

Description

The 5.0SMDJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Mechanical Characteristics

- ◆ Case: DO-214AB Molded plastic
- ◆ Terminal: Solder plated
- ◆ Polarity: Color band denotes cathode except Bipolar
- ◆ Standard Packaging: 12mm tape(EIA STD RS-481)
- ◆ Weight: 0.021grams

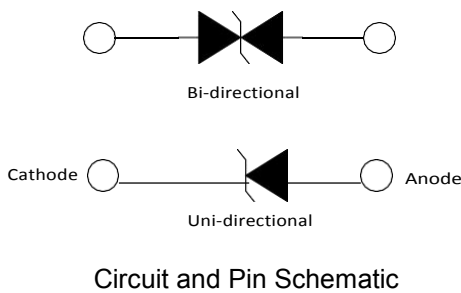
Features

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Glass passivated junction
- ◆ Excellent clamping capability
- ◆ Fast response time: typically less than 1.0ps from 0V to V(BR) for unidirectional types
- ◆ Typical IR less than 5uA above 20V
- ◆ High temperature soldering: 250°C/ 10 seconds at terminals
- ◆ Flammability 94V-0
- ◆ 5000W peak pulse power capability with a 10/1000us waveform

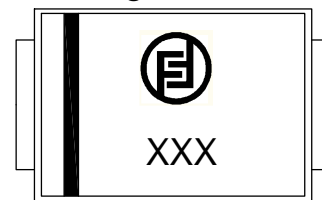
Applications

TVS devices are ideal for the protection of I/O interfaces, Vcc bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

Dimensions and Pin Configuration



Marking Information



XX = Device Marking Code
Bar denotes Cathode
(for unidirectional only)

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

| RATING | SYMBOL | VALUE | UNITS |
|--|-----------------------------------|-------------|----------|
| Peak Pulse Power Dissipation on 10/1000µs waveform (note1) | P _{PPM} | Max 5000 | Watts |
| Peak Pulse Current of on 10/1000µs waveform (note1) | I _{PPM} | SEE TABLE 1 | Amps |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave unidirectional only (note2) | I _{FSM} | 300 | Amps |
| Maximum Instantaneous Forward Voltage at 100A for Unidirectional only(note3) | V _F | 3.0/5.0 | V |
| Operating junction and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

- Notes :
1. Non-repetitive current pulse , per Fig. 5 and derated above T_A = 25°C per Fig. 1 .
 2. Mounted on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minutes maximum
 3. V_F<3.5V for devices of V_{BR}<200V and V_F <5.0V for devices of V_{BR}>201V

