

TVS Diode – 5.0ASMDJ Series

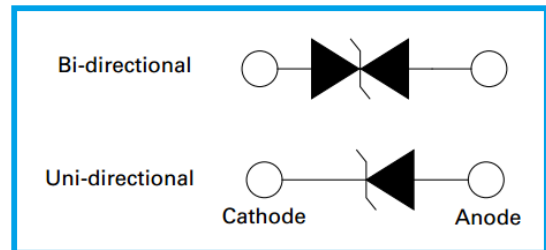
Features

- Plastic package, excellent insulation strength.
- Glass passivated chip junction in SMC package.
- Excellent voltage clamping capability.
- Automotive grade AEC-Q101 qualified.
- Low Zener impedance.
- 5000W peak pulse power capability on 10/1000µs waveform.
- Typical leakage current less than 1µA above 13V.
- Very fast response time, typically less than 1.0ps from 0 volt to V_{BR} minimum.
- High temperature soldering guaranteed: 265°C/10 sec.
- MSL: JEDEC-J-STD-020, Level 1



Applications

- I/O interface, V_{CC} bus
- Telecom / Automotive
- Industrial and consumer electronic applications.
- Relay and electromagnetic valve surge absorption.



Mechanical and Physical Data

- Case: JEDEC SMC molded plastic.
- Surface mount device, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional.

Maximum Ratings and Thermal Characteristics

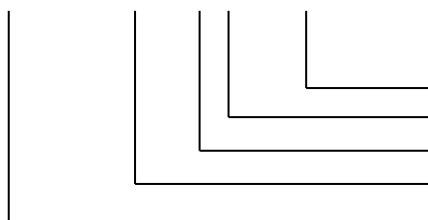
| Parameter | Symbol | Value | Unit |
|--|-----------------------------------|-----------|------|
| Peak Pulse Power Dissipation on 10/1000µs waveform (Note 1, Fig.1). | P _{PPM} | Min 5000 | Watt |
| Peak Pulse Current of 10/1000µs waveform (Note 1, Fig.3). | I _{PPM} | See Table | Amp |
| Steady State Power Dissipation at T _L = 75°C, Lead lengths 0.375", (9.5mm) (Fig.5). | P _{M(AV)} | 6.5 | Watt |
| Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6). | I _{FSM} | 300 | Amp |
| Operating Junction and Storage Temperature Range. | T _J , T _{STG} | -55~150 | °C |

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A = 25°C per Fig.2.
2. 8.3ms single half sine wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

Part Number Code

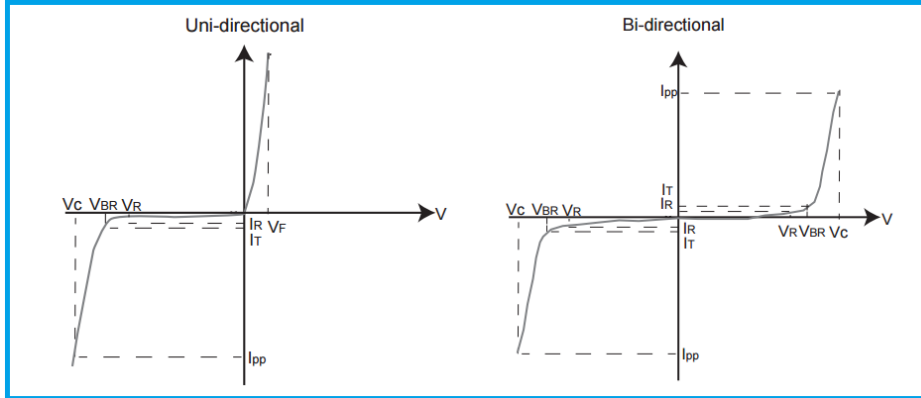
5.0ASMDJ □□□ CA - □□□



- Packaging Code (T13: Tape with 13" Reel; T7: Tape with 7")
- V_{BR} Voltage tolerance (A: 5%; Blank: 10%)
- C: Bi-directional; Blank: Uni-directional
- Reverse Stand-Off Voltage or Typical Breakdown Voltage
- Automotive 5.0ASMDJ Series (5000W)

