

Surface Mount Transient Voltage Suppressor Power  
**4000Watts**  
**Stand-Off Voltage: 5.0V~170V**

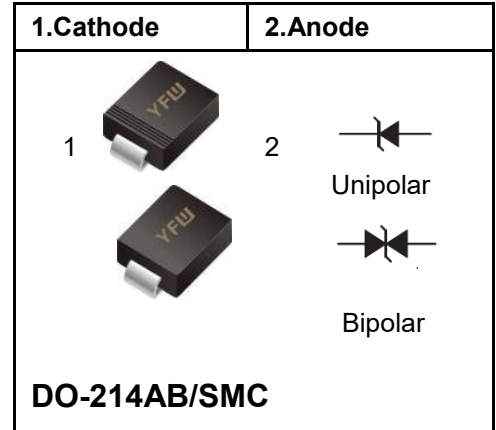
## FEATURES

- ◆ Peak power dissipation 4000w @10 x 1000 us Pulse
- ◆ Low profile package.
- ◆ Excellent clamping capability.
- ◆ Typical  $I_R$  less than 2uA when  $V_{BR}$  above 12V.
- ◆ Glass passivated junction.
- ◆ Fast response time: typically less than 1.0ps from 0 Volts to BV min
- ◆ IEC 61000-4-2 ESD 30KV(Air), 30KV(Contact)
- ◆ ESD protection of data lines in accordance with IEC 61000-4-2
- ◆ EFT protection of data lines in accordance with IEC 61000-4-4
- ◆ Halogen free and ROHS compliant
- ◆ Lead-free finish

## MECHANICAL CHARACTERISTICS

- ◆ Case: SMC (DO-214AB) Molded Plastic over glass passivated junction.
- ◆ Mounting Position: Any
- ◆ Polarity: by cathode band denotes UNI-directional device, none cathode band denotes bi-directional device.
- ◆ Terminal: Solder plated

## Pinning



## Maximum Ratings and Characteristics @ 25°C Ambient Temperature (unless otherwise noted)

| Parameter   | Symbol         | Value          | Unit             |
|---|----------------|----------------|------------------|
| Peak Pulse Power Dissipation on 10/1000 us waveform (Note 1, 2, FIG.1)    | $P_{PPM}$      | 4000           | W                |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave (Note 2, 3)       | $I_{FSM}$      | 300            | A                |
| Peak Pulse Current of on 10/1000us Waveform (Note 1, FIG.3)               | $I_{PPM}$      | See Next Table | A                |
| Power dissipation on Infinite heat sink at $T_L=50\text{ }^\circ\text{C}$ | $P_D$          | 6.5            | W                |
| Operating Junction Temperature and Storage Temperature Range              | $T_J, T_{STG}$ | -65 to +150    | $^\circ\text{C}$ |

### NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.2.
2. Mounted on  $8.0 \times 8.0\text{mm}^2$  (0.03mm thick) Copper Pads to each terminal.
3. Measured on 8.3ms single half sine-wave, or equivalent square wave, for Unidirectional device only.

