# SMBJ5.0A(CA) - SMBJ440A(CA)

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR DIODE

**VOLTAGE RANGE: 5.0 - 440 V**
**POWER: 600Watts**



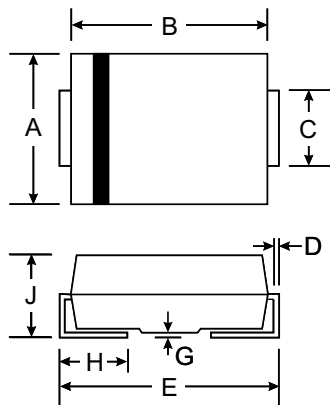
### Features

- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- Plastic Material: UL Flammability Classification Rating 94V-0

### Mechanical Data

- Case: SMB/DO-214AA, Molded Plastic
- Terminals: Solder Plated, Solderable per MIL-STD-750, Method 2026
- Polarity: Cathode Band or Cathode Notch
- Marking: Type Number
- Weight: 0.093 grams (approx.)

RoHS COMPLIANT




| SMB(DO-214AA) | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 3.30 | 3.94 |
| **B** | 4.06 | 4.70 |
| **C** | 1.91 | 2.21 |
| **D** | 0.15 | 0.31 |
| **E** | 5.00 | 5.59 |
| **G** | 0.10 | 0.20 |
| **H** | 0.76 | 1.52 |
| **J** | 2.00 | 2.62 |
| **All Dimensions in mm** | | |

### Maximum Ratings @ $T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power Dissipation (Non repetitive current pulse derated above $T_A$ = 25°C) (Note 1) | $P_{PK}$ | 600 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Notes 1, 2, & 3) | $I_{FSM}$ | 100 | A |
| Instantaneous Forward Voltage @ $I_{PP}$ = 35A (Notes 1, 2, & 3) $V_{BR}$<100V<br>$V_{BR}$ ≥100V | $V_F$ | 3.5<br>5.0 | V<br>V |
| Operating and Storage Temperature Range | $T_j$, $T_{STG}$ | -55 to +150 | °C |

Notes: 1. Valid provided that terminals are kept at ambient temperature.
2. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
3. Unidirectional units only.

