

Surface Mount Ultrafast Plastic Rectifier


DO-214AC (SMA)

| PRIMARY 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 |

TYPICAL APPLICATIONS

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

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-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

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 - RoHS-compliant, AEC-Q101 qualified
 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 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

| 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) | $I_{F(AV)}$ | 1.0 | | | | 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 | VALUE | UNIT | |
| Maximum instantaneous forward voltage | $I_F = 0.6\text{ A}$ | $V_F^{(1)}$ | 0.865 | V | |
| | $I_F = 1.0\text{ A}$ | V_F | 0.920 | | |
| Maximum DC reverse current at rated DC blocking voltage | | I_R | $T_A = 25\text{ }^\circ\text{C}$ | 5.0 | μA |
| | | | $T_A = 100\text{ }^\circ\text{C}$ | 100 | |
| 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_{rr} | $T_J = 25\text{ }^\circ\text{C}$ | 25 | ns |
| | | | $T_J = 100\text{ }^\circ\text{C}$ | 35 | |
| Maximum stored charge | $I_F = 0.6\text{ A}, V_R = 30\text{ V}, dI/dt = 50\text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$ | Q_{rr} | $T_J = 25\text{ }^\circ\text{C}$ | 10 | nC |
| | | | $T_J = 100\text{ }^\circ\text{C}$ | 25 | |
| Typical junction capacitance | 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 | $R_{\theta JA}^{(1)}$ | 85 | | | | $^\circ\text{C}/\text{W}$ |
| | $R_{\theta JL}^{(1)}$ | 35 | | | | |

Note

(1) Units mounted on PCB 5.0 mm 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 and reel |
| ES1D-E3/5AT | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |
| ES1DHE3/61T ⁽¹⁾ | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| ES1DHE3/5AT ⁽¹⁾ | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |
| ES1DHE3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| ES1DHE3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |

Note

(1) AEC_Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

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

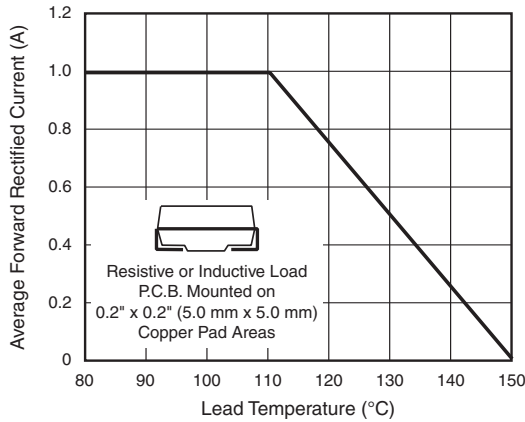


Fig. 1 - Maximum Forward Current Derating Curve

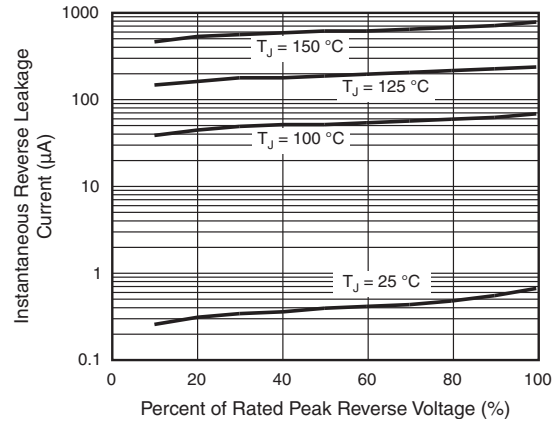


Fig. 4 - Typical Reverse Leakage Characteristics

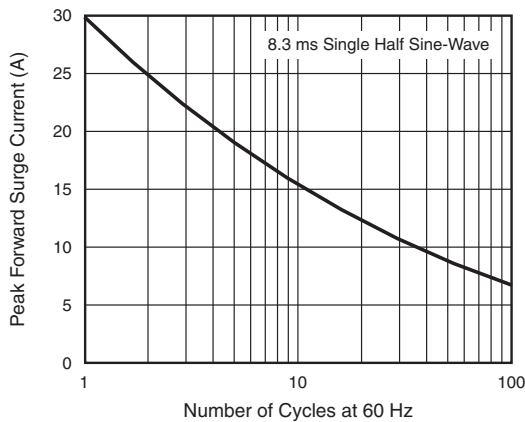


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

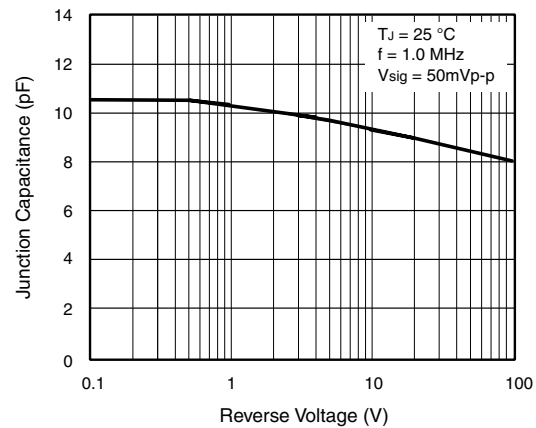


Fig. 5 - Typical Junction Capacitance

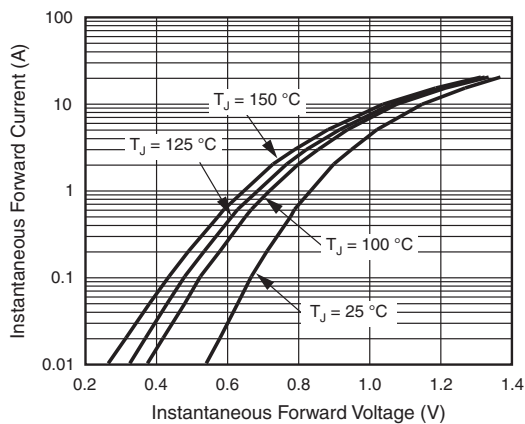


Fig. 3 - Typical Instantaneous Forward Characteristics

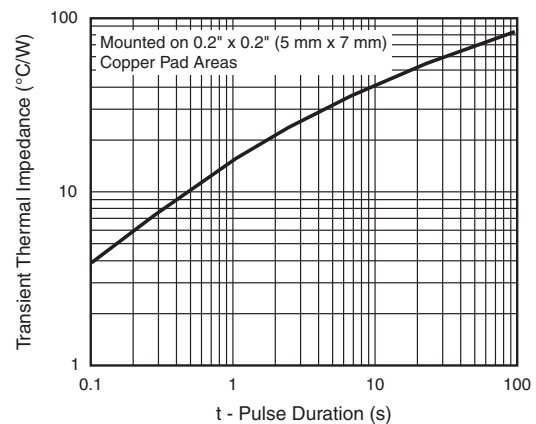
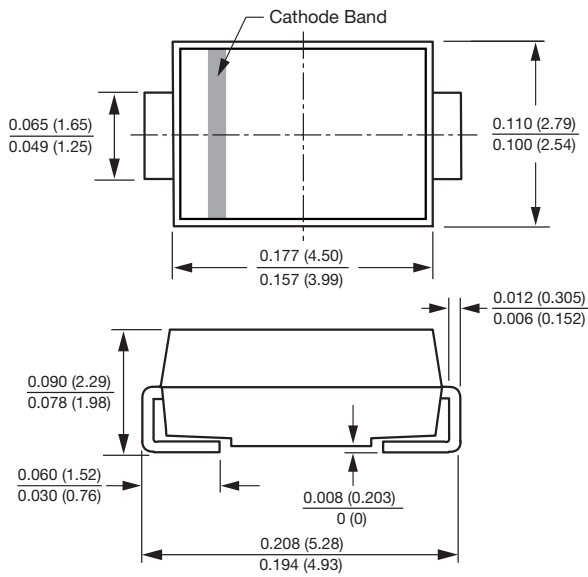


Fig. 6 - Typical Thermal Impedance

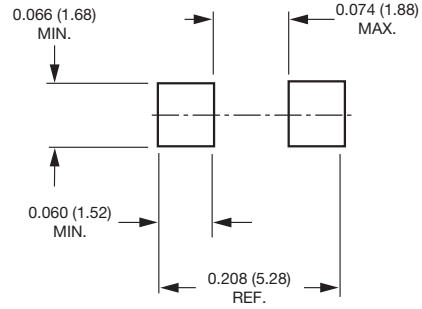


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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