

Features

- 1500W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C

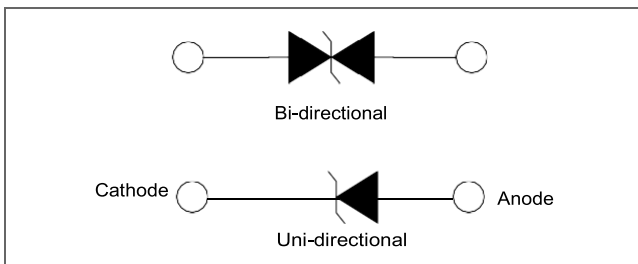
RoHS
Compliant



Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Function Diagram




| Maximum Ratings and Thermal Characteristics (T _A =25°C unless otherwise noted) | | | |
|---|------------------|------------|------|
| Parameter | Symbol | Value | Unit |
| Peak Pulse Power Dissipation at T _A =25°C by 10/1000µs Waveform (Fig.3) | P _{PPM} | 1500 | W |
| Power Dissipation on Infinite Heat Sink at T _L =50°C | P _D | 6.5 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1) | I _{FSM} | 200 | A |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2) | V _F | 3.5/5 | V |
| Operating Temperature Range | T _J | -55 to 150 | °C |
| Storage Temperature Range | T _{STG} | -55 to 150 | °C |

| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
| | Pending |


Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
2. V_F < 3.5V for single die parts and V_F< 5V for stacked-die parts.

