

DESCRIPTION:

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

FEATURES:

- ✧ Glass passivated or planar junction.
- ✧ Excellent clamping capability.
- ✧ Repetition rate (duty cycle): 0.01%.
- ✧ Typical I_R less than $1\mu A$ above 10V.
- ✧ Low profile package and low inductance.
- ✧ 3000W peak pulse power capability at $10 \times 1000\mu s$ waveform.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ High temperature soldering: $260^\circ C/10s$ at terminals.
- ✧ Plastic package has Underwriters Laboratory Flammability 94V-0.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ AEC-Q101 qualified.



SMC



Bi-directional



Uni-direction

Symbol

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$, RH=45%-75%, unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-------------|-------------|------------|
| Storage temperature range | T_{stg} | -55 to +150 | $^\circ C$ |
| Operating junction temperature range | T_j | -55 to +125 | $^\circ C$ |
| Steady state power dissipation at $T_L=75^\circ C$ | $P_{M(AV)}$ | 8.0 | W |
| Peak pulse power dissipation on 10/1000 μs waveform | P_{PP} | 3000 | W |
| Maximum instantaneous forward voltage at 80A for unidirectional | V_F | 5.0 | V |

ELECTRICAL CHARACTERISTICS (T =25°C)

| Part Number | | V _R | I _R @V _R | V _{BR} @I _T | | I _T | V _C @I _{PP} | I _{PP} ^① |
|-------------|-----------|----------------|--------------------------------|---------------------------------|--------|----------------|---------------------------------|------------------------------|
| Uni-Polar | Bi-Polar | V | μA | min(V) | max(V) | mA | max(V) | A |
| SMDJ5.0A | SMDJ5.0CA | 5.0 | 800 | 6.40 | 7.00 | 10 | 9.2 | 326.1 |
| SMDJ6.0A | SMDJ6.0CA | 6.0 | 800 | 6.67 | 7.37 | 10 | 10.3 | 291.3 |
| SMDJ6.5A | SMDJ6.5CA | 6.5 | 500 | 7.22 | 7.98 | 10 | 11.2 | 267.9 |
| SMDJ7.0A | SMDJ7.0CA | 7.0 | 200 | 7.78 | 8.60 | 10 | 12.0 | 250.0 |
| SMDJ7.5A | SMDJ7.5CA | 7.5 | 100 | 8.33 | 9.21 | 1 | 12.9 | 232.6 |
| SMDJ8.0A | SMDJ8.0CA | 8.0 | 50 | 8.89 | 9.83 | 1 | 13.6 | 220.6 |
| SMDJ8.5A | SMDJ8.5CA | 8.5 | 20 | 9.44 | 10.40 | 1 | 14.4 | 208.3 |
| SMDJ9.0A | SMDJ9.0CA | 9.0 | 10 | 10.00 | 11.10 | 1 | 15.4 | 194.8 |
| SMDJ10A | SMDJ10CA | 10 | 5 | 11.10 | 12.30 | 1 | 17.0 | 176.5 |
| SMDJ11A | SMDJ11CA | 11 | 1 | 12.20 | 13.50 | 1 | 18.2 | 164.8 |
| SMDJ12A | SMDJ12CA | 12 | 1 | 13.30 | 14.70 | 1 | 19.9 | 150.8 |
| SMDJ13A | SMDJ13CA | 13 | 1 | 14.40 | 15.90 | 1 | 21.5 | 139.5 |
| SMDJ14A | SMDJ14CA | 14 | 1 | 15.60 | 17.20 | 1 | 23.2 | 129.3 |
| SMDJ15A | SMDJ15CA | 15 | 1 | 16.70 | 18.50 | 1 | 24.4 | 123.0 |
| SMDJ16A | SMDJ16CA | 16 | 1 | 17.80 | 19.70 | 1 | 26.0 | 115.4 |
| SMDJ17A | SMDJ17CA | 17 | 1 | 18.90 | 20.90 | 1 | 27.6 | 108.7 |
| SMDJ18A | SMDJ18CA | 18 | 1 | 20.00 | 22.10 | 1 | 29.2 | 102.7 |
| SMDJ20A | SMDJ20CA | 20 | 1 | 22.20 | 24.50 | 1 | 32.4 | 92.6 |
| SMDJ22A | SMDJ22CA | 22 | 1 | 24.40 | 26.90 | 1 | 35.5 | 84.5 |
| SMDJ24A | SMDJ24CA | 24 | 1 | 26.70 | 29.50 | 1 | 38.9 | 77.1 |
| SMDJ26A | SMDJ26CA | 26 | 1 | 28.90 | 31.90 | 1 | 42.1 | 71.3 |
| SMDJ28A | SMDJ28CA | 28 | 1 | 31.10 | 34.40 | 1 | 45.4 | 66.1 |
| SMDJ30A | SMDJ30CA | 30 | 1 | 33.30 | 36.80 | 1 | 48.4 | 62.0 |
| SMDJ33A | SMDJ33CA | 33 | 1 | 36.70 | 40.60 | 1 | 53.3 | 56.3 |
| SMDJ36A | SMDJ36CA | 36 | 1 | 40.00 | 44.20 | 1 | 58.1 | 51.6 |
| SMDJ40A | SMDJ40CA | 40 | 1 | 44.40 | 49.10 | 1 | 64.5 | 46.5 |
| SMDJ43A | SMDJ43CA | 43 | 1 | 47.80 | 52.80 | 1 | 69.4 | 43.2 |
| SMDJ45A | SMDJ45CA | 45 | 1 | 50.00 | 55.30 | 1 | 72.7 | 41.3 |
| SMDJ48A | SMDJ48CA | 48 | 1 | 53.30 | 58.90 | 1 | 77.4 | 38.8 |
| SMDJ51A | SMDJ51CA | 51 | 1 | 56.70 | 62.70 | 1 | 82.4 | 36.4 |

