

## 3000W, 10V - 100V Surface Mount Transient Voltage Suppressor

### FEATURES

- Ideal for automated placement
- Glass passivated junction
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps
- Moisture sensitivity level: level 1, per J-STD-020
- AEC-Q101 qualified available: ordering code with suffix "H"
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $V_{WM}$       | 10 - 100       | V    |
| $V_{BR}$       | 11.1 - 123     | V    |
| $P_{PK}$       | 3000           | W    |
| $T_{J MAX}$    | 175            | °C   |
| Package        | DO-214AB (SMC) |      |
| Configuration  | Single die     |      |

### APPLICATIONS

- Immunization of sensitive devices in automotive, telecommunications, consumer electronics, and industrial equipment from electrostatic discharge (ESD) and transient voltages induced by load switching and lightning.



DO-214AB (SMC)

### MECHANICAL DATA

- Case : DO-214AB (SMC)
- Molding compound meets UL 94V-0 flammability rating
- Terminal : Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity : As marked
- Weight : 0.29 g (approximately)

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)         |           |             |      |
|---|-----------|-------------|------|
| PARAMETER   | SYMBOL    | VALUE       | UNIT |
| Peak power dissipation at $T_A=25^\circ\text{C}$ , $t_p=1\text{ms}^{(1)}$           | $P_{PK}$  | 3000        | W    |
| Steady state power dissipation at $T_A=25^\circ\text{C}$                            | $P_D$     | 6.5         | W    |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 300         | A    |
| Forward Voltage @ $I_F=100\text{A}$ for Unidirectional only <sup>(2)</sup>          | $V_F$     | 3.5 / 5.0   | V    |
| Junction temperature  | $T_J$     | -55 to +175 | °C   |
| Storage temperature   | $T_{STG}$ | -55 to +175 | °C   |

#### Notes:

1. Non-repetitive current pulse per Fig. 3 and derated above  $T_A=25^\circ\text{C}$  per Fig. 2
2.  $V_F=3.5\text{V}$  on SMDJ10A - SMDJ90A devices and  $V_F=5.0\text{V}$  on SMDJ100A

Devices for bipolar applications

1. For bidirectional use CA suffix for SMDJ10A – SMDJ64A
2. Electrical characteristics apply in both directions

| <b>THERMAL PERFORMANCE</b>             |                 |            |               |
|--|-----------------|------------|---------------|
| <b>PARAMETER</b>                       | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b>   |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 75         | $^{\circ}C/W$ |
| Junction-to-lead thermal resistance    | $R_{\theta JL}$ | 15         | $^{\circ}C/W$ |