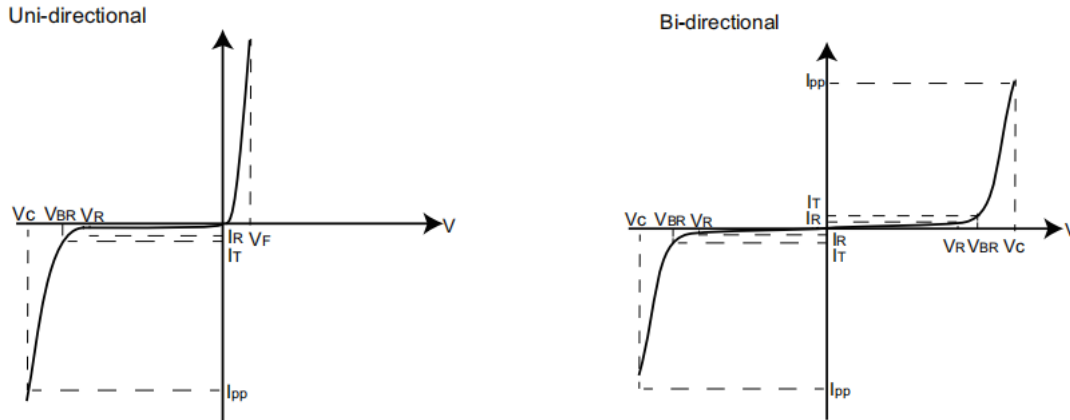
Characteristics (T = 25°C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Key Marking | | Reverse Stand off Voltage V _R (Volts) | Breakdown Voltage V _{BR} (Volts) @ I _T | | Test Current I _T (mA) | Maximum Clamping Voltage V _C @ I _{nn} (V) | Maximum Peak Pulse Current I _{pp} (A) | Maximum Reverse Leakage I _R @ V _R (μA) | Agency Approval  |
|----------------------|---------------------|-------------|-----|---|---|-------|--|---|--|--|---|
| | | UNI | BI | | MIN | MAX | | | | | |
| 1.5SMC6.8A | 1.5SMC6.8CA | 06E | 06E | 5.80 | 6.45 | 7.14 | 10 | 10.5 | 144.8 | 1000 | |
| 1.5SMC7.5A | 1.5SMC7.5CA | 07F | 07F | 6.40 | 7.13 | 7.88 | 10 | 11.3 | 134.5 | 500 | |
| 1.5SMC8.2A | 1.5SMC8.2CA | 08T | 08T | 7.02 | 7.79 | 8.61 | 10 | 12.1 | 125.6 | 200 | |
| 1.5SMC9.1A | 1.5SMC9.1CA | 09O | 09O | 7.78 | 8.65 | 9.50 | 1 | 13.4 | 113.4 | 50 | |
| 1.5SMC10A | 1.5SMC10CA | 010 | 010 | 8.55 | 9.50 | 10.50 | 1 | 14.5 | 104.8 | 10 | |
| 1.5SMC11A | 1.5SMC11CA | 011 | 011 | 9.40 | 10.50 | 11.60 | 1 | 15.6 | 97.4 | 5 | |
| 1.5SMC12A | 1.5SMC12CA | 012 | 012 | 10.2 | 11.4 | 12.60 | 1 | 16.7 | 91.0 | 5 | |
| 1.5SMC13A | 1.5SMC13CA | 013 | 013 | 11.1 | 12.4 | 13.70 | 1 | 18.2 | 83.5 | 1 | |
| 1.5SMC15A | 1.5SMC15CA | 015 | 015 | 12.8 | 14.3 | 15.80 | 1 | 21.2 | 71.7 | 1 | |
| 1.5SMC16A | 1.5SMC16CA | 016 | 016 | 13.6 | 15.2 | 16.80 | 1 | 22.5 | 67.6 | 1 | |
| 1.5SMC18A | 1.5SMC18CA | 018 | 018 | 15.3 | 17.1 | 18.90 | 1 | 25.2 | 60.3 | 1 | |
| 1.5SMC20A | 1.5SMC20CA | 020 | 020 | 17.1 | 19.00 | 21.00 | 1 | 27.7 | 54.9 | 1 | |
| 1.5SMC22A | 1.5SMC22CA | 022 | 022 | 18.8 | 20.9 | 23.10 | 1 | 30.6 | 49.7 | 1 | |
| 1.5SMC24A | 1.5SMC24CA | 024 | 024 | 20.5 | 22.8 | 25.20 | 1 | 33.2 | 45.8 | 1 | |
| 1.5SMC27A | 1.5SMC27CA | 027 | 027 | 23.1 | 25.7 | 28.40 | 1 | 37.5 | 40.5 | 1 | |
| 1.5SMC30A | 1.5SMC30CA | 030 | 030 | 25.6 | 28.5 | 31.50 | 1 | 41.4 | 36.7 | 1 | |
| 1.5SMC33A | 1.5SMC33CA | 033 | 033 | 28.2 | 31.4 | 34.70 | 1 | 45.7 | 33.3 | 1 | |
| 1.5SMC36A | 1.5SMC36CA | 036 | 036 | 30.8 | 34.2 | 37.80 | 1 | 49.9 | 30.5 | 1 | |