| TYPE | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @$I_T$ | Breakdown Voltage Max. @ $I_T$ | Test Current | Maximum Clamping Voltage @$I_{PP}$ | Peak Pulse Current | Reverse Leakage @$V_{RWM}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (Uni) | (Bi) | (Uni) | (Bi) | $V_{RWM}$(V) | $V_{BR\ MIN}$(V) | $V_{BR\ MAX}$(V) | $I_T$ (mA) | $V_C$(V) | $I_{PP}$(A) | $I_R$(uA) |
| SMBJ5.0 | SMBJ5.0C | KD | AD | 5.0 | 6.40 | 7.55 | 10 | 9.6 | 62.5 | 800.0 |
| SMBJ5.0A | SMBJ5.0CA | KE | AE | 5.0 | 6.40 | 7.25 | 10 | 9.2 | 65.2 | 800.0 |
| SMBJ6.0 | SMBJ6.0C | KF | AF | 6.0 | 6.67 | 8.45 | 10 | 11.4 | 52.6 | 800.0 |
| SMBJ6.0A | SMBJ6.0CA | KG | AG | 6.0 | 6.67 | 7.67 | 10 | 10.3 | 58.3 | 800.0 |
| SMBJ6.5 | SMBJ6.5C | KH | AH | 6.5 | 7.22 | 9.14 | 10 | 12.3 | 48.8 | 500.0 |
| SMBJ6.5A | SMBJ6.5CA | KK | AK | 6.5 | 7.22 | 8.30 | 10 | 11.2 | 53.6 | 500.0 |
| SMBJ7.0 | SMBJ7.0C | KL | AL | 7.0 | 7.78 | 9.86 | 10 | 13.3 | 45.1 | 200.0 |
| SMBJ7.0A | SMBJ7.0CA | KM | AM | 7.0 | 7.78 | 8.95 | 10 | 12.0 | 50.0 | 200.0 |
| SMBJ7.5 | SMBJ7.5C | KN | AN | 7.5 | 8.33 | 10.67 | 1.0 | 14.3 | 42.0 | 100.0 |
| SMBJ7.5A | SMBJ7.5CA | KP | AP | 7.5 | 8.33 | 9.58 | 1.0 | 12.9 | 46.5 | 100.0 |
| SMBJ8.0 | SMBJ8.0C | KQ | AQ | 8.0 | 8.89 | 11.3 | 1.0 | 15.0 | 40.0 | 50.0 |
| SMBJ8.0A | SMBJ8.0CA | KR | AR | 8.0 | 8.89 | 10.23 | 1.0 | 13.6 | 44.1 | 50.0 |
| SMBJ8.5 | SMBJ8.5C | KS | AS | 8.5 | 9.44 | 11.92 | 1.0 | 15.9 | 37.7 | 20.0 |
| SMBJ8.5A | SMBJ8.5CA | KT | AT | 8.5 | 9.44 | 10.82 | 1.0 | 14.4 | 41.7 | 20.0 |
| SMBJ9.0 | SMBJ9.0C | KU | AU | 9.0 | 10.0 | 12.6 | 1.0 | 16.9 | 35.5 | 10.0 |
| SMBJ9.0A | SMBJ9.0CA | KV | AV | 9.0 | 10.0 | 11.5 | 1.0 | 15.4 | 39.0 | 10.0 |
| SMBJ10 | SMBJ10C | KW | AW | 10 | 11.1 | 14.1 | 1.0 | 18.8 | 31.9 | 5.0 |
