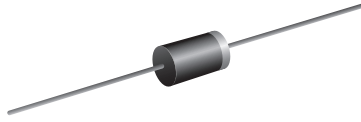


PAR[®] Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions


MPG06
FEATURES

- 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 resistance
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


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
 Molding compound meets UL 94 V-0 flammability rating
 Base P/NHE3_X - RoHS-compliant, AEC-Q101 qualified
 ("X" denotes revision code e.g. A, B, ...)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
 HE3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|------------------|
| V_{BR} | 10 V to 43 V |
| V_{WM} | 8.55 V to 36.8 V |
| P_{PPM} | 400 W |
| P_D | 1.0 W |
| I_{FSM} | 40 A |
| T_J max. | 185 °C |
| Polarity | Unidirectional |
| Package | MPG06 |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | |
|--|----------------|----------------|------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Peak pulse power dissipation with a 10/1000 μ s waveform ⁽¹⁾ (fig. 1) | P_{PPM} | 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

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

| DEVICE TYPE | BREAKDOWN VOLTAGE V_{BR} AT I_T ⁽¹⁾ (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} $T_J = 150\text{ }^\circ\text{C}$ (μA) | MAXIMUM PEAK PULSE CURRENT I_{PPM} ⁽²⁾ (A) | MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V) | MAXIMUM TEMPERATURE COEFFICIENT OF V_{BR} (%/ $^\circ\text{C}$) |
|-------------|--|------|-------------------------|--------------------------------|---|---|---|---|--|
| | MIN. | MAX. | | | | | | | |
| TMPG06-10A | 9.50 | 10.5 | 1.0 | 8.55 | 5.0 | 20.0 | 27.6 | 14.5 | 0.073 |
| TMPG06-11A | 10.5 | 11.6 | 1.0 | 9.40 | 2.0 | 10.0 | 25.6 | 15.6 | 0.075 |
| TMPG06-12A | 11.4 | 12.6 | 1.0 | 10.2 | 1.0 | 5.0 | 24.0 | 16.7 | 0.078 |
| TMPG06-13A | 12.4 | 13.7 | 1.0 | 11.1 | 1.0 | 5.0 | 22.0 | 18.2 | 0.081 |
| TMPG06-15A | 14.3 | 15.8 | 1.0 | 12.8 | 1.0 | 5.0 | 18.9 | 21.2 | 0.084 |
| TMPG06-16A | 15.2 | 16.8 | 1.0 | 13.6 | 1.0 | 5.0 | 17.8 | 22.5 | 0.086 |
| TMPG06-18A | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 5.0 | 15.9 | 25.5 | 0.088 |
| TMPG06-20A | 19.0 | 21.0 | 1.0 | 17.0 | 1.0 | 5.0 | 14.4 | 27.7 | 0.090 |
| TMPG06-22A | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 5.0 | 13.1 | 30.6 | 0.092 |
| TMPG06-24A | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 5.0 | 12.0 | 33.2 | 0.094 |
| TMPG06-27A | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 5.0 | 10.7 | 37.5 | 0.096 |
| TMPG06-30A | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 5.0 | 9.7 | 41.4 | 0.097 |
| TMPG06-33A | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 5.0 | 8.8 | 45.7 | 0.098 |
| TMPG06-36A | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 5.0 | 8.0 | 49.9 | 0.099 |
| TMPG06-39A | 37.1 | 41.0 | 1.0 | 33.3 | 1.0 | 5.0 | 7.4 | 53.9 | 0.100 |
| 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 CA62.35

ORDERING INFORMATION (Example)

| PREFERRED PIN | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|----------------------------------|-----------------|------------------------|---------------|----------------------------------|
| TMPG06-10AHE3_A/C ⁽¹⁾ | 0.218 | C | 5500 | 13" diameter paper tape and reel |