| 1.5SMC39A | 1.5SMC39CA | 039 | 039 | 33.3 | 37.1 | 41.00 | 1 | 53.9 | 28.2 | 1 | |
| 1.5SMC43A | 1.5SMC43CA | 043 | 043 | 36.8 | 40.9 | 45.20 | 1 | 59.3 | 25.6 | 1 | |
| 1.5SMC47A | 1.5SMC47CA | 047 | 047 | 40.2 | 44.7 | 49.40 | 1 | 64.8 | 23.5 | 1 | |
| 1.5SMC51A | 1.5SMC51CA | 051 | 051 | 43.6 | 48.5 | 53.60 | 1 | 70.1 | 21.7 | 1 | |
| 1.5SMC56A | 1.5SMC56CA | 056 | 056 | 47.8 | 53.2 | 58.80 | 1 | 77.0 | 19.7 | 1 | |
| 1.5SMC62A | 1.5SMC62CA | 062 | 062 | 53.0 | 58.9 | 65.10 | 1 | 85.0 | 17.9 | 1 | |
| 1.5SMC68A | 1.5SMC68CA | 068 | 068 | 58.1 | 64.6 | 71.40 | 1 | 92.0 | 16.5 | 1 | |
| 1.5SMC75A | 1.5SMC75CA | 075 | 075 | 64.1 | 71.3 | 78.80 | 1 | 103.0 | 14.8 | 1 | |
| 1.5SMC82A | 1.5SMC82CA | 082 | 082 | 70.1 | 77.9 | 86.10 | 1 | 113.0 | 13.5 | 1 | |
| 1.5SMC91A | 1.5SMC91CA | 091 | 091 | 77.8 | 86.5 | 95.50 | 1 | 125.0 | 12.2 | 1 | |
| 1.5SMC100A | 1.5SMC100CA | 100 | 100 | 85.5 | 95.0 | 105.0 | 1 | 137.0 | 11.1 | 1 | |
| 1.5SMC110A | 1.5SMC110CA | 110 | 110 | 94.0 | 105.0 | 116.0 | 1 | 152.0 | 10.0 | 1 | |
| 1.5SMC120A | 1.5SMC120CA | 120 | 120 | 102.0 | 114.0 | 126.0 | 1 | 165.0 | 9.2 | 1 | |
| 1.5SMC130A | 1.5SMC130CA | 130 | 130 | 111.0 | 124.0 | 137.0 | 1 | 179.0 | 8.5 | 1 | |
| 1.5SMC150A | 1.5SMC150CA | 150 | 150 | 128.0 | 143.0 | 158.0 | 1 | 207.0 | 7.3 | 1 | |
| 1.5SMC160A | 1.5SMC160CA | 160 | 160 | 136.0 | 152.0 | 168.0 | 1 | 219.0 | 6.9 | 1 | |
| 1.5SMC170A | 1.5SMC170CA | 170 | 170 | 145.0 | 162.0 | 179.0 | 1 | 234.0 | 6.5 | 1 | |
| 1.5SMC180A | 1.5SMC180CA | 180 | 180 | 154.0 | 171.0 | 189.0 | 1 | 246.0 | 6.2 | 1 | |
| 1.5SMC200A | 1.5SMC200CA | 200 | 200 | 171.0 | 190.0 | 210.0 | 1 | 274.0 | 5.5 | 1 | |
| 1.5SMC220A | 1.5SMC220CA | 220 | 220 | 185.0 | 209.0 | 231.0 | 1 | 328.0 | 4.6 | 1 | |
| 1.5SMC250A | 1.5SMC250CA | 250 | 250 | 214.0 | 237.0 | 263.0 | 1 | 344.0 | 4.4 | 1 | |
| 1.5SMC300A | 1.5SMC300CA | 300 | 300 | 256.0 | 285.0 | 315.0 | 1 | 414.0 | 3.7 | 1 | |
| 1.5SMC350A | 1.5SMC350CA | 350 | 350 | 299.3 | 332.5 | 367.5 | 1 | 482.0 | 3.1 | 1 | |
| 1.5SMC380A | 1.5SMC380CA | 380 | 380 | 324.9 | 361.0 | 399.0 | 1 | 524.4 | 2.9 | 1 | |



