

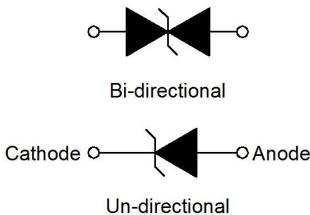
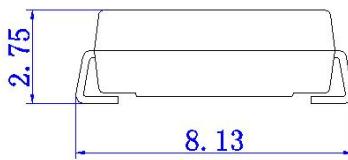
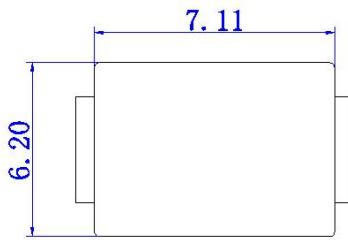
Description

Transient voltage suppression diodes, also known as TVS diodes, are protective electronic parts that protect electrical equipment from voltage spikes introduced by wires.

Features

- For surface mounted applications
- Excellent clamping capability
- 5000 W peak pulse power capability with a 10/1000 μ s Waveform.
- V_{RWM} 12-190V
- Low profile package and low inductance
- Typical IR less than 1uA above 12V
- Fast response time: typically less than 1.0ps from 0V to V_{BR} min.

Dimensions & Symbol (Unit: mm Max)



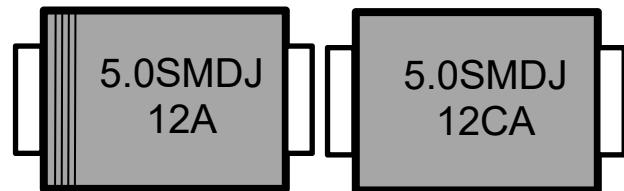
Applications

- computer system
- domestic appliance
- video input

Mechanical Characteristics

- Package: SMC/DO-214AB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0 .RoHS compliant
- Moisture Sensitivity: Meet MSL 1
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Weight: 0.28g(approximate)

Marking Information



5.0SMDJ12A: 5.0SMDJ12A Marking code

5.0SMDJ12CA: 5.0SMDJ12CA Marking code

Electrical Characteristics (T=25°C)

