



Surface Mount Ultrafast Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS COMPLIANT

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DO-214AC (SMA)

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

E3 suffix meets JESD 201 class 2 whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|---|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 50 V, 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V |
| I_{FSM} | 30 A |
| t_{rr} | 50 ns, 75 ns |
| V_F at I_F | 1.0 V, 1.7 V |
| T_J max. | 150 °C |
| Package | DO-214AC (SMA) |
| Diode variations | Single die |

| MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted) | | | | | | | | | |
|--|----------------|-------------|------|------|------|------|------|------|------|
| PARAMETER | SYMBOL | US1A | US1B | US1D | US1G | US1J | US1K | US1M | UNIT |
| Device marking code | | UA | UB | UD | UG | UJ | UK | UM | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | V_{RMS} | 35 | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | V_{DC} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum average forward rectified current at $T_L = 110\text{ °C}$ | $I_{F(AV)}$ | 1.0 | | | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 30 | | | | | | | A |
| Operating 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 | US1A | US1B | US1D | US1G | US1J | US1K | US1M | UNIT |
| Maximum instantaneous forward voltage | 1.0 A | V _F ⁽¹⁾ | 1.0 | | | | 1.7 | | | V |
| Maximum DC reverse current at rated DC blocking voltage | T _A = 25 °C | I _R | 10 | | | | | | | μA |
| | T _A = 100 °C | | 50 | | | | | | | |
| Maximum reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | t _{rr} | 50 | | | | 75 | | | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | C _J | 15 | | | | 10 | | | pF |

Note

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

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | | |
|---|---------------------------------|------|------|------|------|------|------|------|------|--|
| PARAMETER | SYMBOL | US1A | US1B | US1D | US1G | US1J | US1K | US1M | UNIT | |
| Maximum thermal resistance | R _{θJA} ⁽¹⁾ | 75 | | | | | °C/W | | | |
| | R _{θJL} ⁽¹⁾ | 27 | | | | | | | | |

Note

(1) PCB mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad area

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| US1J-E3/61T | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| US1J-E3/5AT | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |
| US1JHE3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| US1JHE3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