## Electrical Specification @ Ta=25°C

| Type Number |              | Marking |      | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I <sub>T</sub> | Breakdown Voltage Max. @ I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RMW</sub> |
|-------------|--------------|---------|------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni)       | (Bi)         | (Uni)   | (Bi) | V <sub>RMW</sub> (V)      | V <sub>BR MIN</sub> (V)                | V <sub>BR MAX</sub> (V)                 | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> ( $\mu$ A)         |
| 4.0SMDJ5.0A | 4.0SMDJ5.0CA | HDE     | IDE  | 5.0                       | 6.40                                   | 7.00                                    | 10                  | 9.2                                       | 554.3               | 800                               |
| 4.0SMDJ6.0A | 4.0SMDJ6.0CA | HDG     | IDG  | 6.0                       | 6.67                                   | 7.37                                    | 10                  | 10.3                                      | 495.1               | 800                               |
| 4.0SMDJ6.5A | 4.0SMDJ6.5CA | HDK     | IDK  | 6.5                       | 7.22                                   | 7.98                                    | 10                  | 11.2                                      | 455.4               | 500                               |
| 4.0SMDJ7.0A | 4.0SMDJ7.0CA | HDM     | IDM  | 7.0                       | 7.78                                   | 8.60                                    | 10                  | 12.0                                      | 425.0               | 200                               |
| 4.0SMDJ7.5A | 4.0SMDJ7.5CA | HDP     | IDP  | 7.5                       | 8.33                                   | 9.21                                    | 1                   | 12.9                                      | 395.3               | 100                               |
| 4.0SMDJ8.0A | 4.0SMDJ8.0CA | HDR     | IDR  | 8.0                       | 8.89                                   | 9.83                                    | 1                   | 13.6                                      | 375.0               | 50                                |
| 4.0SMDJ8.5A | 4.0SMDJ8.5CA | HDT     | IDT  | 8.5                       | 9.44                                   | 10.40                                   | 1                   | 14.4                                      | 354.2               | 20                                |
| 4.0SMDJ9.0A | 4.0SMDJ9.0CA | HDV     | IDV  | 9.0                       | 10.00                                  | 11.10                                   | 1                   | 15.4                                      | 331.2               | 10                                |
| 4.0SMDJ10A  | 4.0SMDJ10CA  | HDX     | IDX  | 10.0                      | 11.10                                  | 12.30                                   | 1                   | 17.0                                      | 300.0               | 5                                 |
| 4.0SMDJ11A  | 4.0SMDJ11CA  | HDZ     | IDZ  | 11.0                      | 12.20                                  | 13.50                                   | 1                   | 18.2                                      | 280.2               | 2                                 |
| 4.0SMDJ12A  | 4.0SMDJ12CA  | HEE     | IEE  | 12.0                      | 13.30                                  | 14.70                                   | 1                   | 19.9                                      | 256.3               | 2                                 |
| 4.0SMDJ13A  | 4.0SMDJ13CA  | HEG     | IEG  | 13.0                      | 14.40                                  | 15.90                                   | 1                   | 21.5                                      | 237.2               | 2                                 |
| 4.0SMDJ14A  | 4.0SMDJ14CA  | HEK     | IEK  | 14.0                      | 15.60                                  | 17.20                                   | 1                   | 23.2                                      | 219.8               | 2                                 |
| 4.0SMDJ15A  | 4.0SMDJ15CA  | HEM     | IEM  | 15.0                      | 16.70                                  | 18.50                                   | 1                   | 24.4                                      | 209.0               | 2                                 |
| 4.0SMDJ16A  | 4.0SMDJ16CA  | HEP     | IEP  | 16.0                      | 17.80                                  | 19.70                                   | 1                   | 26.0                                      | 196.2               | 2                                 |
| 4.0SMDJ17A  | 4.0SMDJ17CA  | HER     | IER  | 17.0                      | 18.90                                  | 20.90                                   | 1                   | 27.6                                      | 184.8               | 2                                 |
| 4.0SMDJ18A  | 4.0SMDJ18CA  | HET     | IET  | 18.0                      | 20.00                                  | 22.10                                   | 1                   | 29.2                                      | 174.7               | 2                                 |
