



# Jiangsu Weida Semiconductor Co.,Ltd

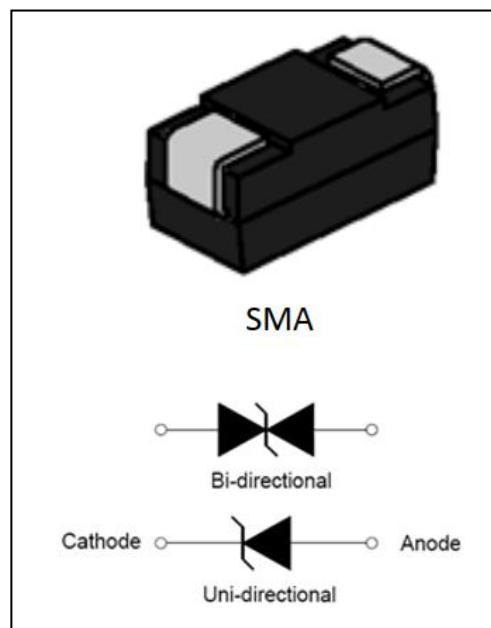
## SMAJ Series 400W Transient Voltage Suppressor

### 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:

- ◆ Low profile package.
- ◆ Low inductance.
- ◆ Excellent clamping capability.
- ◆ 400W peak pulse power capability at 10/1000 $\mu$ s waveform.
- ◆ Typical  $I_R$  less than 1 $\mu$ A above 10V.
- ◆ Fast response time: typically less than 1.0ps from 0V to  $V_{BR}$  min.
- ◆ High temperature to reflow soldering: 260 $^{\circ}$ C/40s 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 operating junction temperature range                    | $T_{STG} / T_J$ | -55 to +150 | $^{\circ}$ C   |
| Steady state power dissipation at $T_L=75^{\circ}$ C            | $P_{M(AV)}$     | 3.3         | W              |
| Peak pulse power dissipation on 10/1000 $\mu$ s waveform        | $P_{PP}$        | 400         | W              |
| Maximum instantaneous forward voltage at 50A for unidirectional | $V_F$           | 5.0         | V              |
| Peak forward surge current, 8.3ms single half sine wave(Note 1) | $I_{FSM}$       | 60          | A              |
| Typical thermal resistance junction to lead                     | $R_{\theta JL}$ | 30          | $^{\circ}$ C/W |
| Typical thermal resistance junction to ambient                  | $R_{\theta JA}$ | 120         | $^{\circ}$ C/W |

