

MDE Semiconductor, Inc.

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SMAJ SERIES

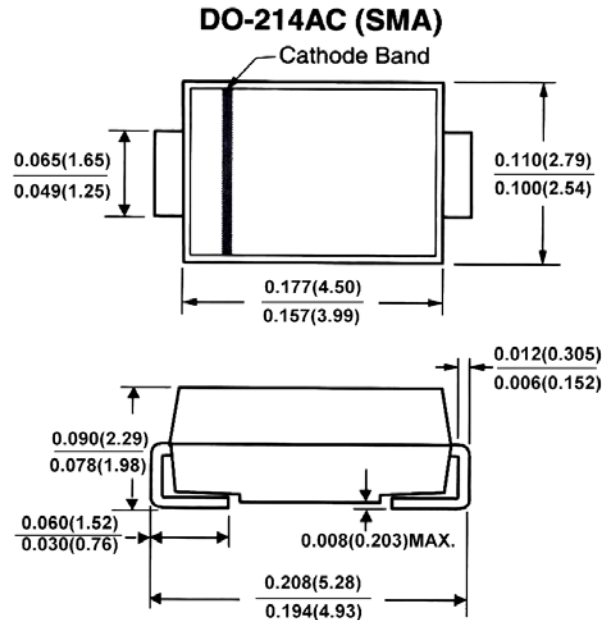
SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-5.0 TO 440 Volts 400 Watt Peak Pulse Power

FEATURES

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Repetition rate (duty cycle):0.01%
- Fast response time: typically less than 1.0 ps from 0 volts to BV for unidirectional types
- Typical IR less than 1µA above 10V
- High temperature soldering:
250°C/10 seconds at terminals
- Plastic package has Underwriters Laboratory Flammability Classification 94 V-O

MECHANICAL DATA

Case: JEDEC DO214AC. Molded plastic over glass passivated junction
Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
Polarity: Color band denoted positive end (cathode) except Bidirectional
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.002 ounces, 0.064 grams



Dimensions in inches (millimeters)

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types SMAJ5.0 thru types SMAJ440 (e.g. SMAJ5.0C, SMAJ440CA)
Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| RATING | SYMBOL | VALUE | UNITS |
|--|----------------|-------------|-------|
| Peak Pulse Power Dissipation on 10/1000 µs waveform (NOTE 1, 2, Fig.1) | P_{PPM} | Minimum 400 | Watts |
| Peak Pulse Current of on 10/1000 µs waveform (Note 1, Fig 3) | I_{PPM} | SEE TABLE 1 | Amps |
| Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load, (JEDEC Method)(Note2, 3) | I_{FSM} | 40 | Amps |
| Operatings and Storage Temperature Range | T_J, T_{STG} | -55 +150 | °C |

NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above $T_a=25^\circ\text{C}$ per Fig.2.
2. Mounted on Copper Pad area of 0.8x0.8" (20x20mm) per Fig.5.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