| Part Number | | Marking | | V _R | I _{R@V_R} | V _{BR@I_T} | | I _T | V _{C@I_{PP}} | I _{PP} |
|-------------|-------------|------------|-------------|----------------|------------------------------|-------------------------------|--------|----------------|-------------------------------|-----------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | μA | min(V) | max(V) | mA | max(V) | A |
| 5.0SMDJ12A | 5.0SMDJ12CA | 5.0SMDJ12A | 5.0SMDJ12CA | 12.0 | 1 | 13.30 | 14.70 | 1 | 19.9 | 251.3 |
| 5.0SMDJ13A | 5.0SMDJ13CA | 5.0SMDJ13A | 5.0SMDJ13CA | 13.0 | 1 | 14.40 | 15.90 | 1 | 21.5 | 232.6 |
| 5.0SMDJ14A | 5.0SMDJ14CA | 5.0SMDJ14A | 5.0SMDJ14CA | 14.0 | 1 | 15.60 | 17.20 | 1 | 23.2 | 215.6 |
| 5.0SMDJ15A | 5.0SMDJ15CA | 5.0SMDJ15A | 5.0SMDJ15CA | 15.0 | 1 | 16.70 | 18.50 | 1 | 24.4 | 205.0 |
| 5.0SMDJ16A | 5.0SMDJ16CA | 5.0SMDJ16A | 5.0SMDJ16CA | 16.0 | 1 | 17.80 | 19.70 | 1 | 26.0 | 192.4 |
| 5.0SMDJ17A | 5.0SMDJ17CA | 5.0SMDJ17A | 5.0SMDJ17CA | 17.0 | 1 | 18.90 | 20.90 | 1 | 27.6 | 181.2 |
| 5.0SMDJ18A | 5.0SMDJ18CA | 5.0SMDJ18A | 5.0SMDJ18CA | 18.0 | 1 | 20.00 | 22.10 | 1 | 29.2 | 171.3 |
| 5.0SMDJ20A | 5.0SMDJ20CA | 5.0SMDJ20A | 5.0SMDJ20CA | 20.0 | 1 | 22.20 | 24.50 | 1 | 32.4 | 154.4 |
| 5.0SMDJ22A | 5.0SMDJ22CA | 5.0SMDJ22A | 5.0SMDJ22CA | 22.0 | 1 | 24.40 | 26.90 | 1 | 35.5 | 140.9 |
| 5.0SMDJ24A | 5.0SMDJ24CA | 5.0SMDJ24A | 5.0SMDJ24CA | 24.0 | 1 | 26.70 | 29.50 | 1 | 38.9 | 128.6 |
| 5.0SMDJ26A | 5.0SMDJ26CA | 5.0SMDJ26A | 5.0SMDJ26CA | 26.0 | 1 | 28.90 | 31.90 | 1 | 42.1 | 118.8 |
| 5.0SMDJ28A | 5.0SMDJ28CA | 5.0SMDJ28A | 5.0SMDJ28CA | 28.0 | 1 | 31.10 | 34.40 | 1 | 45.4 | 110.2 |
| 5.0SMDJ30A | 5.0SMDJ30CA | 5.0SMDJ30A | 5.0SMDJ30CA | 30.0 | 1 | 33.30 | 36.80 | 1 | 48.4 | 103.4 |
| 5.0SMDJ33A | 5.0SMDJ33CA | 5.0SMDJ33A | 5.0SMDJ33CA | 33.0 | 1 | 36.70 | 40.60 | 1 | 53.3 | 93.81 |
| 5.0SMDJ36A | 5.0SMDJ36CA | 5.0SMDJ36A | 5.0SMDJ36CA | 36.0 | 1 | 40.00 | 44.20 | 1 | 58.1 | 86.06 |
| 5.0SMDJ40A | 5.0SMDJ40CA | 5.0SMDJ40A | 5.0SMDJ40CA | 40.0 | 1 | 44.40 | 49.10 | 1 | 64.5 | 77.52 |
| 5.0SMDJ43A | 5.0SMDJ43CA | 5.0SMDJ43A | 5.0SMDJ43CA | 43.0 | 1 | 47.80 | 52.80 | 1 | 69.4 | 72.05 |
| 5.0SMDJ45A | 5.0SMDJ45CA | 5.0SMDJ45A | 5.0SMDJ45CA | 45.0 | 1 | 50.00 | 55.30 | 1 | 72.7 | 68.78 |
| 5.0SMDJ48A | 5.0SMDJ48CA | 5.0SMDJ48A | 5.0SMDJ48CA | 48.0 | 1 | 53.30 | 58.90 | 1 | 77.4 | 64.60 |
| 5.0SMDJ51A | 5.0SMDJ51CA | 5.0SMDJ51A | 5.0SMDJ51CA | 51.0 | 1 | 56.70 | 62.70 | 1 | 82.4 | 60.68 |
| 5.0SMDJ54A | 5.0SMDJ54CA | 5.0SMDJ54A | 5.0SMDJ54CA | 54.0 | 1 | 60.00 | 66.30 | 1 | 87.1 | 57.41 |
| 5.0SMDJ58A | 5.0SMDJ58CA | 5.0SMDJ58A | 5.0SMDJ58CA | 58.0 | 1 | 64.40 | 71.20 | 1 | 93.6 | 53.42 |
| 5.0SMDJ60A | 5.0SMDJ60CA | 5.0SMDJ60A | 5.0SMDJ60CA | 60.0 | 1 | 66.70 | 73.70 | 1 | 96.8 | 51.66 |
| 5.0SMDJ64A | 5.0SMDJ64CA | 5.0SMDJ64A | 5.0SMDJ64CA | 64.0 | 1 | 71.10 | 78.60 | 1 | 103.0 | 48.55 |
| 5.0SMDJ70A | 5.0SMDJ70CA | 5.0SMDJ70A | 5.0SMDJ70CA | 70.0 | 1 | 77.80 | 86.00 | 1 | 113.0 | 44.25 |

Electrical Characteristics (T=25°C)