TVS Diode – 5.0ASMDJ Series

I-V Curve Characteristics



- P_{PPM} Peak Pulse Power Dissipation – Maximum 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

Electrical Characteristics

| Part Number | | Marking | | Reverse Stand Off Voltage V_R (V) | Breakdown Voltage V_{BR} (V) @ I_T | | Test Current I_T (mA) | Maximum Clamping Voltage V_C (V) @ I_{PP} | Maximum Peak Pulse Current I_{PP} (A) | Maximum Reverse Leakage I_R (μ A) @ V_R |
|-------------|--------------|---------|--------|-------------------------------------|--|------|-------------------------|---|---|--|
| Uni | Bi | Uni | Bi | | Min. | Max. | | | | |
| 5.0ASMDJ10A | 5.0ASMDJ10CA | 5PEMA | 5BEMA | 10.0 | 11.1 | 12.3 | 1 | 17.0 | 294.1 | 2 |
| 5.0ASMDJ11A | 5.0ASMDJ11CA | 5PEN A | 5BENA | 11.0 | 12.2 | 13.5 | 1 | 18.2 | 275.0 | 2 |
| 5.0ASMDJ12A | 5.0ASMDJ12CA | 5PEPA | 5BEPA | 12.0 | 13.3 | 14.7 | 1 | 19.9 | 252.0 | 2 |
| 5.0ASMDJ13A | 5.0ASMDJ13CA | 5PEQA | 5BEQA | 13.0 | 14.4 | 15.9 | 1 | 21.5 | 233.0 | 2 |
| 5.0ASMDJ14A | 5.0ASMDJ14CA | 5PERA | 5BERA | 14.0 | 15.6 | 17.2 | 1 | 23.2 | 216.0 | 2 |
| 5.0ASMDJ15A | 5.0ASMDJ15CA | 5PESA | 5BESA | 15.0 | 16.7 | 18.5 | 1 | 24.4 | 205.0 | 2 |
| 5.0ASMDJ16A | 5.0ASMDJ16CA | 5PETA | 5BETA | 16.0 | 17.8 | 19.7 | 1 | 26.0 | 193.0 | 2 |
| 5.0ASMDJ17A | 5.0ASMDJ17CA | 5PEUA | 5BEUA | 17.0 | 18.9 | 20.9 | 1 | 27.6 | 181.0 | 2 |
| 5.0ASMDJ18A | 5.0ASMDJ18CA | 5PEVA | 5BEVA | 18.0 | 20.0 | 22.1 | 1 | 29.2 | 172.0 | 2 |
| 5.0ASMDJ20A | 5.0ASMDJ20CA | 5PEWA | 5BEWA | 20.0 | 22.2 | 24.5 | 1 | 32.4 | 155.0 | 2 |
| 5.0ASMDJ22A | 5.0ASMDJ22CA | 5PEXA | 5BEXA | 22.0 | 24.4 | 26.9 | 1 | 35.5 | 141.0 | 2 |
| 5.0ASMDJ24A | 5.0ASMDJ24CA | 5PEZA | 5BEZA | 24.0 | 26.7 | 29.5 | 1 | 38.9 | 129.0 | 2 |
| 5.0ASMDJ26A | 5.0ASMDJ26CA | 5PFEA | 5BFEA | 26.0 | 28.9 | 31.9 | 1 | 42.1 | 119.0 | 2 |
| 5.0ASMDJ28A | 5.0ASMDJ28CA | 5PFGA | 5BFGA | 28.0 | 31.1 | 34.4 | 1 | 45.4 | 110.0 | 2 |
| 5.0ASMDJ30A | 5.0ASMDJ30CA | 5PFKA | 5BFKA | 30.0 | 33.3 | 36.8 | 1 | 48.4 | 103.0 | 2 |
| 5.0ASMDJ33A | 5.0ASMDJ33CA | 5PFMA | 5BFMA | 33.0 | 36.7 | 40.6 | 1 | 53.3 | 93.9 | 2 |
| 5.0ASMDJ36A | 5.0ASMDJ36CA | 5PFPA | 5BFPA | 36.0 | 40.0 | 44.2 | 1 | 58.1 | 86.1 | 2 |
| 5.0ASMDJ40A | 5.0ASMDJ40CA | 5PFRA | 5BFRA | 40.0 | 44.4 | 49.1 | 1 | 64.5 | 77.6 | 2 |
| 5.0ASMDJ43A | 5.0ASMDJ43CA | 5PFTA | 5BFTA | 43.0 | 47.8 | 52.8 | 1 | 69.4 | 72.1 | 2 |
| 5.0ASMDJ45A | 5.0ASMDJ45CA | 5PFVA | 5BFVA | 45.0 | 50.0 | 55.3 | 1 | 72.7 | 68.8 | 2 |
| 5.0ASMDJ48A | 5.0ASMDJ48CA | 5PFXA | 5BFXA | 48.0 | 53.3 | 58.9 | 1 | 77.4 | 64.7 | 2 |
| 5.0ASMDJ51A | 5.0ASMDJ51CA | 5PFZA | 5BFZA | 51.0 | 56.7 | 62.7 | 1 | 82.4 | 60.7 | 2 |
| 5.0ASMDJ54A | 5.0ASMDJ54CA | 5RGEA | 5BG EA | 54.0 | 60.0 | 66.3 | 1 | 87.1 | 57.5 | 2 |
| 5.0ASMDJ58A | 5.0ASMDJ58CA | 5PGGA | 5BGG A | 58.0 | 64.4 | 71.2 | 1 | 93.6 | 53.5 | 2 |