Certified RoHS Compliant

UL File # E223026

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RATING AND CHARACTERISTIC CURVES SMAJ SERIES

Fig. 1 - Peak Pulse Power Rating

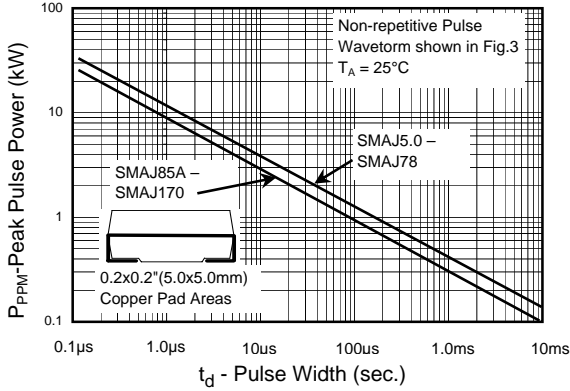


Fig.2 - Pulse Derating Curve

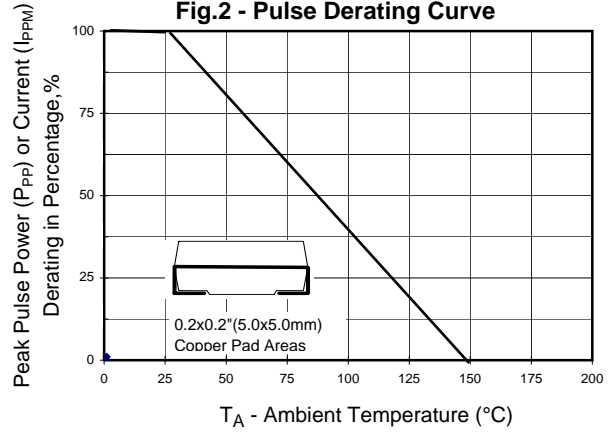


Fig.3 - Pulse Waveform

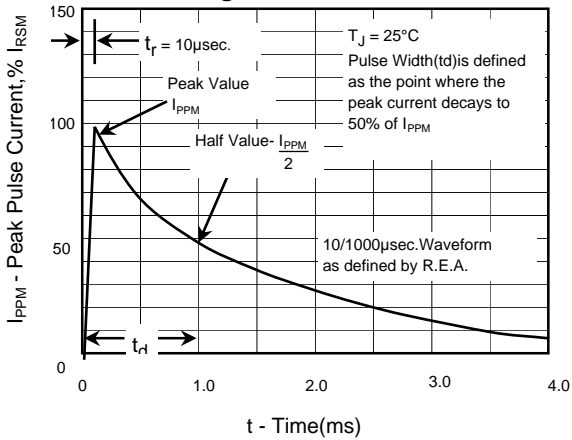


Fig.4 - Typical Junction Capacitance

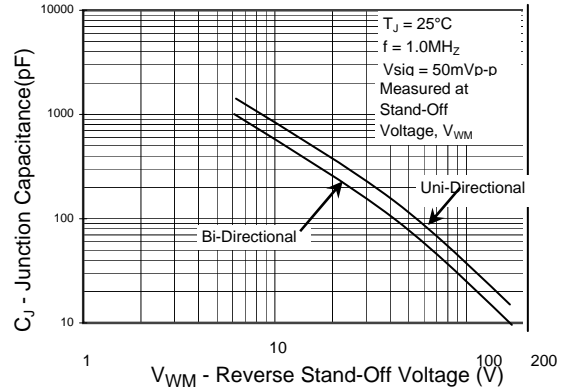
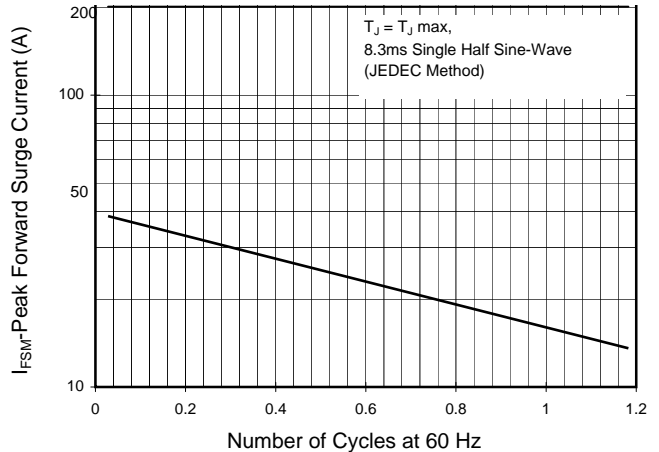
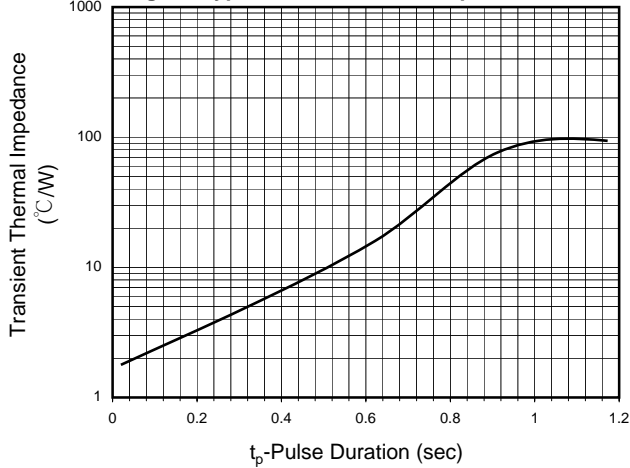