| SMBJ10A | SMBJ10CA | KX | AX | 10 | 11.1 | 12.8 | 1.0 | 17.0 | 35.3 | 5.0 |
| SMBJ11 | SMBJ11C | KY | AY | 11 | 12.2 | 15.4 | 1.0 | 20.1 | 29.9 | 5.0 |
| SMBJ11A | SMBJ11CA | KZ | AZ | 11 | 12.2 | 14.0 | 1.0 | 18.2 | 33.0 | 5.0 |
| SMBJ12 | SMBJ12C | LD | BD | 12 | 13.3 | 16.9 | 1.0 | 22.0 | 27.3 | 5.0 |
| SMBJ12A | SMBJ12CA | LE | BE | 12 | 13.3 | 15.3 | 1.0 | 19.9 | 30.2 | 5.0 |
| SMBJ13 | SMBJ13C | LF | BF | 13 | 14.4 | 18.2 | 1.0 | 23.8 | 25.2 | 5.0 |
| SMBJ13A | SMBJ13CA | LG | BG | 13 | 14.4 | 16.5 | 1.0 | 21.5 | 27.9 | 5.0 |
| SMBJ14 | SMBJ14C | LH | BH | 14 | 15.6 | 19.8 | 1.0 | 25.8 | 23.3 | 5.0 |
| SMBJ14A | SMBJ14CA | LK | BK | 14 | 15.6 | 17.9 | 1.0 | 23.2 | 25.9 | 5.0 |
| SMBJ15 | SMBJ15C | LL | BL | 15 | 16.7 | 21.1 | 1.0 | 26.9 | 22.3 | 5.0 |
| SMBJ15A | SMBJ15CA | LM | BM | 15 | 16.7 | 19.2 | 1.0 | 24.4 | 24.6 | 5.0 |
| SMBJ16 | SMBJ16C | LN | BN | 16 | 17.8 | 22.6 | 1.0 | 28.8 | 20.8 | 5.0 |
| SMBJ16A | SMBJ16CA | LP | BP | 16 | 17.8 | 20.5 | 1.0 | 26.0 | 23.1 | 5.0 |
| SMBJ17 | SMBJ17C | LQ | BQ | 17 | 18.9 | 23.9 | 1.0 | 30.5 | 19.7 | 5.0 |
| SMBJ17A | SMBJ17CA | LR | BR | 17 | 18.9 | 21.7 | 1.0 | 27.6 | 21.7 | 5.0 |
| SMBJ18 | SMBJ18C | LS | BS | 18 | 20.0 | 25.3 | 1.0 | 32.2 | 18.6 | 5.0 |
| SMBJ18A | SMBJ18CA | LT | BT | 18 | 20.0 | 23.3 | 1.0 | 29.2 | 20.5 | 5.0 |
| SMBJ20 | SMBJ20C | LU | BU | 20 | 22.2 | 28.1 | 1.0 | 35.8 | 16.8 | 5.0 |
| SMBJ20A | SMBJ20CA | LV | BV | 20 | 22.2 | 25.5 | 1.0 | 32.4 | 18.5 | 5.0 |
| SMBJ22 | SMBJ22C | LW | BW | 22 | 24.4 | 30.9 | 1.0 | 39.4 | 15.2 | 5.0 |
| SMBJ22A | SMBJ22CA | LX | BX | 22 | 24.4 | 28.0 | 1.0 | 35.5 | 16.9 | 5.0 |

**Note:**

( 1 ) $V_{BR}$ measured after $I_T$ applied for 300 μs., $I_T$ = square wave pulse or equivalent.

