

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
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, 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_{tr} | 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 °C unless otherwise noted) | | | | | | |
|--|--|---|-----------------|--------------|--------------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage ⁽¹⁾ | I _F = 0.6 A I _F = 1.0 A | T _A = 25 °C | V _F | 0.82 0.87 | 0.87 0.92 | V |
| | I _F = 0.6 A I _F = 1.0 A | T _A = 100 °C | | 0.71 0.76 | 0.78 0.84 | |
| Reverse current ⁽²⁾ | rated V _R | T _A = 25 °C T _A = 100 °C | I _R | - 55 | 5.0 100 | μA |
| Reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | T _A = 25 °C | t _{rr} | - | 15 | ns |
| | I _F = 0.6 A, dI/dt = 50 A/μs, V _R = 30 V, I _{rr} = 0.1 I _{RM} | T _A = 25 °C T _A = 100 °C | t _{rr} | 24 29 | - - | ns |
| Storage charge | I _F = 0.6 A, dI/dt = 50 A/μs, V _R = 30 V, I _{rr} = 0.1 I _{RM} | T _A = 25 °C T _A = 100 °C | Q _{rr} | 7 13 | - - | nC |
| 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 ≤ 40 ms

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | |
|---|--------------------------------------|-----|-----------|-----|------|
| PARAMETER | SYMBOL | U1B | U1C | U1D | UNIT |
| Typical thermal resistance ⁽¹⁾ | R _{θJA} R _{θJM} | | 115 22 | | °C/W |

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 °C unless otherwise noted)

