



Surface Mount Ultrafast Rectifier



DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery times for high frequency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC


RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds of ac-to-ac and dc-to-dc converters in high temperature conditions for both consumer and automotive applications.

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94 V-0 flammability rating

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

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|---------------------|
| $I_{F(AV)}$ | 3.0 A |
| V_{RRM} | 100 V, 150 V, 200 V |
| I_{FSM} | 80 A |
| t_{rr} | 25 ns |
| V_F at $I_F = 3.0$ A | 0.75 V |
| T_J max. | 175 °C |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | |
|--|----------------|--|------|------|------|
| PARAMETER | SYMBOL | UH3B | UH3C | UH3D | UNIT |
| Device marking code | | HB | HC | HD | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 150 | 200 | V |
| Maximum average forward rectified current (Fig. 1) | $I_{F(AV)}$ | 2.5 ⁽¹⁾ 3.0 ⁽²⁾ | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 80 | | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | - 55 to + 175 | | | °C |

Notes:

(1) Free air, mounted on recommended copper pad area

(2) Units mounted on P.C.B. with 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pad area

UH3B, UH3C & UH3D

Vishay General Semiconductor



| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | |
|--|--|---|-----------------|--------------|-----------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage ⁽¹⁾ | I _F = 1.5 A I _F = 3.0 A | T _A = 25 °C | V _F | 0.85 0.95 | - 1.05 | V |
| | I _F = 1.5 A I _F = 3.0 A | T _A = 125 °C | | 0.65 0.75 | - 0.90 | |
| Reverse current ⁽²⁾ | Rated V _R | T _A = 25 °C T _A = 125 °C | I _R | - 15 | 5 100 | μA |
| Maximum reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | T _A = 25 °C | t _{rr} | 14 | 25 | ns |
| Typical reverse recovery time | I _F = 1.0 A, dI/dt = 50 A/μs, V _R = 30 V, I _{rr} = 0.1 I _{RM} | | | 23 | 40 | |
| Typical softness factor (t _b /t _a) | I _F = 3.0 A, dI/dt = 200 A/μs, V _R = 200 V | T _A = 125 °C | S | 0.2 | - | |
| Typical reverse recovery current | | | I _{RM} | 5.0 | 7.0 | A |
| Typical stored charge | | | Q _{rr} | 60 | - | nC |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 42 | - | pF |

Notes:

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | |
|---|------------------|------|------|------|------|
| PARAMETER | SYMBOL | UH3B | UH3C | UH3D | UNIT |
| Typical thermal resistance ⁽¹⁾ | R _{θJA} | | 95 | | °C/W |
| | R _{θJM} | | 12 | | |

Note:(1) Free air, mounted on recommended copper pad area. Thermal resistance R_{θJA} - junction to ambient, R_{θJM} - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| UH3D-E3/57T | 0.236 | 57T | 850 | 7" diameter plastic tape and reel |
| UH3D-E3/9AT | 0.236 | 9AT | 3500 | 13" diameter plastic tape and reel |
| UH3DHE3/57T ⁽¹⁾ | 0.236 | 57T | 850 | 7" diameter plastic tape and reel |
| UH3DHE3/9AT ⁽¹⁾ | 0.236 | 9AT | 3500 | 13" diameter plastic tape and reel |

Note:

(1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES

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

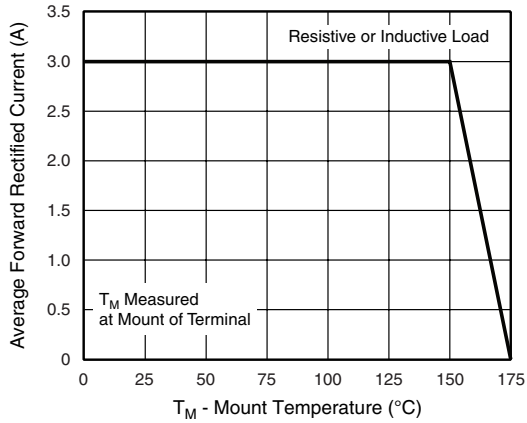


Figure 1. Maximum Forward Current Derating Curve

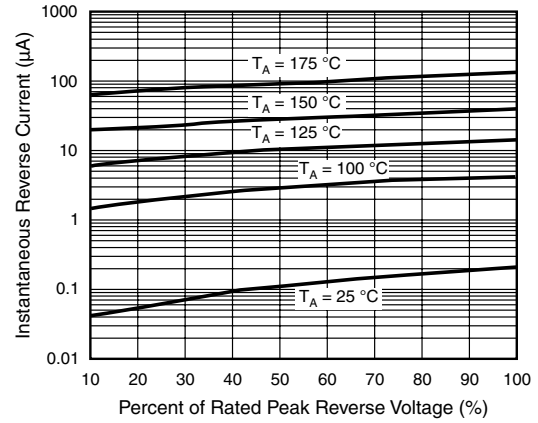


Figure 4. Typical Reverse Characteristics

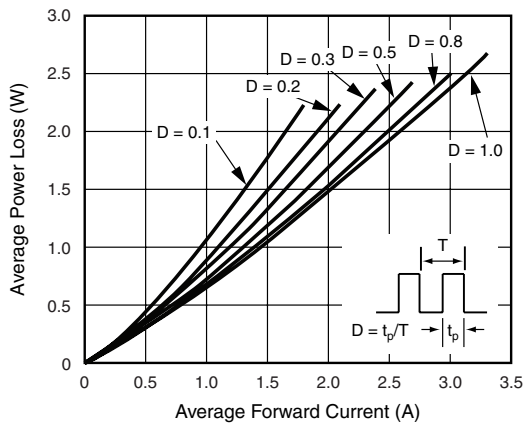


Figure 2. Forward Power Loss Characteristics

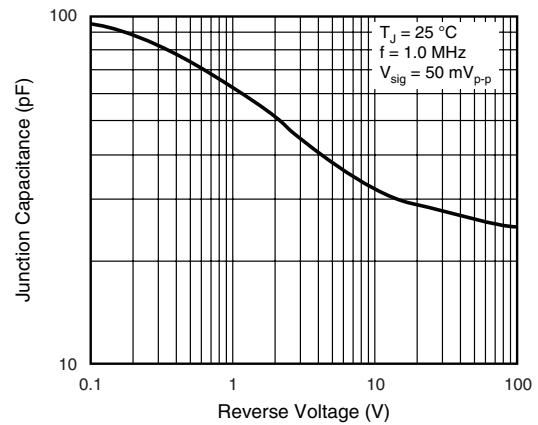


Figure 5. Typical Junction Capacitance

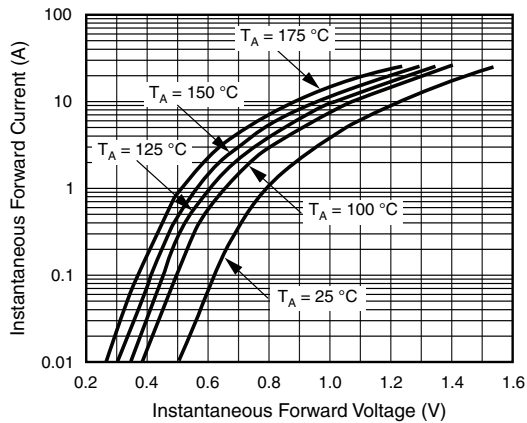


Figure 3. Typical Instantaneous Forward Characteristics

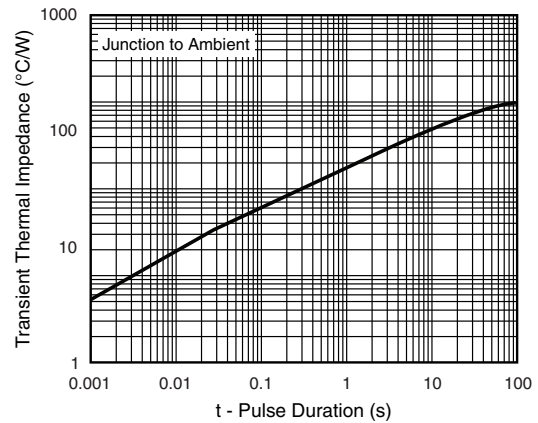


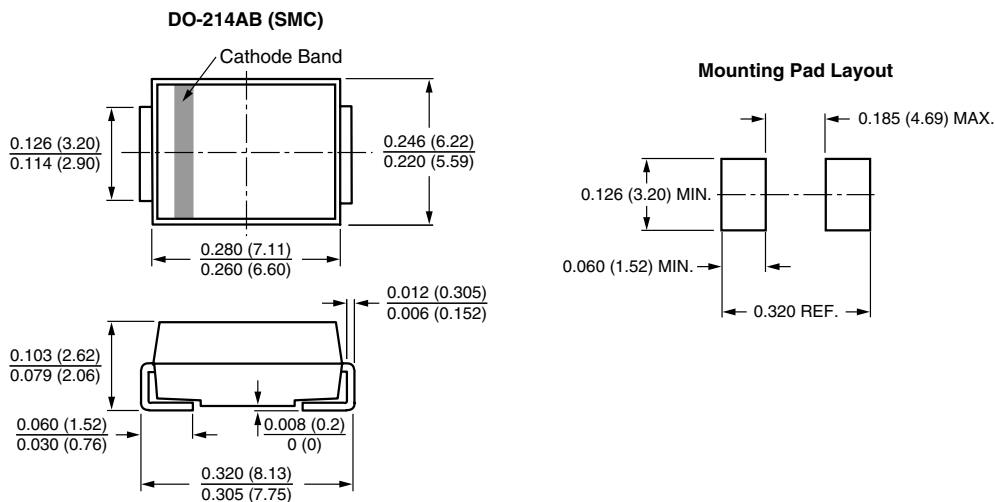
Figure 6. Typical Transient Thermal Impedance

UH3B, UH3C & UH3D

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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