

Surface Mount Ultrafast Rectifier


SMC (DO-214AB)

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
- AEC-Q101 qualified available
- Automotive ordering code: base P/NHE3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
HALOGEN
FREE
 Available

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds of AC/AC and DC/DC converters in high temperature conditions for both consumer and automotive applications.

MECHANICAL DATA

Case: SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating
 Base P/NHE3_X - RoHS-compliant and 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 | |
|-------------------------|----------------|
| $I_{F(AV)}$ | 3.0 A |
| V_{RRM} | 100 V, 150 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 |
| Package | SMC (DO-214AB) |
| Diode variations | Single |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | |
|--|----------------------------|-------------|------|------|
| PARAMETER | SYMBOL | UH3B | UH3C | UNIT |
| Device marking code | | HB | HC | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 150 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ ⁽¹⁾ | 2.5 | | A |
| | $I_{F(AV)}$ ⁽²⁾ | 3.0 | | |
| 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 PCB with 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pad area



| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | |
|--|--|-------------------------|-------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 1.5 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.85 | - | V |
| | I _F = 3.0 A | | | 0.95 | 1.05 | |
| | I _F = 1.5 A | T _A = 125 °C | | 0.65 | - | |
| | I _F = 3.0 A | | | 0.75 | 0.90 | |
| Reverse current | Rated V _R | T _A = 25 °C | I _R ⁽²⁾ | - | 5 | μA |
| | | T _A = 125 °C | | 15 | 100 | |
| 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) | | T _A = 125 °C | S | 0.2 | - | |
| Typical reverse recovery current | I _F = 3.0 A, di/dt = 200 A/μs, V _R = 200 V | | 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 | UNIT |
| Typical thermal resistance | R _{θJA} ⁽¹⁾ | 95 | | °C/W |
| | R _{θJM} ⁽¹⁾ | 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 |
| UH3CHE3_A/H ⁽¹⁾ | 0.236 | H | 850 | 7" diameter plastic tape and reel |
| UH3CHE3_A/I ⁽¹⁾ | 0.236 | I | 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)

