Micro Commercial Components

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20736 Marilla Street Chatsworth
CA 91311
Phone: (818) 701-4933
Fax: (818) 701-4939

# SMAJ5.0AHE3 THRU SMAJ440CAHE3

## 400 Watt Transient Voltage Suppressors 5.0 to 440 Volts

## Features

- Halogen free
- For Surface Mount Applications
- Unidirectional And Bidirectional
- Low Inductance
- High Temp Soldering: 260°C for 10 Seconds At Terminals
- For Bidirectional Devices Add “C” To The Suffix of The Part Number: i.e.SMAJ5.0CAHE3 for 5% Tolerance
- Lead Free Finish/Rohs Compliant (Note1) ("P"Suffix designates Compliant. See ordering information)
- UL Recognized File # E331408
- Meet AEC-Q101 Requirement

## Mechanical Data

- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Manufacturing code added for better tracking
- Polarity: Indicated by cathode band except bi-directional types

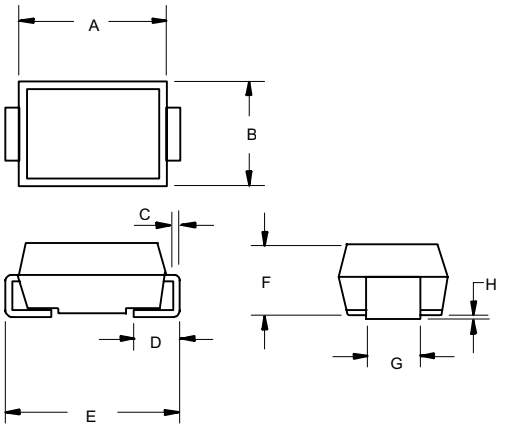
## Maximum Rating:

- Operating Temperature: -55°C to +175°C
- Storage Temperature: -55°C to +175°C
- Typical Thermal Resistance: 100℃/W Junction to Ambient

| | | | |
|---|---|---|---|
| Peak Pulse Current on 10/1000 us Wave form | $I_{PPM}$ | See Table 1 | Note 2 |
| Peak Pulse Power Dissipation | $P_{PPM}$ | Min 400 W | Note 2, 6 |
| Steady State Power Dissipation | $P_{M(AV)}$ | 1.5 W | Note 2, 5 |

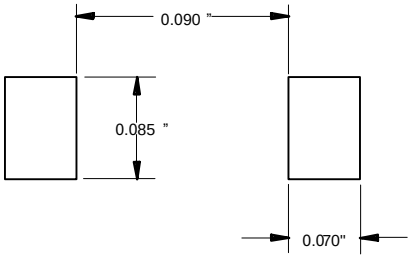
Note: 1. High Temperature Solder Exemptions Applied, see EU Directive Annex 7.
2. Non-repetitive current pulse, per Fig.3 and derated above $T_A$=25℃ per Fig.2.
3. Mounted on 5.0mm$^2$ copper pads to each terminal.
4. 8.3ms, single half sine wave duty cycle = 4 pulses per Minutes maximum.
5. Lead temperature at $T_L$ = 75℃.
6. Peak pulse power waveform is 10/1000us

DO-214AC
(SMA)( LEAD FRAME)




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| | INCHES | | MM | | |
| DIM | MIN | MAX | MIN | MAX | NOTE |
| A | .157 | .181 | 4.00 | 4.60 | |
| B | .098 | .114 | 2.50 | 2.90 | |
| C | .006 | .012 | 0.152 | 0.305 | |
| D | .030 | .060 | 0.76 | 1.52 | |
| E | .188 | .208 | 4.80 | 5.28 | |
| F | .078 | .096 | 2.00 | 2.44 | |
| G | .050 | .064 | 1.27 | 1.63 | |
| H | .002 | .008 | 0.051 | 0.203 | |