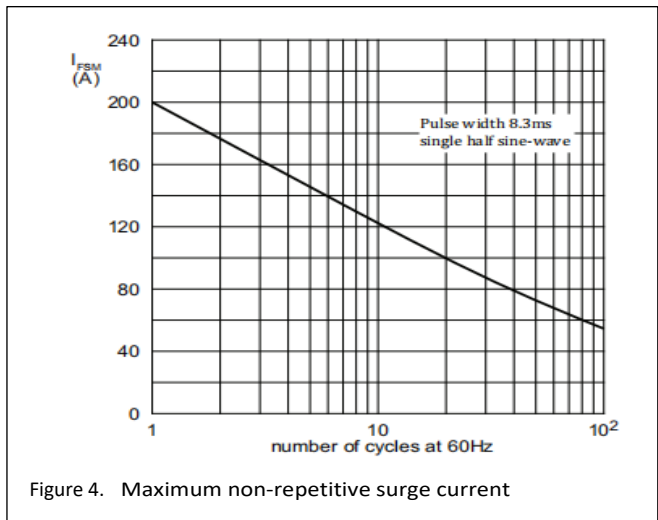
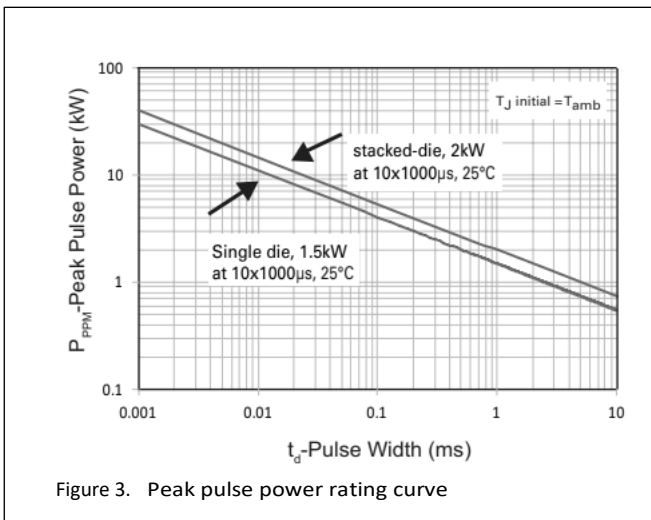
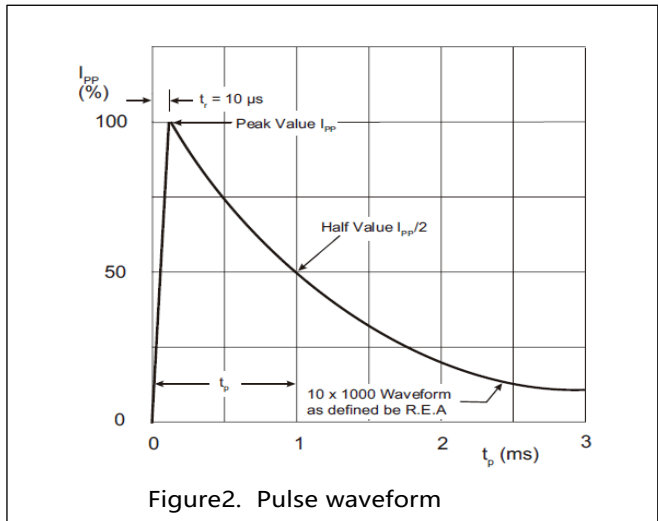
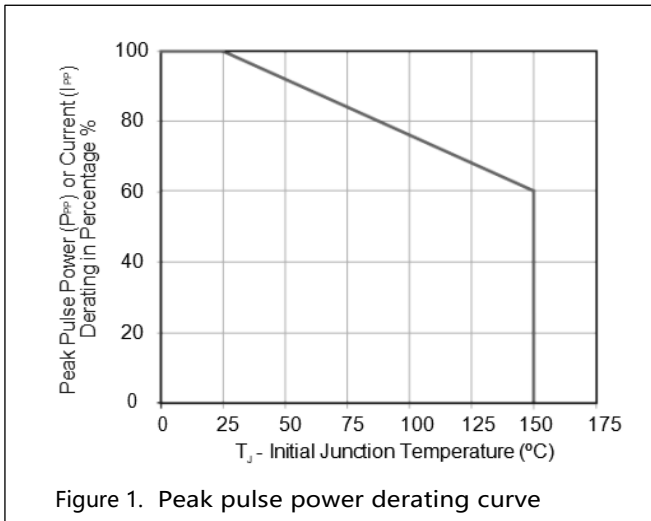
| Part Number (Uni) | Part Number (Bi) | Key Marking | | Reverse Stand off Voltage V_R (Volts) | Breakdown Voltage V_{BR} (Volts) @ I_T | | Test Current I_T (mA) | Maximum Clamping Voltage V_C @ I_{DM} (V) | Maximum Peak Pulse Current I_{pp} (A) | Maximum Reverse Leakage I_R @ V_R (μ A) | Agency Approval  |
|----------------------|---------------------|-------------|-----|--|--|-------|-------------------------------|---|---|--|---|
| | | UNI | BI | | MIN | MAX | | | | | |
| 1.5SMC400A | 1.5SMC400CA | 400 | 400 | 342.0 | 380.0 | 420.0 | 1 | 548.0 | 2.7 | 1 | |
| 1.5SMC440A | 1.5SMC440CA | 440 | 440 | 376.2 | 418.0 | 462.0 | 1 | 602.0 | 2.5 | 1 | |
| 1.5SMC500A | 1.5SMC500CA | 500 | 500 | 427.5 | 475.0 | 525.0 | 1 | 690.0 | 2.2 | 1 | |
| 1.5SMC520A | 1.5SMC520CA | 520 | 520 | 444.6 | 494.0 | 546.0 | 1 | 717.6 | 2.1 | 1 | |
| 1.5SMC540A | 1.5SMC540CA | 540 | 540 | 460.0 | 513.0 | 567.0 | 1 | 740.0 | 2.0 | 1 | |
| 1.5SMC550A | 1.5SMC550CA | 550 | 550 | 470.3 | 522.5 | 577.5 | 1 | 759.0 | 2.0 | 1 | |
| 1.5SMC600A | 1.5SMC600CA | 600 | 600 | 513.0 | 570.0 | 630.0 | 1 | 828.0 | 1.8 | 1 | |