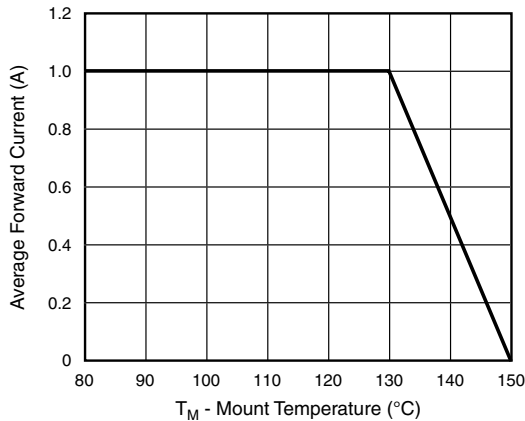


Figure 1. Forward Derating Curve

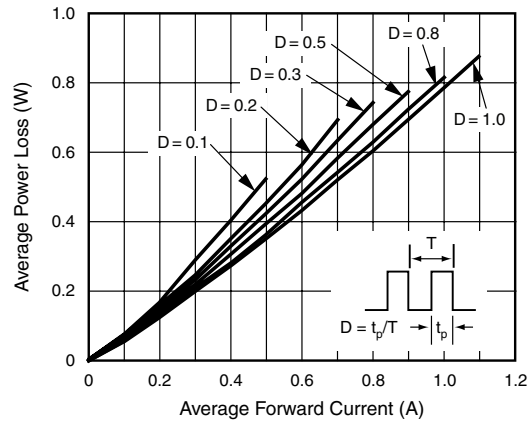


Figure 2. Forward Power Loss Characteristics

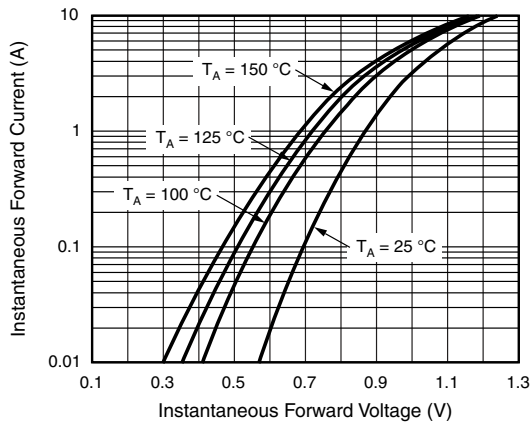


Figure 3. Typical Instantaneous Forward Characteristics

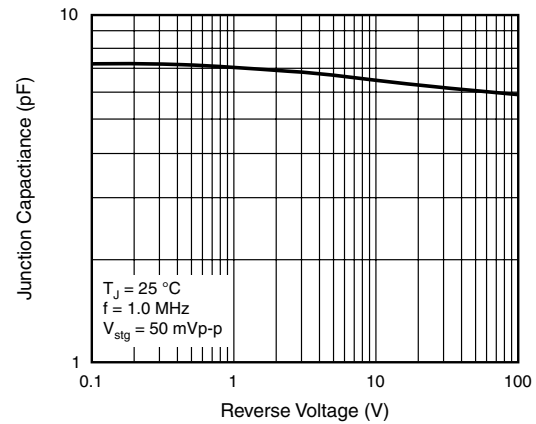


Figure 5. Typical Junction Capacitance

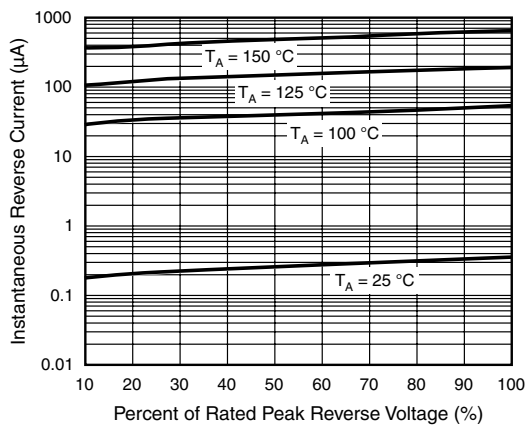


Figure 4. Typical Reverse Characteristics

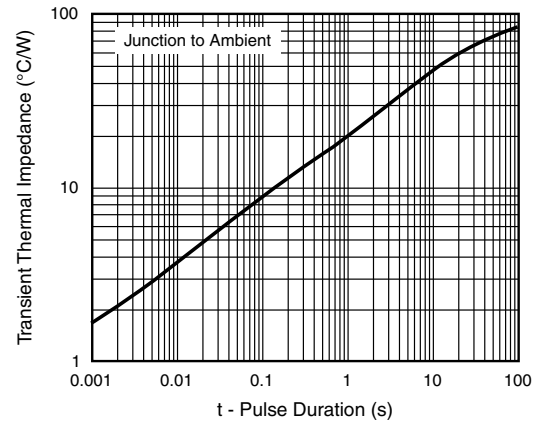
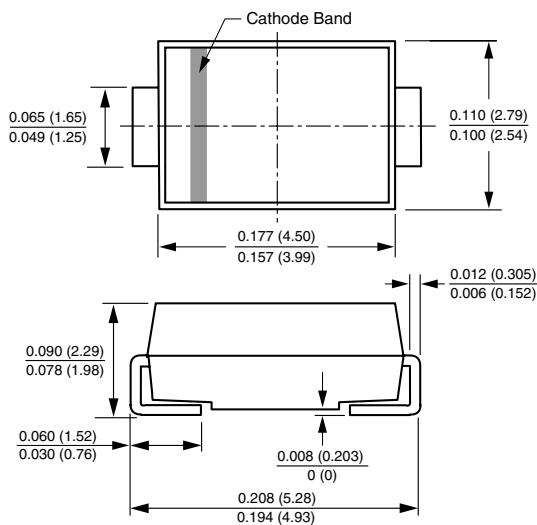


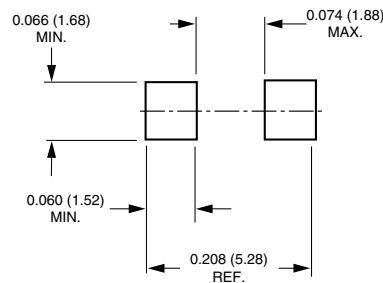
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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All product specifications and data are subject to change without notice.

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