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Device Marking Code | | Breakdown Voltage V_{BR} @ I_T | | | Maximum Reverse Leakage I_R @ V_{RWM} (uA) | Working Peak Reverse Voltage V_{RWM} (V) | Maximum Reverse Surge Current I_{PP} (A) | Maximum Clamping Voltage V_C @ I_{PP} (V) |
|-------------------|------------------|---------------------|------|------------------------------------|---------|------------|--|--|--|---|
| | | Uni | Bi | Min (V) | Max (V) | I_T (mA) | | | | |
| 5.0SMDJ11 | 5.0SMDJ11C | 5PDW | 5BDW | 12.20 | 14.90 | 10 | 800 | 11.0 | 248.8 | 20.1 |
| 5.0SMDJ11A | 5.0SMDJ11CA | 5PDX | 5BDX | 12.20 | 13.50 | 10 | 800 | 11.0 | 274.7 | 18.2 |
| 5.0SMDJ12 | 5.0SMDJ12C | 5PDY | 5BDY | 13.30 | 16.30 | 10 | 800 | 12.0 | 227.3 | 22.0 |
| 5.0SMDJ12A | 5.0SMDJ12CA | 5PDZ | 5BDZ | 13.30 | 14.70 | 10 | 800 | 12.0 | 251.3 | 19.9 |
| 5.0SMDJ13 | 5.0SMDJ13C | 5PED | 5BED | 14.40 | 17.60 | 10 | 500 | 13.0 | 210.1 | 23.8 |
| 5.0SMDJ13A | 5.0SMDJ13CA | 5PEE | 5BEE | 14.40 | 15.90 | 10 | 500 | 13.0 | 232.6 | 21.5 |
| 5.0SMDJ14 | 5.0SMDJ14C | 5PEF | 5BEF | 15.60 | 19.10 | 10 | 200 | 14.0 | 193.8 | 25.8 |
| 5.0SMDJ14A | 5.0SMDJ14CA | 5PEG | 5BEG | 15.60 | 17.20 | 10 | 200 | 14.0 | 215.5 | 23.2 |
| 5.0SMDJ15 | 5.0SMDJ15C | 5PEH | 5BEH | 16.70 | 20.40 | 1 | 100 | 15.0 | 185.9 | 26.9 |
| 5.0SMDJ15A | 5.0SMDJ15CA | 5PEK | 5BEK | 16.70 | 18.50 | 1 | 100 | 15.0 | 204.9 | 24.4 |
| 5.0SMDJ16 | 5.0SMDJ16C | 5PEL | 5BEL | 17.80 | 21.80 | 1 | 50 | 16.0 | 173.6 | 28.8 |
| 5.0SMDJ16A | 5.0SMDJ16CA | 5PEM | 5BEM | 17.80 | 19.70 | 1 | 50 | 16.0 | 192.3 | 26.0 |
| 5.0SMDJ17 | 5.0SMDJ17C | 5PEN | 5BEN | 18.90 | 23.10 | 1 | 20 | 17.0 | 163.9 | 30.5 |
| 5.0SMDJ17A | 5.0SMDJ17CA | 5PEP | 5BEP | 18.90 | 20.90 | 1 | 20 | 17.0 | 181.2 | 27.6 |
| 5.0SMDJ18 | 5.0SMDJ18C | 5PEQ | 5BEQ | 20.00 | 24.40 | 1 | 10 | 18.0 | 155.3 | 32.2 |
| 5.0SMDJ18A | 5.0SMDJ18CA | 5PER | 5BER | 20.00 | 22.10 | 1 | 10 | 18.0 | 171.2 | 29.2 |
| 5.0SMDJ19 | 5.0SMDJ19C | 5PES | 5BES | 21.13 | 25.76 | 1 | 10 | 19.0 | 147.0 | 34.0 |
| 5.0SMDJ19A | 5.0SMDJ19CA | 5PET | 5BET | 21.10 | 23.30 | 1 | 10 | 19.0 | 162.4 | 30.8 |
| 5.0SMDJ20 | 5.0SMDJ20C | 5PEU | 5BEU | 22.20 | 27.10 | 1 | 5 | 20.0 | 139.7 | 35.8 |
| 5.0SMDJ20A | 5.0SMDJ20CA | 5PEV | 5BEV | 22.20 | 24.50 | 1 | 5 | 20.0 | 154.3 | 32.4 |
| 5.0SMDJ22 | 5.0SMDJ22C | 5PEW | 5BEW | 24.40 | 29.80 | 1 | 5 | 22.0 | 126.9 | 39.4 |
| 5.0SMDJ22A | 5.0SMDJ22CA | 5PEX | 5BEX | 24.40 | 26.90 | 1 | 5 | 22.0 | 140.8 | 35.5 |
| 5.0SMDJ24 | 5.0SMDJ24C | 5PEY | 5BEY | 26.70 | 32.60 | 1 | 5 | 24.0 | 116.3 | 43.0 |