Fig. 5 - Typ. Transient Thermal Impedance



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400 Watt Surface Mount TVS

| UNI-POLAR | BI-POLAR | DEVICE MARKING CODE | | REVERSE STANDOFF VOLTAGE V_{RWM} (V) | BREAKDOWN VOLTAGE V_{BR} (V) MIN. @ I_T | BREAKDOWN VOLTAGE V_{BR} (V) MAX. @ I_T | TEST CURRENT (I_T) mA | MAXIMUM CLAMPING VOLTAGE @ I_{PP} V_C (V) | PEAK PULSE CURRENT I_{PP} (A) | REVERSE LEAKAGE @ V_{RWM} I_R (μ A) |
|-----------|-----------|---------------------|----|---|---|---|---------------------------------|--|------------------------------------|--|
| | | UNI | BI | | | | | | | |
| SMAJ5.0A | SMAJ5.0CA | AE | WE | 5.00 | 6.40 | 7.00 | 10 | 9.2 | 43.5 | 800 |
| SMAJ6.0A | SMAJ6.0CA | AG | WG | 6.00 | 6.67 | 7.37 | 10 | 10.3 | 38.8 | 800 |
| SMAJ6.5A | SMAJ6.5CA | AK | WK | 6.50 | 7.22 | 7.98 | 10 | 11.2 | 35.7 | 500 |
| SMAJ7.0A | SMAJ7.0CA | AM | WM | 7.00 | 7.78 | 8.60 | 10 | 12.0 | 33.3 | 200 |
| SMAJ7.5A | SMAJ7.5CA | AP | WP | 7.50 | 8.33 | 9.21 | 1 | 12.9 | 31.0 | 100 |
| SMAJ8.0A | SMAJ8.0CA | AR | WR | 8.00 | 8.89 | 9.83 | 1 | 13.6 | 29.4 | 50 |
| SMAJ8.5A | SMAJ8.5CA | AT | WT | 8.50 | 9.44 | 10.40 | 1 | 14.4 | 27.8 | 20 |
| SMAJ9.0A | SMAJ9.0CA | AV | WV | 9.00 | 10.00 | 11.10 | 1 | 15.4 | 26.0 | 10 |
| SMAJ10A | SMAJ10CA | AX | WX | 10.00 | 11.10 | 12.30 | 1 | 17.0 | 23.5 | 5 |
| SMAJ11A | SMAJ11CA | AZ | WZ | 11.00 | 12.20 | 13.50 | 1 | 18.2 | 22.0 | 5 |
| SMAJ12A | SMAJ12CA | BE | XE | 12.00 | 13.30 | 14.70 | 1 | 19.9 | 20.1 | 5 |
| SMAJ13A | SMAJ13CA | BG | XG | 13.00 | 14.40 | 15.90 | 1 | 21.5 | 18.6 | 5 |
| SMAJ14A | SMAJ14CA | BK | XK | 14.00 | 15.60 | 17.20 | 1 | 23.2 | 17.2 | 5 |
| SMAJ15A | SMAJ15CA | BM | XM | 15.00 | 16.70 | 18.50 | 1 | 24.4 | 16.4 | 5 |
| SMAJ16A | SMAJ16CA | BP | XP | 16.00 | 17.80 | 19.70 | 1 | 26.0 | 15.4 | 5 |
| SMAJ17A | SMAJ17CA | BR | XR | 17.00 | 18.90 | 20.90 | 1 | 27.6 | 14.5 | 5 |
| SMAJ18A | SMAJ18CA | BT | XT | 18.00 | 20.00 | 22.10 | 1 | 29.2 | 13.7 | 5 |
| SMAJ20A | SMAJ20CA | BV | XV | 20.00 | 22.20 | 24.50 | 1 | 32.4 | 12.3 | 5 |
| SMAJ22A | SMAJ22CA | BX | XX | 22.00 | 24.40 | 26.90 | 1 | 35.5 | 11.3 | 5 |
| SMAJ24A | SMAJ24CA | BZ | XZ | 24.00 | 26.70 | 29.50 | 1 | 38.9 | 10.3 | 5 |
| SMAJ26A | SMAJ26CA | CE | YE | 26.00 | 28.90 | 31.90 | 1 | 42.1 | 9.5 | 5 |
| SMAJ28A | SMAJ28CA | CG | YG | 28.00 | 31.10 | 34.40 | 1 | 45.4 | 8.8 | 5 |
| SMAJ30A | SMAJ30CA | CK | YK | 30.00 | 33.30 | 36.80 | 1 | 48.4 | 8.3 | 5 |
| SMAJ33A | SMAJ33CA | CM | YM | 33.00 | 36.70 | 40.60 | 1 | 53.3 | 7.5 | 5 |
