

Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- 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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

PRIMARY CHARACTERISTICS

| | |
|--------------------|--------------|
| $I_{F(AV)}$ | 2.0 A |
| V_{RRM} | 300 V, 400 V |
| I_{FSM} | 50 A |
| t_{rr} | 35 ns |
| V_F | 1.1 V |
| $T_J \text{ max.}$ | 150 °C |

MECHANICAL DATA

Case: DO-214AA (SMB)

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

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 | ES2F | ES2G | UNIT |
|--|----------------|---------------|------|------|
| Device marking code | | EF | EG | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 300 | 400 | V |
| Working peak reverse voltage | V_{RWM} | 225 | 300 | V |
| Maximum RMS voltage | V_{RMS} | 210 | 280 | V |
| Maximum average forward rectified current at $T_L = 110\text{ °C}$ | $I_{F(AV)}$ | 2.0 | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 50 | | 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 | ES2F | ES2G | UNIT |
| Maximum instantaneous forward voltage | 2.0 A | | V _F ⁽¹⁾ | 1.1 | | V |
| Maximum reverse current at V _{RRM} | | T _A = 25 °C | I _R | 10 | | μA |
| | | T _A = 100 °C | | 200 | | |
| Maximum reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | | t _{rr} | 35 | | ns |
| Maximum reverse recovery time | I _F = 1.0 A, dI/dt = 100 A/μs, V _R = 30 V, I _{rr} = 0.1 I _{RM} | | t _{rr} | 50 | | ns |
| Maximum reverse recovery current | I _F = 1.0 A, dI/dt = 100 A/μs, V _R = 30 V, I _{rr} = 0.1 I _{RM} | | I _{RM} | 3.0 | | A |
| Maximum stored charge | I _F = 1.0 A, dI/dt = 100 A/μs, V _R = 30 V, I _{rr} = 0.1 I _{RM} | | Q _{rr} | 50 | | nC |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 15 | | 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 | ES2F | ES2G | UNIT |
| Maximum thermal resistance | $R_{\theta JA}^{(1)}$ | 75 | | $^{\circ}\text{C}/\text{W}$ |
| | $R_{\theta JL}^{(1)}$ | 25 | | |

Note

⁽¹⁾ Units mounted on P.C.B. 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 |
| ES2G-E3/52T | 0.096 | 52T | 750 | 7" diameter plastic tape and reel |
| ES2G-E3/5BT | 0.096 | 5BT | 3200 | 13" diameter plastic tape and reel |
| ES2GHE3/52T ⁽¹⁾ | 0.096 | 52T | 750 | 7" diameter plastic tape and reel |
| ES2GHE3/5BT ⁽¹⁾ | 0.096 | 5BT | 3200 | 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)