| 5.0SMDJ24A | 5.0SMDJ24CA | 5PEZ | 5BEZ | 26.70 | 29.50 | 1 | 5 | 24.0 | 128.5 | 38.9 |
| 5.0SMDJ26 | 5.0SMDJ26C | 5PFD | 5BFD | 28.90 | 35.30 | 1 | 5 | 26.0 | 107.3 | 46.6 |
| 5.0SMDJ26A | 5.0SMDJ26CA | 5PFE | 5BFE | 28.90 | 31.90 | 1 | 5 | 26.0 | 118.8 | 42.1 |
| 5.0SMDJ28 | 5.0SMDJ28C | 5PFF | 5BFF | 31.10 | 38.00 | 1 | 5 | 28.0 | 100.0 | 50.0 |
| 5.0SMDJ28A | 5.0SMDJ28CA | 5PFG | 5BFG | 31.10 | 34.40 | 1 | 5 | 28.0 | 110.1 | 45.4 |
| 5.0SMDJ30 | 5.0SMDJ30C | 5PFH | 5BFH | 33.30 | 40.70 | 1 | 5 | 30.0 | 93.5 | 53.5 |
| 5.0SMDJ30A | 5.0SMDJ30CA | 5PFK | 5BFK | 33.30 | 36.80 | 1 | 5 | 30.0 | 103.3 | 48.4 |
| 5.0SMDJ33 | 5.0SMDJ33C | 5PFL | 5BFL | 36.70 | 44.90 | 1 | 5 | 33.0 | 84.7 | 59.0 |
| 5.0SMDJ33A | 5.0SMDJ33CA | 5PFM | 5BFM | 36.70 | 40.60 | 1 | 5 | 33.0 | 93.8 | 53.3 |
| 5.0SMDJ36 | 5.0SMDJ36C | 5PFN | 5BFN | 40.00 | 48.90 | 1 | 5 | 36.0 | 77.8 | 64.3 |
| 5.0SMDJ36A | 5.0SMDJ36CA | 5PFP | 5BFP | 40.00 | 44.20 | 1 | 5 | 36.0 | 86.1 | 58.1 |
| 5.0SMDJ40 | 5.0SMDJ40C | 5PFQ | 5BFQ | 44.40 | 54.30 | 1 | 5 | 40.0 | 70.0 | 71.4 |
| 5.0SMDJ40A | 5.0SMDJ40CA | 5PFR | 5BFR | 44.40 | 49.10 | 1 | 5 | 40.0 | 77.5 | 64.5 |
| 5.0SMDJ43 | 5.0SMDJ43C | 5PFS | 5BFS | 47.80 | 58.40 | 1 | 5 | 43.0 | 65.2 | 76.7 |
| 5.0SMDJ43A | 5.0SMDJ43CA | 5PFT | 5BFT | 47.80 | 52.80 | 1 | 5 | 43.0 | 72.0 | 69.4 |
| 5.0SMDJ45 | 5.0SMDJ45C | 5PFU | 5BFU | 50.00 | 61.10 | 1 | 5 | 45.0 | 62.3 | 80.3 |
| 5.0SMDJ45A | 5.0SMDJ45CA | 5PFV | 5BFV | 50.00 | 55.30 | 1 | 5 | 45.0 | 68.8 | 72.7 |
| 5.0SMDJ48 | 5.0SMDJ48C | 5PFW | 5BFW | 53.30 | 65.10 | 1 | 5 | 48.0 | 58.5 | 85.5 |
| 5.0SMDJ48A | 5.0SMDJ48CA | 5PFX | 5BFX | 53.30 | 58.90 | 1 | 5 | 48.0 | 64.6 | 77.4 |
| 5.0SMDJ51 | 5.0SMDJ51C | 5PFY | 5BFY | 56.70 | 69.30 | 1 | 5 | 51.0 | 54.9 | 91.1 |
| 5.0SMDJ51A | 5.0SMDJ51CA | 5PFZ | 5BFZ | 56.70 | 62.70 | 1 | 5 | 51.0 | 60.7 | 82.4 |
| 5.0SMDJ54 | 5.0SMDJ54C | 5PGD | 5BGD | 60.00 | 73.30 | 1 | 5 | 54.0 | 51.9 | 96.3 |
| 5.0SMDJ54A | 5.0SMDJ54CA | 5PGE | 5BGE | 60.00 | 66.30 | 1 | 5 | 54.0 | 57.4 | 87.1 |
| 5.0SMDJ58 | 5.0SMDJ58C | 5PGF | 5BGF | 64.40 | 78.70 | 1 | 5 | 58.0 | 48.5 | 103.0 |
| 5.0SMDJ58A | 5.0SMDJ58CA | 5PGG | 5BGG | 64.40 | 71.20 | 1 | 5 | 58.0 | 53.4 | 93.6 |
| 5.0SMDJ60 | 5.0SMDJ60C | 5PGH | 5BGH | 66.70 | 81.50 | 1 | 5 | 60.0 | 46.7 | 107.0 |
| 5.0SMDJ60A | 5.0SMDJ60CA | 5PGK | 5BGK | 66.70 | 73.70 | 1 | 5 | 60.0 | 51.7 | 96.8 |
| 5.0SMDJ64 | 5.0SMDJ64C | 5PGL | 5BGL | 71.10 | 86.90 | 1 | 5 | 64.0 | 43.9 | 114.0 |
| 5.0SMDJ64A | 5.0SMDJ64CA | 5PGM | 5BGM | 71.10 | 78.60 | 1 | 5 | 64.0 | 48.5 | 103.0 |