( 2 ) Surge Current Waveform per Figure 5 and Derate per Figure 1

( 3 ) A Transient suppressor is normally selected according to the reverse " Stand-off Voltage " ($V_{WM}$) which should be equal to or greater then the D.C. or continuous peak operating voltage level.

| TYPE | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @$I_T$ | Breakdown Voltage Max. @ $I_T$ | Test Current | Maximum Clamping Voltage @$I_{PP}$ | Peak Pulse Current | Reverse Leakage @$V_{RWM}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (Uni) | (Bi) | (Uni) | (Bi) | $V_{RWM}$(V) | $V_{BR\ MIN}$(V) | $V_{BR\ MAX}$(V) | $I_T$ (mA) | $V_C$(V) | $I_{PP}$(A) | $I_R$(uA) |
| SMBJ24 | SMBJ24C | LY | BY | 24 | 26.7 | 33.8 | 1.0 | 43.0 | 14.0 | 5.0 |
| SMBJ24A | SMBJ24CA | LZ | BZ | 24 | 26.7 | 30.7 | 1.0 | 38.9 | 15.4 | 5.0 |
| SMBJ26 | SMBJ26C | MD | CD | 26 | 28.9 | 36.6 | 1.0 | 46.6 | 12.9 | 5.0 |
| SMBJ26A | SMBJ26CA | ME | CE | 26 | 28.9 | 33.2 | 1.0 | 42.1 | 14.3 | 5.0 |
| SMBJ28 | SMBJ28C | MF | CF | 28 | 31.1 | 39.4 | 1.0 | 50.0 | 12.0 | 5.0 |
| SMBJ28A | SMBJ28CA | MG | CG | 28 | 31.1 | 35.8 | 1.0 | 45.4 | 13.2 | 5.0 |
| SMBJ30 | SMBJ30C | MH | CH | 30 | 33.3 | 42.2 | 1.0 | 53.5 | 11.2 | 5.0 |
| SMBJ30A | SMBJ30CA | MK | CK | 30 | 33.3 | 38.3 | 1.0 | 48.4 | 12.4 | 5.0 |
| SMBJ33 | SMBJ33C | ML | CL | 33 | 36.7 | 46.5 | 1.0 | 59.0 | 10.2 | 5.0 |
| SMBJ33A | SMBJ33CA | MM | CM | 33 | 36.7 | 42.2 | 1.0 | 53.3 | 11.3 | 5.0 |
| SMBJ36 | SMBJ36C | MN | CN | 36 | 40.0 | 50.7 | 1.0 | 64.3 | 9.3 | 5.0 |
| SMBJ36A | SMBJ36CA | MP | CP | 36 | 40.0 | 46.0 | 1.0 | 58.1 | 10.3 | 5.0 |
| SMBJ40 | SMBJ40C | MQ | CQ | 40 | 44.4 | 56.3 | 1.0 | 71.4 | 8.4 | 5.0 |
| SMBJ40A | SMBJ40CA | MR | CR | 40 | 44.4 | 51.1 | 1.0 | 64.5 | 9.3 | 5.0 |
| SMBJ43 | SMBJ43C | MS | CS | 43 | 47.8 | 60.5 | 1.0 | 76.7 | 7.8 | 5.0 |
| SMBJ43A | SMBJ43CA | MT | CT | 43 | 47.8 | 54.9 | 1.0 | 69.4 | 8.6 | 5.0 |
| SMBJ45 | SMBJ45C | MU | CU | 45 | 50.0 | 63.3 | 1.0 | 80.3 | 7.5 | 5.0 |
| SMBJ45A | SMBJ45CA | MV | CV | 45 | 50.0 | 57.5 | 1.0 | 72.7 | 8.3 | 5.0 |
| SMBJ48 | SMBJ48C | MW | CW | 48 | 53.3 | 67.5 | 1.0 | 85.5 | 7.0 | 5.0 |
| SMBJ48A | SMBJ48CA | MX | CX | 48 | 53.3 | 61.3 | 1.0 | 77.4 | 7.8 | 5.0 |
| SMBJ51 | SMBJ51C | MY | CY | 51 | 56.7 | 71.8 | 1.0 | 91.1 | 6.6 | 5.0 |
| SMBJ51A | SMBJ51CA | MZ | CZ | 51 | 56.7 | 65.2 | 1.0 | 82.4 | 7.3 | 5.0 |
| SMBJ54 | SMBJ54C | ND | DD | 54 | 60.0 | 76.0 | 1.0 | 96.3 | 6.2 | 5.0 |
| SMBJ54A | SMBJ54CA | NE | DE | 54 | 60.0 | 69.0 | 1.0 | 87.1 | 6.9 | 5.0 |
| SMBJ58 | SMBJ58C | NF | DF | 58 | 64.4 | 81.6 | 1.0 | 103 | 5.8 | 5.0 |
| SMBJ58A | SMBJ58CA | NG | DG | 58 | 64.4 | 74.1 | 1.0 | 93.6 | 6.4 | 5.0 |
| SMBJ60 | SMBJ60C | NH | DH | 60 | 66.7 | 84.5 | 1.0 | 107 | 5.6 | 5.0 |
| SMBJ60A | SMBJ60CA | NK | DK | 60 | 66.7 | 76.7 | 1.0 | 96.8 | 6.2 | 5.0 |
| SMBJ64 | SMBJ64C | NL | DL | 64 | 71.1 | 90.1 | 1.0 | 114 | 5.3 | 5.0 |
| SMBJ64A | SMBJ64CA | NM | DM | 64 | 71.1 | 81.8 | 1.0 | 103 | 5.8 | 5.0 |
| SMBJ70 | SMBJ70C | NN | DN | 70 | 77.8 | 98.6 | 1.0 | 125 | 4.8 | 5.0 |
| SMBJ70A | SMBJ70CA | NP | DP | 70 | 77.8 | 89.5 | 1.0 | 113 | 5.3 | 5.0 |
| SMBJ75 | SMBJ75C | NQ | DQ | 75 | 83.0 | 105.7 | 1.0 | 134 | 4.5 | 5.0 |
| SMBJ75A | SMBJ75CA | NR | DR | 75 | 83.0 | 95.8 | 1.0 | 121 | 5.0 | 5.0 |
| SMBJ78 | SMBJ78C | NS | DS | 78 | 86.0 | 109.8 | 1.0 | 139 | 4.3 | 5.0 |
| SMBJ78A | SMBJ78CA | NT | DT | 78 | 86.0 | 99.7 | 1.0 | 126 | 4.8 | 5.0 |
| SMBJ85 | SMBJ85C | NU | DU | 85 | 94.0 | 119.2 | 1.0 | 151 | 4.0 | 5.0 |
| SMBJ85A | SMBJ85CA | NV | DV | 85 | 94.0 | 108.2 | 1.0 | 137 | 4.4 | 5.0 |

