



DO-214AC(SMA)

| Features                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Glass passivated chip</li><li>• 400 W peak pulse power capability with a 10/1000 <math>\mu</math>s waveform, repetitive rate (duty cycle):0.01 %</li><li>• Low leakage</li><li>• Uni and Bidirectional unit</li><li>• Excellent clamping capability</li><li>• Very fast response time</li><li>• RoHS compliant</li></ul> |

| Primary Characteristics |        |
|-------------------------|--------|
| $V_{BR}$                | 5~440V |
| $P_{PPM}$               | 400W   |
| $P_D$                   | 1W     |
| $T_J \text{ max}$       | 150°C  |

| Mechanical Date                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Case: DO-214AC(SMA)</li><li>• Epoxy: UL 94V-0 rate flame retardant</li><li>• Lead: Solderable per MIL-STD-750, method 2026</li><li>• Polarity: cathode band except Bipolar</li><li>• Mounting position: Any</li><li>• Weight: 0.063 grams (approximate)</li></ul> |

| Ordering Information |                    |         |                    |
|----------------------|--------------------|---------|--------------------|
| Part No.             | Remark             | Package | Packing            |
| SMAJ SERIES          | General            | SMA     | 5000 / Tape & Reel |
| SMAJ SERIES-H        | Halogen Free       |         |                    |
| SMAJ SERIES-Q        | AEC-Q101 qualified |         |                    |

| Maximum Ratings (TA=25°C unless otherwise noted)                                      |                |                |       |
|---------------------------------------------------------------------------------------|----------------|----------------|-------|
| Parameter                                                                             | Symbol         | Limits         | Units |
| Peak power dissipation with a 10/1000 $\mu$ s waveform (Note 1)                       | $P_{PP}$       | 400            | W     |
| Peak pulse current wih a 10/1000 $\mu$ s waveform (Note 1)                            | $I_{PP}$       | See Next Table | A     |
| Power dissipation on infinite heatsink at TL = 75 °C                                  | $P_D$          | 1              | W     |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only (Note 2) | $I_{FSM}$      | 40             | A     |
| Maximum instantaneous forward voltage at 25 A for unidirectional only (Note 3)        | $V_F$          | 3.5 / 5.0      | V     |
| Operating junction and storage temperature range                                      | $T_J, T_{STG}$ | -55 ~ +150     | °C    |

- Note:
- (1)Non-repetitive current pulse per Fig.5 and derated above  $T_A= 25\text{ }^{\circ}\text{C}$  per Fig.1
  - (2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
  - (3) $V_F<3.5\text{V}$  for devices of  $V_{BR}<200\text{V}$  and  $V_F<5.0\text{V}$  for devices of  $V_{BR}>201\text{V}$