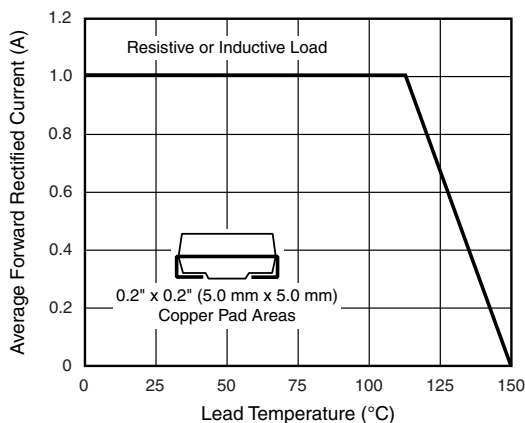


Fig. 1 - Forward Current Derating Curve

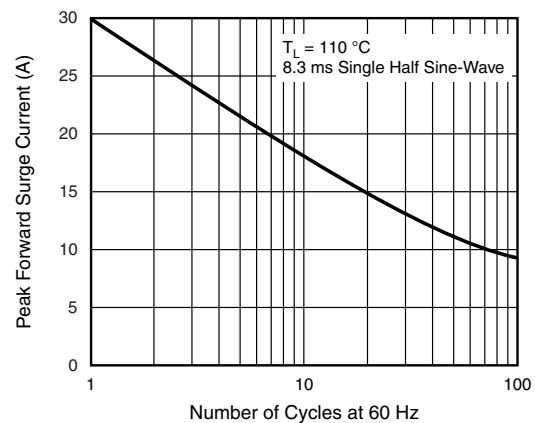


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

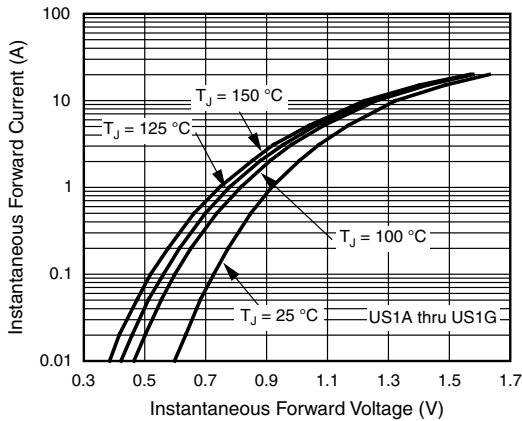


Fig. 3 - Typical Instantaneous Forward Characteristics

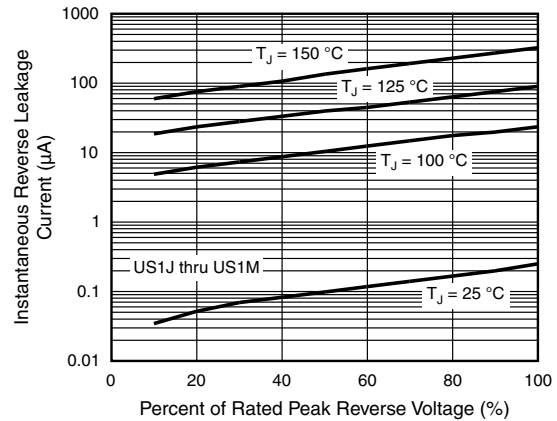


Fig. 6 - Typical Reverse Leakage Characteristics

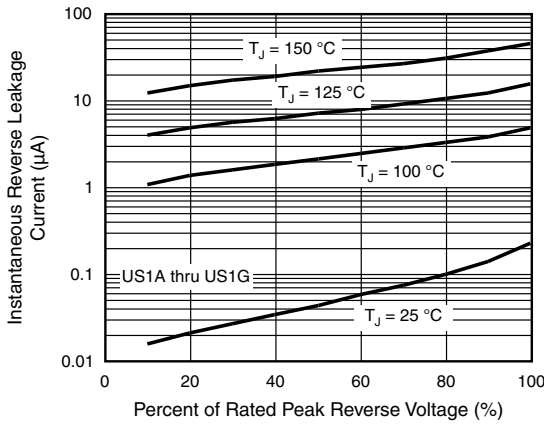


Fig. 4 - Typical Reverse Leakage Characteristics

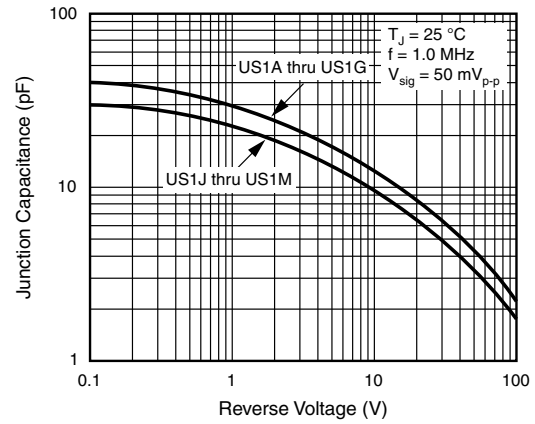


Fig. 7 - Typical Junction Capacitance

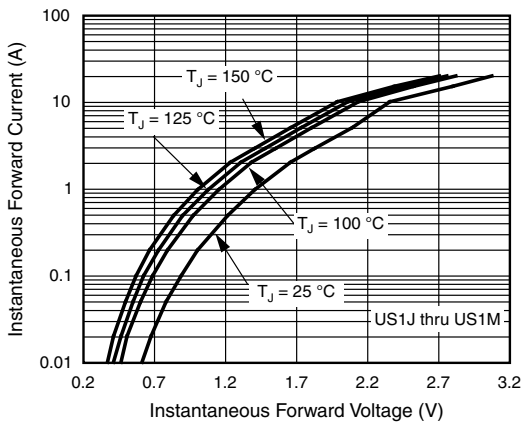


Fig. 5 - Typical Instantaneous Forward Characteristics

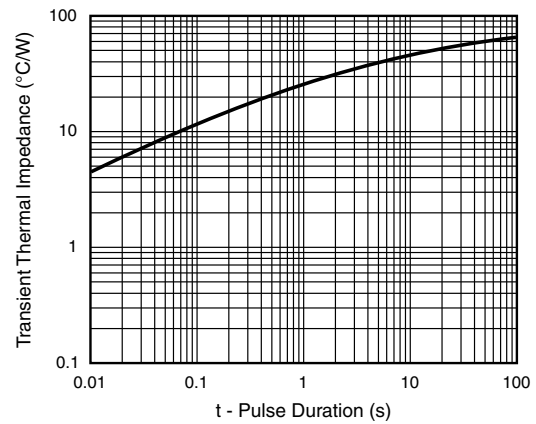
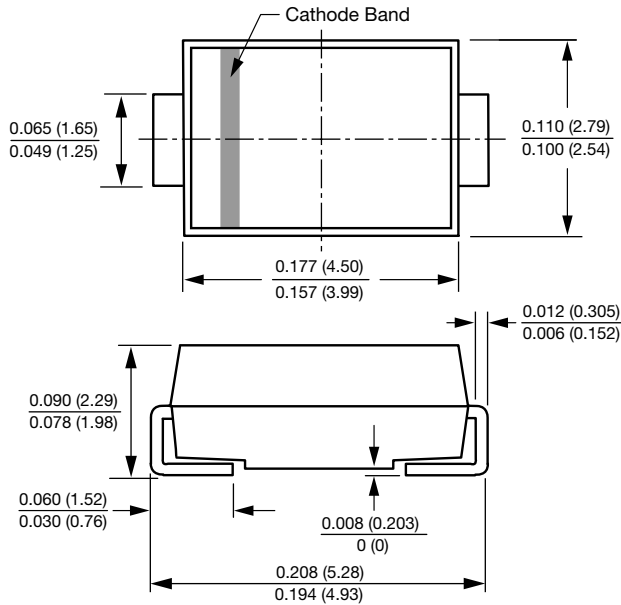


Fig. 8 - Typical Transient Thermal Impedance

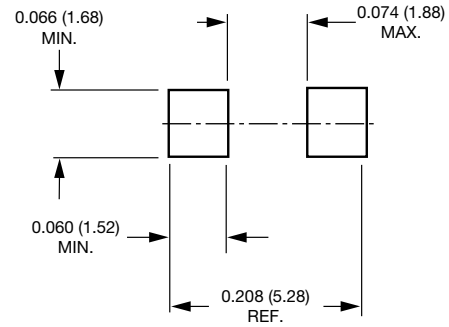


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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