I-V Curve Characteristics



- P_{PPM} Peak Pulse Power Dissipation -- Max power dissipation
- V_R Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation
- V_{BR} Breakdown Voltage -- Maximum voltage that flows through the TVS at a specified test current (I_T)
- V_C Clamping Voltage -- Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)
- I_R Reverse Leakage Current -- Current measured at V_R
- V_F Forward Voltage Drop for Uni-directional

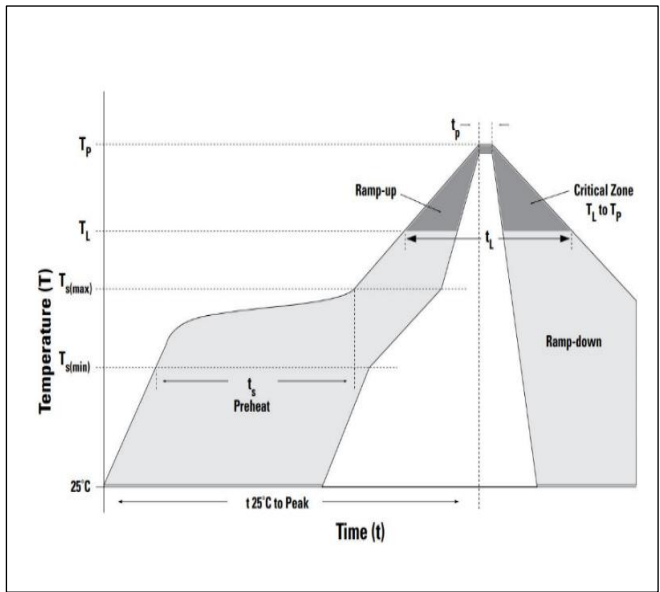
Ratings and Characteristic Curves (T = 25°C unless otherwise noted)



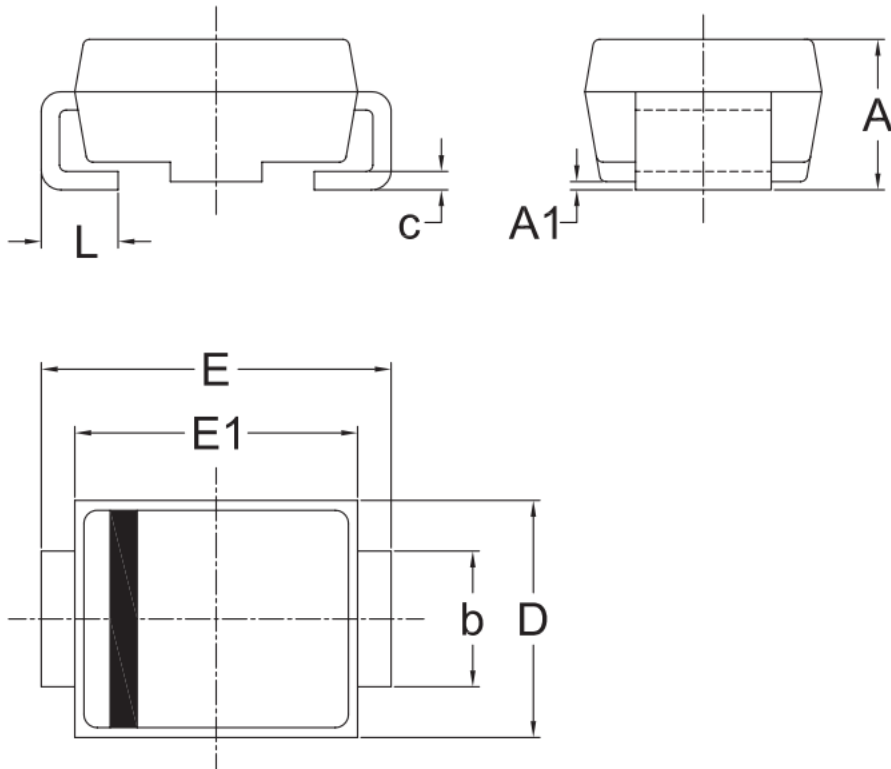
Soldering Parameters

Soldering profile

| | | |
|--|------------------------------------|-------------------------|
| Reflow Condition | | Lead-free assembly |
| 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 (Liquidus Temp (T_A) to peak) | | 3°C/second max |
| $T_{s(max)}$ to T_A - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature (T_A) (Liquidus) | 217°C |
| | - Time (min to max) (t_s) | 60 – 150 seconds |
| Peak Temperature (T_p) | | 260 ^{+0/-5} °C |
| Time within 5°C of actual peak Temperature (t_p) | | 20 – 40 seconds |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (T_p) | | 8 minutes Max. |
| Do not exceed | | 260°C |