| 4.0SMDJ20A  | 4.0SMDJ20CA  | HEV     | IEV  | 20.0                      | 22.20                                  | 24.50                                   | 1                   | 32.4                                      | 157.4               | 2                                 |
| 4.0SMDJ22A  | 4.0SMDJ22CA  | HEX     | IEX  | 22.0                      | 24.40                                  | 26.90                                   | 1                   | 35.5                                      | 143.7               | 2                                 |
| 4.0SMDJ24A  | 4.0SMDJ24CA  | HEZ     | IEZ  | 24.0                      | 26.70                                  | 29.50                                   | 1                   | 38.9                                      | 131.1               | 2                                 |
| 4.0SMDJ26A  | 4.0SMDJ26CA  | HFE     | IFE  | 26.0                      | 28.90                                  | 31.90                                   | 1                   | 42.1                                      | 121.1               | 2                                 |
| 4.0SMDJ28A  | 4.0SMDJ28CA  | HFG     | IFG  | 28.0                      | 31.10                                  | 34.40                                   | 1                   | 45.4                                      | 112.3               | 2                                 |
| 4.0SMDJ30A  | 4.0SMDJ30CA  | HFK     | IFK  | 30.0                      | 33.30                                  | 36.80                                   | 1                   | 48.4                                      | 105.4               | 2                                 |
| 4.0SMDJ33A  | 4.0SMDJ33CA  | HFM     | IFM  | 33.0                      | 36.70                                  | 40.60                                   | 1                   | 53.3                                      | 95.7                | 2                                 |
| 4.0SMDJ36A  | 4.0SMDJ36CA  | HFP     | IFP  | 36.0                      | 40.00                                  | 44.20                                   | 1                   | 58.1                                      | 87.8                | 2                                 |
| 4.0SMDJ40A  | 4.0SMDJ40CA  | HFR     | IFR  | 40.0                      | 44.40                                  | 49.10                                   | 1                   | 64.5                                      | 79.1                | 2                                 |
| 4.0SMDJ43A  | 4.0SMDJ43CA  | HFT     | IFT  | 43.0                      | 47.80                                  | 52.80                                   | 1                   | 69.4                                      | 73.5                | 2                                 |
| 4.0SMDJ45A  | 4.0SMDJ45CA  | HFV     | IFV  | 45.0                      | 50.00                                  | 55.30                                   | 1                   | 72.7                                      | 70.2                | 2                                 |
| 4.0SMDJ48A  | 4.0SMDJ48CA  | HFX     | IFX  | 48.0                      | 53.30                                  | 58.90                                   | 1                   | 77.4                                      | 65.9                | 2                                 |
| 4.0SMDJ51A  | 4.0SMDJ51CA  | HFZ     | IFZ  | 51.0                      | 56.70                                  | 62.70                                   | 1                   | 82.4                                      | 61.9                | 2                                 |
| 4.0SMDJ54A  | 4.0SMDJ54CA  | HGE     | IGE  | 54.0                      | 60.00                                  | 66.30                                   | 1                   | 87.1                                      | 58.6                | 2                                 |
| 4.0SMDJ58A  | 4.0SMDJ58CA  | HGG     | IGG  | 58.0                      | 64.40                                  | 71.20                                   | 1                   | 93.6                                      | 54.5                | 2                                 |
| 4.0SMDJ60A  | 4.0SMDJ60CA  | HGK     | IGK  | 60.0                      | 66.70                                  | 73.70                                   | 1                   | 96.8                                      | 52.7                | 2                                 |
| 4.0SMDJ64A  | 4.0SMDJ64CA  | HGM     | IGM  | 64.0                      | 71.10                                  | 78.60                                   | 1                   | 103.0                                     | 49.5                | 2                                 |
| 4.0SMDJ70A  | 4.0SMDJ70CA  | HGP     | IGP  | 70.0                      | 77.80                                  | 86.00                                   | 1                   | 113.0                                     | 45.1                | 2                                 |
| 4.0SMDJ75A  | 4.0SMDJ75CA  | HGR     | IGR  | 75.0                      | 83.30                                  | 92.10                                   | 1                   | 121.0                                     | 42.1                | 2                                 |