**ELECTRICAL SPECIFICATIONS** ( $T_A = 25^{\circ}C$  unless otherwise noted)

| Part number |          | Marking code |     | Breakdown voltage<br>$V_{BR}@I_T$<br>(V) |      | Test current<br>$I_T$<br>(mA) | Working stand-off voltage<br>$V_{WM}$<br>(V) | Maximum Reverse Leakage<br>$I_R@V_{WM}$<br>( $\mu A$ ) | Maximum peak impulse current<br>$I_{PPM}$<br>(A) | Maximum clamping voltage<br>$V_C@I_{PPM}$<br>(V) |
|-------------|----------|--------------|-----|--|------|-------------------------------|--|--|--|--|
| UNI.        | BI.      | UNI.         | BI. | MIN.                                     | MAX. |                               |  |  |  |  |
| SMDJ10A     | SMDJ10CA | PDX          | DDX | 11.1                                     | 12.3 | 1                             | 10   | 5  | 176.5  | 17.0   |
| SMDJ11A     | SMDJ11CA | PDZ          | DDZ | 12.2                                     | 13.5 | 1                             | 11   | 1  | 164.8  | 18.2   |
| SMDJ12A     | SMDJ12CA | PEE          | DEE | 13.3                                     | 14.7 | 1                             | 12   | 1  | 150.8  | 19.9   |
| SMDJ13A     | SMDJ13CA | PEG          | DEG | 14.4                                     | 15.9 | 1                             | 13   | 1  | 139.5  | 21.5   |
| SMDJ14A     | SMDJ14CA | PEK          | DEK | 15.6                                     | 17.2 | 1                             | 14   | 1  | 129.3  | 23.2   |
| SMDJ15A     | SMDJ15CA | PEM          | DEM | 16.7                                     | 18.5 | 1                             | 15   | 1  | 123.0  | 24.4   |
| SMDJ16A     | SMDJ16CA | PEP          | DEP | 17.8                                     | 19.7 | 1                             | 16   | 1  | 115.4  | 26.0   |
| SMDJ17A     | SMDJ17CA | PER          | DER | 18.9                                     | 20.9 | 1                             | 17   | 1  | 108.7  | 27.6   |
| SMDJ18A     | SMDJ18CA | PET          | DET | 20.0                                     | 22.1 | 1                             | 18   | 1  | 102.7  | 29.2   |
| SMDJ20A     | SMDJ20CA | PEV          | DEV | 22.2                                     | 24.5 | 1                             | 20   | 1  | 92.6   | 32.4   |
| SMDJ22A     | SMDJ22CA | PEX          | DEX | 24.4                                     | 26.9 | 1                             | 22   | 1  | 84.5   | 35.5   |
| SMDJ24A     | SMDJ24CA | PEZ          | DEZ | 26.7                                     | 29.5 | 1                             | 24   | 1  | 77.1   | 38.9   |
| SMDJ26A     | SMDJ26CA | PFE          | DFE | 28.9                                     | 31.9 | 1                             | 26   | 1  | 71.3   | 42.1   |
| SMDJ28A     | SMDJ28CA | PFG          | DFG | 31.1                                     | 34.4 | 1                             | 28   | 1  | 66.1   | 45.4   |
| SMDJ30A     | SMDJ30CA | PFK          | DFK | 33.3                                     | 36.8 | 1                             | 30   | 1  | 62.0   | 48.4   |
| SMDJ33A     | SMDJ33CA | PFM          | DFM | 36.7                                     | 40.6 | 1                             | 33   | 1  | 56.3   | 53.3   |
| SMDJ36A     | SMDJ36CA | PFP          | DFP | 40.0                                     | 44.2 | 1                             | 36   | 1  | 51.6   | 58.1   |
| SMDJ40A     | SMDJ40CA | PFR          | DFR | 44.4                                     | 49.1 | 1                             | 40   | 1  | 46.5   | 64.5   |
| SMDJ43A     | SMDJ43CA | PFT          | DFT | 47.8                                     | 52.8 | 1                             | 43   | 1  | 43.2   | 69.4   |
| SMDJ45A     | SMDJ45CA | PFV          | DFV | 50.0                                     | 55.3 | 1                             | 45   | 1  | 41.3   | 72.7   |
| SMDJ48A     | SMDJ48CA | PFX          | DFX | 53.3                                     | 58.9 | 1                             | 48   | 1  | 38.8   | 77.4   |
| SMDJ51A     | SMDJ51CA | PFZ          | DFZ | 56.7                                     | 62.7 | 1                             | 51   | 1  | 36.4   | 82.4   |
| SMDJ54A     | SMDJ54CA | PGE          | DGE | 60.0                                     | 66.3 | 1                             | 54   | 1  | 34.4   | 87.1   |
| SMDJ58A     | SMDJ58CA | PGG          | DGG | 64.4                                     | 71.2 | 1                             | 58   | 1  | 32.1   | 93.6   |
| SMDJ60A     | SMDJ60CA | PGK          | DGK | 66.7                                     | 73.7 | 1                             | 60   | 1  | 31.0   | 96.8   |
| SMDJ64A     | SMDJ64CA | PGM          | DGM | 71.1                                     | 78.6 | 1                             | 64   | 1  | 29.1   | 103  |
| SMDJ70A     |          | PGP          |     | 77.8                                     | 86.0 | 1                             | 70   | 1  | 26.5   | 113  |
| SMDJ75A     |          | PGR          |     | 83.3                                     | 92.1 | 1                             | 75   | 1  | 24.8   | 121  |
| SMDJ78A     |          | PGT          |     | 86.7                                     | 95.8 | 1                             | 78   | 1  | 23.8   | 126  |
| SMDJ85A     |          | PGV          |     | 94.4                                     | 104  | 1                             | 85   | 1  | 21.9   | 137  |
| SMDJ90A     |          | PGX          |     | 100                                      | 111  | 1                             | 90   | 1  | 20.5   | 146  |
| SMDJ100A    |          | PGZ          |     | 111                                      | 123  | 1                             | 100  | 1  | 18.5   | 162  |