ELECTRICAL CHARACTERISTICS (T_A=25°C, continued)

| Part Number | | V _R | I _R @V _R | V _{BR} @I _T | | I _T | V _C @I _{PP} | I _{PP} ^① |
|-------------|-----------|----------------|--------------------------------|---------------------------------|--------|----------------|---------------------------------|------------------------------|
| Uni-Polar | Bi-Polar | V | μA | min(V) | max(V) | mA | max(V) | A |
| SMDJ54A | SMDJ54CA | 54 | 1 | 60.00 | 66.30 | 1 | 87.1 | 34.4 |
| SMDJ58A | SMDJ58CA | 58 | 1 | 64.40 | 71.20 | 1 | 93.6 | 32.1 |
| SMDJ60A | SMDJ60CA | 60 | 1 | 66.70 | 73.70 | 1 | 96.8 | 31.0 |
| SMDJ64A | SMDJ64CA | 64 | 1 | 71.10 | 78.60 | 1 | 103.0 | 29.1 |
| SMDJ70A | SMDJ70CA | 70 | 1 | 77.80 | 86.00 | 1 | 113.0 | 26.5 |
| SMDJ75A | SMDJ75CA | 75 | 1 | 83.30 | 92.10 | 1 | 121.0 | 24.8 |
| SMDJ78A | SMDJ78CA | 78 | 1 | 86.70 | 95.80 | 1 | 126.0 | 23.8 |
| SMDJ85A | SMDJ85CA | 85 | 1 | 94.40 | 104.0 | 1 | 137.0 | 21.9 |
| SMDJ90A | SMDJ90CA | 90 | 1 | 100.0 | 111.0 | 1 | 146.0 | 20.5 |
| SMDJ100A | SMDJ100CA | 100 | 1 | 111.0 | 123.0 | 1 | 162.0 | 18.5 |
| SMDJ110A | SMDJ110CA | 110 | 1 | 122.0 | 135.0 | 1 | 177.0 | 16.9 |
| SMDJ120A | SMDJ120CA | 120 | 1 | 133.0 | 147.0 | 1 | 193.0 | 15.5 |
| SMDJ130A | SMDJ130CA | 130 | 1 | 144.0 | 159.0 | 1 | 209.0 | 14.4 |
| SMDJ150A | SMDJ150CA | 150 | 1 | 167.0 | 185.0 | 1 | 243.0 | 12.3 |
| SMDJ160A | SMDJ160CA | 160 | 1 | 178.0 | 197.0 | 1 | 259.0 | 11.6 |
| SMDJ170A | SMDJ170CA | 170 | 1 | 189.0 | 209.0 | 1 | 275.0 | 10.9 |
| SMDJ180A | SMDJ180CA | 180 | 1 | 201.0 | 222.0 | 1 | 292.0 | 10.3 |
| SMDJ190A | SMDJ190CA | 190 | 1 | 211.0 | 234.0 | 1 | 307.0 | 9.7 |
| SMDJ200A | SMDJ200CA | 200 | 1 | 224.0 | 247.0 | 1 | 324.0 | 9.3 |
| SMDJ210A | SMDJ210CA | 210 | 1 | 233.0 | 258.0 | 1 | 337.0 | 8.8 |
| SMDJ220A | SMDJ220CA | 220 | 1 | 246.0 | 272.0 | 1 | 356.0 | 8.4 |