# SMAJ SERIES



## Transient Voltage Suppressors(400W)

| Part Number |           | Marking Code |         | Breakdown Voltage $V_{BR}$<br>@ $I_T$ |        |       | Maximum Reverse Leakage $I_R$ | Working Peak Reverse Voltage | Maximum Reverse Surge Current | Maximum Clamping Voltage $V_C$ |
|-------------|-----------|--------------|---------|---------------------------------------|--------|-------|-------------------------------|------------------------------|-------------------------------|--------------------------------|
| Directional |           | Directional  |         | Min                                   | Max    | $I_T$ | $V_{RWM}$                     | $V_{RWM}$                    | $I_{PP}$                      | $I_{PP}$                       |
| Uni         | Bi        | Uni          | Bi      | (V)                                   | (V)    | (mA)  | ( $\mu A$ )                   | (V)                          | (A)                           | (V)                            |
| SMAJ5.0A    | SMAJ5.0CA | AJ5.0A       | AJ5.0CA | 6.40                                  | 7.00   | 10.0  | 800                           | 5.0                          | 43.48                         | 9.2                            |
| SMAJ6.0A    | SMAJ6.0CA | AJ6.0A       | AJ6.0CA | 6.67                                  | 7.37   | 10.0  | 800                           | 6.0                          | 38.83                         | 10.3                           |
| SMAJ6.5A    | SMAJ6.5CA | AJ6.5A       | AJ6.5CA | 7.22                                  | 7.98   | 10.0  | 500                           | 6.5                          | 35.71                         | 11.2                           |
| SMAJ7.0A    | SMAJ7.0CA | AJ7.0A       | AJ7.0CA | 7.78                                  | 8.60   | 10.0  | 200                           | 7.0                          | 33.30                         | 12.0                           |
| SMAJ7.5A    | SMAJ7.5CA | AJ7.5A       | AJ7.5CA | 8.33                                  | 9.21   | 1.0   | 100                           | 7.5                          | 31.01                         | 12.9                           |
| SMAJ8.0A    | SMAJ8.0CA | AJ8.0A       | AJ8.0CA | 8.89                                  | 9.83   | 1.0   | 50                            | 8.0                          | 29.41                         | 13.6                           |
| SMAJ8.5A    | SMAJ8.5CA | AJ8.5A       | AJ8.5CA | 9.44                                  | 10.40  | 1.0   | 10                            | 8.5                          | 27.78                         | 14.4                           |
| SMAJ9.0A    | SMAJ9.0CA | AJ9.0A       | AJ9.0CA | 10.00                                 | 11.10  | 1.0   | 5                             | 9.0                          | 25.97                         | 15.4                           |
| SMAJ10A     | SMAJ10CA  | AJ10A        | AJ10CA  | 11.10                                 | 12.30  | 1.0   | 5                             | 10.0                         | 23.50                         | 17.0                           |
| SMAJ11A     | SMAJ11CA  | AJ11A        | AJ11CA  | 12.20                                 | 13.50  | 1.0   | 5                             | 11.0                         | 21.98                         | 18.2                           |
| SMAJ12A     | SMAJ12CA  | AJ12A        | AJ12CA  | 13.30                                 | 14.70  | 1.0   | 5                             | 12.0                         | 20.10                         | 19.9                           |
| SMAJ13A     | SMAJ13CA  | AJ13A        | AJ13CA  | 14.40                                 | 15.90  | 1.0   | 5                             | 13.0                         | 18.60                         | 21.5                           |
| SMAJ14A     | SMAJ14CA  | AJ14A        | AJ14CA  | 15.60                                 | 17.20  | 1.0   | 5                             | 14.0                         | 17.24                         | 23.2                           |
| SMAJ15A     | SMAJ15CA  | AJ15A        | AJ15CA  | 16.70                                 | 18.50  | 1.0   | 5                             | 15.0                         | 16.39                         | 24.4                           |
| SMAJ16A     | SMAJ16CA  | AJ16A        | AJ16CA  | 17.80                                 | 19.70  | 1.0   | 5                             | 16.0                         | 15.38                         | 26.0                           |
| SMAJ17A     | SMAJ17CA  | AJ17A        | AJ17CA  | 18.90                                 | 20.90  | 1.0   | 5                             | 17.0                         | 14.49                         | 27.6                           |
| SMAJ18A     | SMAJ18CA  | AJ18A        | AJ18CA  | 20.00                                 | 22.10  | 1.0   | 5                             | 18.0                         | 13.70                         | 29.2                           |
| SMAJ19A     | SMAJ19CA  | AJ19A        | AJ19CA  | 21.10                                 | 23.30  | 1.0   | 5                             | 19.0                         | 13.00                         | 30.8                           |