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Device Marking Code | | Breakdown Voltage V_{BR} @ I_r | | | Maximum Reverse Leakage I_r @ V_{RWM} (μA) | Working Peak Reverse Voltage V_{RWM} (V) | Maximum Reverse Surge Current I_{PP} (A) | Maximum Clamping Voltage V_c @ I_{PP} (V) |
|-------------------|------------------|---------------------|------|------------------------------------|---------|------------|---|--|--|---|
| | | Uni | Bi | Min (V) | Max (V) | I_r (mA) | | | | |
| 5.0SMDJ70 | 5.0SMDJ70C | 5PGN | 5BGN | 77.80 | 95.10 | 1 | 5 | 70.0 | 40.0 | 125.0 |
| 5.0SMDJ70A | 5.0SMDJ70CA | 5PGP | 5BGP | 77.80 | 86.00 | 1 | 5 | 70.0 | 44.2 | 113.0 |
| 5.0SMDJ75 | 5.0SMDJ75C | 5PGQ | 5BGQ | 83.30 | 102.0 | 1 | 5 | 75.0 | 37.3 | 134.0 |
| 5.0SMDJ75A | 5.0SMDJ75CA | 5PGR | 5BGR | 83.30 | 92.10 | 1 | 5 | 75.0 | 41.3 | 121.0 |
| 5.0SMDJ78 | 5.0SMDJ78C | 5PGS | 5BGS | 86.70 | 106.0 | 1 | 5 | 78.0 | 36.0 | 139.0 |
| 5.0SMDJ78A | 5.0SMDJ78CA | 5PGT | 5BGT | 86.70 | 95.80 | 1 | 5 | 78.0 | 39.7 | 126.0 |
| 5.0SMDJ80 | 5.0SMDJ80C | 5PGA | 5BGA | 88.96 | 108.8 | 1 | 5 | 80.0 | 34.9 | 143.2 |
| 5.0SMDJ80A | 5.0SMDJ80CA | 5PGB | 5BGB | 88.80 | 97.60 | 1 | 5 | 80.0 | 38.6 | 129.6 |
| 5.0SMDJ85 | 5.0SMDJ85C | 5PGU | 5BGU | 94.40 | 115.0 | 1 | 5 | 85.0 | 33.1 | 151.0 |
| 5.0SMDJ85A | 5.0SMDJ85CA | 5PGV | 5BGV | 94.40 | 104.0 | 1 | 5 | 85.0 | 36.5 | 137.0 |
| 5.0SMDJ90 | 5.0SMDJ90C | 5PGW | 5BGW | 100.0 | 122.0 | 1 | 5 | 90.0 | 31.3 | 160.0 |
| 5.0SMDJ90A | 5.0SMDJ90CA | 5PGX | 5BGX | 100.0 | 111.0 | 1 | 5 | 90.0 | 34.2 | 146.0 |
| 5.0SMDJ100 | 5.0SMDJ100C | 5PGY | 5BGY | 111.0 | 136.0 | 1 | 5 | 100.0 | 27.9 | 179.0 |
| 5.0SMDJ100A | 5.0SMDJ100CA | 5PGZ | 5BGZ | 111.0 | 123.0 | 1 | 5 | 100.0 | 30.9 | 162.0 |
| 5.0SMDJ110 | 5.0SMDJ110C | 5PHD | 5BHD | 122.0 | 149.0 | 1 | 5 | 110.0 | 25.5 | 196.0 |
| 5.0SMDJ110A | 5.0SMDJ110CA | 5PHE | 5BHE | 122.0 | 135.0 | 1 | 5 | 110.0 | 28.2 | 177.0 |
| 5.0SMDJ120 | 5.0SMDJ120C | 5PHF | 5BHF | 133.0 | 163.0 | 1 | 5 | 120.0 | 23.4 | 214.0 |
