

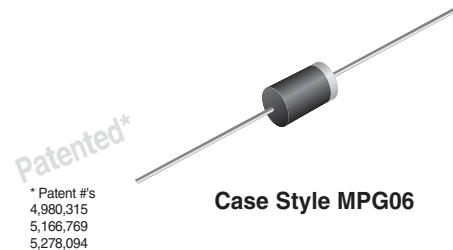


Automotive Transient Voltage Suppressors

High Temperature Stability & High Reliability Conditions

Major Ratings and Characteristics

| | |
|------------|---------------|
| $V_{(BR)}$ | 6.8 V to 43 V |
| P_{PPM} | 400 W |
| P_D | 1.0 W |
| I_{FSM} | 40 A |
| T_J max. | 185 °C |



Features

- Patented PAR[®] construction
- Available in Unidirectional polarity only
- 400 W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Typical I_D less than 1.0 μ A above 10 V rating
- Solder Dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive and Telecommunication.

Mechanical Data

Case: MPG06, molded epoxy over passivated junction
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D
E3 suffix for commercial grade, HE3 suffix for high reliability grade (AEC Q101 qualified)

Polarity: Color band denotes cathode end

Maximum Ratings

($T_A = 25$ °C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|--|----------------|----------------|------|
| Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾ (Fig. 1) | P_{PPM} | Minimum 400 | W |
| Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾⁽²⁾ (Fig. 3) | I_{PPM} | see next table | A |
| Power dissipation on infinite heatsink at $T_L = 75$ °C (Fig. 5) | P_D | 1.0 | W |
| Peak forward surge current 8.3 ms single half sine-wave ⁽²⁾ | I_{FSM} | 40 | A |
| Maximum instantaneous forward voltage at 25 A ⁽²⁾ | V_F | 3.5 | V |
| Operating junction and storage temperature range | T_J, T_{STG} | - 65 to + 185 | °C |

Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25$ °C per Fig. 2

(2) Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

TMPG06-6.8 thru TMPG06-43A



Vishay General Semiconductor

Electrical Characteristics

($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

| Device Type | Maximum Breakdown Voltage $V_{(BR)}^{(1)}$ at I_T (V) | | Test Current I_T (mA) | Stand-off Voltage V_{WM} (V) | Maximum Reverse Leakage at V_{WM} I_D (μA) | Reverse Leakage at V_{WM} $T_J = 150\text{ }^\circ\text{C}$ I_D (μA) | Peak Pulse Current $I_{PPM}^{(2)}$ (A) | Maximum Clamping Voltage at I_{PPM} V_C (Volts) | Maximum Temp. Coefficient of $V_{(BR)}$ (% / $^\circ\text{C}$) |
|-------------|---|------|-------------------------|--------------------------------|---|---|--|---|---|
| | MIN | MAX | | | | | | | |
| TMPG06-6.8 | 6.12 | 7.48 | 10.0 | 5.50 | 300 | 1000 | 27.8 | 10.8 | 0.057 |
| TMPG06-6.8A | 6.45 | 7.14 | 10.0 | 5.80 | 300 | 1000 | 28.6 | 10.5 | 0.057 |
| TMPG06-7.5 | 6.75 | 8.25 | 10.0 | 6.05 | 150 | 500 | 25.6 | 11.7 | 0.060 |
| TMPG06-7.5A | 7.13 | 7.88 | 10.0 | 6.40 | 150 | 500 | 26.5 | 11.3 | 0.061 |
| TMPG06-8.2 | 7.38 | 9.02 | 10.0 | 6.63 | 50.0 | 200 | 24.0 | 12.5 | 0.065 |
| TMPG06-8.2A | 7.79 | 8.61 | 10.0 | 7.02 | 50.0 | 200 | 24.8 | 12.1 | 0.065 |
| TMPG06-9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 10.0 | 50.0 | 21.7 | 13.8 | 0.068 |
| TMPG06-9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 10.0 | 50.0 | 22.4 | 13.4 | 0.068 |
| TMPG06-10 | 9.00 | 11.0 | 1.0 | 8.10 | 5.0 | 20.0 | 26.7 | 15.0 | 0.073 |
| TMPG06-10A | 9.50 | 10.5 | 1.0 | 8.55 | 5.0 | 20.0 | 27.6 | 14.5 | 0.073 |
| TMPG06-11 | 9.90 | 12.1 | 1.0 | 8.92 | 2.0 | 10.0 | 24.7 | 16.2 | 0.075 |
| TMPG06-11A | 10.5 | 11.6 | 1.0 | 9.40 | 2.0 | 10.0 | 25.6 | 15.6 | 0.075 |
| TMPG06-12 | 10.8 | 13.2 | 1.0 | 9.72 | 1.0 | 5.0 | 23.1 | 17.3 | 0.076 |
| TMPG06-12A | 11.4 | 12.6 | 1.0 | 10.2 | 1.0 | 5.0 | 24.0 | 16.7 | 0.078 |
| TMPG06-13 | 11.7 | 14.3 | 1.0 | 10.5 | 1.0 | 5.0 | 21.1 | 19.0 | 0.081 |
| TMPG06-13A | 12.4 | 13.7 | 1.0 | 11.1 | 1.0 | 5.0 | 22.0 | 18.2 | 0.081 |
| TMPG06-15 | 13.5 | 16.3 | 1.0 | 12.1 | 1.0 | 5.0 | 18.2 | 22.0 | 0.084 |
| TMPG06-15A | 14.3 | 15.8 | 1.0 | 12.8 | 1.0 | 5.0 | 18.9 | 21.2 | 0.084 |
| TMPG06-16 | 14.4 | 17.6 | 1.0 | 12.9 | 1.0 | 5.0 | 17.0 | 23.5 | 0.086 |
| TMPG06-16A | 15.2 | 16.8 | 1.0 | 13.6 | 1.0 | 5.0 | 17.8 | 22.5 | 0.086 |
| TMPG06-18 | 16.2 | 19.8 | 1.0 | 14.5 | 1.0 | 5.0 | 15.1 | 26.5 | 0.088 |
| TMPG06-18A | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 5.0 | 15.9 | 25.5 | 0.088 |
| TMPG06-20 | 18.0 | 22.0 | 1.0 | 16.2 | 1.0 | 5.0 | 13.7 | 29.1 | 0.090 |
| TMPG06-20A | 19.0 | 21.0 | 1.0 | 17.0 | 1.0 | 5.0 | 14.4 | 27.7 | 0.090 |
| TMPG06-22 | 19.8 | 24.2 | 1.0 | 17.8 | 1.0 | 5.0 | 12.5 | 31.9 | 0.092 |
| TMPG06-22A | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 5.0 | 13.1 | 30.6 | 0.092 |
| TMPG06-24 | 21.6 | 26.4 | 1.0 | 19.4 | 1.0 | 5.0 | 11.5 | 34.2 | 0.094 |
| TMPG06-24A | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 5.0 | 12.0 | 33.2 | 0.094 |
| TMPG06-27 | 24.3 | 29.7 | 1.0 | 21.8 | 1.0 | 5.0 | 10.2 | 39.1 | 0.096 |
| TMPG06-27A | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 5.0 | 10.7 | 37.5 | 0.096 |
| TMPG06-30 | 27.0 | 33.0 | 1.0 | 24.3 | 1.0 | 5.0 | 9.2 | 43.5 | 0.097 |
| TMPG06-30A | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 5.0 | 9.7 | 41.4 | 0.097 |
| TMPG06-33 | 29.7 | 36.3 | 1.0 | 26.8 | 1.0 | 5.0 | 8.4 | 47.7 | 0.098 |
| TMPG06-33A | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 5.0 | 8.8 | 45.7 | 0.098 |
| TMPG06-36 | 32.4 | 39.6 | 1.0 | 29.1 | 1.0 | 5.0 | 7.7 | 52.0 | 0.099 |
| TMPG06-36A | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 5.0 | 8.0 | 49.9 | 0.099 |
| TMPG06-39 | 35.1 | 42.9 | 1.0 | 31.6 | 1.0 | 5.0 | 7.1 | 56.4 | 0.100 |
| TMPG06-39A | 37.1 | 41.0 | 1.0 | 33.3 | 1.0 | 5.0 | 7.4 | 53.9 | 0.100 |
| TMPG06-43 | 38.7 | 47.3 | 1.0 | 34.8 | 1.0 | 5.0 | 6.5 | 61.9 | 0.101 |
| TMPG06-43A | 40.9 | 45.2 | 1.0 | 36.8 | 1.0 | 5.0 | 6.7 | 59.3 | 0.101 |

Notes:

(1) Pulse test: $t_p \leq 50\text{ ms}$

(2) Surge current waveform per Fig. 3 and derated per Fig. 2

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



TMPG06-6.8 thru TMPG06-43A

Vishay General Semiconductor

Ordering Information

| Preferred P/N | Unit Weight (g) | Preferred Package Code | Base Quantity | Delivery Mode |
|-------------------|-----------------|------------------------|---------------|--------------------------------|
| TMPG06-6.8A-E3/54 | 0.218 | 54 | 5500 | 13" Diameter Paper Tape & Reel |

Ratings and Characteristics Curves

($T_A = 25^\circ\text{C}$ unless otherwise specified)