① Surge waveform: 10/1000μs

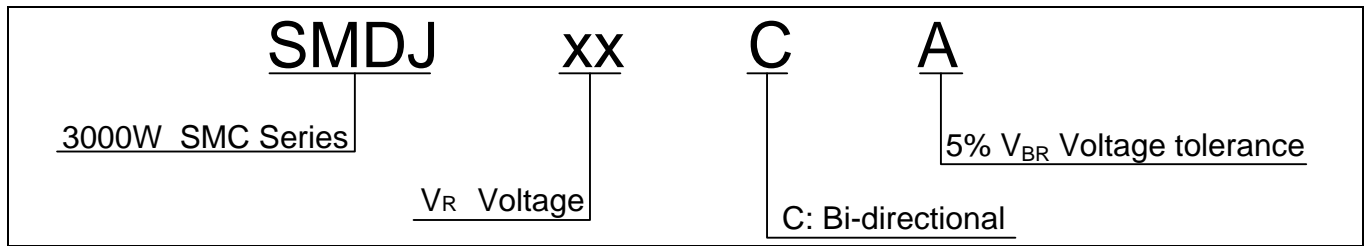
V_R: Stand-off voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown voltage

V_C: Clamping voltage -- Peak voltage measured across the suppressor at a specified I_{PP}

I_R: Reverse leakage current

ORDERING INFORMATION



RATINGS AND V-I CHARACTERISTICS CURVES ($T_A=25^\circ\text{C}$, unless otherwise noted)

FIG.1: V- I curve characteristics (Uni-directional)

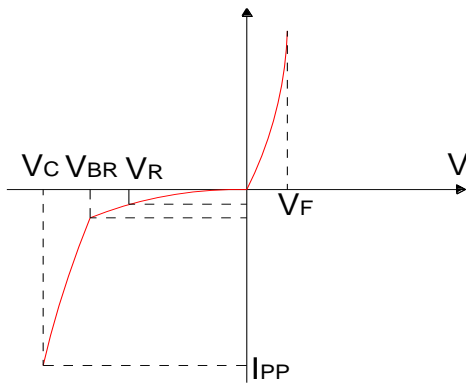


FIG.2: V- I curve characteristics (Bi-directional)