**Notes:** 1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum



# Jiangsu Weida Semiconductor Co., Ltd

## SMAJ Series 400W Transient Voltage Suppressor

### ELECTRICAL CHARACTERISTICS( $T_A=25^{\circ}\text{C}$ , continued)

| Part Number |           | $V_R$ | $I_R@V_R$     | $V_{BR}@I_T$ |        | $I_T$ | $V_C@I_{PP}$ | $I_{PP}$ |
|-------------|-----------|-------|---------------|--------------|--------|-------|--------------|----------|
| Uni-Polar   | Bi-Polar  | V     | $\mu\text{A}$ | Min(V)       | Max(V) | mA    | Max(V)       | A        |
| SMAJ5.0A    | SMAJ5.0CA | 5.0   | 120           | 6.40         | 7.00   | 10    | 9.2          | 43.5     |
| SMAJ6.0A    | SMAJ6.0CA | 6.0   | 120           | 6.67         | 7.37   | 10    | 10.3         | 38.8     |
| SMAJ6.5A    | SMAJ6.5CA | 6.5   | 120           | 7.22         | 7.98   | 10    | 11.2         | 35.7     |
| SMAJ7.0A    | SMAJ7.0CA | 7.0   | 50            | 7.78         | 8.60   | 10    | 12.0         | 33.3     |
| SMAJ7.5A    | SMAJ7.5CA | 7.5   | 50            | 8.33         | 9.21   | 1     | 12.9         | 31.0     |
| SMAJ8.0A    | SMAJ8.0CA | 8.0   | 20            | 8.89         | 9.83   | 1     | 13.6         | 29.4     |
| SMAJ8.5A    | SMAJ8.5CA | 8.5   | 10            | 9.44         | 10.40  | 1     | 14.4         | 27.8     |
| SMAJ9.0A    | SMAJ9.0CA | 9.0   | 5             | 10.00        | 11.10  | 1     | 15.4         | 26.0     |
| SMAJ10A     | SMAJ10CA  | 10    | 2             | 11.10        | 12.30  | 1     | 17.0         | 23.5     |
| SMAJ11A     | SMAJ11CA  | 11    | 1             | 12.20        | 13.50  | 1     | 18.2         | 22.0     |
| SMAJ12A     | SMAJ12CA  | 12    | 1             | 13.30        | 14.70  | 1     | 19.9         | 20.1     |
| SMAJ13A     | SMAJ13CA  | 13    | 1             | 14.40        | 15.90  | 1     | 21.5         | 18.6     |
| SMAJ14A     | SMAJ14CA  | 14    | 1             | 15.60        | 17.20  | 1     | 23.2         | 17.3     |
| SMAJ15A     | SMAJ15CA  | 15    | 1             | 16.70        | 18.50  | 1     | 24.4         | 16.4     |
| SMAJ16A     | SMAJ16CA  | 16    | 1             | 17.80        | 19.70  | 1     | 26.0         | 15.4     |
| SMAJ17A     | SMAJ17CA  | 17    | 1             | 18.90        | 20.90  | 1     | 27.6         | 14.5     |
| SMAJ18A     | SMAJ18CA  | 18    | 1             | 20.00        | 22.10  | 1     | 29.2         | 13.7     |
| SMAJ20A     | SMAJ20CA  | 20    | 1             | 22.20        | 24.50  | 1     | 32.4         | 12.4     |
| SMAJ22A     | SMAJ22CA  | 22    | 1             | 24.40        | 26.90  | 1     | 35.5         | 11.3     |
| SMAJ24A     | SMAJ24CA  | 24    | 1             | 26.70        | 29.50  | 1     | 38.9         | 10.3     |
| SMAJ26A     | SMAJ26CA  | 26    | 1             | 28.90        | 31.90  | 1     | 42.1         | 9.5      |
| SMAJ28A     | SMAJ28CA  | 28    | 1             | 31.10        | 34.40  | 1     | 45.4         | 8.8      |
| SMAJ30A     | SMAJ30CA  | 30    | 1             | 33.30        | 36.80  | 1     | 48.4         | 8.3      |
| SMAJ33A     | SMAJ33CA  | 33    | 1             | 36.70        | 40.60  | 1     | 53.3         | 7.5      |
| SMAJ36A     | SMAJ36CA  | 36    | 1             | 40.00        | 44.20  | 1     | 58.1         | 6.9      |



