

Surface Mount Ultrafast Plastic Rectifier



DO-214AC (SMA)

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


RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, DC/DC converters or polarity protection application.

MECHANICAL DATA

Case: DO-214AC (SMA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

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

E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|---------------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 100 V, 150 V, 200 V |
| I_{FSM} | 30 A |
| t_{rr} | 15 ns |
| V_F at $I_F = 1.0$ A | 0.76 V |
| T_J max. | 150 °C |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | |
|--|----------------|---------------|-----|-----|------|
| PARAMETER | SYMBOL | U1B | U1C | U1D | UNIT |
| Device marking code | | U1B | U1C | U1D | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 150 | 200 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 1.0 | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 30 | | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | - 55 to + 150 | | | °C |

| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|--|-----------------------------------|-------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F = 0.6\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.82 | 0.87 | V |
| | $I_F = 1.0\text{ A}$ | | | 0.87 | 0.92 | |
| | $I_F = 0.6\text{ A}$ | $T_A = 100\text{ }^\circ\text{C}$ | | 0.71 | 0.78 | |
| | $I_F = 1.0\text{ A}$ | | | 0.76 | 0.84 | |
| Reverse current | Rated V_R | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 5.0 | μA |
| | | $T_A = 100\text{ }^\circ\text{C}$ | | 55 | 100 | |
| 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} | - | 15 | ns |
| | | $T_A = 25\text{ }^\circ\text{C}$ | | 24 | - | |
| | | $T_A = 100\text{ }^\circ\text{C}$ | | 29 | - | |
| Storage charge | $I_F = 0.6\text{ A}, dI/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}, I_{rr} = 0.1\text{ I}_{RM}$ | $T_A = 25\text{ }^\circ\text{C}$ | Q_{rr} | 7 | - | nC |
| | | $T_A = 100\text{ }^\circ\text{C}$ | | 13 | - | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 6.8 | - | 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 | U1B | U1C | U1D | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 115 | | | $^\circ\text{C}/\text{W}$ |
| | $R_{\theta JM}^{(1)}$ | 22 | | | |

Note

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

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| U1D-E3/61T | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| U1D-E3/5AT | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |

RATINGS AND CHARACTERISTICS CURVES

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

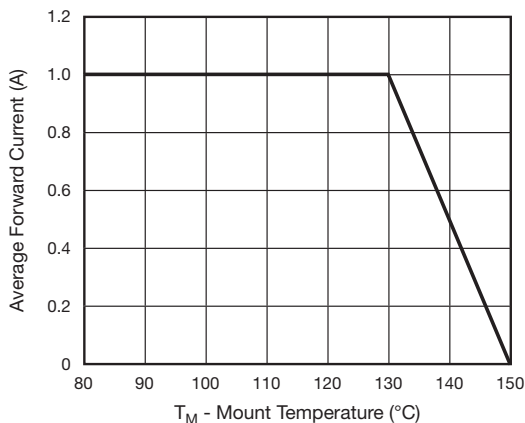


Fig. 1 - Forward Derating Curve

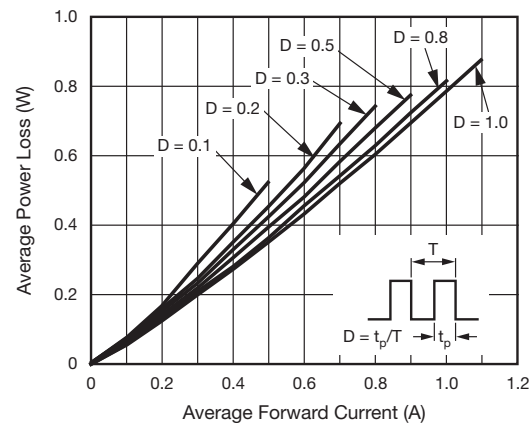


Fig. 2 - Forward Power Loss Characteristics

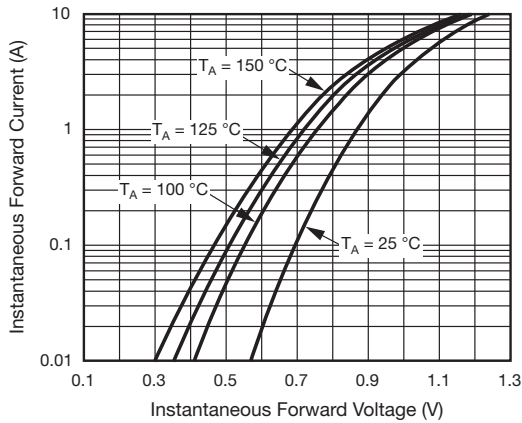


Fig. 3 - Typical Instantaneous Forward Characteristics

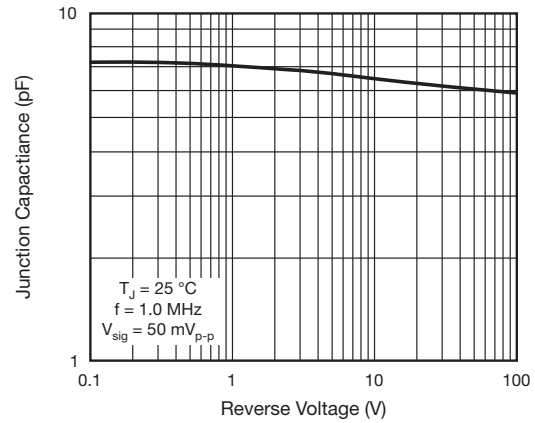


Fig. 5 - Typical Junction Capacitance

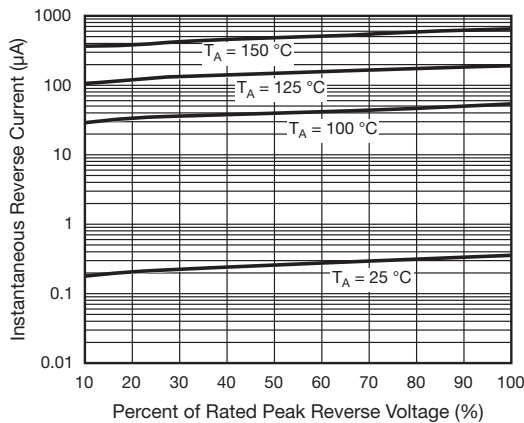


Fig. 4 - Typical Reverse Characteristics

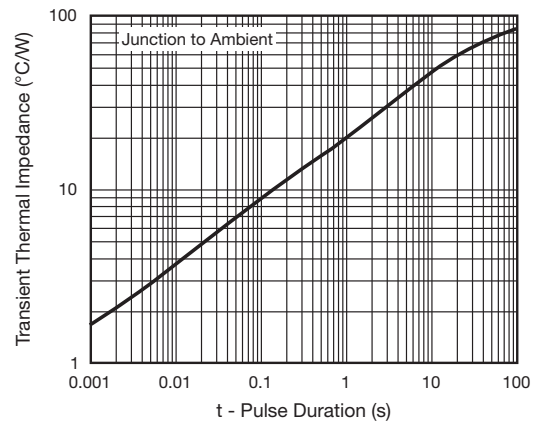
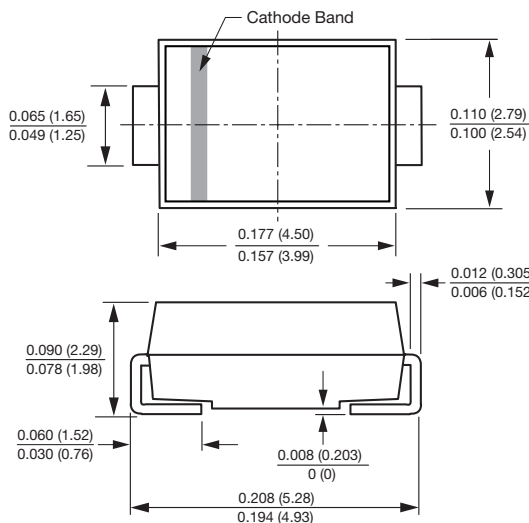


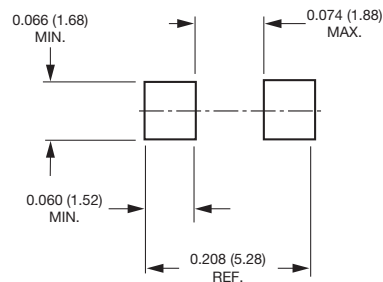
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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