

# Vishay General Semiconductor

| <b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted) |                           |   |      |   |   |   |  |   |  |
|---|---------------------------|---|------|---|---|---|--|---|--|
| DEVICE TYPE   | DEVICE<br>MARKING<br>CODE | BREAKDOWN VOLTAGE VBR AT IT (1) (V) MIN. MAX. |      | TEST<br>CURRENT<br>I <sub>T</sub><br>(mA) | STAND-OFF<br>VOLTAGE V <sub>WM</sub><br>(V) | MAXIMUM<br>REVERSE<br>LEAKAGE<br>AT V <sub>WM</sub><br>I <sub>D</sub> (μA) <sup>(3)</sup> | MAXIMUM<br>PEAK PULSE<br>SURGE<br>CURRENT<br>I <sub>PPM</sub> (A) <sup>(2)</sup> | MAXIMUM<br>CLAMPING<br>VOLTAGE AT<br>I <sub>PPM</sub><br>V <sub>C</sub> (V) |  |
| SMP3V3  | AC                        | 4.10  | 5.10 | 1.0                                       | 3.3   | 200   | 54.8   | 7.3   |  |
| SMP5.0A   | AE                        | 6.40  | 7.07 | 10  | 5.0   | 150   | 43.5   | 9.2   |  |
| SMP6.0A   | AG                        | 6.67  | 7.37 | 10  | 6.0   | 600   | 38.8   | 10.3  |  |
| SMP6.5A   | AK                        | 7.22  | 7.98 | 10  | 6.5   | 100   | 35.7   | 11.2  |  |
| SMP7.0A   | AM                        | 7.78  | 8.60 | 10  | 7.0   | 50  | 33.3   | 12.0  |  |
| SMP7.5A   | AN                        | 8.33  | 9.21 | 1.0                                       | 7.5   | 50  | 31.0   | 12.9  |  |
| SMP8.0A   | AR                        | 8.89  | 9.83 | 1.0                                       | 8.0   | 20  | 29.4   | 13.6  |  |
| SMP11A  | AZ                        | 12.2  | 13.5 | 1.0                                       | 11  | 1.0   | 22.0   | 18.2  |  |
| SMP12A  | BE                        | 13.3  | 14.7 | 1.0                                       | 12  | 1.0   | 20.1   | 19.9  |  |
| SMP13A  | BG                        | 14.4  | 15.9 | 1.0                                       | 13  | 1.0   | 18.6   | 21.5  |  |
| SMP14A  | BK                        | 15.6  | 17.2 | 1.0                                       | 14  | 1.0   | 17.2   | 23.2  |  |
| SMP15A  | BM                        | 16.7  | 18.5 | 1.0                                       | 15  | 1.0   | 16.4   | 24.4  |  |
| SMP16A  | BP                        | 17.8  | 19.7 | 1.0                                       | 16  | 1.0   | 15.4   | 26.0  |  |
| SMP17A  | BR                        | 18.9  | 20.9 | 1.0                                       | 17  | 1.0   | 14.5   | 27.6  |  |
| SMP18A  | BT                        | 20.0  | 22.1 | 1.0                                       | 18  | 1.0   | 13.7   | 29.2  |  |
| SMP20A  | BV                        | 22.2  | 24.5 | 1.0                                       | 20  | 1.0   | 12.3   | 32.4  |  |
| SMP22A  | BX                        | 24.4  | 26.9 | 1.0                                       | 22  | 1.0   | 11.3   | 35.5  |  |
| SMP24A  | BZ                        | 26.7  | 29.5 | 1.0                                       | 24  | 1.0   | 10.3   | 38.9  |  |
| SMP26A  | CE                        | 28.9  | 31.9 | 1.0                                       | 26  | 1.0   | 9.5  | 42.1  |  |
| SMP28A  | CG                        | 31.1  | 34.4 | 1.0                                       | 28  | 1.0   | 8.8  | 45.4  |  |
| SMP30A  | CK                        | 33.3  | 36.8 | 1.0                                       | 30  | 1.0   | 8.3  | 48.4  |  |
| SMP33A  | CM                        | 36.7  | 40.6 | 1.0                                       | 33  | 1.0   | 7.5  | 53.3  |  |
| SMP36A  | CP                        | 40.0  | 44.2 | 1.0                                       | 36  | 1.0   | 6.9  | 58.1  |  |

