

## 5000W, 16V - 100V Surface Mount Transient Voltage Suppressor

### FEATURES

- 5000W peak pulse power capability at 10/1000 $\mu$ s waveform
- Ideal for automated placement
- Photo glass passivated chip junction
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- I/O interface
- AC/DC power supply

### 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: Indicated by cathode band
- Weight: 0.300g (approximately)

| KEY PARAMETERS                |                |      |
|-------------------------------|----------------|------|
| PARAMETER                     | VALUE          | UNIT |
| $V_{WM}$                      | 16 - 100       | V    |
| $V_{BR}$<br>(uni-directional) | 17.8 - 123     | V    |
| $P_{PPSM}$                    | 5000           | W    |
| $T_{JMAX}$                    | 175            | °C   |
| Package                       | DO-214AB (SMC) |      |
| Configuration                 | Stacked die    |      |


**DO-214AB (SMC)**


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

| PARAMETER  | SYMBOL    | VALUE       | UNIT |
|--|-----------|-------------|------|
| Non-repetitive peak impulse power dissipation with 10/1000 $\mu$ s waveform <sup>(1)</sup> | $P_{PK}$  | 5000        | W    |
| Steady state power dissipation at $T_L = 75^\circ\text{C}$ <sup>(2)</sup>                  | $P_D$     | 6.25        | W    |
| Forward Voltage @ $I_F = 100\text{A}$ for Uni-directional only <sup>(3)</sup>              | $V_F$     | 5           | 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.1
2. Units mounted on PCB (16mm x 16mm Cu pad test board)
3. Pulse test with PW = 0.3ms

### THERMAL PERFORMANCE

| PARAMETER                              | SYMBOL          | TYP | UNIT |
|--|-----------------|-----|------|
| Junction-to-lead thermal resistance    | $R_{\theta JL}$ | 16  | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 61  | °C/W |
| Junction-to-case thermal resistance    | $R_{\theta JC}$ | 17  | °C/W |

**Thermal Performance Note:** Units mounted on PCB (16mm x 16mm Cu pad test board)

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

| Part number | Marking code | Breakdown voltage<br>$V_{BR}@I_T$<br>(V)<br>(Note 1) |      | Test current<br>$I_T$<br>(mA) | Working stand-off voltage<br>$V_{WM}$<br>(V) | Maximum blocking leakage current<br>$I_{IB}@V_{WM}$<br>( $\mu\text{A}$ )<br>(Note 1) | Maximum peak impulse current<br>$I_{PP}$<br>(A) | Maximum clamping voltage<br>$V_C@I_{PP}$<br>(V) | Maximum Temp. coefficient of $V_{BR}$<br>$\alpha V_{BR}@I_T$<br>(mV/ $^\circ\text{C}$ ) |
|-------------|--------------|--|------|-------------------------------|--|--|---|---|---|
|             |              | Min  | Max  |                               |  |  |   |   |   |
| 5.0SMDJ16A  | 5PET         | 17.8   | 19.7 | 1                             | 16   | 50   | 193   | 26.0  | 0.096   |
| 5.0SMDJ17A  | 5PEU         | 18.9   | 20.9 | 1                             | 17   | 20   | 181   | 27.6  | 0.097   |
| 5.0SMDJ18A  | 5PEV         | 20.0   | 22.1 | 1                             | 18   | 10   | 172   | 29.2  | 0.098   |
| 5.0SMDJ20A  | 5PEW         | 22.2   | 24.5 | 1                             | 20   | 5  | 155   | 32.4  | 0.099   |
| 5.0SMDJ22A  | 5PEX         | 24.4   | 26.9 | 1                             | 22   | 5  | 141   | 35.5  | 0.100   |
| 5.0SMDJ24A  | 5PEZ         | 26.7   | 29.5 | 1                             | 24   | 2  | 129   | 38.9  | 0.101   |
| 5.0SMDJ26A  | 5PFE         | 28.9   | 31.9 | 1                             | 26   | 2  | 119   | 42.1  | 0.101   |
| 5.0SMDJ28A  | 5PFG         | 31.1   | 34.4 | 1                             | 28   | 2  | 110   | 45.4  | 0.102   |
| 5.0SMDJ30A  | 5PFK         | 33.3   | 36.8 | 1                             | 30   | 2  | 103   | 48.4  | 0.103   |
| 5.0SMDJ33A  | 5PFM         | 36.7   | 40.6 | 1                             | 33   | 2  | 93.9  | 53.3  | 0.104   |
| 5.0SMDJ36A  | 5PFP         | 40.0   | 44.2 | 1                             | 36   | 2  | 86.1  | 58.1  | 0.104   |
| 5.0SMDJ40A  | 5PFR         | 44.4   | 49.1 | 1                             | 40   | 2  | 77.6  | 64.5  | 0.105   |
| 5.0SMDJ43A  | 5PFT         | 47.8   | 52.8 | 1                             | 43   | 2  | 72.1  | 69.4  | 0.105   |
| 5.0SMDJ45A  | 5PFV         | 50.0   | 55.3 | 1                             | 45   | 2  | 68.8  | 72.7  | 0.106   |
| 5.0SMDJ48A  | 5PFX         | 53.3   | 58.9 | 1                             | 48   | 2  | 64.7  | 77.4  | 0.106   |
| 5.0SMDJ51A  | 5PFZ         | 56.7   | 62.7 | 1                             | 51   | 2  | 60.7  | 82.4  | 0.107   |
| 5.0SMDJ54A  | 5PGE         | 60.0   | 66.3 | 1                             | 54   | 2  | 57.5  | 87.1  | 0.107   |
| 5.0SMDJ58A  | 5PGG         | 64.4   | 71.2 | 1                             | 58   | 2  | 53.5  | 93.6  | 0.107   |
| 5.0SMDJ60A  | 5PGK         | 66.7   | 73.7 | 1                             | 60   | 2  | 51.7  | 96.8  | 0.108   |
| 5.0SMDJ64A  | 5PGM         | 71.1   | 78.6 | 1                             | 64   | 2  | 48.6  | 103   | 0.108   |
| 5.0SMDJ70A  | 5PGP         | 77.8   | 86.0 | 1                             | 70   | 2  | 44.3  | 113   | 0.108   |
| 5.0SMDJ75A  | 5PGR         | 83.3   | 92.1 | 1                             | 75   | 2  | 41.4  | 121   | 0.108   |
| 5.0SMDJ78A  | 5PGT         | 86.7   | 95.8 | 1                             | 78   | 2  | 39.7  | 126   | 0.108   |
| 5.0SMDJ85A  | 5PGV         | 94.4   | 104  | 1                             | 85   | 2  | 36.5  | 137   | 0.110   |
| 5.0SMDJ90A  | 5PGX         | 100  | 111  | 1                             | 90   | 2  | 34.3  | 146   | 0.110   |
| 5.0SMDJ100A | 5PGZ         | 111  | 123  | 1                             | 100  | 2  | 30.9  | 162   | 0.110   |

