

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

### FEATURES

- AEC-Q101 qualified
- 5000W peak pulse power capability at 10/1000 $\mu$ s waveform
- Ideal for automated placement
- Photo glass passivated 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    |
| $T_{J\ MAX}$                  | 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>$I_{B@V_{WM}}$<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  |                               |                                              |                                                                                     |                                                 |                                                 |                                                                                         |
| 5.0SMDJ16AH  | 5PET         | 17.8                                                 | 19.7 | 1                             | 16                                           | 50                                                                                  | 193                                             | 26.0                                            | 0.096                                                                                   |
| 5.0SMDJ17AH  | 5PEU         | 18.9                                                 | 20.9 | 1                             | 17                                           | 20                                                                                  | 181                                             | 27.6                                            | 0.097                                                                                   |
| 5.0SMDJ18AH  | 5PEV         | 20.0                                                 | 22.1 | 1                             | 18                                           | 10                                                                                  | 172                                             | 29.2                                            | 0.098                                                                                   |
| 5.0SMDJ20AH  | 5PEW         | 22.2                                                 | 24.5 | 1                             | 20                                           | 5                                                                                   | 155                                             | 32.4                                            | 0.099                                                                                   |
| 5.0SMDJ22AH  | 5PEX         | 24.4                                                 | 26.9 | 1                             | 22                                           | 5                                                                                   | 141                                             | 35.5                                            | 0.100                                                                                   |
| 5.0SMDJ24AH  | 5PEZ         | 26.7                                                 | 29.5 | 1                             | 24                                           | 2                                                                                   | 129                                             | 38.9                                            | 0.101                                                                                   |
| 5.0SMDJ26AH  | 5PFE         | 28.9                                                 | 31.9 | 1                             | 26                                           | 2                                                                                   | 119                                             | 42.1                                            | 0.101                                                                                   |
| 5.0SMDJ28AH  | 5PFG         | 31.1                                                 | 34.4 | 1                             | 28                                           | 2                                                                                   | 110                                             | 45.4                                            | 0.102                                                                                   |
| 5.0SMDJ30AH  | 5PFK         | 33.3                                                 | 36.8 | 1                             | 30                                           | 2                                                                                   | 103                                             | 48.4                                            | 0.103                                                                                   |
| 5.0SMDJ33AH  | 5PFM         | 36.7                                                 | 40.6 | 1                             | 33                                           | 2                                                                                   | 93.9                                            | 53.3                                            | 0.104                                                                                   |
| 5.0SMDJ36AH  | 5PFP         | 40.0                                                 | 44.2 | 1                             | 36                                           | 2                                                                                   | 86.1                                            | 58.1                                            | 0.104                                                                                   |
| 5.0SMDJ40AH  | 5PFR         | 44.4                                                 | 49.1 | 1                             | 40                                           | 2                                                                                   | 77.6                                            | 64.5                                            | 0.105                                                                                   |
| 5.0SMDJ43AH  | 5PFT         | 47.8                                                 | 52.8 | 1                             | 43                                           | 2                                                                                   | 72.1                                            | 69.4                                            | 0.105                                                                                   |
| 5.0SMDJ45AH  | 5PFV         | 50.0                                                 | 55.3 | 1                             | 45                                           | 2                                                                                   | 68.8                                            | 72.7                                            | 0.106                                                                                   |
| 5.0SMDJ48AH  | 5PFX         | 53.3                                                 | 58.9 | 1                             | 48                                           | 2                                                                                   | 64.7                                            | 77.4                                            | 0.106                                                                                   |
| 5.0SMDJ51AH  | 5PFZ         | 56.7                                                 | 62.7 | 1                             | 51                                           | 2                                                                                   | 60.7                                            | 82.4                                            | 0.107                                                                                   |
| 5.0SMDJ54AH  | 5PGE         | 60.0                                                 | 66.3 | 1                             | 54                                           | 2                                                                                   | 57.5                                            | 87.1                                            | 0.107                                                                                   |
| 5.0SMDJ58AH  | 5PGG         | 64.4                                                 | 71.2 | 1                             | 58                                           | 2                                                                                   | 53.5                                            | 93.6                                            | 0.107                                                                                   |
| 5.0SMDJ60AH  | 5PGK         | 66.7                                                 | 73.7 | 1                             | 60                                           | 2                                                                                   | 51.7                                            | 96.8                                            | 0.108                                                                                   |
| 5.0SMDJ64AH  | 5PGM         | 71.1                                                 | 78.6 | 1                             | 64                                           | 2                                                                                   | 48.6                                            | 103                                             | 0.108                                                                                   |
| 5.0SMDJ70AH  | 5PGP         | 77.8                                                 | 86.0 | 1                             | 70                                           | 2                                                                                   | 44.3                                            | 113                                             | 0.108                                                                                   |
| 5.0SMDJ75AH  | 5PGR         | 83.3                                                 | 92.1 | 1                             | 75                                           | 2                                                                                   | 41.4                                            | 121                                             | 0.108                                                                                   |
| 5.0SMDJ78AH  | 5PGT         | 86.7                                                 | 95.8 | 1                             | 78                                           | 2                                                                                   | 39.7                                            | 126                                             | 0.108                                                                                   |
| 5.0SMDJ85AH  | 5PGV         | 94.4                                                 | 104  | 1                             | 85                                           | 2                                                                                   | 36.5                                            | 137                                             | 0.110                                                                                   |
| 5.0SMDJ90AH  | 5PGX         | 100                                                  | 111  | 1                             | 90                                           | 2                                                                                   | 34.3                                            | 146                                             | 0.110                                                                                   |
| 5.0SMDJ100AH | 5PGZ         | 111                                                  | 123  | 1                             | 100                                          | 2                                                                                   | 30.9                                            | 162                                             | 0.110                                                                                   |