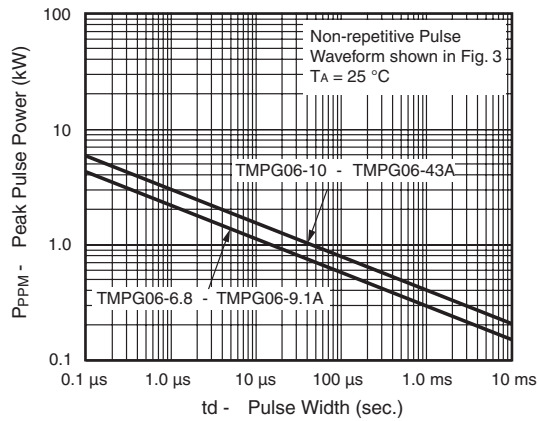


Figure 1. Peak Pulse Power Rating Curve

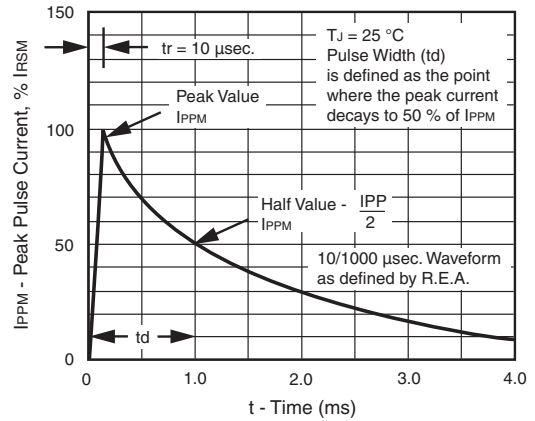


Figure 3. Pulse Waveform

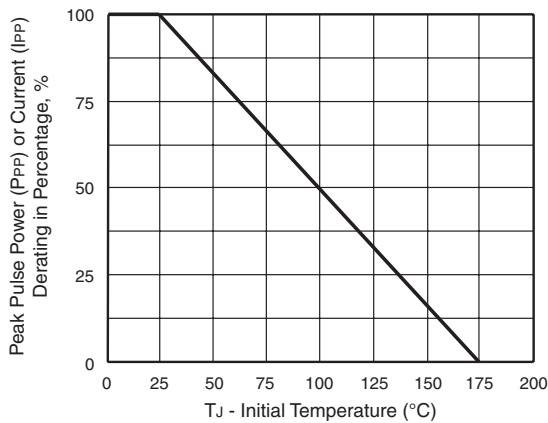


Figure 2. Pulse Power or Current versus Initial Junction Temperature

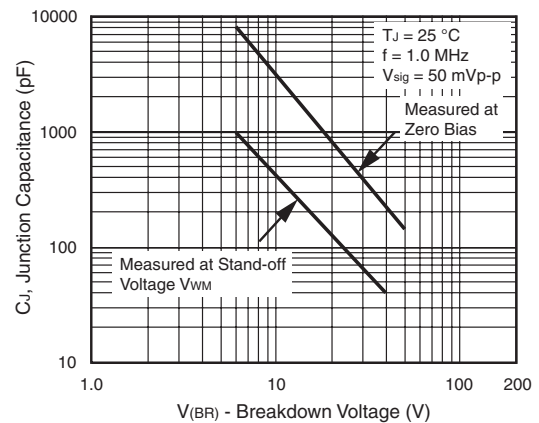


Figure 4. Typical Junction Capacitance

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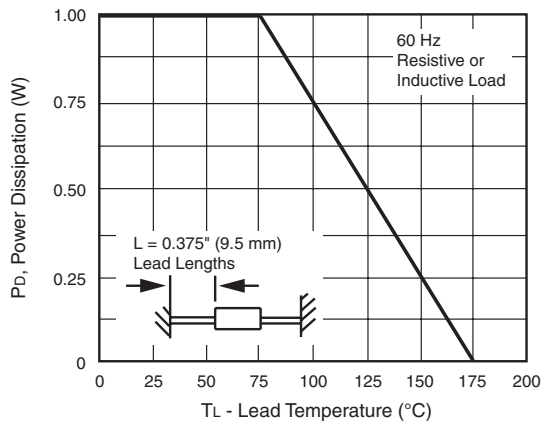


Figure 5. Power Derating Curve

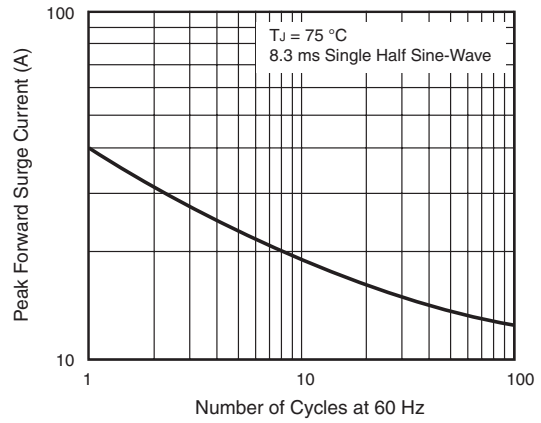
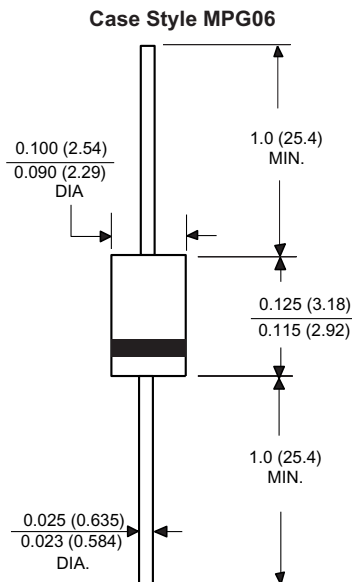


Figure 6. Maximum Non-Repetitive Forward Surge Current

Package outline dimensions in inches (millimeters)





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