| 5.0SMDJ120A | 5.0SMDJ120CA | 5PHG | 5BHG | 133.0 | 147.0 | 1 | 5 | 120.0 | 25.9 | 193.0 |
| 5.0SMDJ130 | 5.0SMDJ130C | 5PHH | 5BHH | 144.0 | 176.0 | 1 | 5 | 130.0 | 21.6 | 231.0 |
| 5.0SMDJ130A | 5.0SMDJ130CA | 5PHK | 5BHK | 144.0 | 159.0 | 1 | 5 | 130.0 | 23.9 | 209.0 |
| 5.0SMDJ140 | 5.0SMDJ140C | 5PHA | 5BHA | 155.7 | 190.4 | 1 | 5 | 140.0 | 20.0 | 250.6 |
| 5.0SMDJ140A | 5.0SMDJ140CA | 5PHB | 5BHB | 155.0 | 171.0 | 1 | 5 | 140.0 | 22.0 | 226.8 |
| 5.0SMDJ150 | 5.0SMDJ150C | 5PHL | 5BHL | 167.0 | 204.0 | 1 | 5 | 150.0 | 18.7 | 268.0 |
| 5.0SMDJ150A | 5.0SMDJ150CA | 5PHM | 5BHM | 167.0 | 185.0 | 1 | 5 | 150.0 | 20.6 | 243.0 |
| 5.0SMDJ160 | 5.0SMDJ160C | 5PHN | 5BHN | 178.0 | 218.0 | 1 | 5 | 160.0 | 17.4 | 287.0 |
| 5.0SMDJ160A | 5.0SMDJ160CA | 5PHP | 5BHP | 178.0 | 197.0 | 1 | 5 | 160.0 | 19.3 | 259.0 |
| 5.0SMDJ170 | 5.0SMDJ170C | 5PHQ | 5BHQ | 189.0 | 231.0 | 1 | 5 | 170.0 | 16.4 | 304.0 |
| 5.0SMDJ170A | 5.0SMDJ170CA | 5PHR | 5BHR | 189.0 | 209.0 | 1 | 5 | 170.0 | 18.2 | 275.0 |
| 5.0SMDJ180 | 5.0SMDJ180C | 5PHS | 5BHS | 200.2 | 244.8 | 1 | 5 | 180.0 | 15.5 | 322.2 |
| 5.0SMDJ180A | 5.0SMDJ180CA | 5PHT | 5BHT | 200.0 | 220.0 | 1 | 5 | 180.0 | 17.1 | 291.6 |
| 5.0SMDJ190 | 5.0SMDJ190C | 5PHU | 5BHU | 211.3 | 258.4 | 1 | 5 | 190.0 | 14.7 | 340.1 |
| 5.0SMDJ190A | 5.0SMDJ190CA | 5PHV | 5BHV | 211.0 | 232.0 | 1 | 5 | 190.0 | 16.2 | 307.8 |
| 5.0SMDJ200A | 5.0SMDJ200CA | 5PHW | 5BHW | 224.0 | 247.0 | 1 | 5 | 200.0 | 15.4 | 324.0 |
| 5.0SMDJ220A | 5.0SMDJ220CA | 5PHX | 5BHX | 246.0 | 272.0 | 1 | 5 | 220.0 | 14.0 | 356.0 |
| 5.0SMDJ250A | 5.0SMDJ250CA | 5PHZ | 5BHZ | 279.0 | 309.0 | 1 | 5 | 250.0 | 12.3 | 405.0 |
| 5.0SMDJ300A | 5.0SMDJ300CA | 5PJE | 5BJE | 335.0 | 371.0 | 1 | 5 | 300.0 | 10.3 | 486.0 |
| 5.0SMDJ350A | 5.0SMDJ350CA | 5PJG | 5BJG | 391.0 | 432.0 | 1 | 5 | 350.0 | 8.8 | 567.0 |
| 5.0SMDJ400A | 5.0SMDJ400CA | 5PKJ | 5BJK | 447.0 | 494.0 | 1 | 5 | 400.0 | 7.7 | 648.0 |
| 5.0SMDJ440A | 5.0SMDJ440CA | 5PJM | 5BJM | 492.0 | 543.0 | 1 | 5 | 440.0 | 7.0 | 713.0 |