## Jiangsu Weida Semiconductor Co.,Ltd

### SMAJ Series 400W Transient Voltage Suppressor

| Uni-Polar | Bi-Polar | V   | $\mu$ A | Min(V) | Max(V) | mA | Max(V) | A   |
|-----------|----------|-----|---------|--------|--------|----|--------|-----|
| SMAJ40A   | SMAJ40CA | 40  | 1       | 44.40  | 49.10  | 1  | 64.5   | 6.2 |
| SMAJ43A   | SMAJ43CA | 43  | 1       | 47.80  | 52.80  | 1  | 69.4   | 5.8 |
| SMAJ45A   | SMAJ45CA | 45  | 1       | 50.00  | 55.30  | 1  | 72.7   | 5.5 |
| SMAJ48A   | SMAJ48CA | 48  | 1       | 53.30  | 58.90  | 1  | 77.4   | 5.2 |
| SMAJ51A   | SMAJ51CA | 51  | 1       | 56.70  | 62.70  | 1  | 82.4   | 4.9 |
| SMAJ54A   | SMAJ54CA | 54  | 1       | 60.00  | 66.30  | 1  | 87.1   | 4.6 |
| SMAJ58A   | SMAJ58CA | 58  | 1       | 64.40  | 71.20  | 1  | 93.6   | 4.3 |
| SMAJ60A   | SMAJ60CA | 60  | 1       | 66.70  | 73.70  | 1  | 96.8   | 4.1 |
| SMAJ64A   | SMAJ64CA | 64  | 1       | 71.10  | 78.60  | 1  | 103.0  | 3.9 |
| SMAJ70A   | SMAJ70CA | 70  | 1       | 77.80  | 86.00  | 1  | 113.0  | 3.6 |
| SMAJ75A   | SMAJ75CA | 75  | 1       | 83.30  | 92.10  | 1  | 121.0  | 3.3 |
| SMAJ78A   | SMAJ78CA | 78  | 1       | 86.70  | 95.80  | 1  | 126.0  | 3.2 |
| SMAJ85A   | SMAJ85CA | 85  | 1       | 94.40  | 104.0  | 1  | 137.0  | 2.9 |
| SMAJ90A   | SMAJ90CA | 90  | 1       | 100.0  | 111.0  | 1  | 146.0  | 2.8 |
| SMAJ100A  | SMAJ100C | 100 | 1       | 111.0  | 123.0  | 1  | 162.0  | 2.5 |
| SMAJ110A  | SMAJ110C | 110 | 1       | 122.0  | 135.0  | 1  | 177.0  | 2.3 |
| SMAJ120A  | SMAJ120C | 120 | 1       | 133.0  | 147.0  | 1  | 193.0  | 2.1 |
| SMAJ130A  | SMAJ130C | 130 | 1       | 144.0  | 159.0  | 1  | 209.0  | 1.9 |
| SMAJ150A  | SMAJ150C | 150 | 1       | 167.0  | 185.0  | 1  | 243.0  | 1.7 |
| SMAJ160A  | SMAJ160C | 160 | 1       | 178.0  | 197.0  | 1  | 259.0  | 1.6 |
| SMAJ170A  | SMAJ170C | 170 | 1       | 189.0  | 209.0  | 1  | 275.0  | 1.5 |
| SMAJ180A  | SMAJ180C | 180 | 1       | 201.0  | 222.0  | 1  | 292.0  | 1.4 |
| SMAJ200A  | SMAJ200C | 200 | 1       | 211.0  | 234.0  | 1  | 324.0  | 1.3 |
| SMAJ220A  | SMAJ220C | 220 | 1       | 224.0  | 247.0  | 1  | 356.0  | 1.1 |
| SMAJ250A  | SMAJ250C | 250 | 1       | 233.0  | 258.0  | 1  | 405.0  | 1.0 |
| SMAJ300A  | SMAJ300C | 300 | 1       | 246.0  | 279.0  | 1  | 486.0  | 0.8 |
| SMAJ350A  | SMAJ350C | 350 | 1       | 391.0  | 432.0  | 1  | 567.0  | 0.7 |



# Jiangsu Weida Semiconductor Co.,Ltd

## SMAJ Series 400W Transient Voltage Suppressor

| Uni-Polar | Bi-Polar  | V   | $\mu\text{A}$ | Min(V) | Max(V) | mA | Max(V) | A   |
|-----------|-----------|-----|---------------|--------|--------|----|--------|-----|
| SMBJ400A  | SMBJ400CA | 400 | 1             | 447.0  | 494.0  | 1  | 648.0  | 0.6 |
| SMBJ440A  | SMBJ440CA | 440 | 1             | 492.0  | 543.0  | 1  | 713.0  | 0.6 |