SUGGESTED SOLDER PAD LAYOUT



# SMAJ5.0AHE3 thru SMAJ440CAHE3

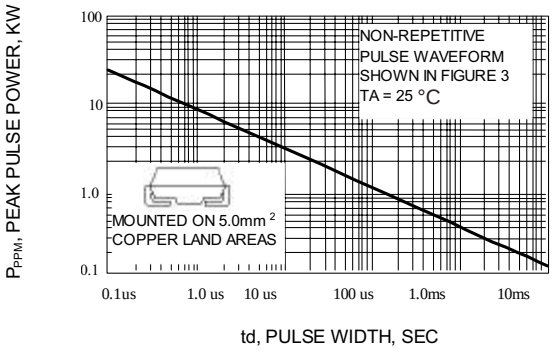



Fig. 1-PEAK PULSE POWER RATING CURVE

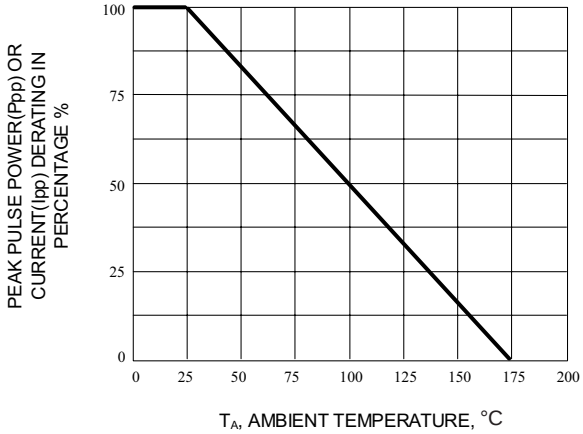



Fig. 2-PULSE RATING CURVE

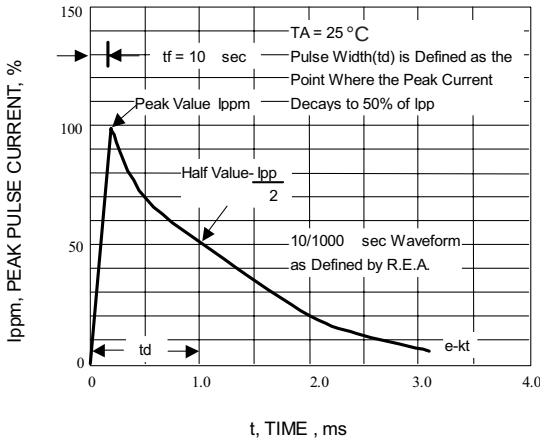



Fig. 3-PULSE WAVEFORM

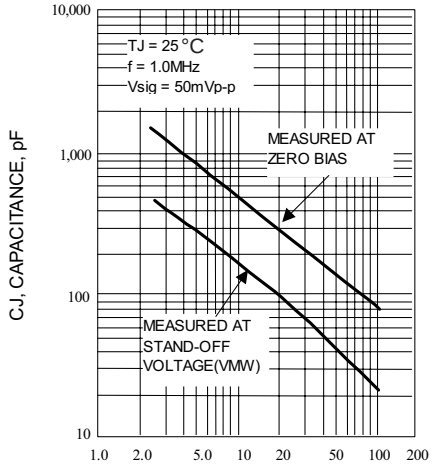



Fig. 4-TYPICAL JUNCTION CAPACITANCE

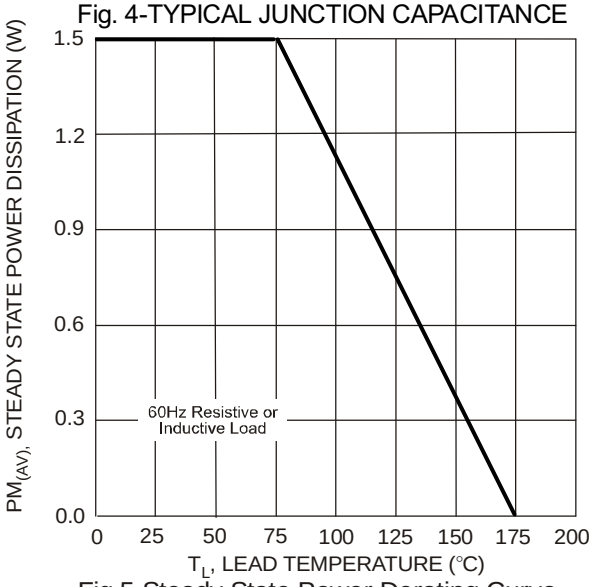



Fig.5-Steady State Power Derating Curve

## ELECTRICAL CHARACTERISTICS @25°C

| MCC PART NUMBER | | REVERSE STAND-OFF VOLTAGE $V_{WM}$ | BREAKDOWN VOLTAGE $V_{(BR)}$ @ $I_T$ (VOLTS) | | | MAXIMUM CLAMPING VOLTAGE @ $I_{PP}$ | PEAK PULSE CURRENT $I_{PP}$ | MAXIMUM REVERSE LEAKAGE @$V_{WM}$ $I_D$ | MARKING CODE | |
|---|---|---|---|---|---|---|---|---|---|---|
| UNI-POLAR | BI-POLAR | (VOLTS) | MIN | MAX | $I_T$ (mA) | (VOLTS) | (AMPS) | (μA) | 1 | 2 |
| SMAJ5.0AHE3 | SMAJ5.0CAHE3 | 5.0 | 6.40 | 7.00 | 10 | 9.2 | 43.5 | 800 | AE | WE |
| SMAJ6.0AHE3 | SMAJ6.0CAHE3 | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 38.8 | 800 | AG | WG |
| SMAJ6.5AHE3 | SMAJ6.5CAHE3 | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 35.7 | 500 | AK | WK |
| SMAJ7.0AHE3 | SMAJ7.0CAHE3 | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 33.3 | 200 | AM | WM |
| SMAJ7.5AHE3 | SMAJ7.5CAHE3 | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 31.0 | 100 | AP | WP |
| SMAJ8.0AHE3 | SMAJ8.0CAHE3 | 8.0 | 8.89 | 9.83 | 1 | 13.6 | 29.4 | 50 | AR | WR |
| SMAJ8.5AHE3 | SMAJ8.5CAHE3 | 8.5 | 9.44 | 10.4 | 1 | 14.4 | 27.7 | 20 | AT | WT |
| SMAJ9.0AHE3 | SMAJ9.0CAHE3 | 9.0 | 10.0 | 11.1 | 1 | 15.4 | 26.0 | 10 | AV | WV |
| SMAJ10AHE3 | SMAJ10CAHE3 | 10 | 11.1 | 12.3 | 1 | 17.0 | 23.5 | 5 | AX | WX |
| SMAJ11AHE3 | SMAJ11CAHE3 | 11 | 12.2 | 13.5 | 1 | 18.2 | 22.0 | 1 | AZ | WZ |