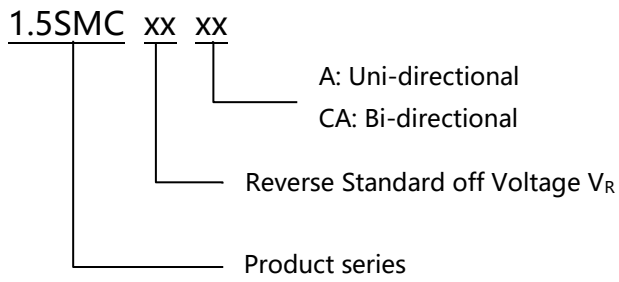
Dimensions



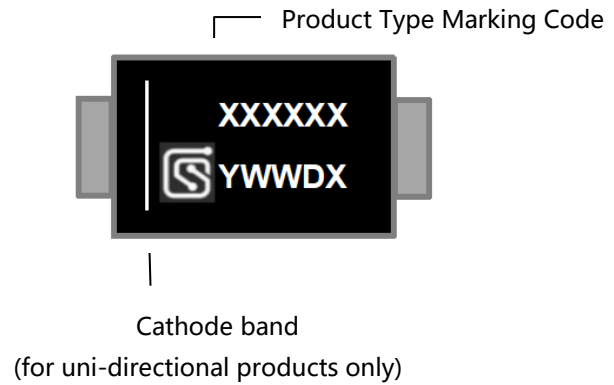
| UNIT | | A | A1 | b | c | D | E | E1 | L |
|------|-----|------|------|------|------|------|------|------|------|
| mm | Max | 2.83 | 0.30 | 3.10 | 0.25 | 6.15 | 8.15 | 7.05 | 1.60 |
| | Min | 2.33 | 0.00 | 2.80 | 0.15 | 5.85 | 7.65 | 6.75 | 0.90 |

Remark: Dimensions D and E1 do not include mold flash & gate remain.

Part Numbering



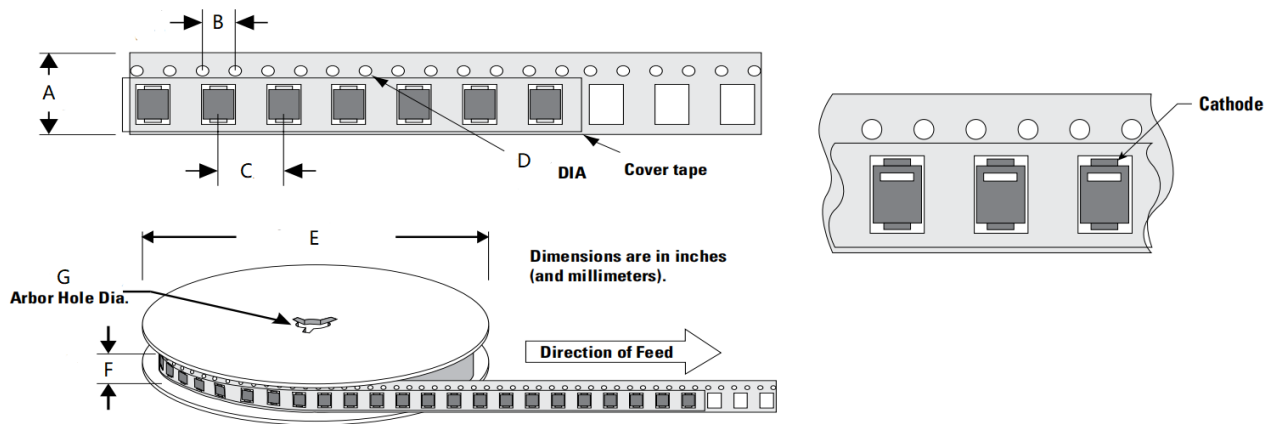
Part Marking



Packing

| Part number | Package name | Small packing quantity | Packing method |
|-------------|--------------|------------------------|----------------|
| 1.5SMCXXXX | DO-214AB | 3000 | Tape & Reel |

Tape and Reel Specification



| Symbol | Millimeter |
|--------|-------------|
| A | 16.00±0.10 |
| B | 4.00±0.10 |
| C | 8.00±0.10 |
| D | 1.55±0.05 |
| E | 330.20±2.00 |
| F | 19.70±2.00 |
| G | 13.30±0.30 |

Revision history of Specification

| Version | Change Items | Effective Date |
|---------|-----------------|----------------|
| 1.0 | Initial Release | 13-Aug-2021 |

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