① Surge waveform: 10/1000 $\mu\text{s}$

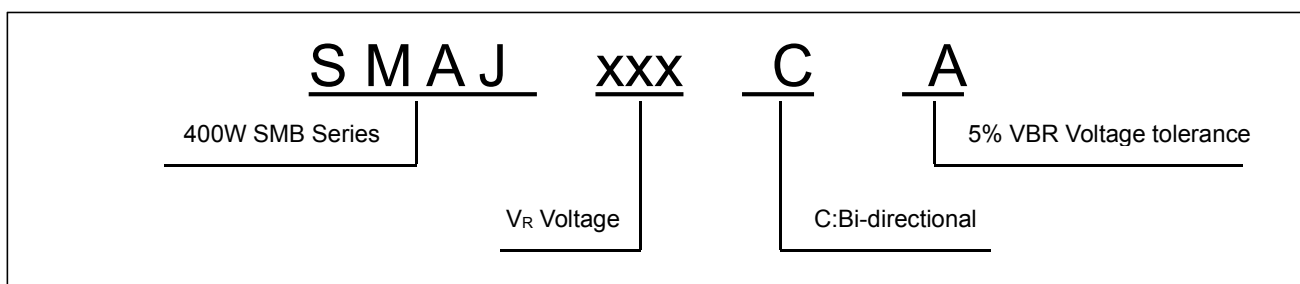
$V_R$ : Stand-off voltage -- Maximum voltage that can be applied

$V_{BR}$ : Breakdown voltage

$V_C$ : clamping voltage -- Peak voltage measured across the suppressor at a specified IPP