Note:

1. Suffix 'A' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having V_R of 20 volts and under, the I_R limit is double

Typical Performance Characteristics (TA=25°C unless otherwise Specified)

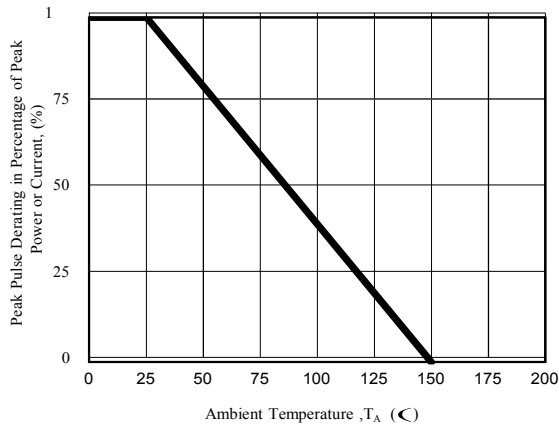


Fig. 1 - Pulse Derating Curve

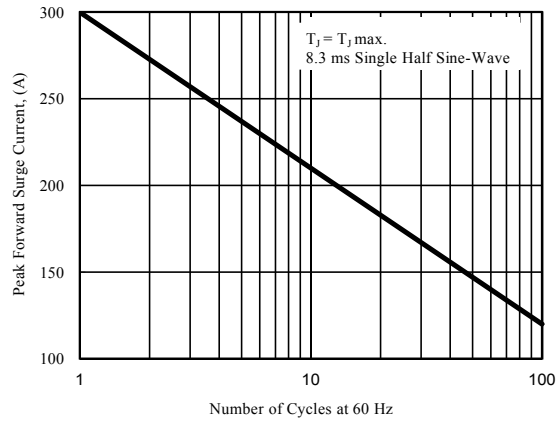


Fig. 2 - Maximum Non-Repetitive Surge Current

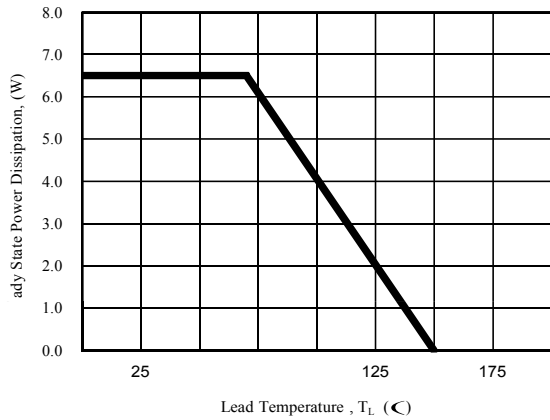


Fig. 3 - Steady State Power Derating Curve

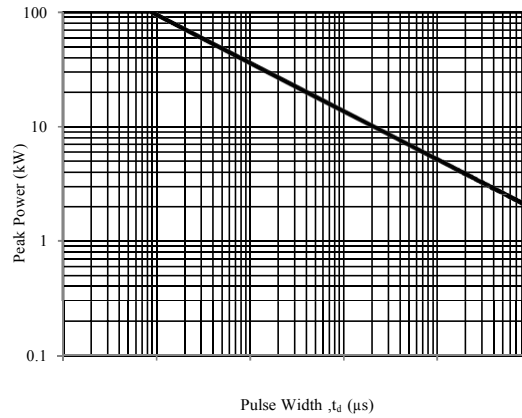


Fig. 4 - Peak Pulse Power Rating Curve