| SMAJ20A     | SMAJ20CA  | AJ20A        | AJ20CA  | 22.20                                 | 24.50  | 1.0   | 5                             | 20.0                         | 12.30                         | 32.4                           |
| SMAJ22A     | SMAJ22CA  | AJ22A        | AJ22CA  | 24.40                                 | 26.90  | 1.0   | 5                             | 22.0                         | 11.27                         | 35.5                           |
| SMAJ24A     | SMAJ24CA  | AJ24A        | AJ24CA  | 26.70                                 | 29.50  | 1.0   | 5                             | 24.0                         | 10.28                         | 38.9                           |
| SMAJ26A     | SMAJ26CA  | AJ26A        | AJ26CA  | 28.90                                 | 31.90  | 1.0   | 5                             | 26.0                         | 9.50                          | 42.1                           |
| SMAJ28A     | SMAJ28CA  | AJ28A        | AJ28CA  | 31.10                                 | 34.40  | 1.0   | 5                             | 28.0                         | 8.81                          | 45.4                           |
| SMAJ30A     | SMAJ30CA  | AJ30A        | AJ30CA  | 33.30                                 | 36.80  | 1.0   | 5                             | 30.0                         | 8.26                          | 48.4                           |
| SMAJ33A     | SMAJ33CA  | AJ33A        | AJ33CA  | 36.70                                 | 40.60  | 1.0   | 5                             | 33.0                         | 7.50                          | 53.3                           |
| SMAJ36A     | SMAJ36CA  | AJ36A        | AJ36CA  | 40.00                                 | 44.20  | 1.0   | 5                             | 36.0                         | 6.88                          | 58.1                           |
| SMAJ40A     | SMAJ40CA  | AJ40A        | AJ40CA  | 44.40                                 | 49.10  | 1.0   | 5                             | 40.0                         | 6.20                          | 64.5                           |
| SMAJ43A     | SMAJ43CA  | AJ43A        | AJ43CA  | 47.80                                 | 52.80  | 1.0   | 5                             | 43.0                         | 5.76                          | 69.4                           |
| SMAJ45A     | SMAJ45CA  | AJ45A        | AJ45CA  | 50.00                                 | 55.30  | 1.0   | 5                             | 45.0                         | 5.50                          | 72.7                           |
| SMAJ48A     | SMAJ48CA  | AJ48A        | AJ48CA  | 53.30                                 | 58.90  | 1.0   | 5                             | 48.0                         | 5.17                          | 77.4                           |
| SMAJ51A     | SMAJ51CA  | AJ51A        | AJ51CA  | 56.70                                 | 62.70  | 1.0   | 5                             | 51.0                         | 4.85                          | 82.4                           |
| SMAJ54A     | SMAJ54CA  | AJ54A        | AJ54CA  | 60.00                                 | 66.30  | 1.0   | 5                             | 54.0                         | 4.59                          | 87.1                           |
| SMAJ58A     | SMAJ58CA  | AJ58A        | AJ58CA  | 64.40                                 | 71.20  | 1.0   | 5                             | 58.0                         | 4.27                          | 93.6                           |
| SMAJ60A     | SMAJ60CA  | AJ60A        | AJ60CA  | 66.70                                 | 73.70  | 1.0   | 5                             | 60.0                         | 4.13                          | 96.8                           |
| SMAJ64A     | SMAJ64CA  | AJ64A        | AJ64CA  | 71.10                                 | 78.60  | 1.0   | 5                             | 64.0                         | 3.88                          | 103.0                          |
| SMAJ70A     | SMAJ70CA  | AJ70A        | AJ70CA  | 77.80                                 | 86.00  | 1.0   | 5                             | 70.0                         | 3.54                          | 113.0                          |
| SMAJ75A     | SMAJ75CA  | AJ75A        | AJ75CA  | 83.30                                 | 92.10  | 1.0   | 5                             | 75.0                         | 3.31                          | 121.0                          |
| SMAJ78A     | SMAJ78CA  | AJ78A        | AJ78CA  | 86.70                                 | 95.80  | 1.0   | 5                             | 78.0                         | 3.17                          | 126.0                          |
| SMAJ80A     | SMAJ80CA  | AJ80A        | AJ80CA  | 88.80                                 | 97.60  | 1.0   | 5                             | 80.0                         | 3.09                          | 129.6                          |
| SMAJ85A     | SMAJ85CA  | AJ85A        | AJ85CA  | 94.40                                 | 104.00 | 1.0   | 5                             | 85.0                         | 2.92                          | 137.0                          |