※ For Bi-directional type having V<sub>RMW</sub> of 10 Volts and less, the I<sub>R</sub> limit is double

※ For parts without A, the VBR is  $\pm$  10% and VC is 5% higher than with A parts.

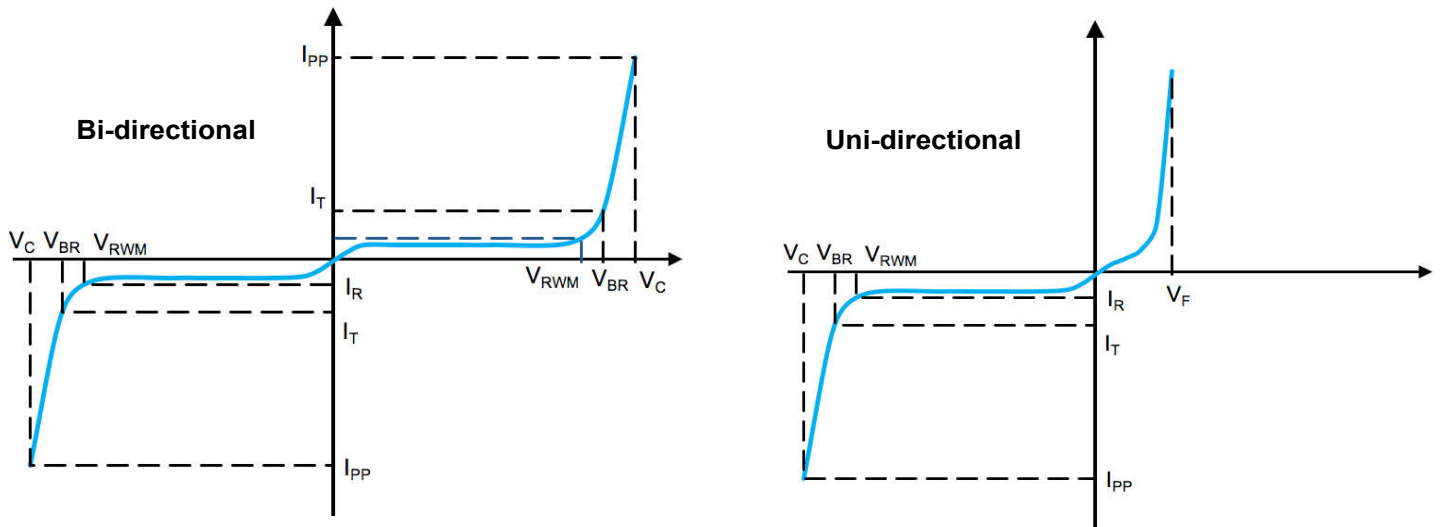
## Electrical Specification @ Ta=25°C

| Type Number |              | Marking |      | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I <sub>T</sub> | Breakdown Voltage Max. @ I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|-------------|--------------|---------|------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni)       | (Bi)         | (Uni)   | (Bi) | V <sub>RWM</sub> (V)      | V <sub>BR MIN</sub> (V)                | V <sub>BR MAX</sub> (V)                 | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (uA)               |
| 4.0SMDJ78A  | 4.0SMDJ78CA  | HGT     | IGT  | 78.0                      | 86.70                                  | 95.80                                   | 1                   | 126.0                                     | 40.5                | 2                                 |
| 4.0SMDJ85A  | 4.0SMDJ85CA  | HGV     | IGV  | 85.0                      | 94.40                                  | 104.00                                  | 1                   | 137.0                                     | 37.2                | 2                                 |
| 4.0SMDJ90A  | 4.0SMDJ90CA  | HGX     | IGX  | 90.0                      | 100.00                                 | 111.00                                  | 1                   | 146.0                                     | 34.9                | 2                                 |
| 4.0SMDJ100A | 4.0SMDJ100CA | HGZ     | IGZ  | 100.0                     | 111.00                                 | 123.00                                  | 1                   | 162.0                                     | 31.5                | 2                                 |
| 4.0SMDJ110A | 4.0SMDJ110CA | HHE     | IHE  | 110.0                     | 122.00                                 | 135.00                                  | 1                   | 177.0                                     | 28.8                | 2                                 |
| 4.0SMDJ120A | 4.0SMDJ120CA | HHG     | IHG  | 120.0                     | 133.00                                 | 147.00                                  | 1                   | 193.0                                     | 26.4                | 2                                 |
| 4.0SMDJ130A | 4.0SMDJ130CA | HHK     | IHK  | 130.0                     | 144.00                                 | 159.00                                  | 1                   | 209.0                                     | 24.4                | 2                                 |
| 4.0SMDJ150A | 4.0SMDJ150CA | HHM     | IHM  | 150.0                     | 167.00                                 | 185.00                                  | 1                   | 243.0                                     | 21.0                | 2                                 |
| 4.0SMDJ160A | 4.0SMDJ160CA | HHP     | IHP  | 160.0                     | 178.00                                 | 197.00                                  | 1                   | 259.0                                     | 19.7                | 2                                 |
| 4.0SMDJ170A | 4.0SMDJ170CA | HHR     | IHR  | 170.0                     | 189.00                                 | 209.00                                  | 1                   | 275.0                                     | 18.5                | 2                                 |

※ For Bi-directional type having V<sub>RWM</sub> of 10 Volts and less, the I<sub>R</sub> limit is double.

※ For parts without A, the V<sub>BR</sub> is ± 10% and V<sub>C</sub> is 5% higher than with A parts.

### I-V Curve Characteristics



- P<sub>PPM</sub>** Peak Pulse Power Dissipation - Max power dissipation
- V<sub>RWM</sub>** Reverse Stand-off Voltage - Maximum voltage that can be applied to TVS without operation
- V<sub>BR</sub>** Breakdown Voltage – Maximum voltage that flows though the TVS at a specified current (I<sub>T</sub>)
- V<sub>C</sub>** Clamping Voltage – Peak voltage measured across the TVS at a specified I<sub>PPM</sub> (peak impulse current)
- I<sub>R</sub>** Reverse Leakage Current – Current measured at V<sub>R</sub>
- V<sub>F</sub>** Forward Voltage Drop for Uni-directional