| Part Number | | Marking | | V _R | I _{R@V_R} | V _{BR@I_T} | | I _T | V _{C@I_{PP}} | I _{PP} ^① |
|-------------|--------------|-------------|--------------|----------------|------------------------------|-------------------------------|--------|----------------|-------------------------------|------------------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | μA | min(V) | max(V) | mA | max(V) | A |
| 5.0SMDJ75A | 5.0SMDJ75CA | 5.0SMDJ75A | 5.0SMDJ75CA | 75.0 | 1 | 83.30 | 92.10 | 1 | 121.0 | 41.33 |
| 5.0SMDJ78A | 5.0SMDJ78CA | 5.0SMDJ78A | 5.0SMDJ78CA | 78.0 | 1 | 86.70 | 95.80 | 1 | 126.0 | 39.69 |
| 5.0SMDJ85A | 5.0SMDJ85CA | 5.0SMDJ85A | 5.0SMDJ85CA | 85.0 | 1 | 94.40 | 104.0 | 1 | 137.0 | 36.50 |
| 5.0SMDJ90A | 5.0SMDJ90CA | 5.0SMDJ90A | 5.0SMDJ90CA | 90.0 | 1 | 100.0 | 111.0 | 1 | 146.0 | 34.25 |
| 5.0SMDJ100A | 5.0SMDJ100CA | 5.0SMDJ100A | 5.0SMDJ100CA | 100.0 | 1 | 111.0 | 123.0 | 1 | 162.0 | 30.87 |
| 5.0SMDJ110A | 5.0SMDJ110CA | 5.0SMDJ110A | 5.0SMDJ110CA | 110.0 | 1 | 122.0 | 135.0 | 1 | 177.0 | 28.25 |
| 5.0SMDJ120A | 5.0SMDJ120CA | 5.0SMDJ120A | 5.0SMDJ120CA | 120.0 | 1 | 133.0 | 147.0 | 1 | 193.0 | 25.91 |
| 5.0SMDJ130A | 5.0SMDJ130CA | 5.0SMDJ130A | 5.0SMDJ130CA | 130.0 | 1 | 144.0 | 159.0 | 1 | 209.0 | 23.93 |
| 5.0SMDJ150A | 5.0SMDJ150CA | 5.0SMDJ150A | 5.0SMDJ150CA | 150.0 | 1 | 167.0 | 185.0 | 1 | 243.0 | 20.58 |
| 5.0SMDJ160A | 5.0SMDJ160CA | 5.0SMDJ160A | 5.0SMDJ160CA | 160.0 | 1 | 178.0 | 197.0 | 1 | 259.0 | 19.31 |
| 5.0SMDJ170A | 5.0SMDJ170CA | 5.0SMDJ170A | 5.0SMDJ170CA | 170.0 | 1 | 189.0 | 209.0 | 1 | 275.0 | 18.19 |
| 5.0SMDJ180A | 5.0SMDJ180CA | 5.0SMDJ180A | 5.0SMDJ180CA | 180.0 | 1 | 201.0 | 222.0 | 1 | 292.0 | 17.13 |
| 5.0SMDJ190A | 5.0SMDJ190CA | 5.0SMDJ190A | 5.0SMDJ190CA | 190.0 | 1 | 209.0 | 233.0 | 1 | 308.0 | 16.24 |

Notes:

① Surge waveform: 10/1000μs

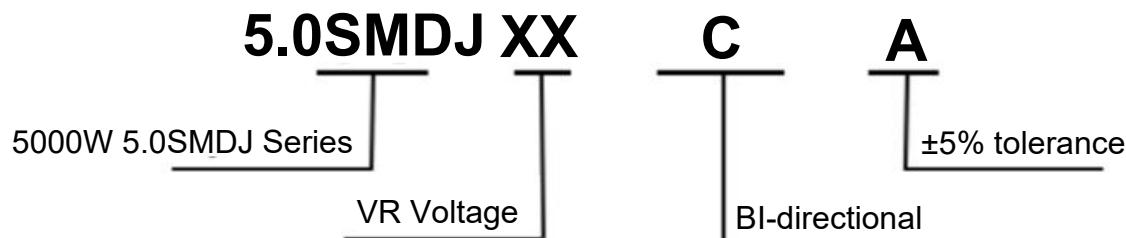
V_R : Stand-off Voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown Voltage