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|-------------|-----------|--------------|---------|---------------------------------------|--------|-------|-------------------------------|------------------------------|-------------------------------|--------------------------------|
| Directional |           | Directional  |         | Min                                   | Max    | $I_T$ | $V_{RWM}$                     | $V_{RWM}$                    | $I_{PP}$                      | $I_{PP}$                       |
| Uni         | Bi        | Uni          | Bi      | (V)                                   | (V)    | (mA)  | ( $\mu A$ )                   | (V)                          | (A)                           | (V)                            |
| SMAJ90A     | SMAJ90CA  | AJ90A        | AJ90CA  | 100.00                                | 111.00 | 1.0   | 5                             | 90.0                         | 2.74                          | 146.0                          |
| SMAJ100A    | SMAJ100CA | AJ100A       | AJ100CA | 111.00                                | 123.00 | 1.0   | 5                             | 100.0                        | 2.47                          | 162.0                          |
| SMAJ110A    | SMAJ110CA | AJ110A       | AJ110CA | 122.00                                | 135.00 | 1.0   | 5                             | 110.0                        | 2.26                          | 177.0                          |
| SMAJ120A    | SMAJ120CA | AJ120A       | AJ120CA | 133.00                                | 147.00 | 1.0   | 5                             | 120.0                        | 2.07                          | 193.0                          |
| SMAJ130A    | SMAJ130CA | AJ130A       | AJ130CA | 144.00                                | 159.00 | 1.0   | 5                             | 130.0                        | 1.91                          | 209.0                          |
| SMAJ140A    | SMAJ140CA | AJ140A       | AJ140CA | 155.00                                | 171.00 | 1.0   | 5                             | 140.0                        | 1.76                          | 227.0                          |
| SMAJ150A    | SMAJ150CA | AJ150A       | AJ150CA | 167.00                                | 185.00 | 1.0   | 5                             | 150.0                        | 1.65                          | 243.0                          |
| SMAJ160A    | SMAJ160CA | AJ160A       | AJ160CA | 178.00                                | 197.00 | 1.0   | 5                             | 160.0                        | 1.54                          | 259.0                          |
| SMAJ170A    | SMAJ170CA | AJ170A       | AJ170CA | 189.00                                | 209.00 | 1.0   | 5                             | 170.0                        | 1.45                          | 275.0                          |
| SMAJ180A    | SMAJ180CA | AJ180A       | AJ180CA | 200.00                                | 220.00 | 1.0   | 5                             | 180.0                        | 1.37                          | 292.0                          |
| SMAJ190A    | SMAJ190CA | AJ190A       | AJ190CA | 211.00                                | 232.00 | 1.0   | 5                             | 190.0                        | 1.30                          | 308.0                          |
| SMAJ200A    | SMAJ200CA | AJ200A       | AJ200CA | 224.00                                | 247.00 | 1.0   | 5                             | 200.0                        | 1.23                          | 324.0                          |
| SMAJ220A    | SMAJ220CA | AJ220A       | AJ220CA | 246.00                                | 272.00 | 1.0   | 5                             | 220.0                        | 1.12                          | 356.0                          |
| SMAJ250A    | SMAJ250CA | AJ250A       | AJ250CA | 279.00                                | 309.00 | 1.0   | 5                             | 250.0                        | 0.99                          | 405.0                          |
| SMAJ300A    | SMAJ300CA | AJ300A       | AJ300CA | 335.00                                | 371.00 | 1.0   | 5                             | 300.0                        | 0.82                          | 486.0                          |
| SMAJ350A    | SMAJ350CA | AJ350A       | AJ350CA | 391.00                                | 432.00 | 1.0   | 5                             | 350.0                        | 0.71                          | 567.0                          |
| SMAJ400A    | SMAJ400CA | AJ400A       | AJ400CA | 447.00                                | 494.00 | 1.0   | 5                             | 400.0                        | 0.62                          | 648.0                          |
| SMAJ440A    | SMAJ440CA | AJ440A       | AJ440CA | 492.00                                | 543.00 | 1.0   | 5                             | 440.0                        | 0.56                          | 713.0                          |