| <b>ORDERING INFORMATION</b>            |                |                          |
|--|----------------|--------------------------|
| <b>ORDERING CODE</b><br>(Note 1, 2, 3) | <b>PACKAGE</b> | <b>PACKING</b>           |
| SMDJxxxxHR7G                           | SMC            | 850 / 7" Plastic reel    |
| SMDJxxxxHR6G                           | SMC            | 3,000 / 13" Paper reel   |
| SMDJxxxxHM6G                           | SMC            | 3,000 / 13" Plastic reel |
| SMDJxxxx R7G                           | SMC            | 850 / 7" Plastic reel    |
| SMDJxxxx R6G                           | SMC            | 3,000 / 13" Paper reel   |
| SMDJxxxx M6G                           | SMC            | 3,000 / 13" Plastic reel |
| SMDJxxxxHV7G                           | Matrix SMC     | 850 / 7" Plastic reel    |
| SMDJxxxxHV6G                           | Matrix SMC     | 3,000 / 13" Plastic reel |
| SMDJxxxx V7G                           | Matrix SMC     | 850 / 7" Plastic reel    |
| SMDJxxxx V6G                           | Matrix SMC     | 3,000 / 13" Plastic reel |
| SMDJxxxxHR7                            | SMC            | 850 / 7" Plastic reel    |
| SMDJxxxxHR6                            | SMC            | 3,000 / 13" Paper reel   |
| SMDJxxxxHM6                            | SMC            | 3,000 / 13" Plastic reel |
| SMDJxxxx R7                            | SMC            | 850 / 7" Plastic reel    |
| SMDJxxxx R6                            | SMC            | 3,000 / 13" Paper reel   |
| SMDJxxxx M6                            | SMC            | 3,000 / 13" Plastic reel |

**Note 1:**

"xxxx" defines voltage from 10V (SMDJ10A) to 100V (SMDJ100A)

**Note 2:**

"H" means AEC-Q101 qualified

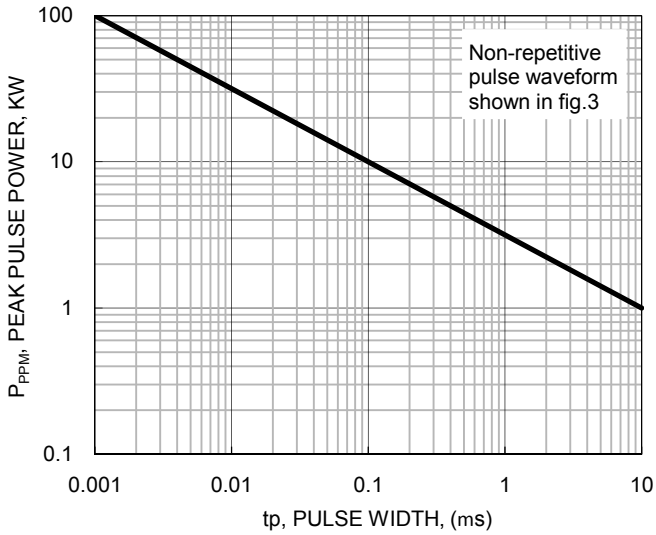
**Note 3:**

"G" means green compound (halogen free)

