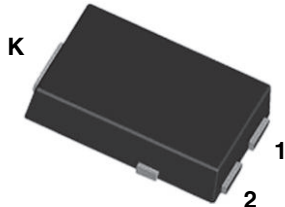


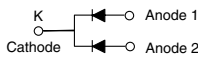


High Current Density Surface Mount Ultrafast Rectifiers

eSMP® Series



TO-277A (SMPC)



RoHS COMPLIANT HALOGEN FREE

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and automotive grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

| PRIMARY CHARACTERISTICS | |
|-------------------------|---------------------|
| $I_{F(AV)}$ | 2 x 2.0 A |
| V_{RRM} | 100 V, 150 V, 200 V |
| I_{FSM} | 40 A |
| t_{rr} | 25 ns |
| V_F at $I_F = 2.0$ A | 0.77 V |
| T_J max. | 175 °C |

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer computer, automotive, and telecommunication applications.

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | |
|---|----------------|---------------|--------|--------|------|
| PARAMETER | SYMBOL | UH4PBC | UH4PCC | UH4PDC | UNIT |
| Device marking code | | H4BC | H4CC | H4DC | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 150 | 200 | V |
| Maximum average forward rectified current (fig. 1) | total device | 4.0 | | | A |
| | per diode | 2.0 | | | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode | I_{FSM} | 40 | | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | - 55 to + 175 | | | °C |



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|---|-----------------------------------|-------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F = 1.0\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.84 | - | V |
| | $I_F = 2.0\text{ A}$ | | | 0.93 | 1.05 | |
| | $I_F = 1.0\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.68 | - | |
| | $I_F = 2.0\text{ A}$ | | | 0.77 | 0.85 | |
| Reverse current per diode | Rated V_R | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 5 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 6.4 | 25 | |
| Maximum reverse recovery time per diode | $I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$ | | t_{rr} | 20 | 25 | ns |
| Typical reverse recovery time per diode | $I_F = 1.0\text{ A}, dI/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}, I_{rr} = 0.1 I_{RM}$ | | | 24 | - | |
| Typical softness factor (t_b/t_a) per diode | | | S | 0.3 | - | - |
| Typical reverse recovery current per diode | $I_F = 2\text{ A}, dI/dt = 200\text{ A}/\mu\text{s}, V_R = 200\text{ V}, I_{rr} = 0.1 I_{RM}$ | | I_{RM} | 5.4 | - | A |
| Typical stored charge per diode | $T_A = 125\text{ }^\circ\text{C}$ | | Q_{rr} | 88 | - | nC |
| Typical junction capacitance per diode | 4.0 V, 1 MHz | | C_J | 21 | - | pF |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified) | | | | | |
|---|-----------------------|--------|--------|--------|---------------------------|
| PARAMETER | SYMBOL | UH4PBC | UH4PCC | UH4PDC | UNIT |
| Typical thermal resistance per diode | $R_{\theta JA}^{(1)}$ | 60 | | | $^\circ\text{C}/\text{W}$ |
| | $R_{\theta JL}$ | 4 | | | |

Note

- (1) Units mounted on recommended PCB 1 oz. pad layout

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| UH4PDC-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| UH4PDC-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| UH4PDCHM3/86A ⁽¹⁾ | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| UH4PDCHM3/87A ⁽¹⁾ | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |

Note

- (1) Automotive grade



RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

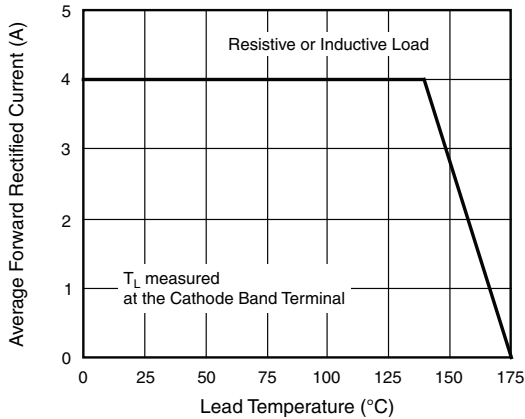


Fig. 1 - Maximum Forward Current Derating Curve

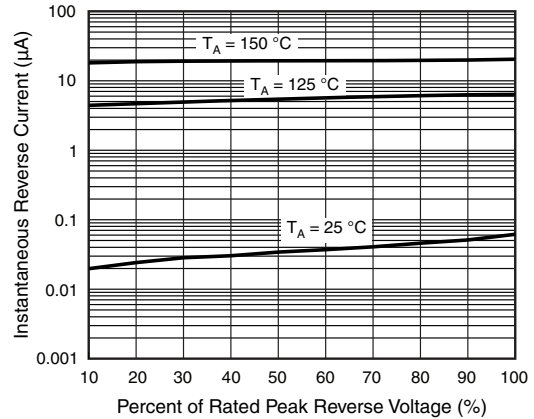


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

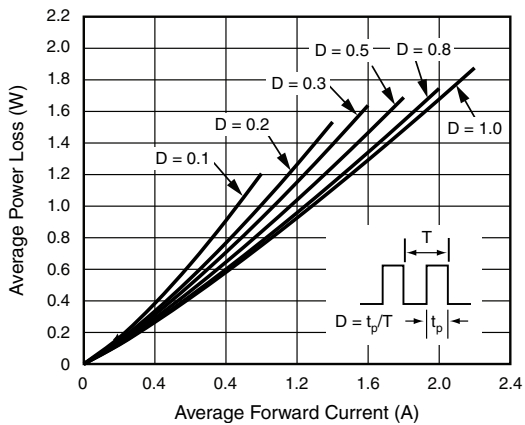


Fig. 2 - Forward Power Loss Characteristics Per Diode

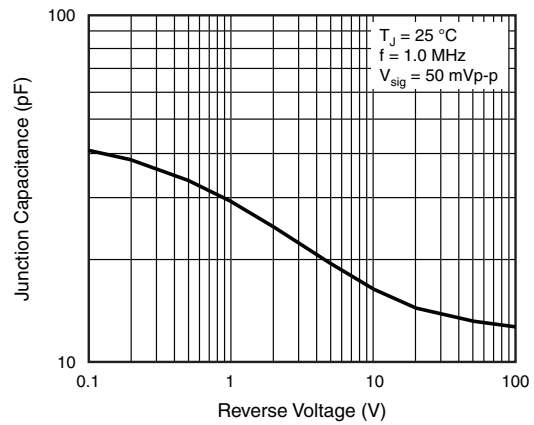


Fig. 5 - Typical Junction Capacitance Per Diode

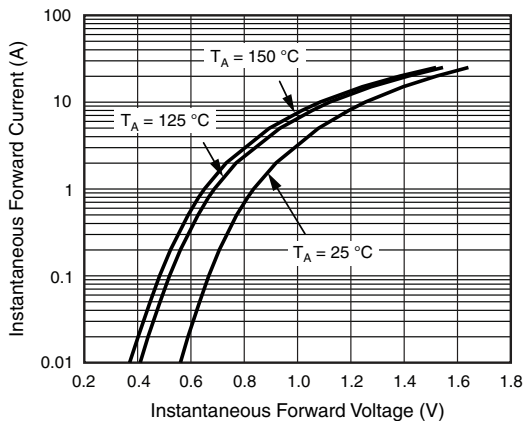


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

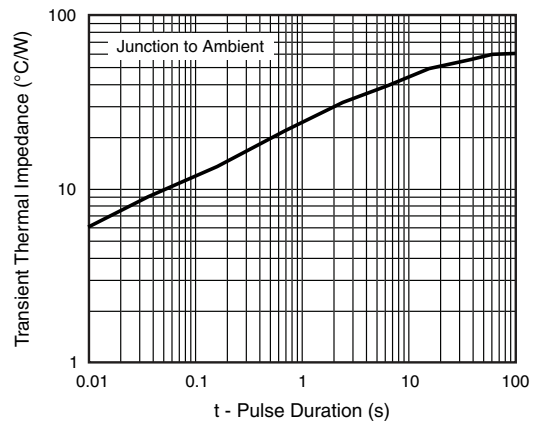
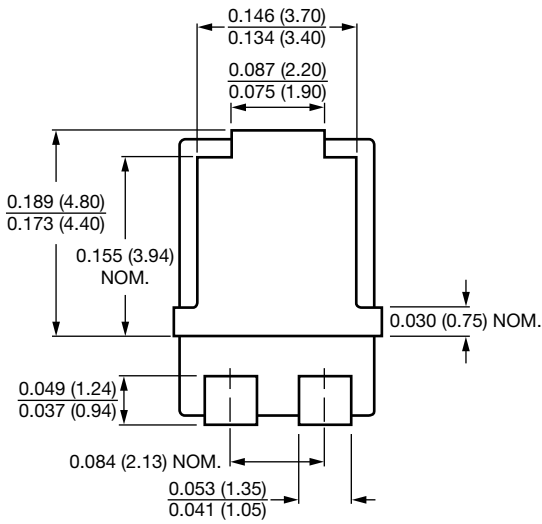
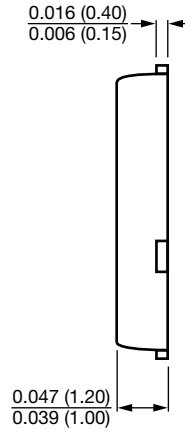
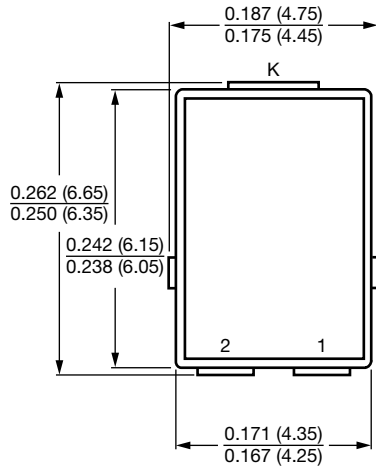


Fig. 6 - Typical Transient Thermal Impedance Per Diode

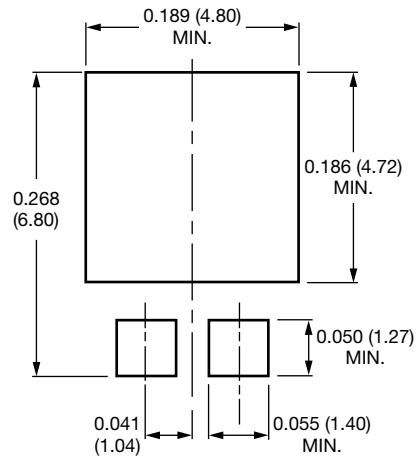


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Mounting Pad Layout



Conform to JEDEC TO-277A



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