| SMAJ12AHE3 | SMAJ12CAHE3 | 12 | 13.3 | 14.7 | 1 | 19.9 | 20.1 | 1 | BE | XE |
| SMAJ13AHE3 | SMAJ13CAHE3 | 13 | 14.4 | 15.9 | 1 | 21.5 | 18.6 | 1 | BG | XG |
| SMAJ14AHE3 | SMAJ14CAHE3 | 14 | 15.6 | 17.2 | 1 | 23.2 | 17.2 | 1 | BK | XK |
| SMAJ15AHE3 | SMAJ15CAHE3 | 15 | 16.7 | 18.5 | 1 | 24.4 | 16.4 | 1 | BM | XM |
| SMAJ16AHE3 | SMAJ16CAHE3 | 16 | 17.8 | 19.7 | 1 | 26.0 | 15.3 | 1 | BP | XP |
| SMAJ17AHE3 | SMAJ17CAHE3 | 17 | 18.9 | 20.9 | 1 | 27.6 | 14.5 | 1 | BR | XR |
| SMAJ18AHE3 | SMAJ18CAHE3 | 18 | 20.0 | 22.1 | 1 | 29.2 | 13.7 | 1 | BT | XT |
| SMAJ20AHE3 | SMAJ20CAHE3 | 20 | 22.2 | 24.5 | 1 | 32.4 | 12.3 | 1 | BV | XV |
| SMAJ22AHE3 | SMAJ22CAHE3 | 22 | 24.4 | 26.9 | 1 | 35.5 | 11.2 | 1 | BX | XX |
| SMAJ24AHE3 | SMAJ24CAHE3 | 24 | 26.7 | 29.5 | 1 | 38.9 | 10.3 | 1 | BZ | XZ |
| SMAJ26AHE3 | SMAJ26CAHE3 | 26 | 28.9 | 31.9 | 1 | 42.1 | 9.5 | 1 | CE | YE |
| SMAJ28AHE3 | SMAJ28CAHE3 | 28 | 31.1 | 34.4 | 1 | 45.4 | 8.8 | 1 | CG | YG |
| SMAJ30AHE3 | SMAJ30CAHE3 | 30 | 33.3 | 36.8 | 1 | 48.4 | 8.3 | 1 | CK | YK |
| SMAJ33AHE3 | SMAJ33CAHE3 | 33 | 36.7 | 40.6 | 1 | 53.3 | 7.5 | 1 | CM | YM |
| SMAJ36AHE3 | SMAJ36CAHE3 | 36 | 40.0 | 44.2 | 1 | 58.1 | 6.9 | 1 | CP | YP |
| SMAJ40AHE3 | SMAJ40CAHE3 | 40 | 44.4 | 49.1 | 1 | 64.5 | 6.2 | 1 | CR | YR |
| SMAJ43AHE3 | SMAJ43CAHE3 | 43 | 47.8 | 52.8 | 1 | 69.4 | 5.7 | 1 | CT | YT |
| SMAJ45AHE3 | SMAJ45CAHE3 | 45 | 50.0 | 55.3 | 1 | 72.7 | 5.5 | 1 | CV | YV |
| SMAJ48AHE3 | SMAJ48CAHE3 | 48 | 53.3 | 58.9 | 1 | 77.4 | 5.2 | 1 | CX | YX |
| SMAJ51AHE3 | SMAJ51CAHE3 | 51 | 56.7 | 62.7 | 1 | 82.4 | 4.9 | 1 | CZ | YZ |
| SMAJ54AHE3 | SMAJ54CAHE3 | 54 | 60.0 | 66.3 | 1 | 87.1 | 4.6 | 1 | RE | ZE |
| SMAJ58AHE3 | SMAJ58CAHE3 | 58 | 64.4 | 71.2 | 1 | 93.6 | 4.3 | 1 | RG | ZG |
| SMAJ60AHE3 | SMAJ60CAHE3 | 60 | 66.7 | 73.7 | 1 | 96.8 | 4.1 | 1 | RK | ZK |