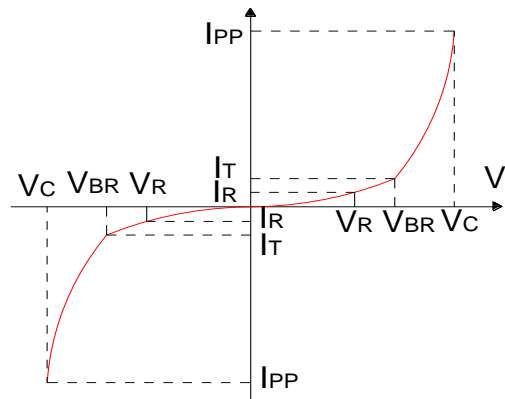


FIG.3: Pulse waveform

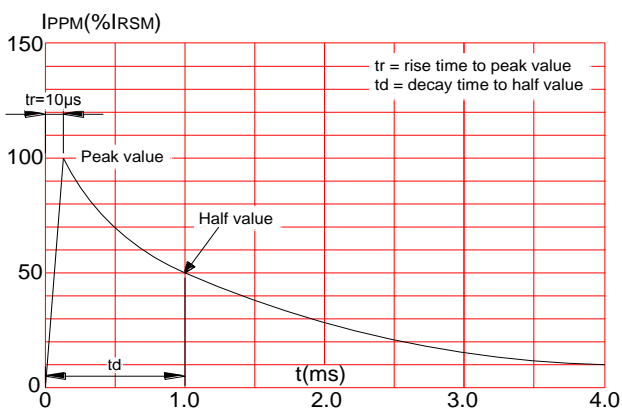
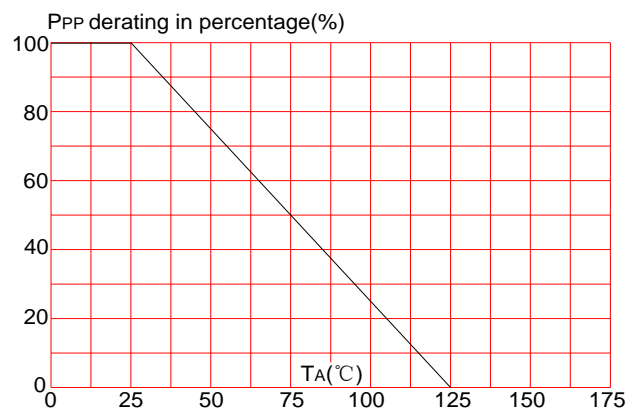
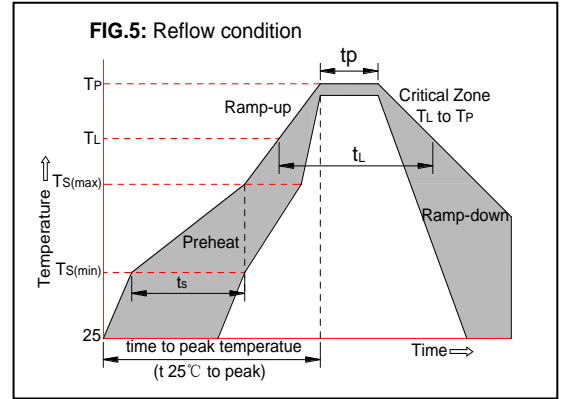


FIG.4: Pulse derating curve

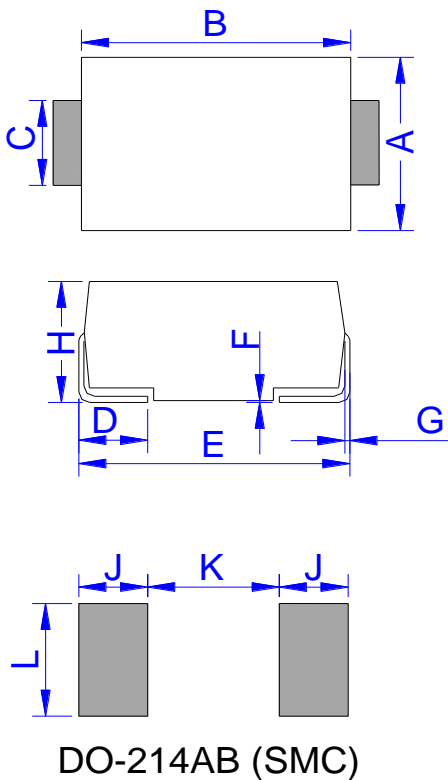


SOLDERING PARAMETERS

| | | |
|---|-----------------------------------|------------------------------|
| Reflow Condition | | Pb-Free assembly (see FIG.5) |
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max($T_{s(max)}$) | +200°C |
| | -Time (Min to Max) (t_s) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp (T_L) to peak) | | 3°C/sec. Max |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature(T_L)(Liquid us) | +217°C |
| | -Temperature(t_L) | 60-150 secs. |
| Peak Temp (T_p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max |
| Ramp-down Rate | | 6°C/sec. Max |
| Time 25°C to Peak Temp (T_p) | | 8 min. Max |
| Do not exceed | | +260°C |