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

I_R: Reverse Leakage Current

Part number code

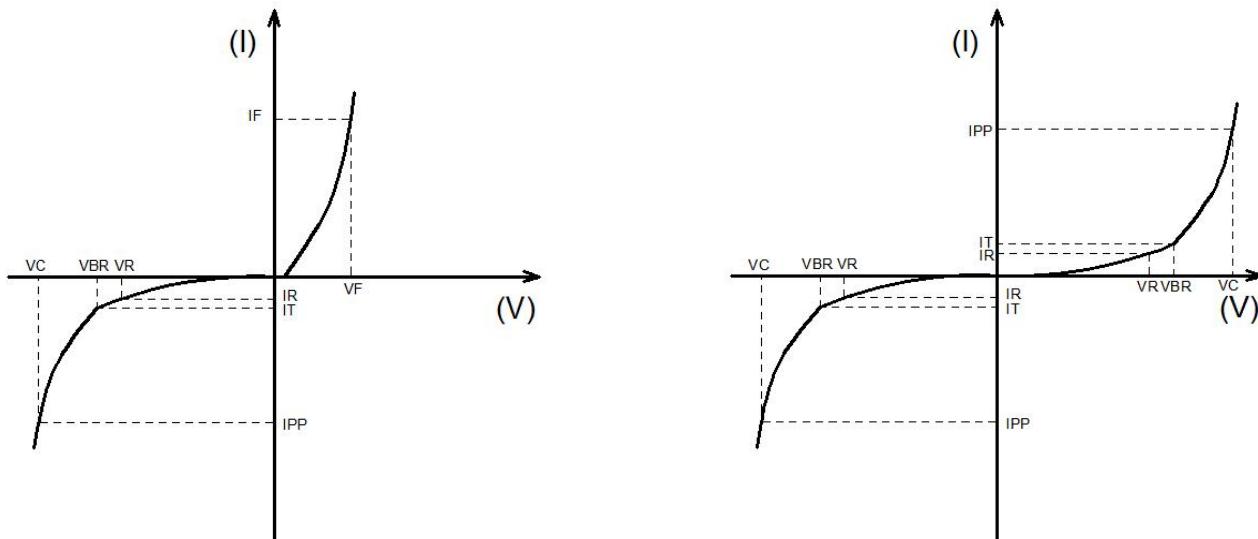


Absolute Maximum Ratings($T=25^{\circ}\text{C}$, $\text{RH}=45\%-75\%$, unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|--------------------|-------------|--------------------|
| Peak pulse power dissipation on 10/1000 μs waveform | P_{PP} | 5000 | W |
| Steady state power dissipation at $T_L=75^{\circ}\text{C}$ | $P_{\text{M(AV)}}$ | 6.5 | W |
| Operating junction temperature range | T_j | -55 to +125 | $^{\circ}\text{C}$ |
| Storage temperature range | T_{stg} | -55 to +150 | $^{\circ}\text{C}$ |

Ratings And V-I Characteristics Curves ($T=25^{\circ}\text{C}$, unless otherwise noted)

FIG1: V-I cure characteristics



| Symbol | Parameter |
|----------|------------------------------------|
| I_F | Mean Forward Current |
| V_F | Maximum Forward Voltage @ I_F |
| V_R | Peak Reverse Working Voltage |
| I_R | Reverse Leakage Current @ V_R |
| V_{BR} | Breakdown Voltage @ I_T |
| I_T | Test Current |
| I_{PP} | Maximum Reverse Peak Pulse Current |
| V_c | Clamping Voltage @ I_{PP} |

