

Surface Mount Ultrafast Plastic Rectifier


SMC (DO-214AB)

**RoHS
COMPLIANT
HALOGEN
FREE**

FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-E3 - RoHS-compliant, commercial grade
 Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

E3 and M3 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, 200 V |
| I_{FSM} | 100 A |
| t_{rr} | 20 ns |
| V_F at $I_F = 3.0$ A | 0.74 V |
| T_J max. | 150 °C |
| Package | SMC (DO-214AB) |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | |
|--|----------------|----------------------------|-----|-----|------|
| PARAMETER | SYMBOL | U3B | U3C | U3D | UNIT |
| Device marking code | | U3B | U3C | U3D | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 150 | 200 | V |
| Maximum average forward rectified current (fig. 1) | $T_M = 134$ °C | $I_{F(AV)}$ ⁽¹⁾ | | 2.0 | A |
| | $T_M = 125$ °C | $I_{F(AV)}$ ⁽²⁾ | | 3.0 | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | | | °C |

Notes

- (1) Free air, mounted on recommended copper pad area
 (2) Units mounted on PCB with 0.47" x 0.47" (12 mm x 12 mm) copper pad areas

| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|---|-----------------------------------|-------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | SYMBOL | TYP. | MAX. | UNIT | |
| Instantaneous forward voltage | $I_F = 3.0\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.85 | 0.90 | V |
| | | $T_A = 100\text{ }^\circ\text{C}$ | | 0.74 | | |
| Reverse current | Rated V_R | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 10 | μA |
| | | $T_A = 100\text{ }^\circ\text{C}$ | | 250 | 500 | |
| Reverse recovery time | $I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | t_{rr} | - | 20 | ns |
| | | $T_A = 25\text{ }^\circ\text{C}$ | | 25 | 30 | |
| | | $T_A = 100\text{ }^\circ\text{C}$ | | 35 | 50 | |
| Storage charge | $I_F = 3.0\text{ A}, dI/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}, I_{rr} = 0.1 I_{RM}$ | $T_A = 25\text{ }^\circ\text{C}$ | Q_{rr} | 9 | 15 | nC |
| | | $T_A = 100\text{ }^\circ\text{C}$ | | 22 | 35 | |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 25 | - | 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 noted) | | | | | |
|---|-----------------------|-----|-----|-----|---------------------------|
| PARAMETER | SYMBOL | U3B | U3C | U3D | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 92 | | | $^\circ\text{C}/\text{W}$ |
| | $R_{\theta JM}^{(1)}$ | 10 | | | |

Note

- (1) Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient, $R_{\theta JM}$ - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| U3D-E3/57T | 0.239 | 57T | 850 | 7" diameter plastic tape and reel |
| U3D-E3/9AT | 0.239 | 9AT | 3500 | 13" diameter plastic tape and reel |
| U3D-M3/57T | 0.239 | 57T | 850 | 7" diameter plastic tape and reel |
| U3D-M3/9AT | 0.239 | 9AT | 3500 | 13" diameter plastic tape and reel |

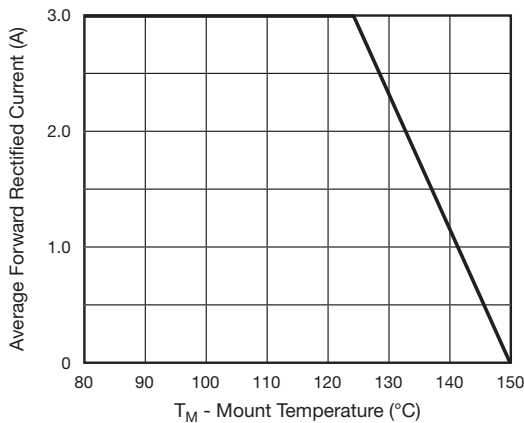
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