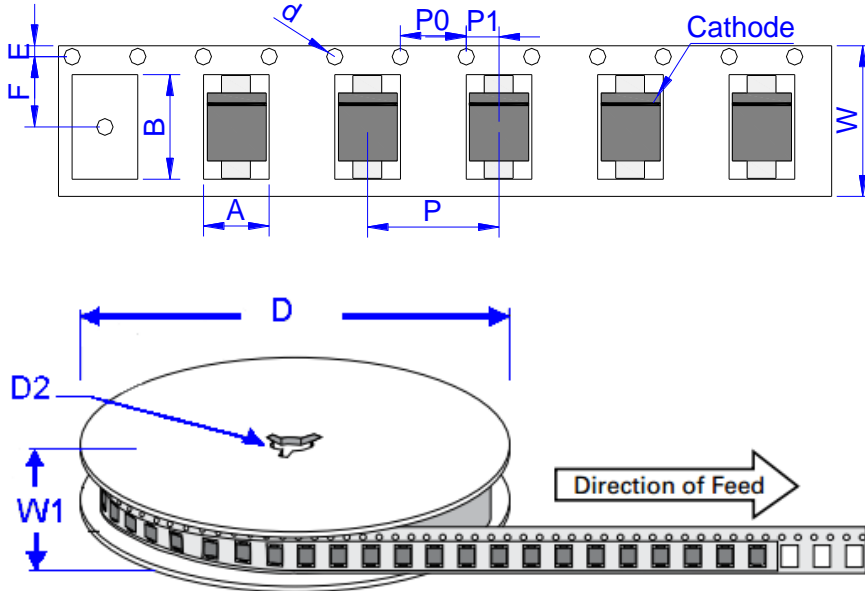


PACKAGE MECHANICAL DATA



| Ref. | Dimensions | | | |
|------|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 5.75 | 6.25 | 0.226 | 0.246 |
| B | 6.90 | 7.40 | 0.272 | 0.291 |
| C | 2.75 | 3.25 | 0.108 | 0.128 |
| D | 0.95 | 1.52 | 0.037 | 0.060 |
| E | 7.70 | 8.20 | 0.303 | 0.323 |
| F | 0.051 | 0.203 | 0.002 | 0.008 |
| G | 0.15 | 0.31 | 0.006 | 0.012 |
| H | 2.15 | 2.62 | 0.085 | 0.103 |
| J | 2.40 | | 0.094 | |
| K | | 4.20 | | 0.165 |
| L | 3.30 | | 0.130 | |

TAPE AND REEL SPECIFICATION-SMC



| Ref. | Dimensions | |
|------|-------------|----------------|
| | Millimeters | Inches |
| A | 6.05 ± 0.3 | 0.238 ± 0.012 |
| B | 8.31 ± 0.3 | 0.327 ± 0.012 |
| d | 1.55 ± 0.1 | 0.061 ± 0.004 |
| D | 330.0 | 13.0 |
| D2 | 13.3 ± 0.3 | 0.524 ± 0.012 |
| E | 1.75 ± 0.2 | 0.069 ± 0.008 |
| F | 7.50 ± 0.2 | 0.295 ± 0.008 |
| P | 8.00 ± 0.2 | 0.3145 ± 0.008 |
| P0 | 4.00 ± 0.2 | 0.157 ± 0.008 |
| P1 | 2.00 ± 0.2 | 0.079 ± 0.008 |
| W | 16.0 ± 0.2 | 0.630 ± 0.008 |
| W1 | 19.7 ± 2.0 | 0.776 ± 0.079 |

| PART No. | PACKAGE | QUANTITY | TAPE & REEL |
|------------|---------------|----------|-------------|
| SMDJxxCA/A | SMC(DO-214AB) | 3,000 | 13 inch |