| SMAJ36A | SMAJ36CA | CP | YP | 36.00 | 40.00 | 44.20 | 1 | 58.1 | 6.9 | 5 |
| SMAJ40A | SMAJ40CA | CR | YR | 40.00 | 44.40 | 49.10 | 1 | 64.5 | 6.2 | 5 |
| SMAJ43A | SMAJ43CA | CT | YT | 43.00 | 47.80 | 52.80 | 1 | 69.4 | 5.8 | 5 |
| SMAJ45A | SMAJ45CA | CV | YV | 45.00 | 50.00 | 55.30 | 1 | 72.7 | 5.5 | 5 |
| SMAJ48A | SMAJ48CA | CX | YX | 48.00 | 53.30 | 58.90 | 1 | 77.4 | 5.2 | 5 |
| SMAJ51A | SMAJ51CA | CZ | YZ | 51.00 | 56.70 | 62.70 | 1 | 82.4 | 4.9 | 5 |
| SMAJ54A | SMAJ54CA | RE | ZE | 54.00 | 60.00 | 66.30 | 1 | 87.1 | 4.6 | 5 |
| SMAJ58A | SMAJ58CA | RG | ZG | 58.00 | 64.40 | 71.20 | 1 | 93.6 | 4.3 | 5 |
| SMAJ60A | SMAJ60CA | RK | ZK | 60.00 | 66.70 | 73.70 | 1 | 96.8 | 4.1 | 5 |
| SMAJ64A | SMAJ64CA | RM | ZM | 64.00 | 71.10 | 78.60 | 1 | 103.0 | 3.9 | 5 |
| SMAJ70A | SMAJ70CA | RP | ZP | 70.00 | 77.80 | 86.00 | 1 | 113.0 | 3.5 | 5 |
| SMAJ75A | SMAJ75CA | RR | ZR | 75.00 | 83.30 | 92.10 | 1 | 121.0 | 3.3 | 5 |
| SMAJ78A | SMAJ78CA | RT | ZT | 78.00 | 86.70 | 95.80 | 1 | 126.0 | 3.2 | 5 |
| SMAJ85A | SMAJ85CA | RV | ZV | 85.00 | 94.40 | 104.00 | 1 | 137.0 | 2.9 | 5 |
| SMAJ90A | SMAJ90CA | RX | ZX | 90.00 | 100.00 | 111.00 | 1 | 146 | 2.7 | 5 |
| SMAJ100A | SMAJ100CA | RZ | ZZ | 100.00 | 111.00 | 123.00 | 1 | 162 | 2.5 | 5 |
| SMAJ110A | SMAJ110CA | SE | VE | 110.00 | 122.00 | 135.00 | 1 | 177 | 2.3 | 5 |
| SMAJ120A | SMAJ120CA | SG | VG | 120.00 | 133.00 | 147.00 | 1 | 193 | 2.1 | 5 |
| SMAJ130A | SMAJ130CA | SK | VK | 130.00 | 144.00 | 159.00 | 1 | 209 | 1.9 | 5 |
| SMAJ150A | SMAJ150CA | SM | VM | 150.00 | 167.00 | 185.00 | 1 | 243 | 1.6 | 5 |
| SMAJ160A | SMAJ160CA | SP | VP | 160.00 | 178.00 | 197.00 | 1 | 259 | 1.5 | 5 |
| SMAJ170A | SMAJ170CA | SR | VR | 170.00 | 189.00 | 209.00 | 1 | 275 | 1.5 | 5 |
| SMAJ180A | SMAJ180CA | ST | VT | 180.00 | 201.00 | 222.00 | 1 | 292 | 1.4 | 5 |
| SMAJ200A | SMAJ200CA | SV | VV | 200.00 | 224.00 | 247.00 | 1 | 324 | 1.2 | 5 |
| SMAJ220A | SMAJ220CA | SX | VX | 220.00 | 246.00 | 272.00 | 1 | 356 | 1.1 | 5 |
| SMAJ250A | SMAJ250CA | SZ | VZ | 250.00 | 279.00 | 309.00 | 1 | 405 | 1.0 | 5 |
| SMAJ300A | SMAJ300CA | TE | UE | 300.00 | 335.00 | 371.00 | 1 | 486 | 0.8 | 5 |
| SMAJ350A | SMAJ350CA | TG | UG | 350.00 | 391.00 | 432.00 | 1 | 567 | 0.7 | 5 |
| SMAJ400A | SMAJ400CA | TK | UK | 400.00 | 447.00 | 494.00 | 1 | 648 | 0.6 | 5 |
| SMAJ440A | SMAJ440CA | TM | UM | 440.00 | 492.00 | 543.00 | 1 | 713 | 0.6 | 5 |

For bidirectional type having V_{RWM} of 10 volts and less, the I_R limit is double.

For parts without A, the V_{BR} is $\pm 10\%$