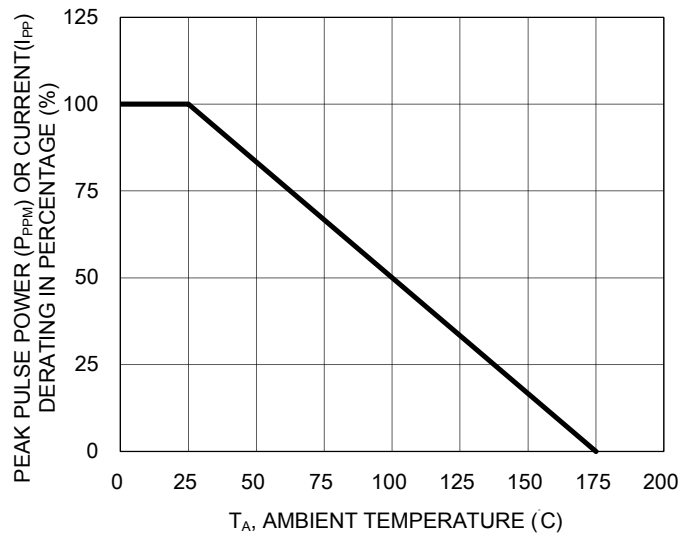
**CHARACTERISTICS CURVES**

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

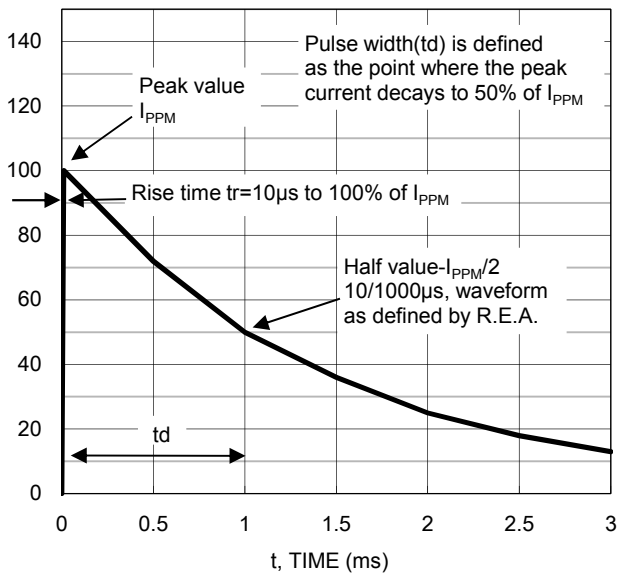
**Fig.1 Peak Pulse Power Rating Curve**



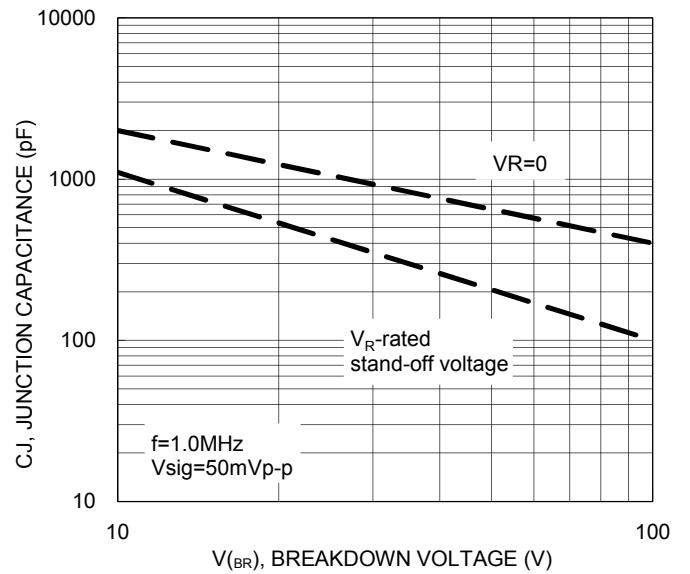
**Fig.2 Pulse Derating Curve**



**Fig.3 Clamping Power Pulse Waveform**



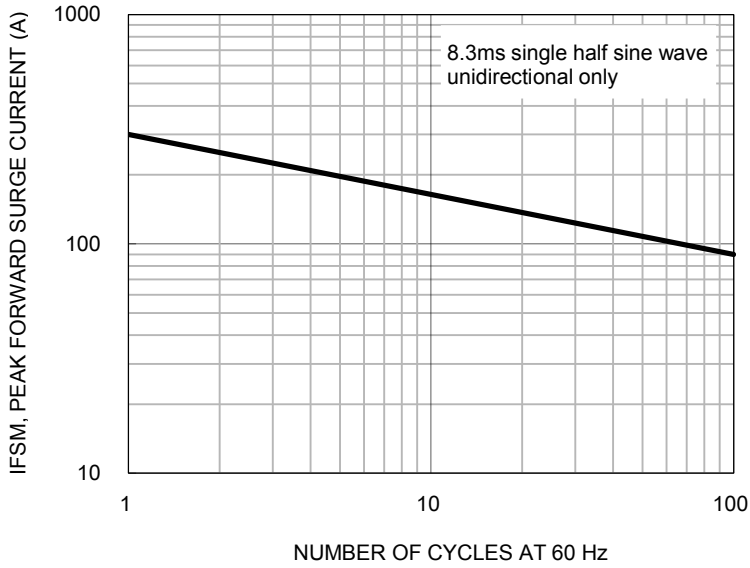
**Fig.4 Typical Junction Capacitance**



**CHARACTERISTICS CURVES**

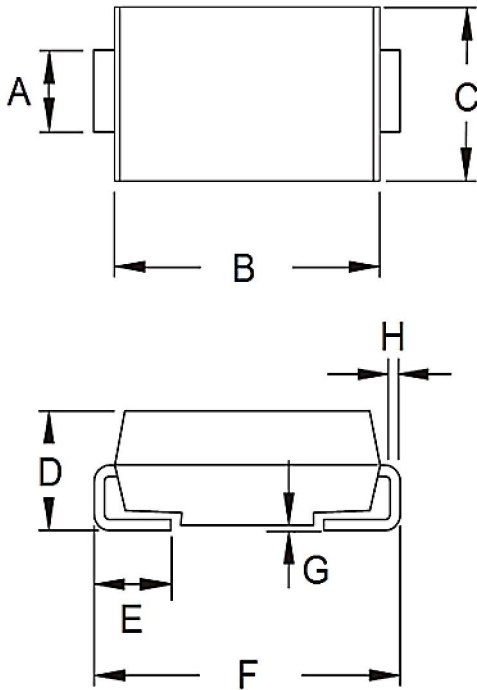
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.5 Maximum Non-repetitive Forward Surge Current**



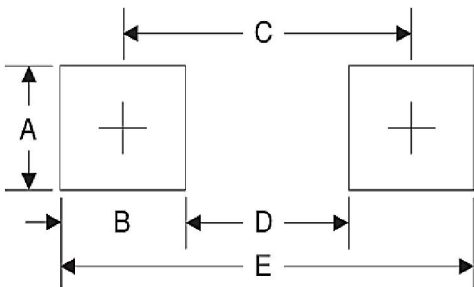
**PACKAGE OUTLINE DIMENSIONS**

DO-214AB (SMC)



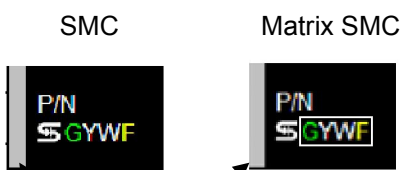
| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 2.90      | 3.20 | 0.114       | 0.126 |
| B    | 6.60      | 7.11 | 0.260       | 0.280 |
| C    | 5.59      | 6.22 | 0.220       | 0.245 |
| D    | 2.00      | 2.62 | 0.079       | 0.103 |
| E    | 1.00      | 1.60 | 0.039       | 0.063 |
| F    | 7.75      | 8.13 | 0.305       | 0.320 |
| G    | 0.10      | 0.20 | 0.004       | 0.008 |
| H    | 0.15      | 0.31 | 0.006       | 0.012 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 3.30      | 0.130       |
| B      | 2.50      | 0.098       |
| C      | 6.80      | 0.268       |
| D      | 4.40      | 0.173       |
| E      | 9.40      | 0.370       |

**MARKING DIAGRAM**



- P/N =Marking Code
- G =Green Compound
- YW =Date Code
- F =Factory Code

Note: Cathode band for unidirectional products only

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