Note

(1) AEC-Q101 qualified



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

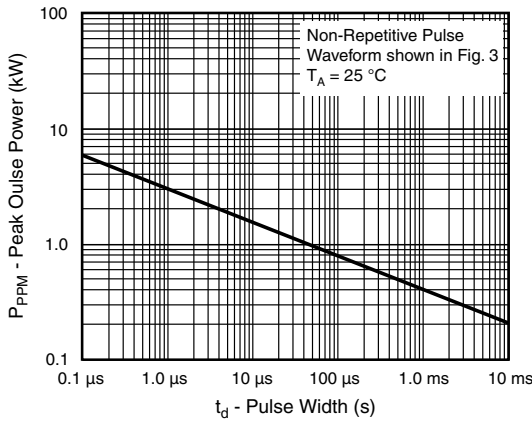


Fig. 1 - Peak Pulse Power Rating Curve

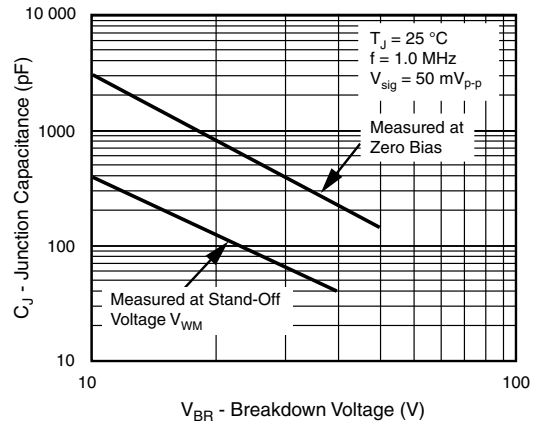


Fig. 4 - Typical Junction Capacitance

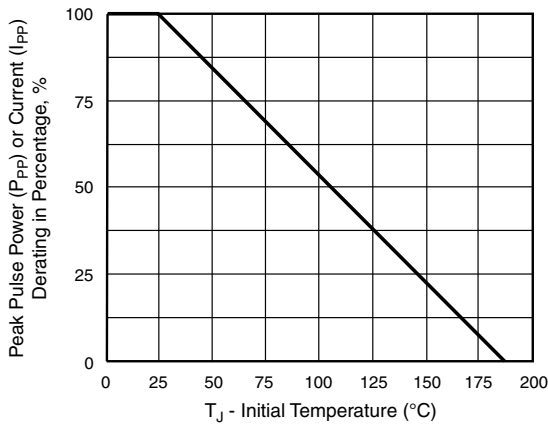


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

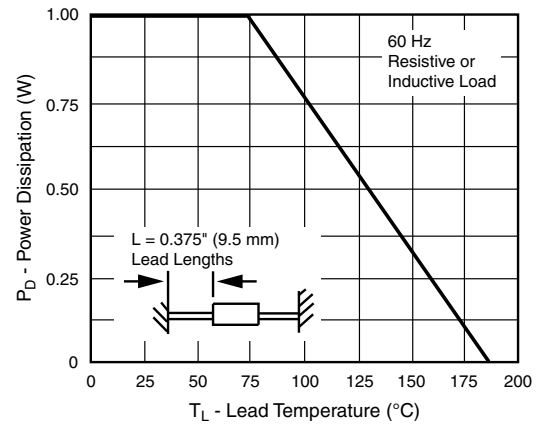


Fig. 5 - Power Derating Curve

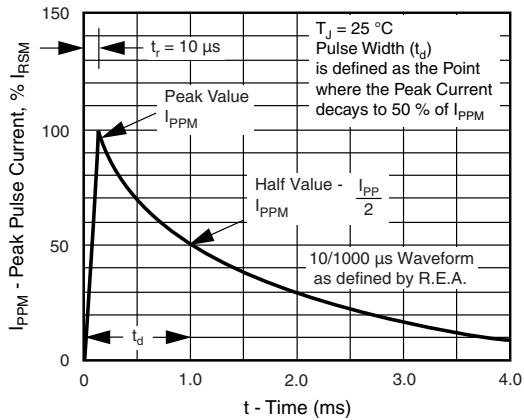


Fig. 3 - Pulse Waveform

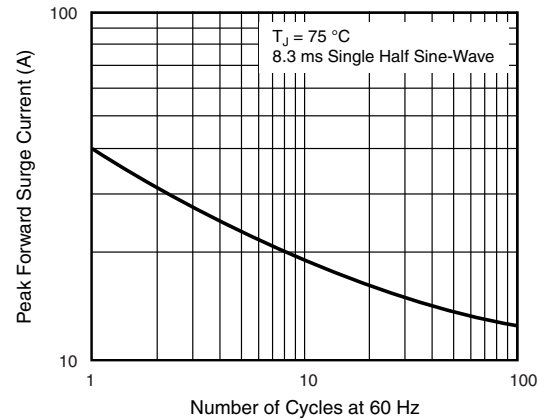
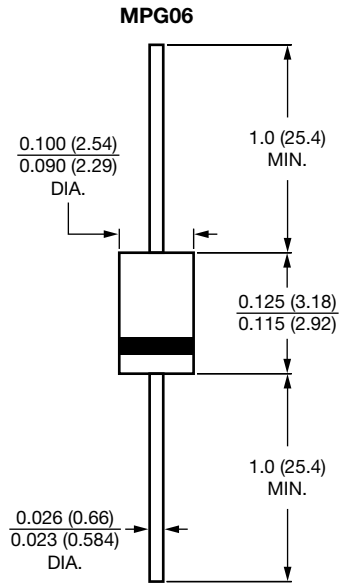


Fig. 6 - Maximum Non-Repetitive Forward Surge Current



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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