Typical Characteristics

FIG2: Pulse Derating Curve

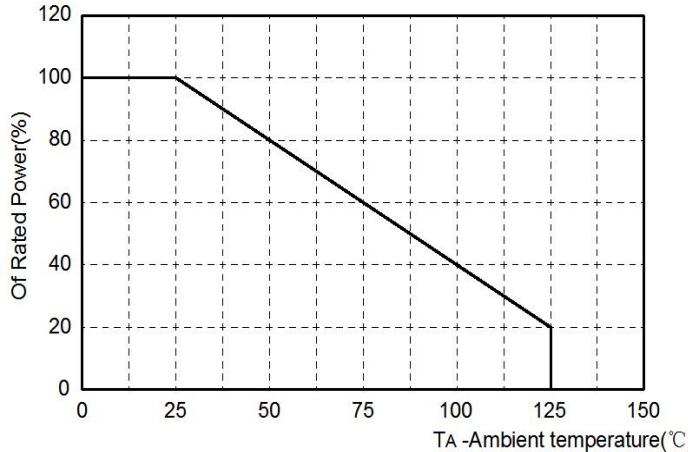


FIG3: Pulse Waveform

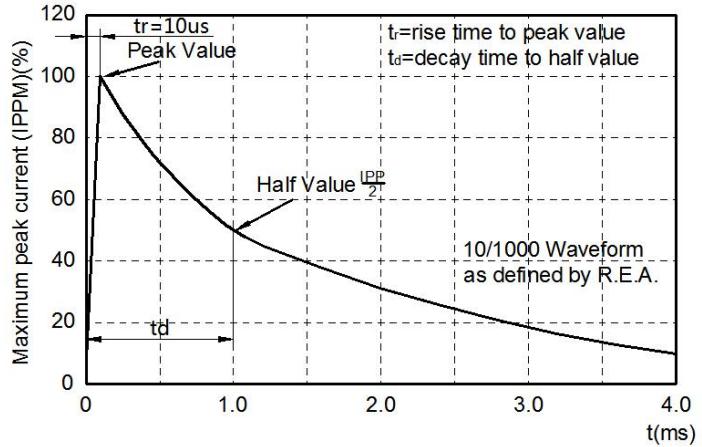


FIG4: Peak Pulse Power Rating Curve

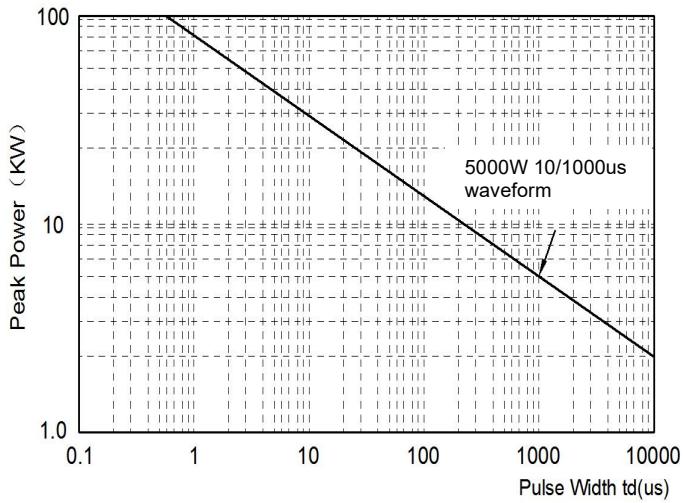
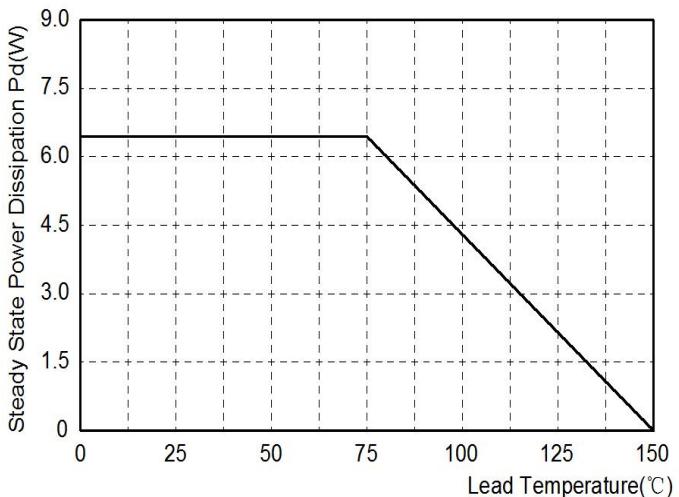
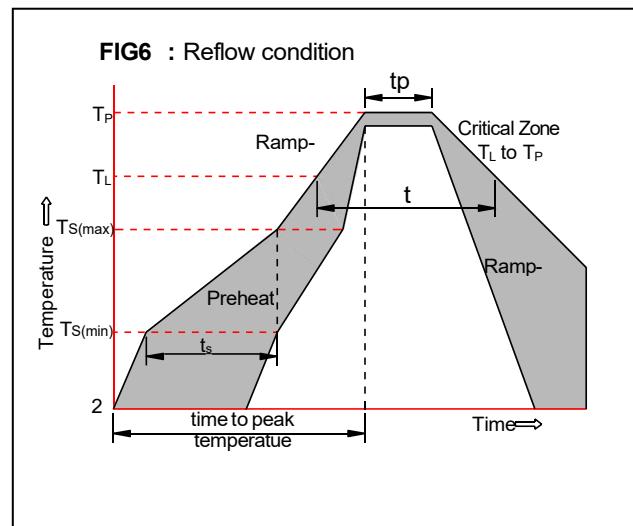