Note:

- For bi-directional type having V_R of 10 volts and less, the I_R limit is double.



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Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

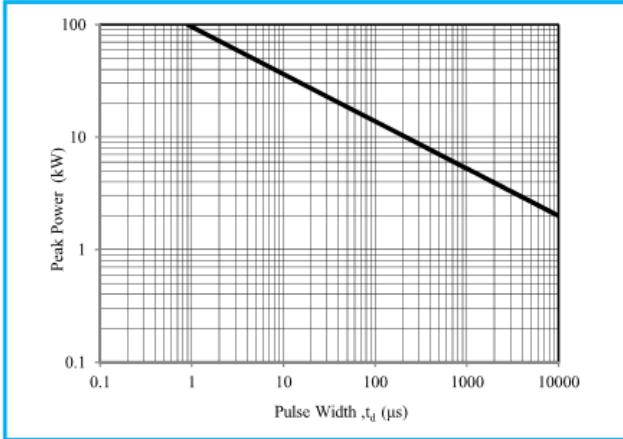


Fig 2 - Pulse Derating Curve

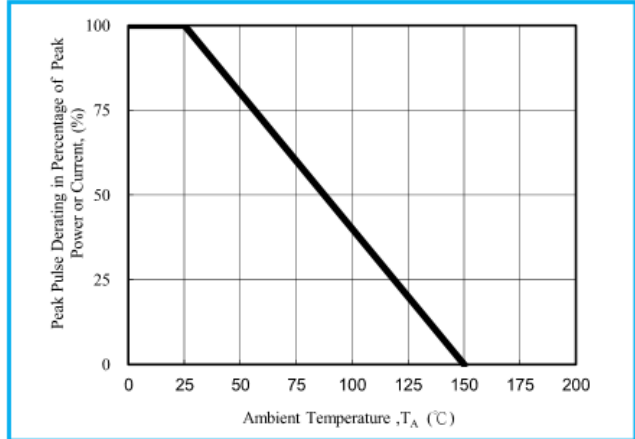


Fig 3 - Pulse Waveform