Note:

1. Suffix 'A ' denotes 5% tolerance device.
2. Add suffix ' CA ' after part number to specify Bi-directional devices.
3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .

### Rating and Characteristics Curvers

Fig. 1 - Pulse Derating Curve

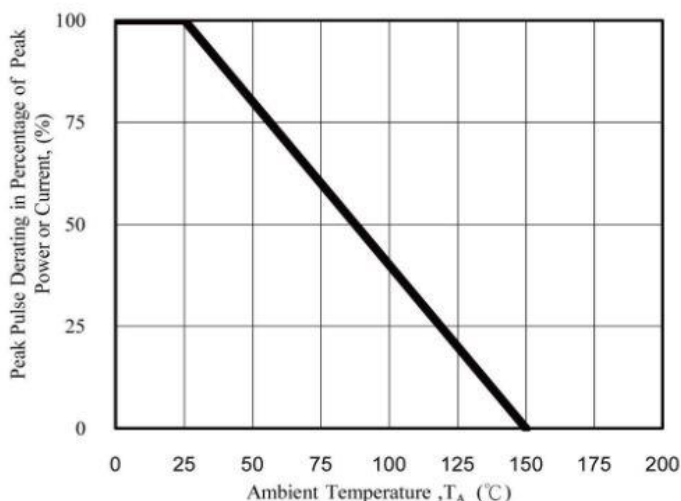


Fig. 2 - Maximum Non-Repetitive Surge Current

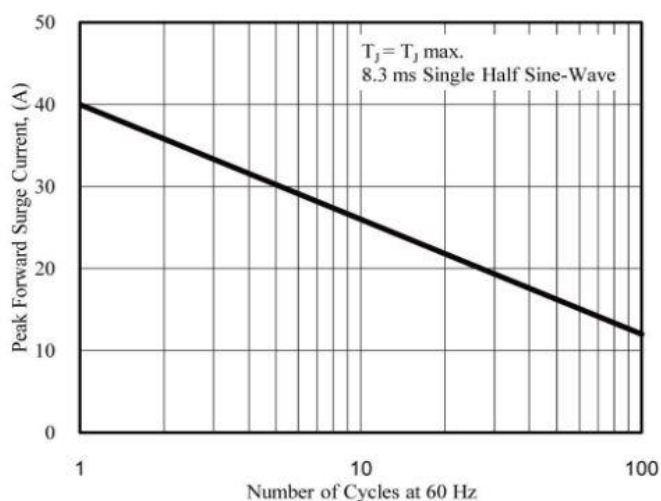


Fig. 3 - Steady State Power Derating Curve

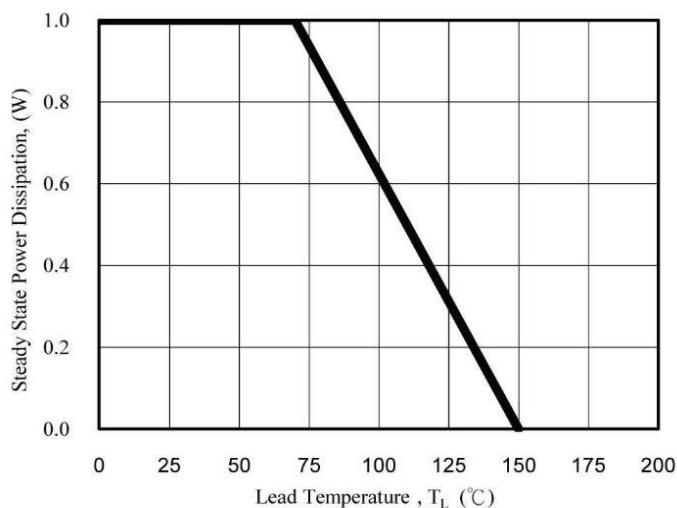


Fig. 4 - Peak Pulse Power Rating Curve

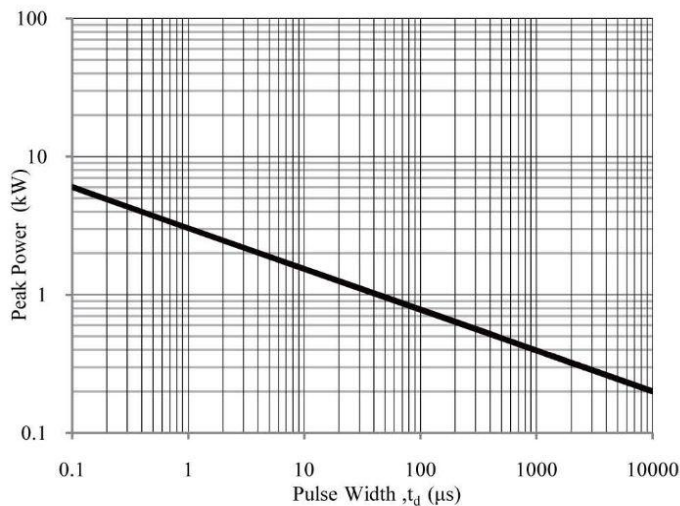


Fig. 5 - Pulse Waveform

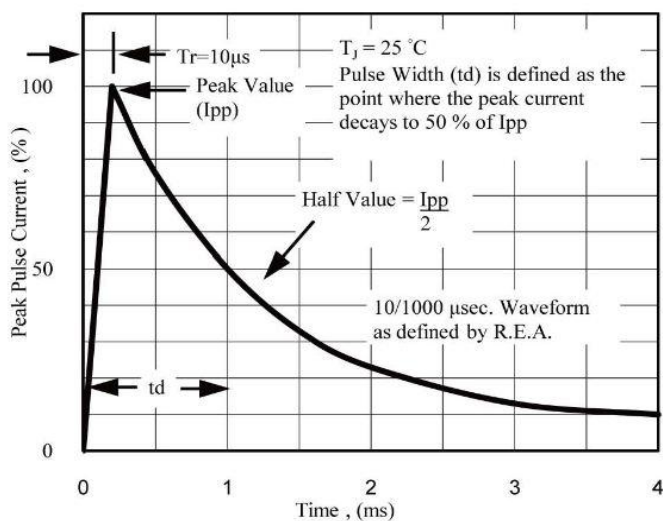
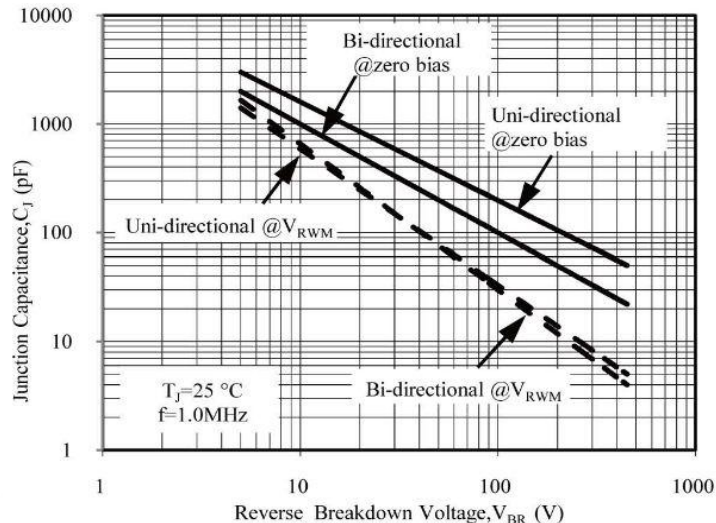
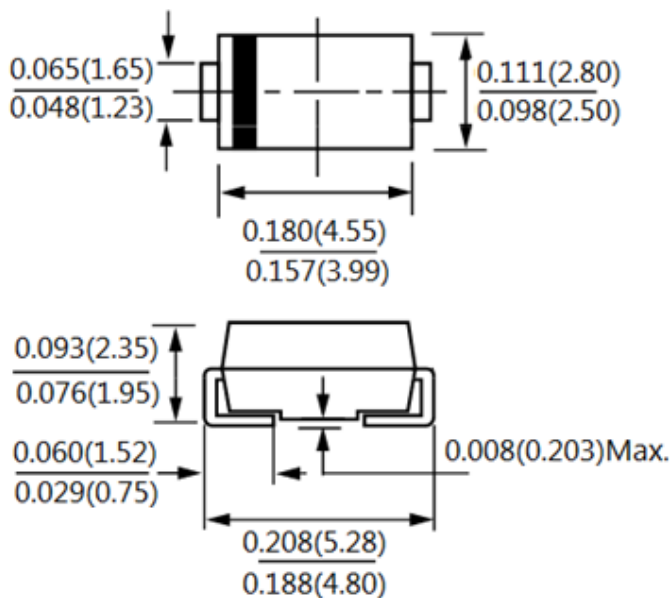


Fig. 6 - Typical junction Capacitance



### Package Outline Dimensions

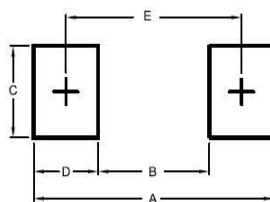


### DO-214AC(SMA)

Dimensions in inches and (millimeters)

### Suggested Pad Layout

| Outline Dimension | SMA (DO-214AC) |
|-------------------|----------------|
| A                 | 5.28           |
| B                 | 1.88           |
| C                 | 1.68           |
| D                 | 1.52           |
| E                 | -              |



### Tap & Reel Specification

| Item                   | Symbol | Dimension   |
|------------------------|--------|-------------|
|                        |        | Unit (mm)   |
| Carrier width          | A      | 2.79±0.10   |
| Carrier length         | B      | 5.33±0.10   |
| Carrier depth          | C      | 4.5(max)    |
| Sprocket hole          | d      | 1.55+0.1/-0 |
| Reel outside diameter  | D      | 330±2.0     |
| Feed hole diameter     | D0     | 13.5±1      |
| Reel inner diameter    | D1     | 50 (min.)   |
| Sprocket hole position | E      | 1.75±0.1    |
| Punch hole position    | F      | 5.5±0.05    |
| Sprocket hole pitch    | P      | 4.0±0.1     |
| Sprocket hole pitch    | P0     | 4.0±0.1     |
| Embossment center      | P1     | 2.0±0.05    |
| Tape width             | W      | 12.0±0.3    |
| Reel width             | W2     | 18.4max)    |
| Reel width             | W1     | 12.4+2 /-0  |