FIG5: Steady State Power Dissipation

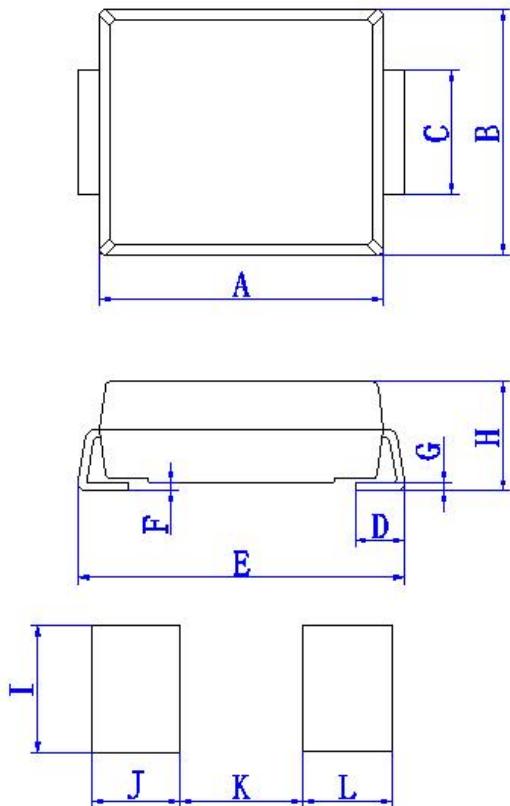


Soldering parameters

| Reflow Condition | | Pb-Free assembly see as bellow |
|---|-----------------------------------|-----------------------------------|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max($T_{s(max)}$) | +200°C |
| | -Time (Min to Max) (ts) | 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 |

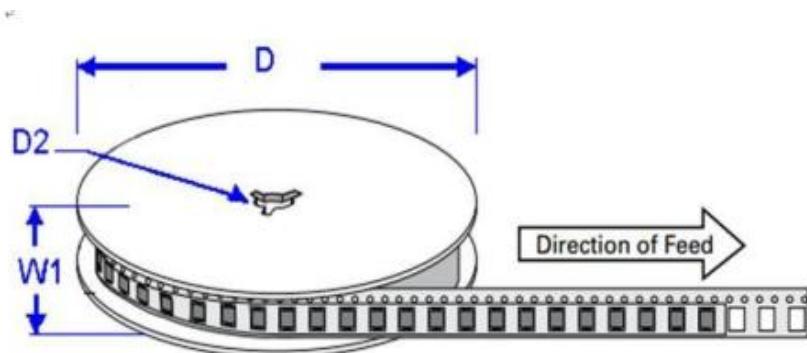
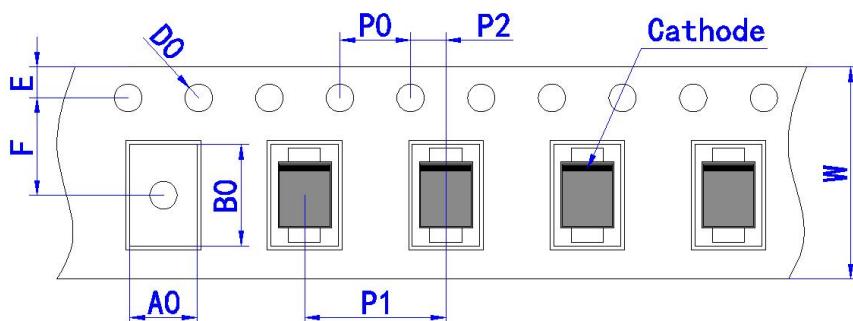


Package mechanical data & Suggested Land Pattern



| Ref.(mm) | Millimeters | |
|----------|-------------|-------|
| | Min. | Max. |
| A | 6.60 | 7.11 |
| B | 5.59 | 6.20 |
| C | 2.75 | 3.20 |
| D | 0.76 | 1.52 |
| E | 7.71 | 8.13 |
| F | 0.051 | 0.203 |
| G | 0.15 | 0.25 |
| H | 2.06 | 2.75 |
| I | 3.30 | |
| J | 1.30 | |
| K | | 5.30 |
| L | 1.30 | |

Tape & reel specification - SMC



| Ref. | Millimeters |
|------|-------------|
| A0 | 6.20±0.20 |
| B0 | 8.31±0.20 |
| C | 330.00 |
| D0 | 1.55±0.10 |
| E | 1.75±0.20 |
| E1 | 13.50±1.00 |
| F | 7.50±0.10 |
| P0 | 8.00±0.20 |
| P1 | 4.00±0.20 |
| P2 | 2.00±0.20 |
| W | 16.00±0.30 |
| W1 | 20.00±4.00 |
| D | 333.00±2.00 |
| D2 | 13.50±0.30 |