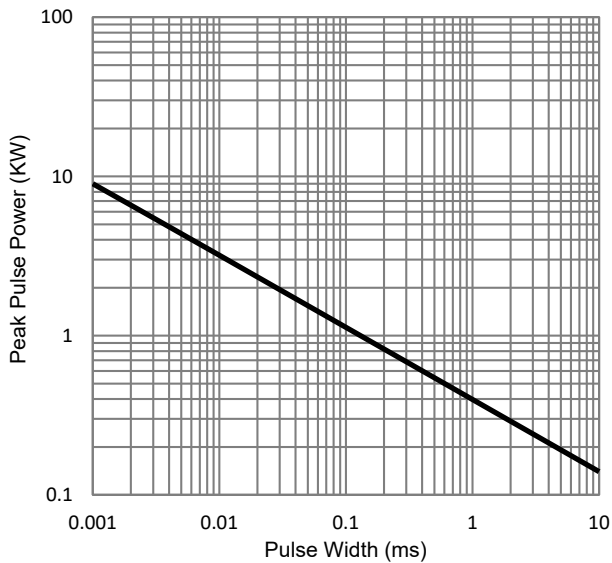


Fig.1 – Peak Pulse Power Derating Curve

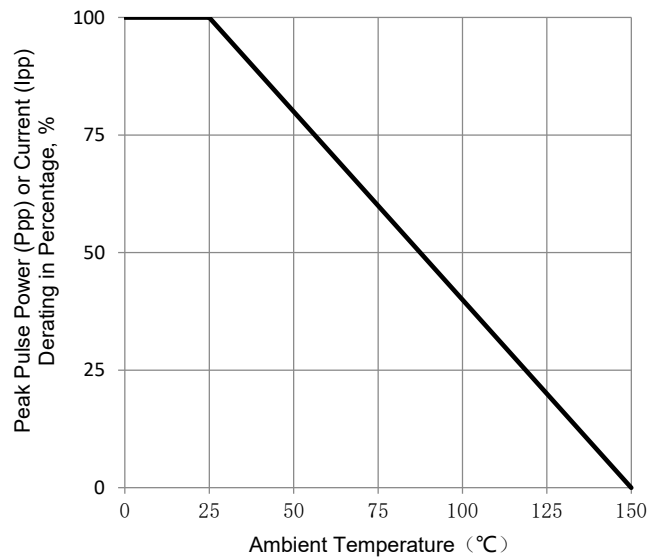


Fig.2 – Pulse Power vs Ambient Temperature

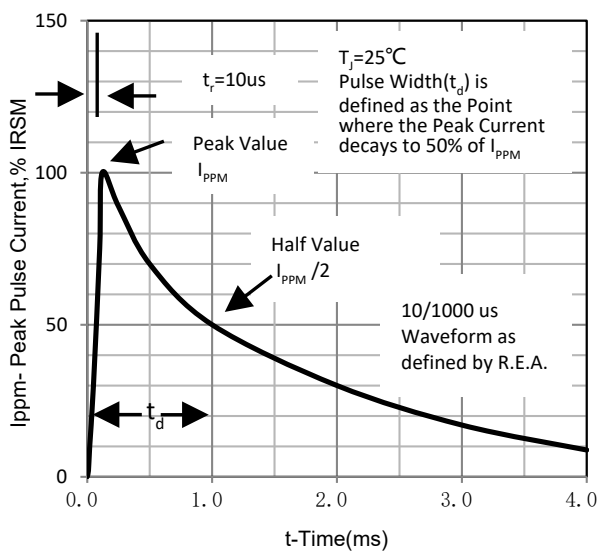


Fig.3 – Pulse Waveform

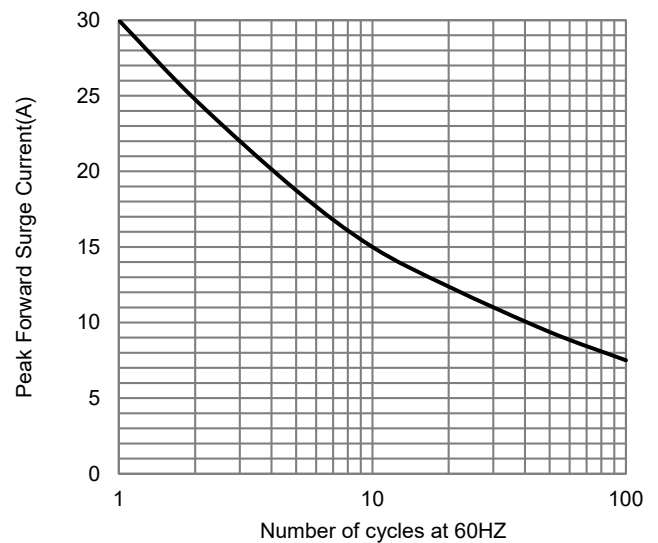
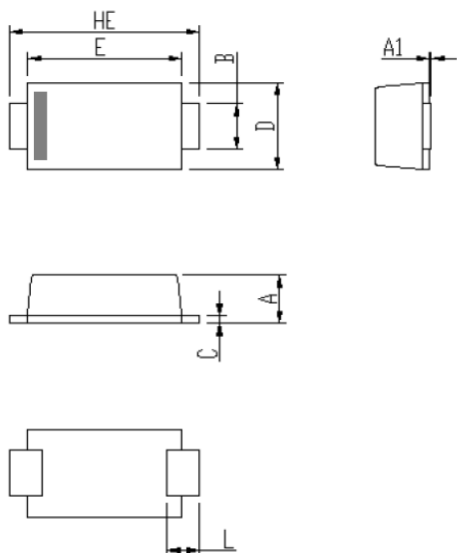


Fig.4 – Maximum Non-Repetitive Surge Current

## Package Outline Dimensions

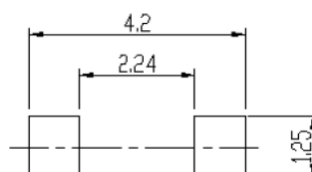
in inches (millimeters)

### eSGA (SOD-123FL)



| DIM | Unit: mm |      | Unit: inch |       |
|-----|----------|------|------------|-------|
|     | MIN      | MAX  | MIN        | MAX   |
| A   | 0.9      | 1.08 | 0.035      | 0.043 |
| A1  | 0        | 0.1  | 0.000      | 0.004 |
| B   | 0.85     | 1.05 | 0.033      | 0.041 |
| C   | 0.1      | 0.25 | 0.004      | 0.010 |
| D   | 1.7      | 2    | 0.067      | 0.079 |
| E   | 2.9      | 3.1  | 0.114      | 0.122 |
| L   | 0.43     | 0.83 | 0.017      | 0.033 |
| HE  | 3.5      | 3.9  | 0.138      | 0.154 |

Soldering footprint



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