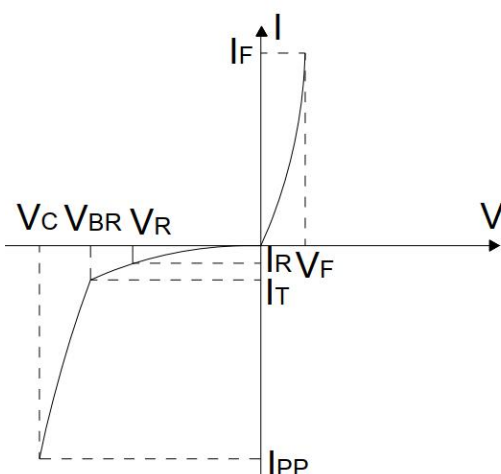
$I_R$ : Reverse leakage current

### ORDERING INFORMATION

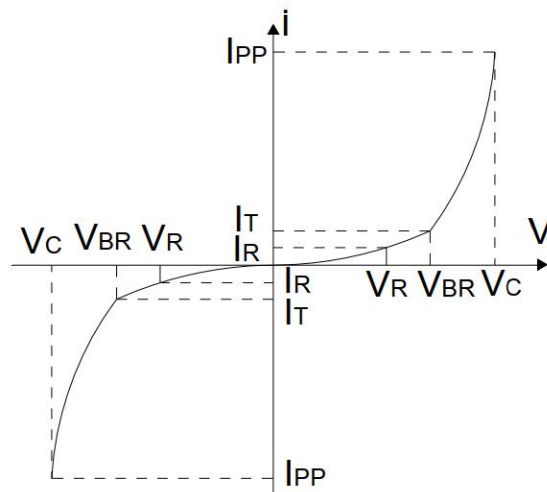


### RATINGS AND V-I CHARACTERISTICS CURVES (TA=25°C, unless otherwise noted)

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



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





# Jiangsu Weida Semiconductor Co.,Ltd

## SMAJ Series 400W Transient Voltage Suppressor

FIG.3:Pulse waveform

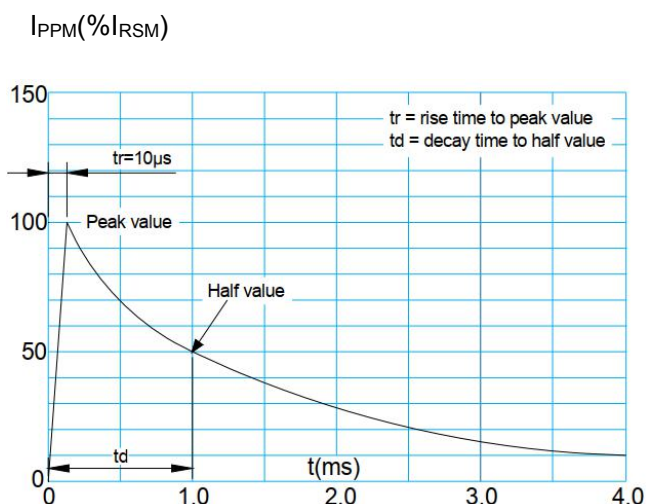
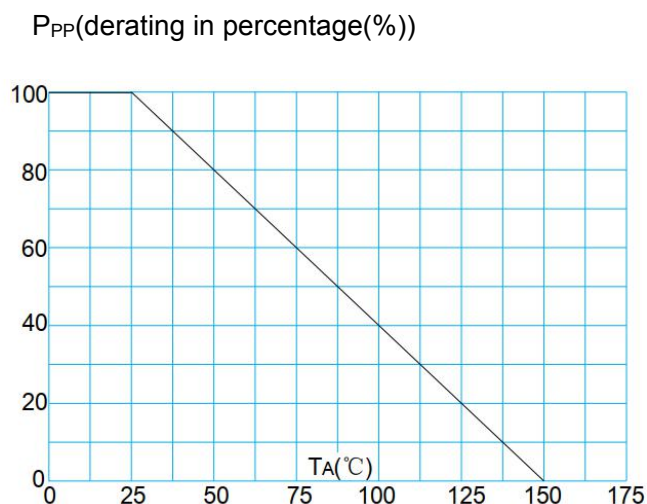
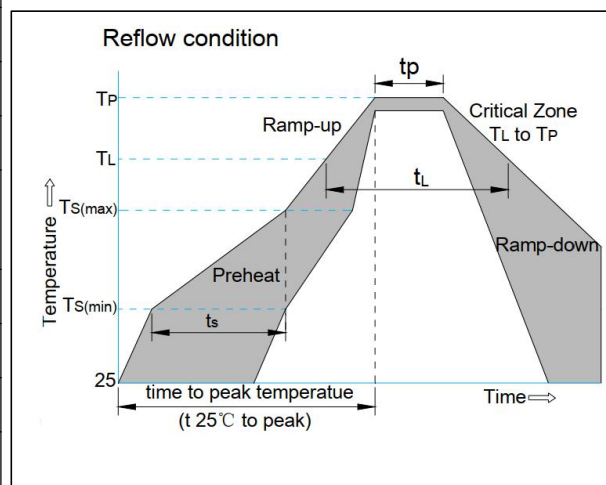


FIG.4:Pulse derating curve



### SOLDERING PARAMETERS

|  |                                   |   |
|--|-----------------------------------|---|
| Reflow Condition                                       |                                   | Pb-Free assembly<br>(see figure at right) |
| 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 (Liquidus Temp ( $T_L$ ) to peak) |                                   | 3°C/sec. Max                              |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                   |                                   | 3°C/sec. Max                              |
| Reflow   | -Temperature( $T_L$ )(Liquidus)   | +217°C                                    |
|  | -Temperature( $t_L$ )             | 60-150 secs.                              |
| Peak Temp ( $T_p$ )                                    |                                   | +260(+0/-5)°C                             |
| Time within 5°C of actual Peak Temp ( $t_p$ )          |                                   | 20-40secs.                                |
| Ramp-down Rate   |                                   | 6°C/sec. Max                              |
| Time 25°C to Peak Temp ( $T_p$ )                       |                                   | 8 min. Max                                |
| Do not exceed  |                                   | +260°C                                    |