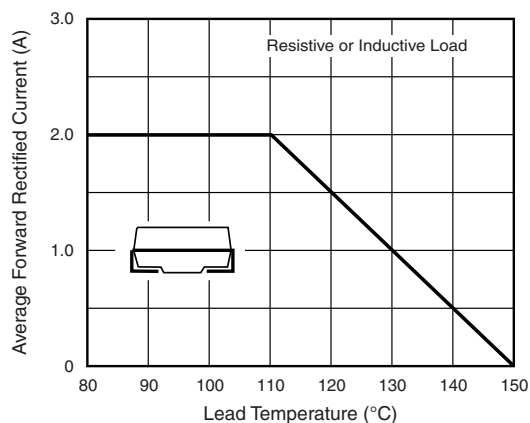


Fig. 1 - Maximum Forward Current Derating Curve

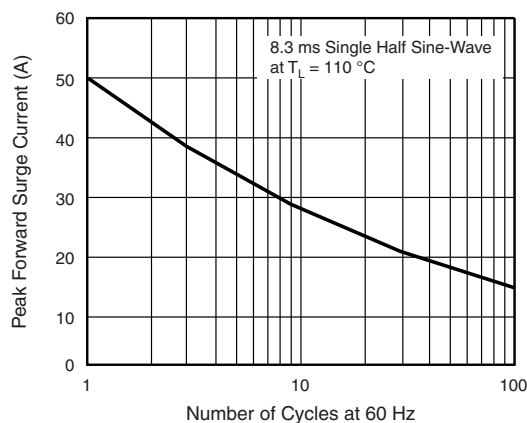


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

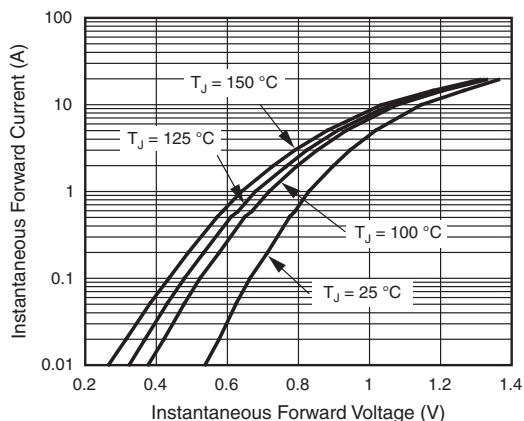


Fig. 3 - Typical Instantaneous Forward Characteristics

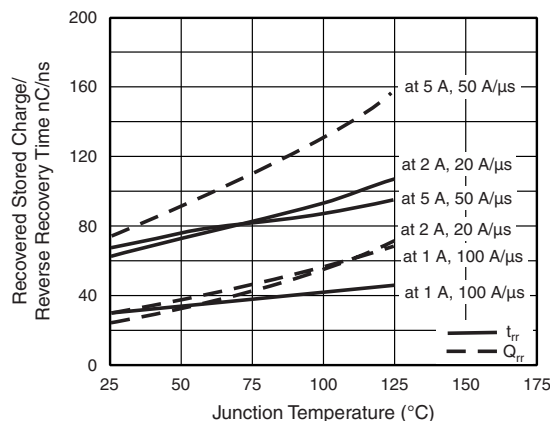


Fig. 5 - Reverse Switching Characteristics

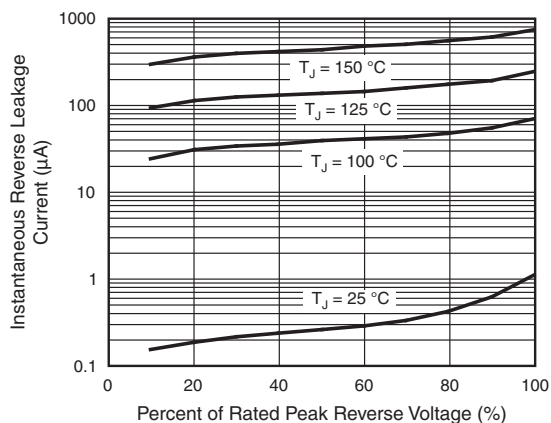


Fig. 4 - Typical Reverse Leakage Characteristics

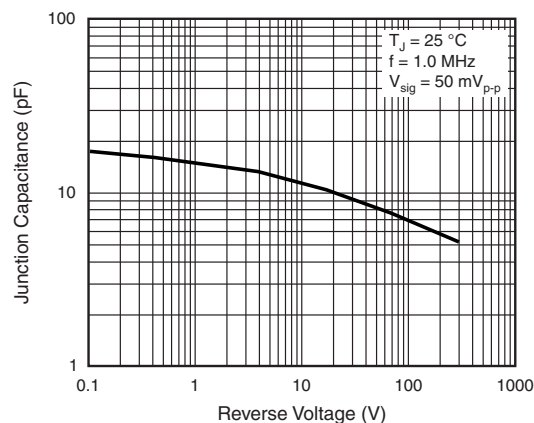
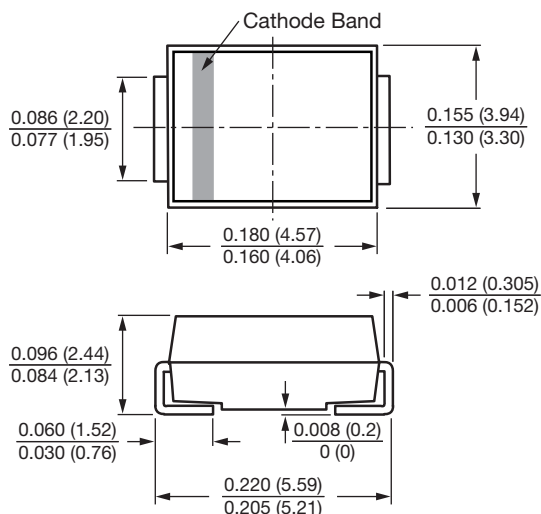


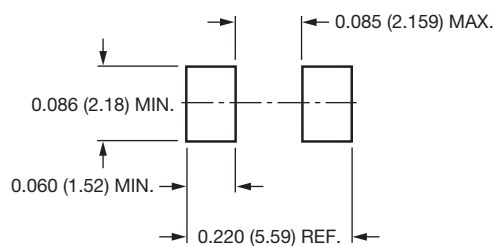
Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



Mounting Pad Layout





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