



MAHE1A~MAHE1M

Surface Mount Ultra Fast Rectifiers

Features

- Low profile package
- Ideal for automated placement
- Glass passivated chip junctions
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- High temperature soldering:
260°C/10 seconds at terminals
- Component in accordance to
RoHS 2002/95/1 and WEEE 2002/96/EC



Mechanical Date

- **Case:** JEDEC MSMA molded plastic body over glass passivated chip
- **Terminals:** Solder plated, solderable per J-STD-002B and JESD22-B102D
- **Polarity:** Laser band denotes cathode end

Major Ratings and Characteristics

| | |
|--------------------|---------------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 50 V to 1000 V |
| I_{FSM} | 30 A |
| t_{rr} | 50nS, 75nS |
| V_F | 1.0 V, 1.3 V, 1.7 V |
| $T_j \text{ max.}$ | 150 °C |

Maximum Ratings & Thermal Characteristics

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

| Items | Symbol | MAHE 1A | MAHE 1B | MAHE 1D | MAHE 1G | MAHE 1J | MAHE 1K | MAHE 1M | UNIT |
|--|-----------------|-------------|---------|---------|---------|---------|---------|---------|------|
| Maximum repetitive peak reverse voltage | V_{RRM} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | V_{RMS} | 35 | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | V_{DC} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum average forward rectified current | $I_{F(AV)}$ | 1.0 | | | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 30 | | | | | | | A |
| Thermal resistance from junction to lead ⁽¹⁾ | $R_{\theta JL}$ | 35 | | | | | | | °C/W |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | | | | | | | °C |

Note 1: Mounted on P.C.B. with 0.2 x 0.2" (5.0 x 5.0mm) copper pad areas.

Electrical Characteristics ($T_A = 25\text{ °C}$ unless otherwise noted)

| Items | Test conditions | Symbol | MAHE1A~MAHE1D | MAHE1G | MAHE1J~MAHE1M | UNIT |
|-------------------------------|---|----------|---------------|--------|---------------|------|
| Instantaneous forward voltage | $I_F = 1.0A^{(2)}$ | V_F | 1.0 | 1.3 | 1.7 | V |
| Reverse current | $V_R = V_{DC}$ $T_A = 25\text{ °C}$ $T_A = 125\text{ °C}$ | I_R | 5 100 | | | μA |
| Reverse recovery time | $I_F = 0.5\text{ A}, I_R = 1.0\text{ A},$ $t_{rr} = 0.25\text{ A}$ | t_{rr} | 50 | | 75 | nS |
| Typical junction capacitance | 4.0V, 1.0MHz | C_J | 15 | | 10 | pF |

Note 2: Pulse test: 300μs pulse width, 1% duty cycle.