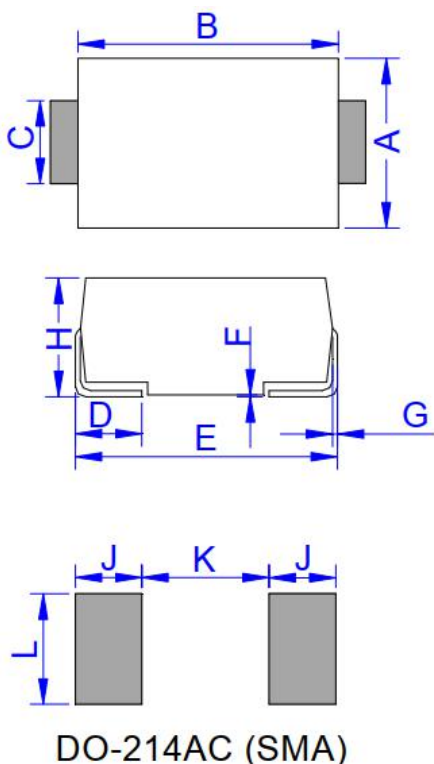




# Jiangsu Weida Semiconductor Co.,Ltd

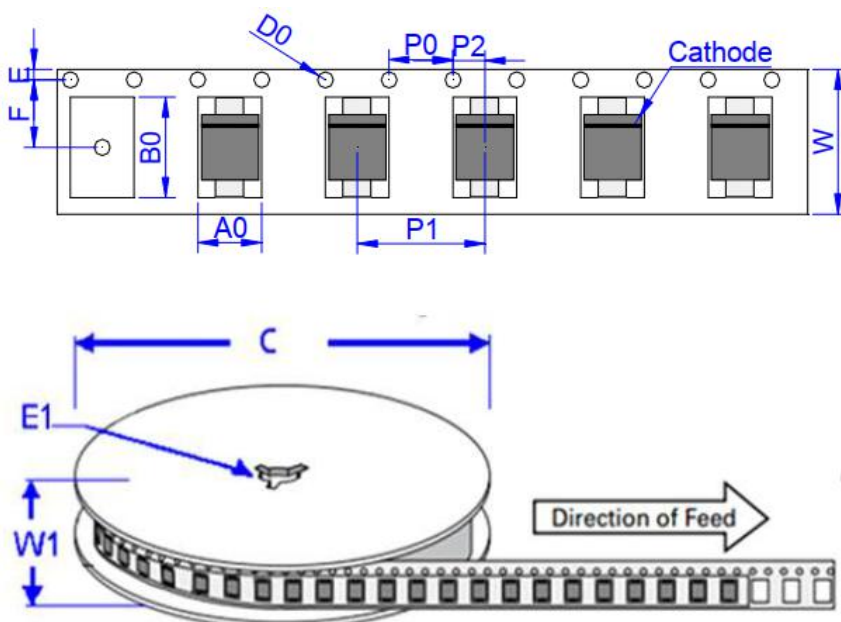
## SMAJ Series 400W Transient Voltage Suppressor

### PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |       |        |       |
|------|-------------|-------|--------|-------|
|      | Millimeters |       | Inches |       |
|      | Min.        | Max.  | Min.   | Max.  |
| A    | 2.60        | 3.00  | 0.102  | 0.118 |
| B    | 4.15        | 4.65  | 0.163  | 0.183 |
| C    | 1.25        | 1.65  | 0.049  | 0.065 |
| D    | 0.95        | 1.52  | 0.037  | 0.060 |
| E    | 4.90        | 5.30  | 0.193  | 0.209 |
| F    | 0.051       | 0.203 | 0.002  | 0.008 |
| G    | 0.15        | 0.31  | 0.006  | 0.012 |
| H    | 2.00        | 2.44  | 0.079  | 0.096 |
| J    | 2.00        |       | 0.079  |       |
| K    |             | 2.30  |        | 0.091 |
| L    | 1.80        |       | 0.071  |       |