**Note:**

1. Pulse test with  $PW = 30\text{ms}$

**ORDERING INFORMATION**

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

**Notes:**

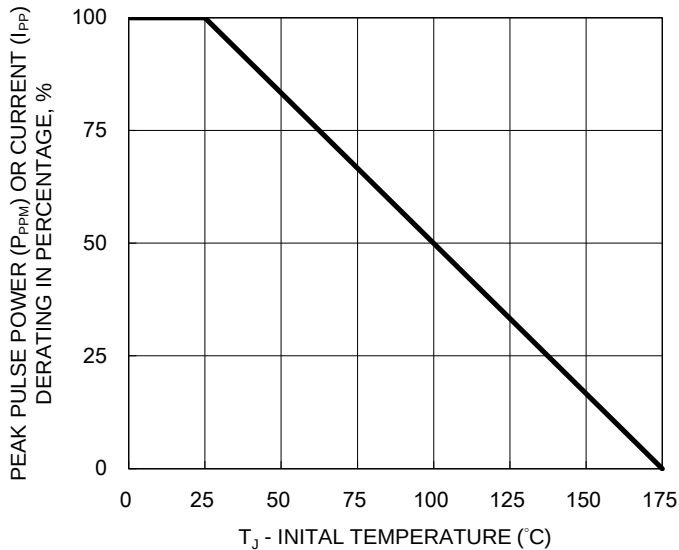
1. "x" defines voltage from 16V(5.0SMDJ16AH) to 100V(5.0SMDJ100AH)

## CHARACTERISTICS CURVES

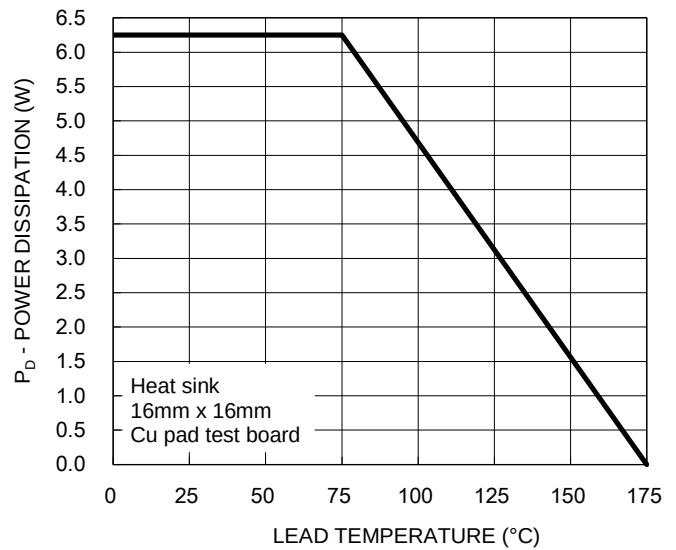
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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