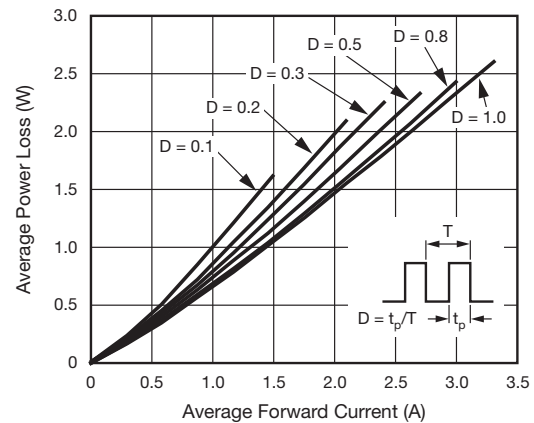


Fig. 2 - Forward Power Loss Characteristics

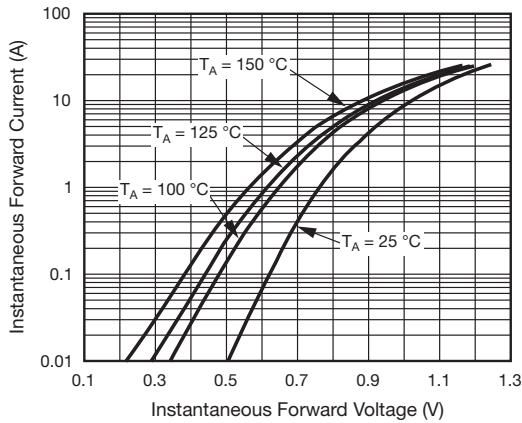


Fig. 3 - Typical Instantaneous Forward Characteristics

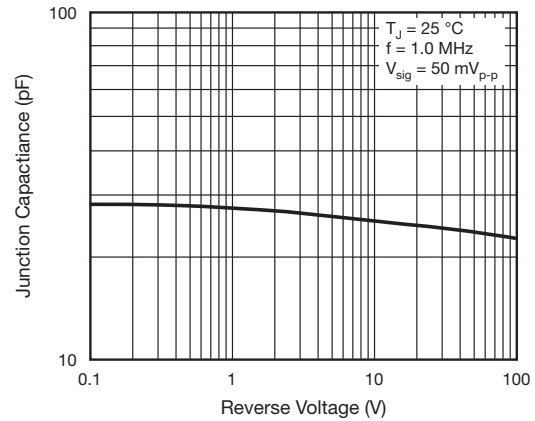


Fig. 5 - Typical Junction Capacitance

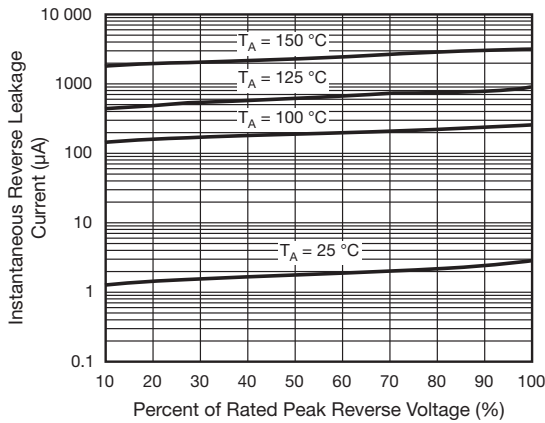


Fig. 4 - Typical Reverse Leakage Characteristics

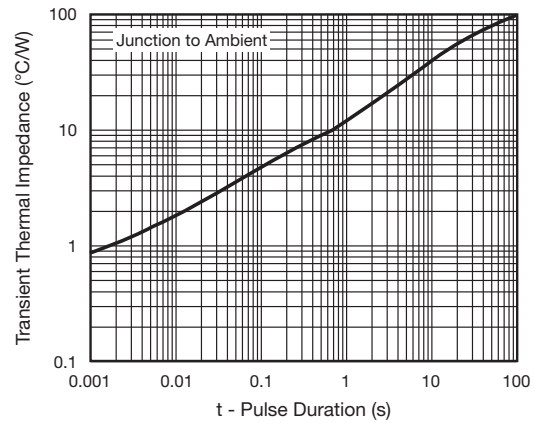
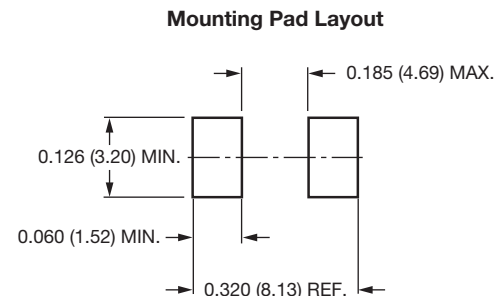
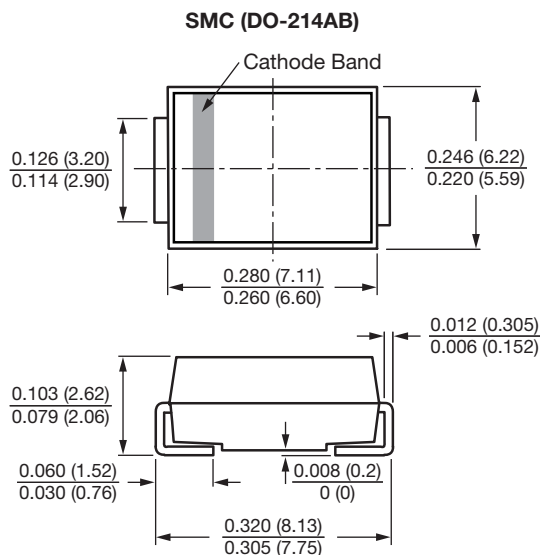


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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