### TAPE AND REEL SPECIFICATION - SMB



| Ref. | Dimensions  |               |
|------|-------------|---------------|
|      | Millimeters | Inches        |
| A0   | 2.79 ± 0.3  | 0.110 ± 0.012 |
| B0   | 5.33 ± 0.3  | 0.210 ± 0.012 |
| C    | 330.0       | 13.0          |
| D0   | 1.55 ± 0.1  | 0.061 ± 0.004 |
| E    | 1.75 ± 0.2  | 0.069 ± 0.008 |
| E1   | 13.3 ± 0.3  | 0.524 ± 0.012 |
| F    | 5.5 ± 0.2   | 0.217 ± 0.008 |
| P0   | 4.00 ± 0.2  | 0.157 ± 0.008 |
| P1   | 4.00 ± 0.2  | 0.157 ± 0.008 |
| P2   | 2.00 ± 0.2  | 0.079 ± 0.008 |
| W    | 12.0 ± 0.2  | 0.472 ± 0.008 |
| W1   | 15.7 ± 2.0  | 0.618 ± 0.079 |

| OUTLINE | UNIT WEIGHT<br>(g/PCS) typ. | REEL<br>(PCS) | PER CARTON<br>(PCS) | REEL<br>DIAMETERS<br>(mm) |
|---------|-----------------------------|---------------|---------------------|---------------------------|
| TAPING  | 0.067                       | 5,000         | 80,000              | 330                       |



**Jiangsu Weida Semiconductor Co.,Ltd**  
**SMAJ Series 400W Transient Voltage Suppressor**

---

Information furnished in this document is believed to be accurate and reliable. However, Jiangsu Weida Semiconductor Co., Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it.

Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Jiangsu Weida Semiconductor Co., Ltd complies with the agreement.

Products and information provided in this document have no infringement of patents. Jiangsu Weida Semiconductor Co., Ltd assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [ESD Suppressors / TVS Diodes](#) category:*

*Click to view products by [Weida Semiconductor](#) manufacturer:*

Other Similar products are found below :

[60KS200C](#) [D18V0L1B2LP-7B](#) [D5V0F4U5P5-7](#) [NTE4902](#) [P4KE27CA](#) [P6KE11CA](#) [P6KE8.2A](#) [SA60CA](#) [SA64CA](#) [SMBJ12CATR](#)  
[SMBJ33CATR](#) [SMBJ6.5A](#) [SMBJ8.0A](#) [ESD101-B1-02ELS](#) [E6327](#) [ESD112-B1-02EL](#) [E6327](#) [ESD7451N2T5G](#) [19180-510](#) [CPDT-5V0USP-](#)  
[HF](#) [3.0SMCJ33CA-F](#) [3.0SMCJ36A-F](#) [HSPC16701B02TP](#) [JANTX1N6126A](#) [D3V3Q1B2DLP3-7](#) [D55V0M1B2WS-7](#) [SCM1293A-04SO](#)  
[ESD200-B1-CSP0201](#) [E6327](#) [SM12-7](#) [CEN955](#) [W/DATA](#) [VESD12A1A-HD1-GS08](#) [CPDQC5V0-HF](#) [D1213A-01LP4-7B](#) [ESD101-B1-02EL](#)  
[E6327](#) [AOZ8808DI-03](#) [5KP15A](#) [5KP48A](#) [5KP90A](#) [ESD3V3D7-TP](#) [15KPA36A-LF](#) [P4KE56CA](#) [P4KE68A](#) [P4KE91CATR](#) [P6KE120A](#)  
[P6KE13CA](#) [P6KE43CA](#) [P6KE6.8CA](#) [P6KE8.2](#) [P6SMBJ20CA](#) [JANTX1N6072A](#) [SR2835ESKG](#) [SA90CA](#)