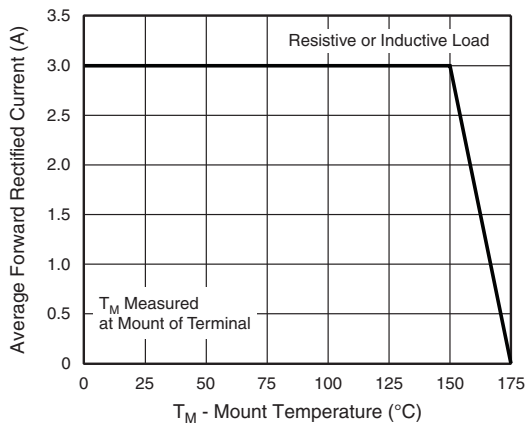


Fig. 1 - Maximum Forward Current Derating Curve

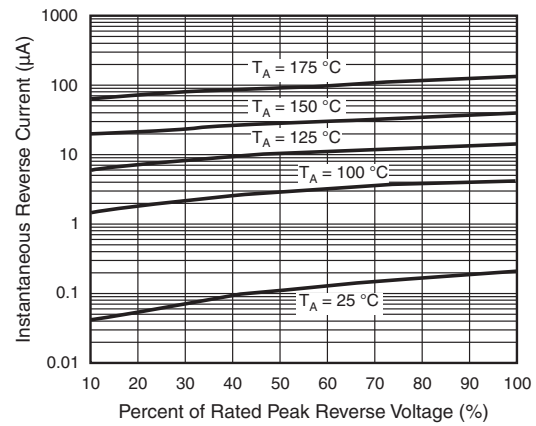


Fig. 4 - Typical Reverse Characteristics

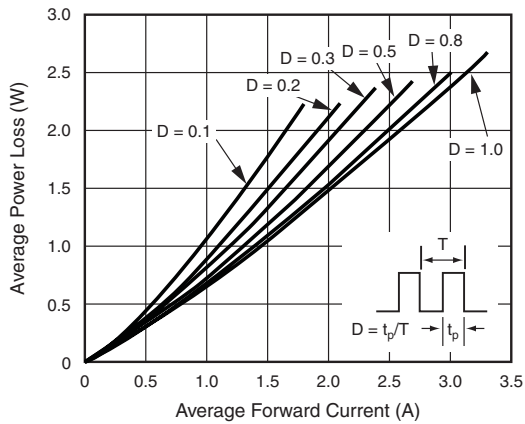


Fig. 2 - Forward Power Loss Characteristics

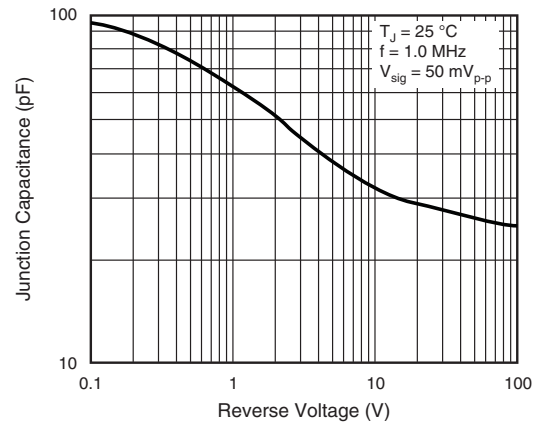


Fig. 5 - Typical Junction Capacitance

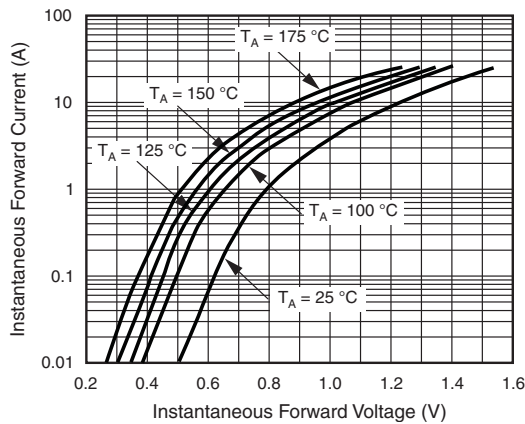


Fig. 3 - Typical Instantaneous Forward Characteristics

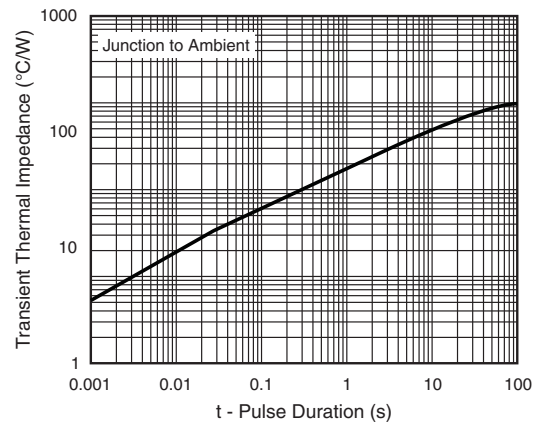
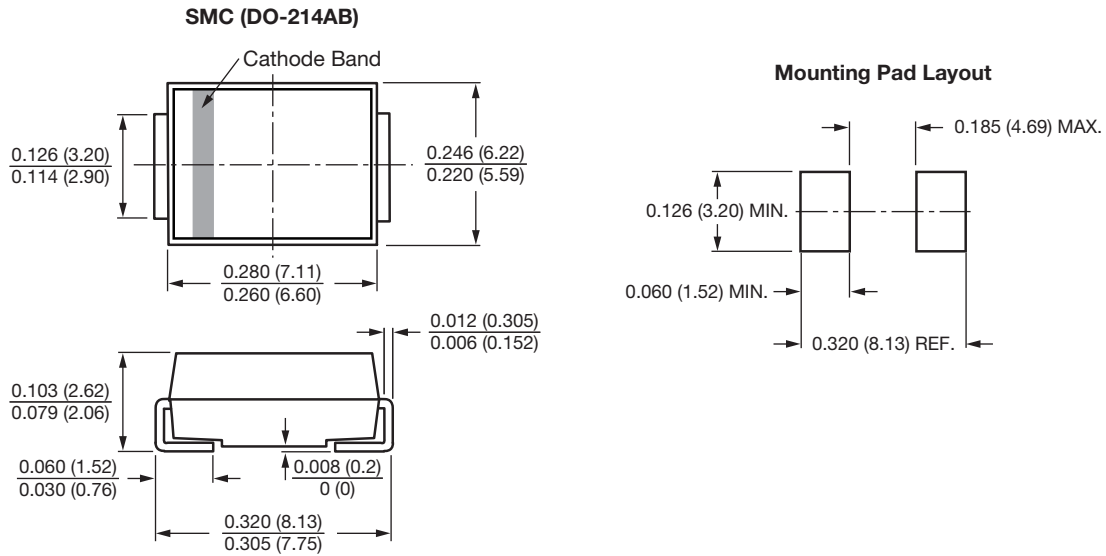


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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