

Surface Mount Ultrafast Plastic Rectifier


DO-214AC (SMA)
FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020C, LF max peak of 260 °C
- Solder Dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC


TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

E3 suffix for commercial grade, HE3 suffix for high reliability grade (AEC Q101 qualified)

Polarity: Color band denotes cathode end

| MAJOR RATINGS AND CHARACTERISTICS | |
|--|---------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 50 V to 200 V |
| I_{FSM} | 30 A |
| t_{rr} | 15 ns |
| V_F | 0.92 V |
| $T_j \text{ max.}$ | 150 °C |

| MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | | | |
|--|----------------|---------------|------|------|------|------|
| PARAMETER | SYMBOL | ES1A | ES1B | ES1C | ES1D | UNIT |
| Device marking code | | EA | EB | EC | ED | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 50 | 100 | 150 | 200 | V |
| Maximum RMS voltage | V_{RMS} | 35 | 70 | 105 | 140 | V |
| Maximum DC blocking voltage | V_{DC} | 50 | 100 | 150 | 200 | V |
| Maximum average forward rectified current (Fig. 1) | $I_{F(AV)}$ | 1 | | | | 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 | VALUE | UNIT |
| Maximum instantaneous forward voltage | at $I_F = 0.6\text{ A}$ ⁽¹⁾ at $I_F = 1.0\text{ A}$ | V_F | 0.865 0.920 | V |
| Maximum DC reverse current at rated DC blocking voltage | $T_A = 25\text{ }^\circ\text{C}$ $T_A = 100\text{ }^\circ\text{C}$ | I_R | 5.0 100 | μA |
| Maximum reverse recovery time | $I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$ | t_{rr} | 15 | ns |
| Maximum reverse recovery time | $I_F = 0.6\text{ A}$, $V_R = 30\text{ V}$, $di/dt = 50\text{ A}/\mu\text{s}$, $I_{rr} = 10\% I_{RM}$ $T_J = 25\text{ }^\circ\text{C}$ $T_J = 100\text{ }^\circ\text{C}$ | t_{rr} | 25 35 | ns |
| Maximum stored charge | $I_F = 0.6\text{ A}$, $V_R = 30\text{ V}$, $di/dt = 50\text{ A}/\mu\text{s}$, $I_{rr} = 10\% I_{RM}$ $T_J = 25\text{ }^\circ\text{C}$ $T_J = 100\text{ }^\circ\text{C}$ | Q_{rr} | 10 25 | nC |
| Typical junction capacitance | at 4.0 V, 1 MHz | C_J | 10 | pF |

Note:

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

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|------------------------------------|------|----------|------|------|---------------------------|
| PARAMETER | SYMBOL | ES1A | ES1B | ES1C | ES1D | UNIT |
| Typical thermal resistance ⁽¹⁾ | $R_{\theta JA}$ $R_{\theta JL}$ | | 85 35 | | | $^\circ\text{C}/\text{W}$ |

Note:

(1) Units mounted on P.C.B. 5.0 x 5.0 mm (0.013 mm thick) land areas

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|----------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| ES1D-E3/61T | 0.064 | 61T | 1800 | 7" Diameter Plastic Tape & Reel |
| ES1D-E3/5AT | 0.064 | 5AT | 7500 | 13" Diameter Plastic Tape & Reel |
| ES1DHE3/61T ⁽¹⁾ | 0.064 | 61T | 1800 | 7" Diameter Plastic Tape & Reel |
| ES1DHE3/5AT ⁽¹⁾ | 0.064 | 5AT | 7500 | 13" Diameter Plastic Tape & Reel |

Note:

(1) Automotive grade AEC Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

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

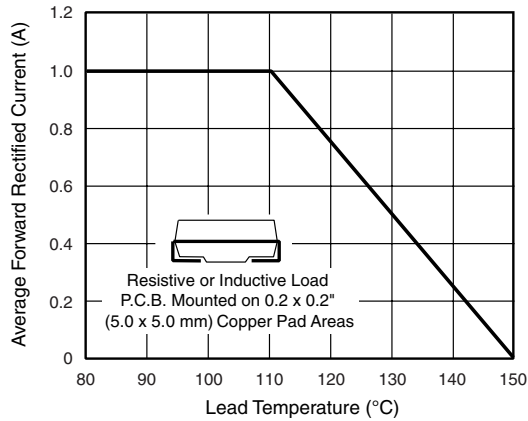


Figure 1. Maximum Forward Current Derating Curve

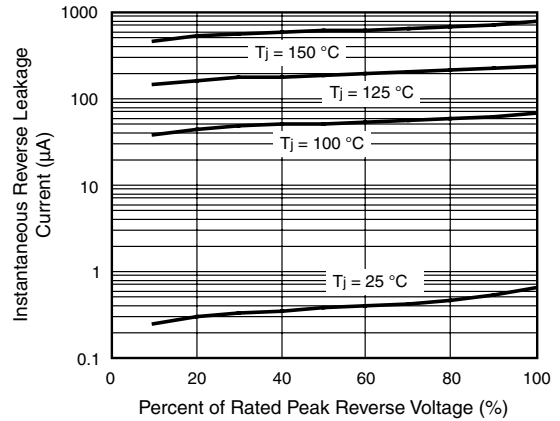


Figure 4. Typical Reverse Leakage Characteristics

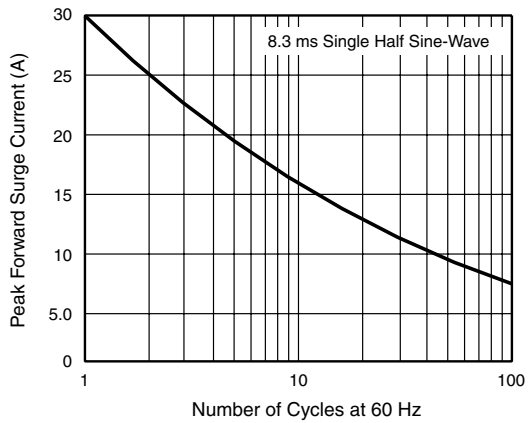


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

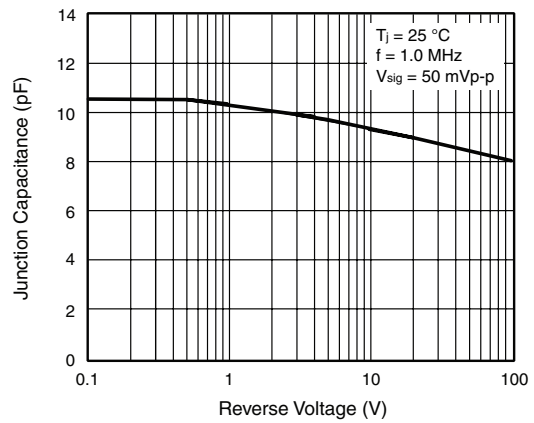


Figure 5. Typical Junction Capacitance

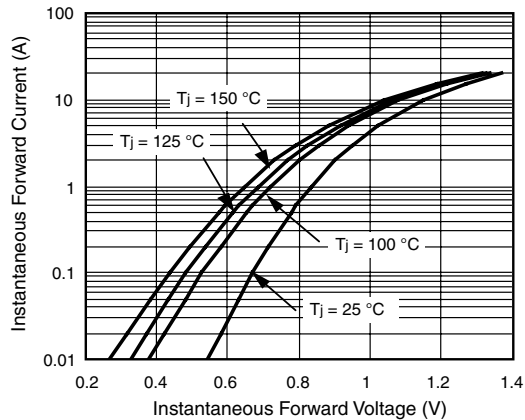


Figure 3. Typical Instantaneous Forward Characteristics

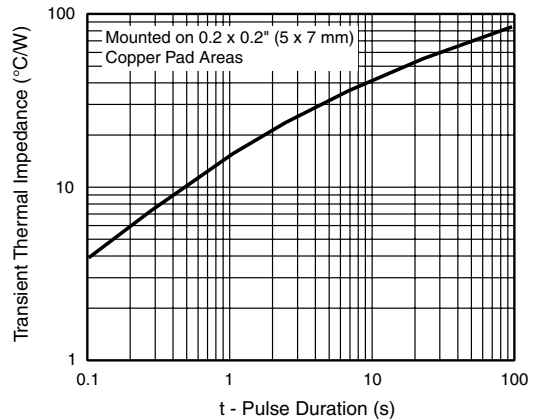
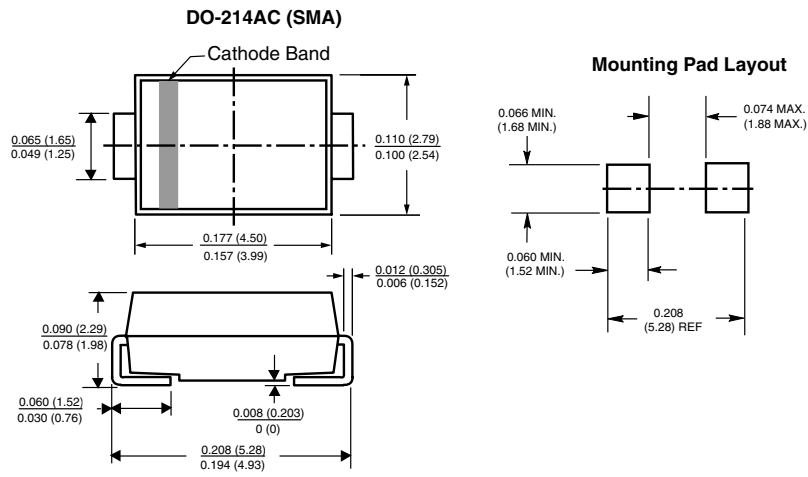


Figure 6. Typical Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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