**Note:**

( 1 ) $V_{BR}$ measured after $I_T$ applied for 300 µs., I =square wave pulse or equivalent.

( 2 ) Surge Current Waveform per Figure 5 and Derate per Figure 1

( 3 ) A Transient suppressor is normally selected according to the reverse " Stand-off Voltage " ($V_{WM}$) which should be equal to or greater then the D.C. or continuous peak operating voltage level.

| TYPE | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @$I_T$ | Breakdown Voltage Max. @ $I_T$ | Test Current | Maximum Clamping Voltage @$I_{PP}$ | Peak Pulse Current | Reverse Leakage @$V_{RWM}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (Uni) | (Bi) | (Uni) | (Bi) | $V_{RWM}$(V) | $V_{BR\ MIN}$(V) | $V_{BR\ MAX}$(V) | $I_T$ (mA) | $V_C$(V) | $I_{PP}$(A) | $I_R$(uA) |
| SMBJ90 | SMBJ90C | NW | DW | 90 | 100 | 126.5 | 1.0 | 160 | 3.8 | 5.0 |
| SMBJ90A | SMBJ90CA | NX | DX | 90 | 100 | 115.5 | 1.0 | 146 | 4.1 | 5.0 |
| SMBJ100 | SMBJ100C | NY | DY | 100 | 111 | 141.0 | 1.0 | 179 | 3.4 | 5.0 |
| SMBJ100A | SMBJ100CA | NZ | DZ | 100 | 111 | 128.0 | 1.0 | 162 | 3.7 | 5.0 |
| SMBJ110 | SMBJ110C | PD | ED | 110 | 122 | 154.5 | 1.0 | 196 | 3.1 | 5.0 |
| SMBJ110A | SMBJ110CA | PE | EE | 110 | 122 | 140.5 | 1.0 | 177 | 3.4 | 5.0 |
| SMBJ120 | SMBJ120C | PF | EF | 120 | 133 | 169.0 | 1.0 | 214 | 2.8 | 5.0 |
| SMBJ120A | SMBJ120CA | PG | EG | 120 | 133 | 153.0 | 1.0 | 193 | 3.1 | 5.0 |
| SMBJ130 | SMBJ130C | PH | EH | 130 | 144 | 182.5 | 1.0 | 231 | 2.6 | 5.0 |
| SMBJ130A | SMBJ130CA | PK | EK | 130 | 144 | 165.5 | 1.0 | 209 | 2.9 | 5.0 |
| SMBJ150 | SMBJ150C | PL | EL | 150 | 167 | 211.5 | 1.0 | 268 | 2.2 | 5.0 |
| SMBJ150A | SMBJ150CA | PM | EM | 150 | 167 | 192.5 | 1.0 | 243 | 2.5 | 5.0 |
| SMBJ160 | SMBJ160C | PN | EN | 160 | 178 | 226.0 | 1.0 | 287 | 2.1 | 5.0 |
| SMBJ160A | SMBJ160CA | PP | EP | 160 | 178 | 205.0 | 1.0 | 259 | 2.3 | 5.0 |
| SMBJ170 | SMBJ170C | PQ | EQ | 170 | 189 | 239.5 | 1.0 | 304 | 2.0 | 5.0 |
| SMBJ170A | SMBJ170CA | PR | ER | 170 | 189 | 217.5 | 1.0 | 275 | 2.2 | 5.0 |
| SMBJ180 | SMBJ180C | PS | ES | 180 | 200 | 253.8 | 1.0 | 321 | 1.9 | 5.0 |
| SMBJ180A | SMBJ180CA | PT | ET | 180 | 200 | 230.4 | 1.0 | 290 | 2.1 | 5.0 |
| SMBJ190 | SMBJ190C | PU | EU | 190 | 211 | 267.9 | 1.0 | 339 | 1.8 | 5.0 |
| SMBJ190A | SMBJ190CA | PV | EV | 190 | 211 | 243.2 | 1.0 | 306 | 2.0 | 5.0 |
| SMBJ200 | SMBJ200C | PW | EW | 200 | 222 | 282.0 | 1.0 | 356 | 1.7 | 5.0 |
| SMBJ200A | SMBJ200CA | PX | EX | 200 | 222 | 256.0 | 1.0 | 322 | 1.9 | 5.0 |
| SMBJ210 | SMBJ210C | PY | EY | 210 | 233 | 296.1 | 1.0 | 375 | 1.6 | 5.0 |
| SMBJ210A | SMBJ210CA | PZ | EZ | 210 | 233 | 268.8 | 1.0 | 339 | 1.8 | 5.0 |
| SMBJ220 | SMBJ220C | QD | FD | 220 | 244 | 310.2 | 1.0 | 392 | 1.5 | 5.0 |
| SMBJ220A | SMBJ220CA | QE | FE | 220 | 244 | 281.6 | 1.0 | 355 | 1.7 | 5.0 |
| SMBJ250 | SMBJ250C | QF | FF | 250 | 278 | 342.5 | 1.0 | 447 | 1.3 | 5.0 |
| SMBJ250A | SMBJ250CA | QG | FG | 250 | 278 | 309.0 | 1.0 | 403 | 1.5 | 5.0 |
| SMBJ300 | SMBJ300C | QH | FH | 300 | 333 | 411.0 | 1.0 | 535 | 1.1 | 5.0 |
| SMBJ300A | SMBJ300CA | QK | FK | 300 | 333 | 371.0 | 1.0 | 484 | 1.2 | 5.0 |
| SMBJ350 | SMBJ350C | QL | FL | 350 | 389 | 479.5 | 1.0 | 624 | 1.0 | 5.0 |
| SMBJ350A | SMBJ350CA | QM | FM | 350 | 389 | 432.0 | 1.0 | 565 | 1.1 | 5.0 |
| SMBJ400 | SMBJ400C | QN | FN | 400 | 444 | 548.0 | 1.0 | 687 | 0.9 | 5.0 |
| SMBJ400A | SMBJ400CA | QP | FP | 400 | 444 | 494.0 | 1.0 | 645 | 0.9 | 5.0 |
| SMBJ440 | SMBJ440C | QQ | FQ | 440 | 489 | 602.8 | 1.0 | 786 | 0.8 | 5.0 |
| SMBJ440A | SMBJ440CA | QR | FR | 440 | 489 | 543.0 | 1.0 | 710 | 0.8 | 5.0 |