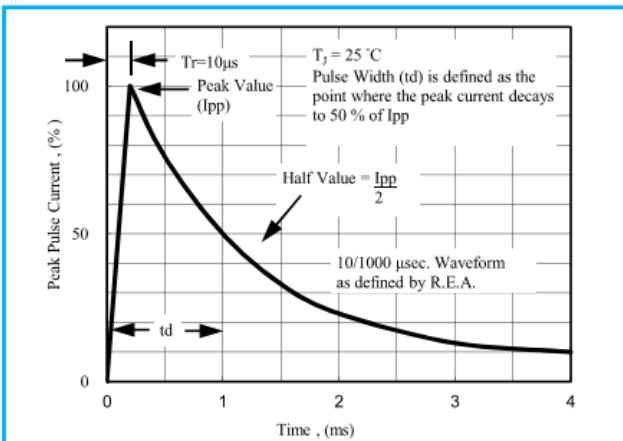


Fig 4 - Typical Junction Capacitance Uni-directional

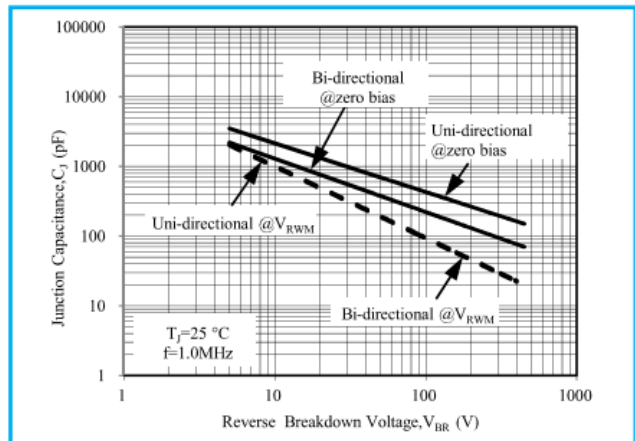


Fig 5 - Steady State Power Dissipation Derating Curve

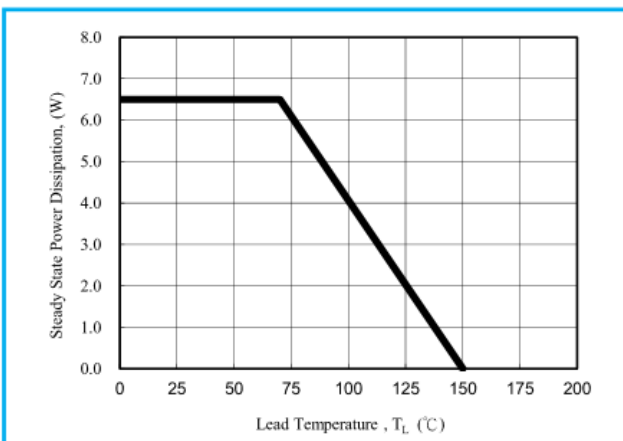
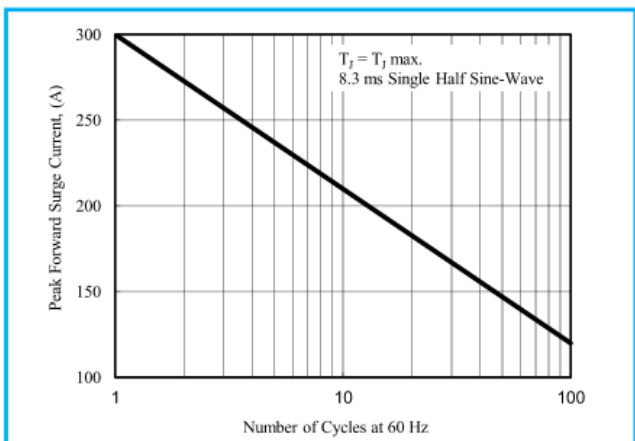
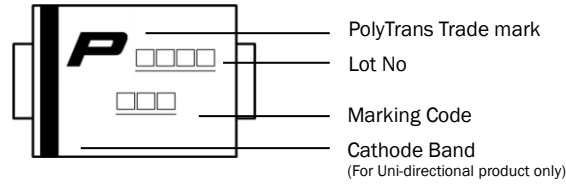