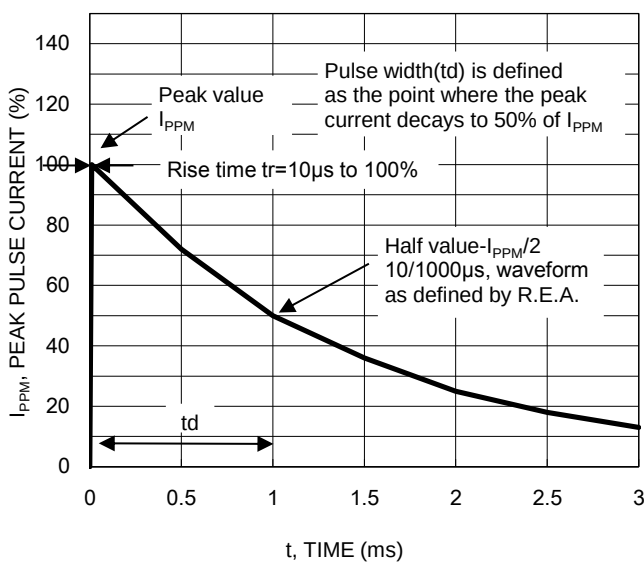
**Temperature**



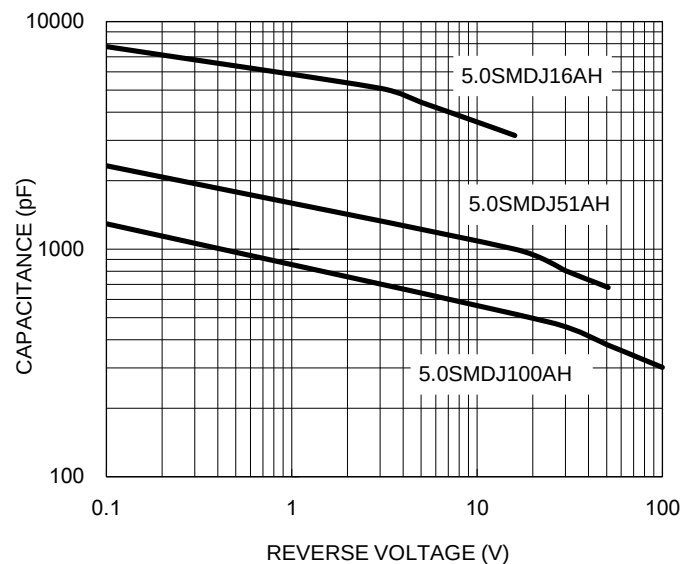
**Fig.2 Power Derating Curve**



**Fig.3 Pulse Waveform**

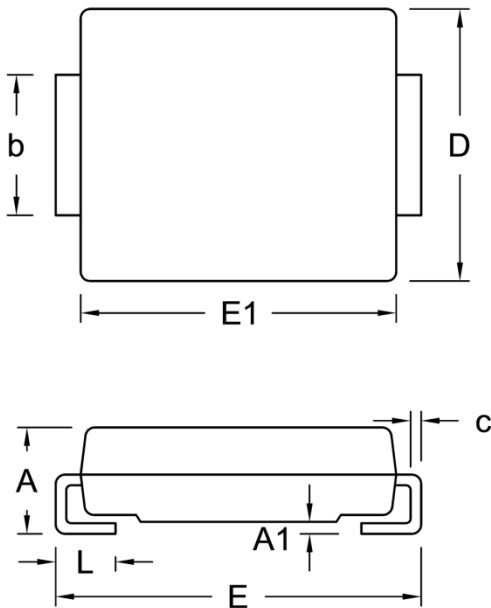


**Fig.4 Typical Junction Capacitance**



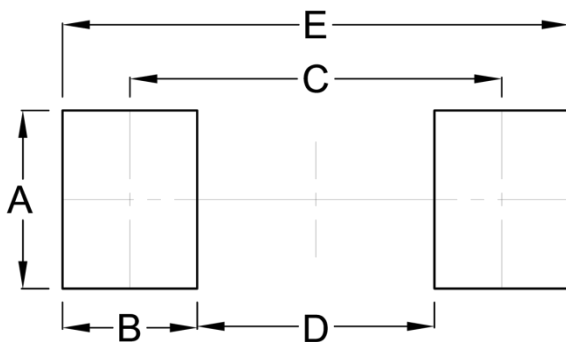
## PACKAGE OUTLINE DIMENSIONS

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

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