## Ratings and Characteristic Curves $T_A$ =25°C unless otherwise noted

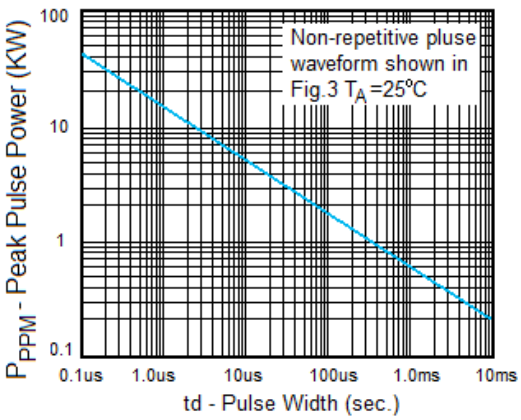



Fig. 1 Peak Pulse Power Rating

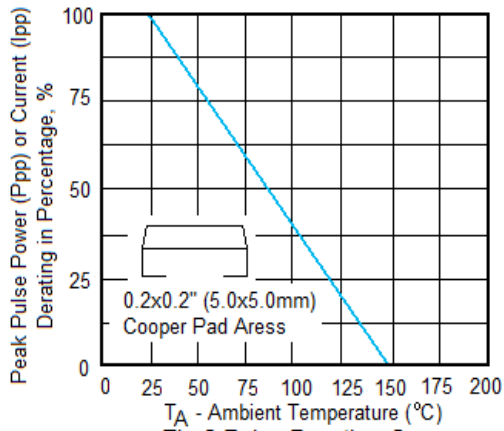



Fig.2 Pulse Derating Cure

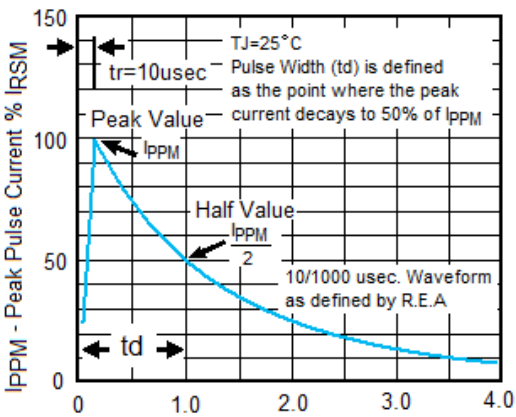



Fig.3 Pulse Waveform

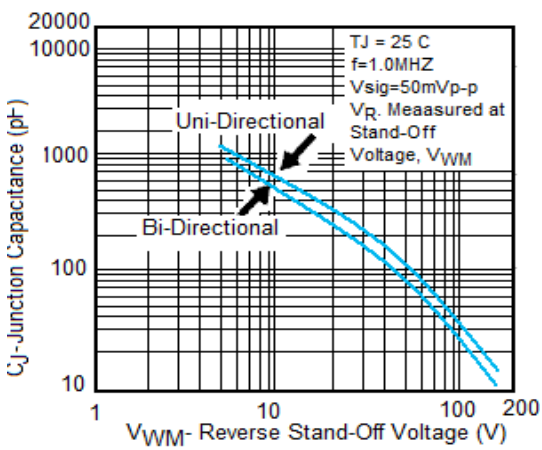



Fig. 4- Typical Junction Capacitance