#### Notes

<sup>(3)</sup> All terms and symbols are consistent with ANSI/IEEE C62.35

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                 |       |      |  |  |  |
|---|-----------------|-------|------|--|--|--|
| PARAMETER   | SYMBOL          | LIMIT | UNIT |  |  |  |
| Typical thermal resistance, junction to lead (1)                        | $R_{	heta JL}$  | 50    | °C/W |  |  |  |
| Typical thermal resistance, junction to ambient (2)                     | $R_{\theta JA}$ | 250   | °C/W |  |  |  |

#### Notes

<sup>(2)</sup> Mounted on minimum recommended pad layout

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |  |  |  |  |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|--|--|--|--|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |  |  |  |  |
| SMP3V3-M3/84A                  | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |  |  |  |  |
| SMP3V3-M3/85A                  | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |  |  |  |  |
| SMP11A-M3/84A                  | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |  |  |  |  |
| SMP11A-M3/85A                  | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |  |  |  |  |

 $<sup>^{(1)}</sup>$  V<sub>BR</sub> measured after I<sub>T</sub> applied for 300  $\mu$ s, I<sub>T</sub> = square wave pulse or equivalent

<sup>(2)</sup> Surge current waveform per fig. 3 and derate per fig. 2

 $<sup>^{(1)}</sup>$  Mounted on PCB with 5.0 mm x 5.0 mm copper pad areas attached to each terminal



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### **RATINGS AND CHARACTERISTICS CURVES** (T<sub>A</sub> = 25 °C unless otherwise noted)

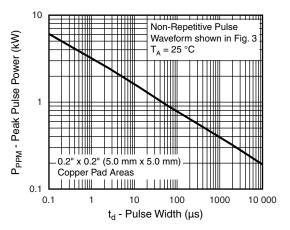


Fig. 1 - Peak Pulse Power Rating Curve

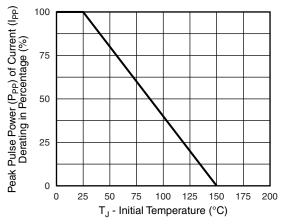


Fig. 2 - Pulse Derating Curve

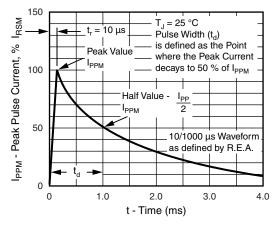


Fig. 3 - Pulse Waveform

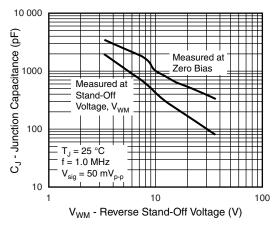


Fig. 4 - Typical Junction Capacitance

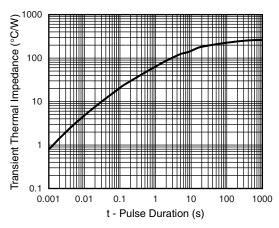


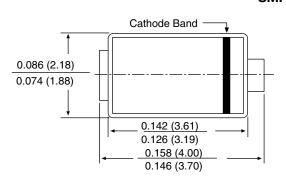
Fig. 5 - Typical Transient Thermal Impedance

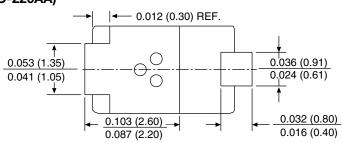


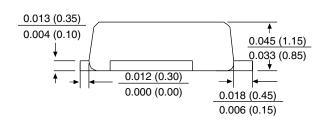
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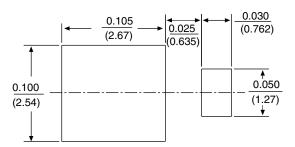
### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

#### **SMP (DO-220AA)**











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Vishay

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### Vishay:

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        SMP3V3-M3/85A
        SMP11A-M3/84A
        SMP13A-M3/84A
        SMP14A-M3/84A
        SMP15A-M3/84A

        SMP16A-M3/84A
        SMP17A-M3/84A
        SMP18A-M3/84A
        SMP20A-M3/84A
        SMP20A-M3/85A
        SMP22A-M3/84A

        SMP24A-M3/84A
        SMP26A-M3/84A
        SMP28A-M3/84A
        SMP30A-M3/84A
        SMP33A-M3/85A
        SMP33A-M3/85A
        SMP12A-M3/85A

        SMP15A-M3/85A
        SMP16A-M3/85A
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        SMP17A-M3/85A
        SMP26A-M3/85A
        SMP5.0A-M3/84A
        SMP5.0A-M3/85A

        SMP8.0A-M3/85A
        SMP6.0A-M3/85A
        SMP6.0A-M3/85A
        SMP7.5A-M3/85A
        SMP7.0A-M3/85A
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