**Note:**

1. Pulse test with PW = 30ms

**ORDERING INFORMATION**

| ORDERING CODE <sup>(1)</sup> | PACKAGE        | PACKING             |
|------------------------------|----------------|---------------------|
| 5.0SMDJx                     | DO-214AB (SMC) | 3,000 / Tape & Reel |

**Notes:**

1. "x" defines voltage from 16V(5.0SMDJ16A) to 100V(5.0SMDJ100A)

**CHARACTERISTICS CURVES**

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

**Fig.1 Pulse Power or Current vs. Initial Junction Temperature**



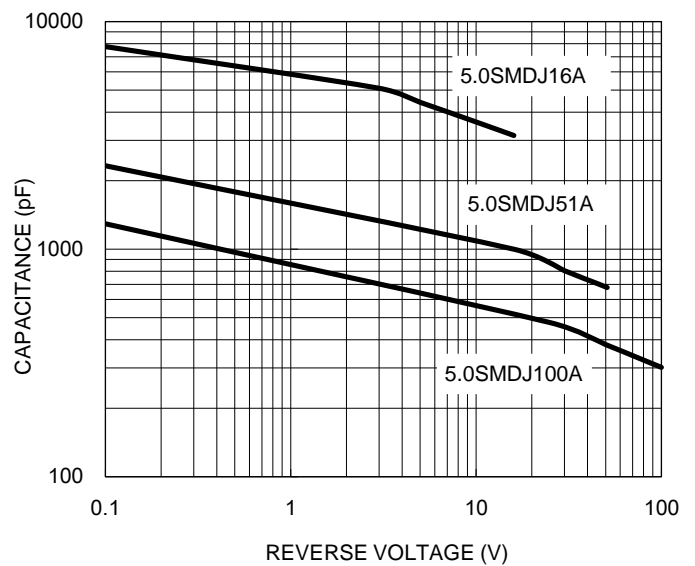
**Fig.2 Power Derating Curve**



**Fig.3 Pulse Waveform**

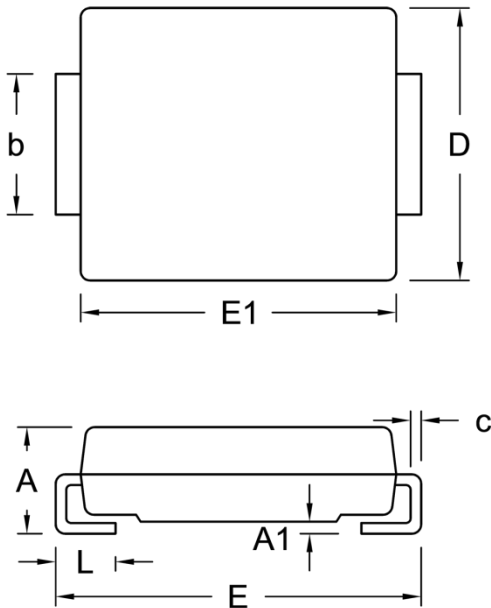


**Fig.4 Typical Junction Capacitance**



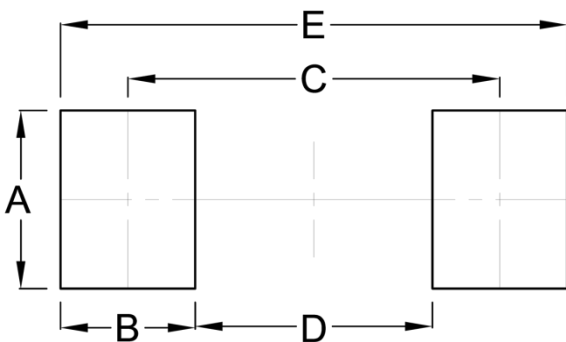
**PACKAGE OUTLINE DIMENSIONS**

DO-214AB (SMC)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 2.00      | 2.62 | 0.079       | 0.103 |
| A1   | 0.10      | 0.20 | 0.004       | 0.008 |
| b    | 2.90      | 3.20 | 0.114       | 0.126 |
| c    | 0.15      | 0.31 | 0.006       | 0.012 |
| D    | 5.59      | 6.22 | 0.220       | 0.245 |
| E    | 7.75      | 8.13 | 0.305       | 0.320 |
| E1   | 6.60      | 7.11 | 0.260       | 0.280 |
| L    | 1.00      | 1.60 | 0.039       | 0.063 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 3.30      | 0.130       |
| B      | 2.50      | 0.098       |
| C      | 6.90      | 0.272       |
| 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