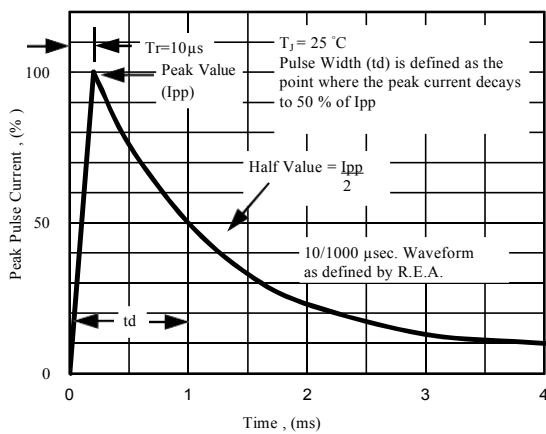


Fig. 5 - Pulse Waveform

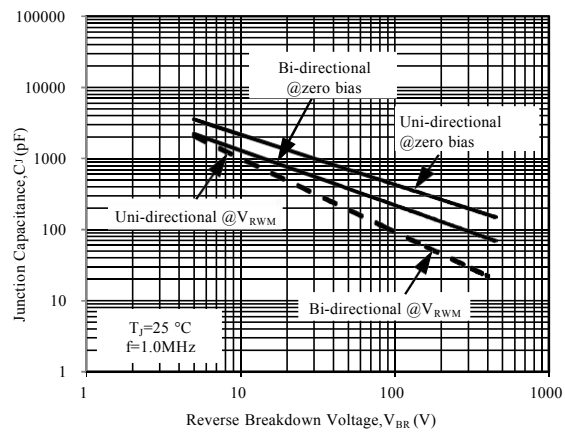
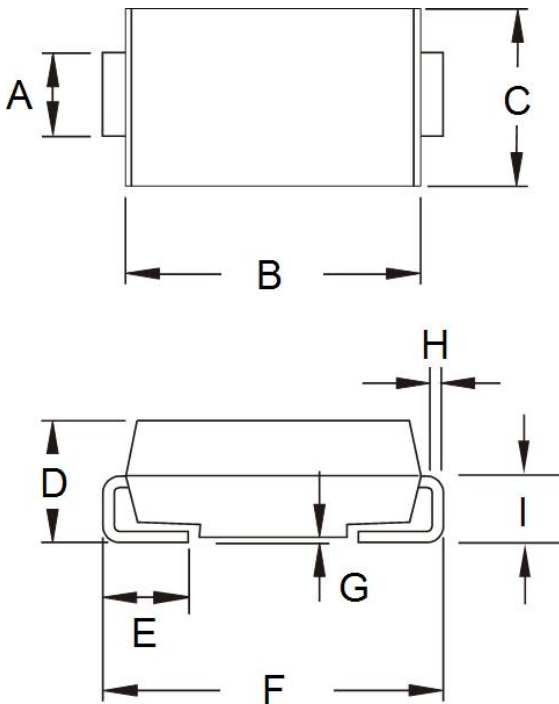


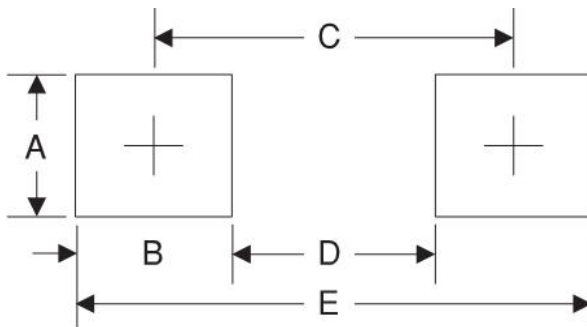
Fig. 6 - Typical Junction Capacitance

DO-214AB Package Outline Drawing



| 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 |
| I | 1.26 | 1.56 | 0.050 | 0.061 |

Suggested Land Pattern



| Symbol | Unit(mm) |
|--------|----------|
| A | 3.3 |
| B | 2.5 |
| C | 6.8 |
| D | 4.4 |
| E | 9.3 |

Contact Information

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