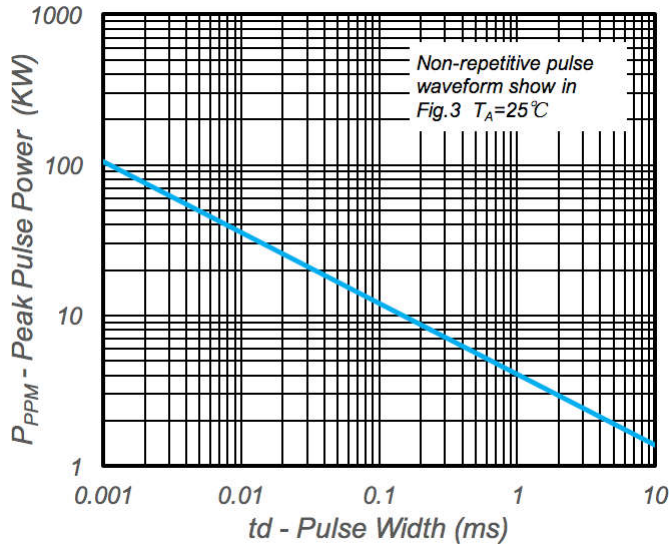


Fig.1 - Peak Pulse Power Rating

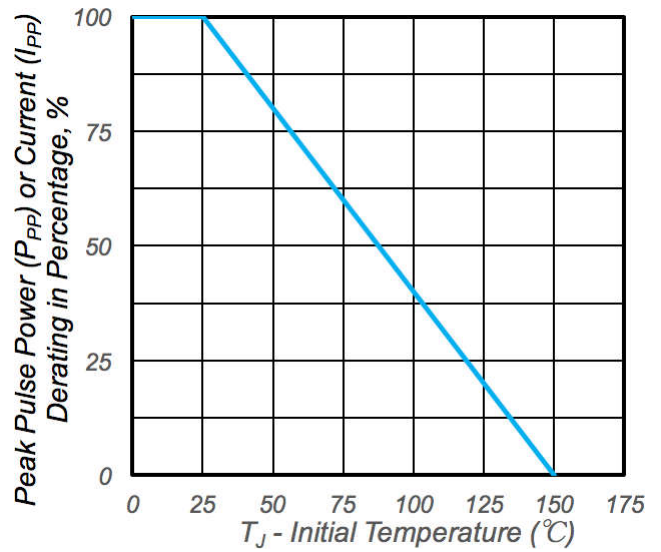


Fig.2 - Pulse Derating Curve

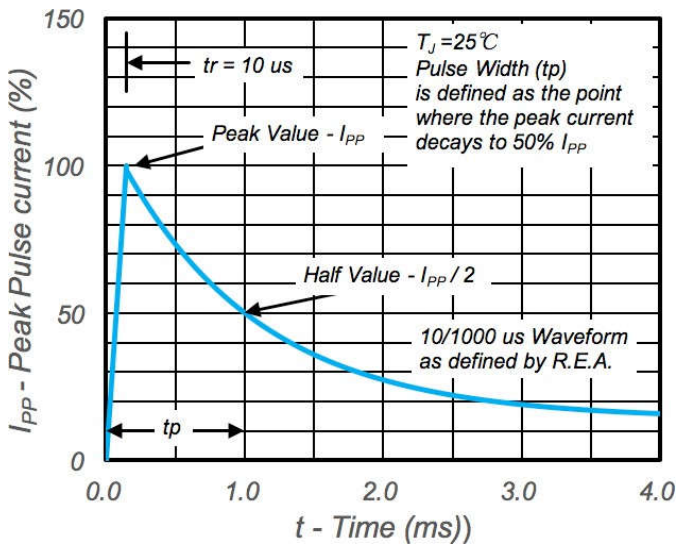


Fig.3 - Pulse Waveform

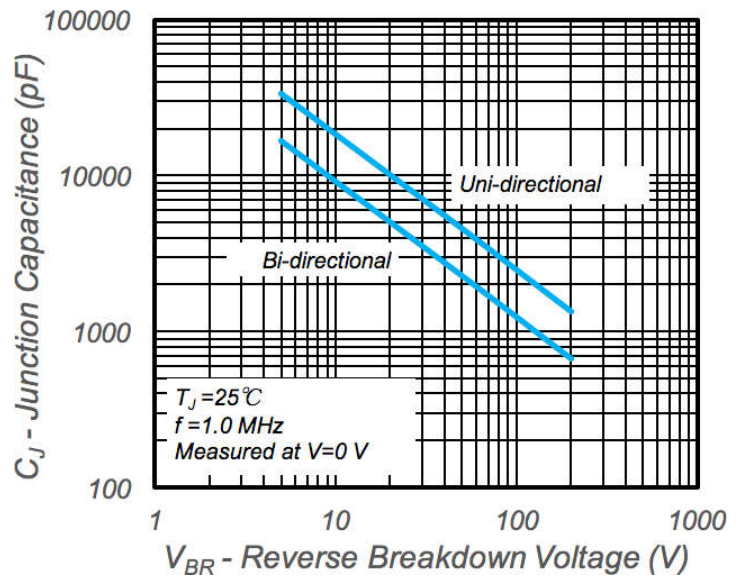
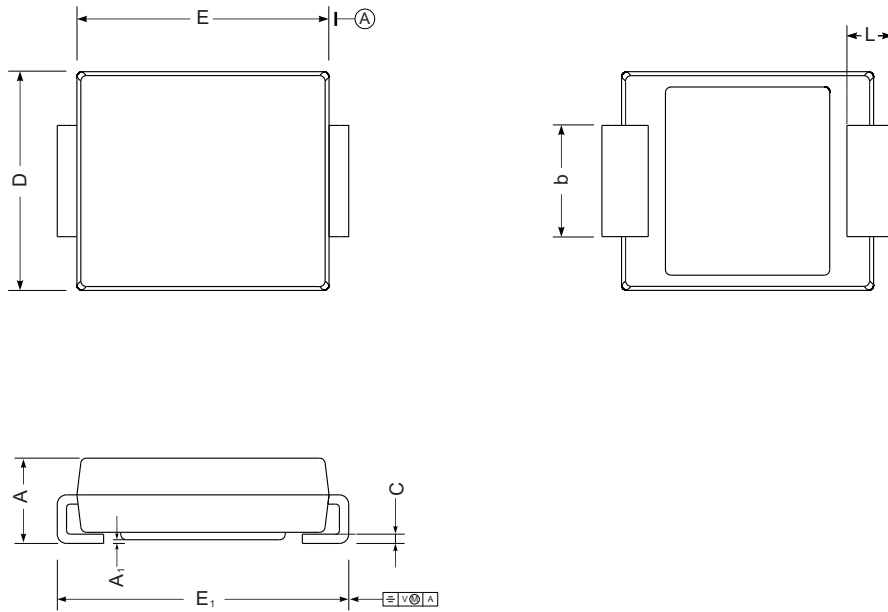


Fig.4 - Typical Junction Capacitance

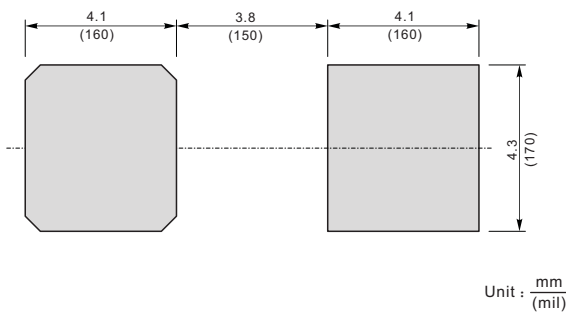
**Package Outline DO-214AB SMC**

Plastic surface mounted package; 2 leads



| UNIT |     | A    | E   | D   | E <sub>1</sub> | A <sub>1</sub> | C    | L   | b    |
|------|-----|------|-----|-----|----------------|----------------|------|-----|------|
| mm   | max | 2.62 | 7.0 | 6.2 | 8.0            | 0.21           | 0.31 | 1.6 | 3.25 |
|      | min | 2.00 | 6.5 | 5.6 | 7.6            | 0.05           | 0.15 | 0.9 | 2.75 |
| mil  | max | 103  | 276 | 244 | 315            | 8.3            | 12   | 63  | 128  |
|      | min | 79   | 256 | 220 | 299            | 2.0            | 5.9  | 35  | 108  |

**The recommended mounting pad size**



**Summary of Packing Options**

| Package      | Packing Description | Packing Quantity | Industry Standard |
|--------------|---------------------|------------------|-------------------|
| DO-214AB SMC | Tape/Reel, 13" reel | 3000             | EIA-481-1         |