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

Fig.1 Forward Current Derating Curve

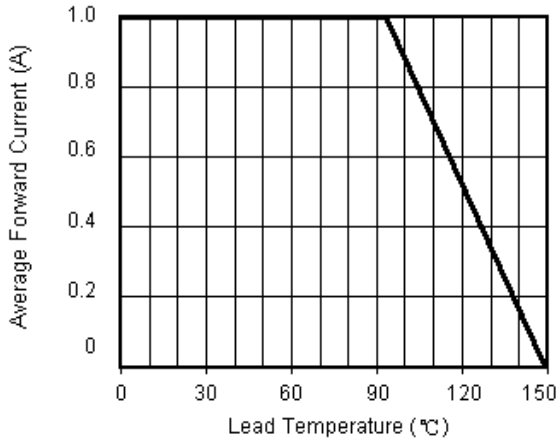


Fig.2 Maximum Non-Repetitive Peak Forward Surge Current

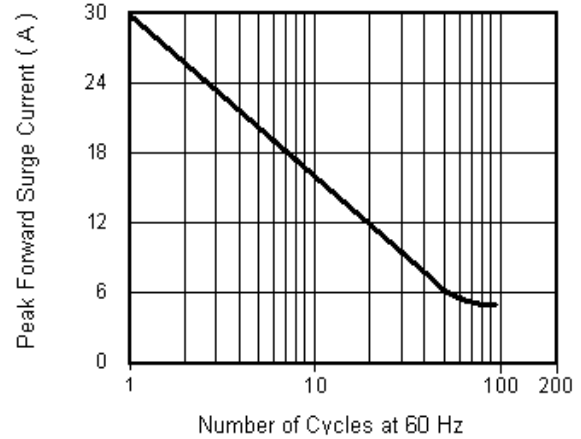


Fig.3 Typical Instantaneous Forward Characteristics

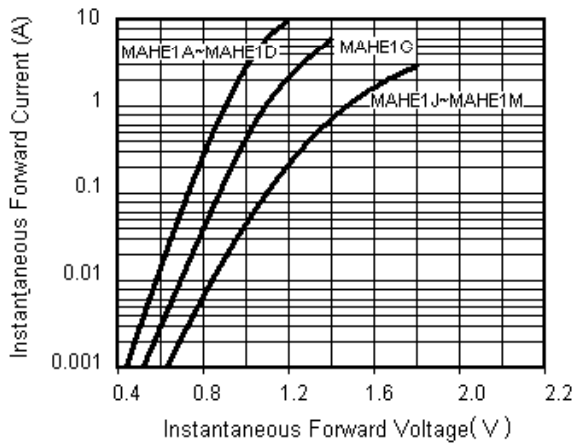


Fig.4 Typical Reverse Leakage Characteristics

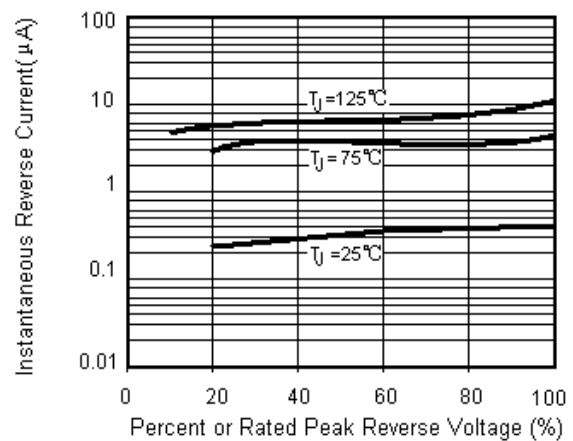


Fig.5 Typical Junction Capacitance

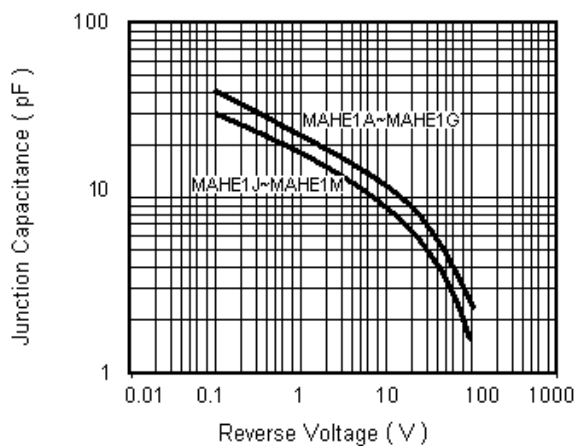
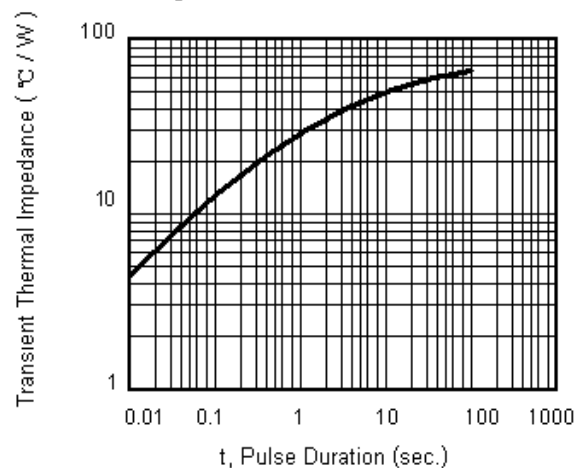


Fig.6 Transient Thermal Impedance

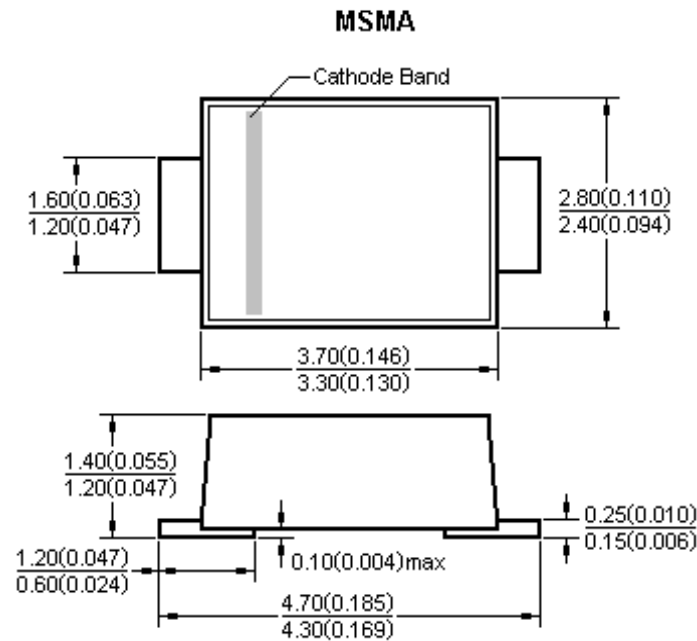




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Package Outline



Notice

- Product is intended for use in general electronics applications.
- Product should be worked less than the ratings; if exceeded, may cause permanent damage or introduce latent failure mechanisms.
- The absolute maximum ratings are rated values and must not be exceeded during operation. The following are the general derating methods you design a circuit with a device.

$I_{F(AV)}$: We recommend that the worst case current be no greater than 80% .

I_{FSM} : This rating specifies the non-repetitive peak current. This is only applied for an abnormal operation, which the general during the lifespan of the device.

T_J : Derate this rating when using a device in order to ensure high reliability. We recommend that the device be used at a T_J of below 125°C.

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