| SMAJ64AHE3 | SMAJ64CAHE3 | 64 | 71.1 | 78.6 | 1 | 103 | 3.9 | 1 | RM | ZM |
| SMAJ70AHE3 | SMAJ70CAHE3 | 70 | 77.8 | 86.0 | 1 | 113 | 3.5 | 1 | RP | ZP |
| SMAJ75AHE3 | SMAJ75CAHE3 | 75 | 83.3 | 92.1 | 1 | 121 | 3.3 | 1 | RR | ZR |
| SMAJ78AHE3 | SMAJ78CAHE3 | 78 | 86.7 | 95.8 | 1 | 126 | 2.2 | 1 | RT | ZT |
| SMAJ85AHE3 | SMAJ85CAHE3 | 85 | 94.4 | 104 | 1 | 137 | 2.9 | 1 | RV | ZV |
| SMAJ90AHE3 | SMAJ90CAHE3 | 90 | 100 | 111 | 1 | 146 | 2.7 | 1 | RX | ZX |
| SMAJ100AHE3 | SMAJ100CAHE3 | 100 | 111 | 123 | 1 | 162 | 2.5 | 1 | RZ | ZZ |
| SMAJ110AHE3 | SMAJ110CAHE3 | 110 | 122 | 135 | 1 | 177 | 2.3 | 1 | SE | VE |
| SMAJ120AHE3 | SMAJ120CAHE3 | 120 | 133 | 147 | 1 | 193 | 2.1 | 1 | SG | VG |
| SMAJ130AHE3 | SMAJ130CAHE3 | 130 | 144 | 159 | 1 | 209 | 1.9 | 1 | SK | VK |
| SMAJ150AHE3 | SMAJ150CAHE3 | 150 | 167 | 185 | 1 | 243 | 1.6 | 1 | SM | VM |
| SMAJ160AHE3 | SMAJ160CAHE3 | 160 | 178 | 197 | 1 | 259 | 1.5 | 1 | SP | VP |
| SMAJ170AHE3 | SMAJ170CAHE3 | 170 | 189 | 209 | 1 | 275 | 1.5 | 1 | SR | VR |
| SMAJ180AHE3 | SMAJ180CAHE3 | 180 | 201 | 222 | 1 | 292 | 1.4 | 1 | ST | VT |
| SMAJ200AHE3 | SMAJ200CAHE3 | 200 | 224 | 247 | 1 | 324 | 1.2 | 1 | SV | VV |
| SMAJ220AHE3 | SMAJ220CAHE3 | 220 | 246 | 272 | 1 | 356 | 1.1 | 1 | SX | VX |
| SMAJ250AHE3 | SMAJ250CAHE3 | 250 | 279 | 309 | 1 | 405 | 1.0 | 1 | SZ | VZ |
| SMAJ300AHE3 | SMAJ300CAHE3 | 300 | 335 | 371 | 1 | 486 | 0.8 | 1 | TE | UE |
| SMAJ350AHE3 | SMAJ350CAHE3 | 350 | 391 | 432 | 1 | 567 | 0.7 | 1 | TG | UG |
| SMAJ400AHE3 | SMAJ400CAHE3 | 400 | 447 | 494 | 1 | 648 | 0.6 | 1 | TK | UK |
| SMAJ440AHE3 | SMAJ440CAHE3 | 440 | 492 | 543 | 1 | 713 | 0.6 | 1 | TM | UM |

For bi-directional type having Vrwm of 10 Volts and less, the IR limit is double.
For parts without A, the VBR is +10%.