Fig 6 - Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

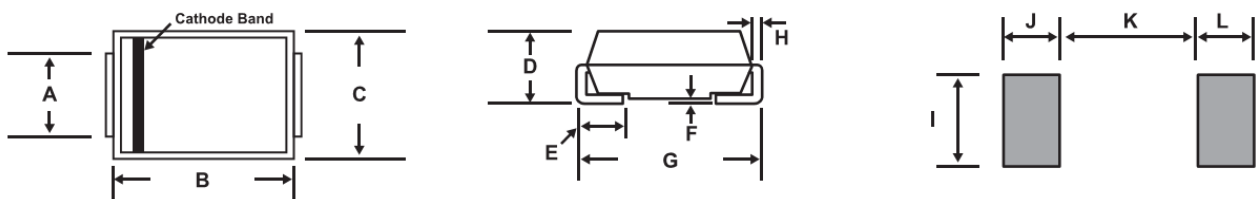


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Marking Definitions



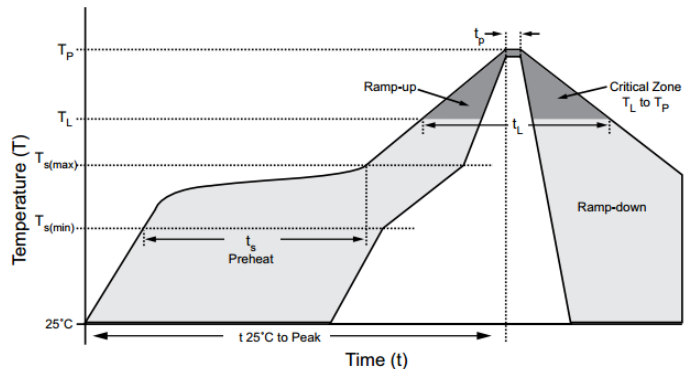
Physical Dimensions



| Dimension | Millimeters | | Inches | |
|-----------|-------------|------|--------|-------|
| | 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 | 2.20 | 2.80 | 0.087 | 0.110 |
| E | 0.76 | 1.52 | 0.030 | 0.060 |
| F | - | 0.20 | - | 0.008 |
| G | 7.75 | 8.13 | 0.305 | 0.320 |
| H | 0.15 | 0.31 | 0.006 | 0.012 |
| I | 3.30 | - | 0.129 | - |
| J | 2.40 | - | 0.094 | - |
| K | - | 4.20 | - | 0.165 |
| L | 2.40 | - | 0.094 | - |

Lead Free Reflow Soldering Recommendations

| | |
|--|-------------------|
| Preheat | |
| - Temperature Min (T_{s_min}) | 150°C |
| - Temperature Max (T_{s_max}) | 200°C |
| - Time (T_{s_min} to T_{s_max}) | 60-180 seconds |
| - Average Ramp-Up Rate | 1~3°C/second |
| Peak Temperature | 260°C max. |
| Time within 5°C of actual Peak Temperature (t_p) | 40 seconds max. |
| Ramp-Down Rate | 6 °C /second max. |



Note: If the soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

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Packaging Information

| Part Number | Packaging Code | Component Package | Quantity | Packaging Option | Packaging Specification |
|-----------------|----------------|-------------------|----------|----------------------------------|-------------------------|
| 5.0ASMDJ Series | T13 | DO-214AB | 3000 | Tape & Reel - 16mm tape/13" reel | EIA STD RS-481 |
| 5.0ASMDJ Series | T7 | DO-214AB | 500 | Tape & Reel - 16mm tape/7" reel | EIA STD RS-481 |

Tape and Reel Specifications

