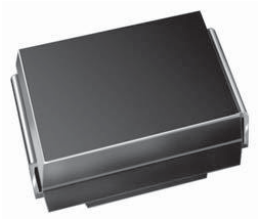
# Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

## FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- 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
- 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, automotive and telecommunication.

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2.0 A |
| $V_{RRM}$ | 50 V to 200 V |
| $I_{FSM}$ | 50 A |
| $t_{rr}$ | 20 ns |
| $V_F$ | 0.90 V |
| $T_J$ 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 (TA = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **ES2A** | **ES2B** | **ES2C** | **ES2D** | **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 at $T_L$ = 110 °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 (TA = 25 °C unless otherwise noted) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **ES2A** | **ES2B** | **ES2C** | **ES2D** | **UNIT** |
| Maximum instantaneous forward voltage | 2.0 A | | $V_F$ (1) | 0.90 | | | | V |
| Maximum DC reverse current at rated DC blocking voltage | | $T_A$ = 25 °C | $I_R$ | 10 | | | | µA |
| | | $T_A$ = 100 °C | | 350 | | | | |

| ELECTRICAL CHARACTERISTICS (TA = 25 °C unless otherwise noted) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | ES2A | ES2B | ES2C | ES2D | UNIT |
| Max. reverse recovery time | $I_F$ = 0.5 A, $I_R$ = 1.0 A, $I_{rr}$ = 0.25 A | | $t_{rr}$ | 20 | | | | ns |
| Maximum reverse recovery time | $I_F$ = 2.0 A, $V_R$ = 30 V, dI/dt = 50 A/µs, $I_r$ = 10 % $I_{RM}$ | $T_J$ = 25 °C | $t_{rr}$ | 30 | | | | ns |
| | | $T_J$ = 100 °C | | 50 | | | | |
| Maximum stored charge | $I_F$ = 2.0 A, $V_R$ = 30 V, dI/dt = 50 A/µs, $I_r$ = 10 % $I_{RM}$ | $T_J$ = 25 °C | $Q_{rr}$ | 10 | | | | nC |
| | | $T_J$ = 100 °C | | 25 | | | | |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 18 | | | | pF |

**Note**

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

| THERMAL CHARACTERISTICS (TA = 25 °C unless otherwise noted) | | | | | | | |
|---|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | ES2A | ES2B | ES2C | ES2D | UNIT |
| Typical thermal resistance | $R_{\theta JA}$ (1) | 75 | | | | °C/W |
| | $R_{\theta JL}$ (1) | 20 | | | | |

**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 |
| ES2D-E3/52T | 0.096 | 52T | 750 | 7" diameter plastic tape and reel |
| ES2D-E3/5BT | 0.096 | 5BT | 3200 | 13" diameter plastic tape and reel |
| ES2DHE3/52T (1) | 0.096 | 52T | 750 | 7" diameter plastic tape and reel |
| ES2DHE3/5BT (1) | 0.096 | 5BT | 3200 | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

($T_A$ = 25 °C unless otherwise noted)

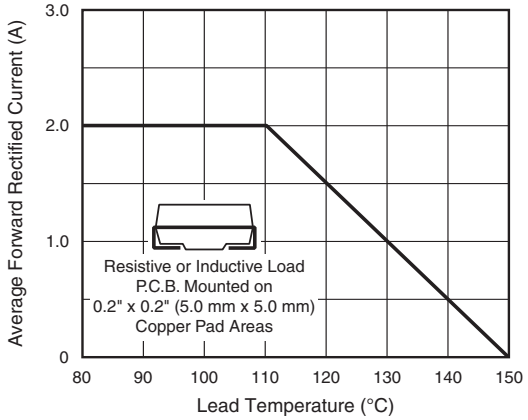



Fig. 1 - Maximum Forward Current Derating Curve

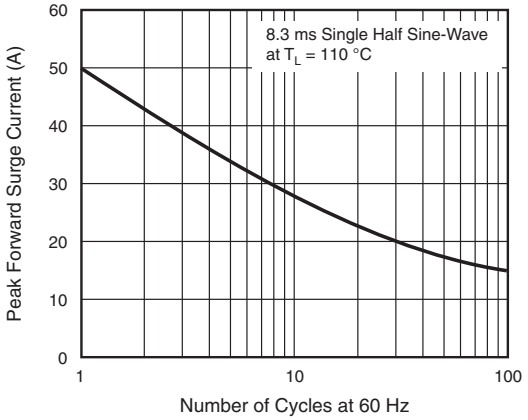



Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

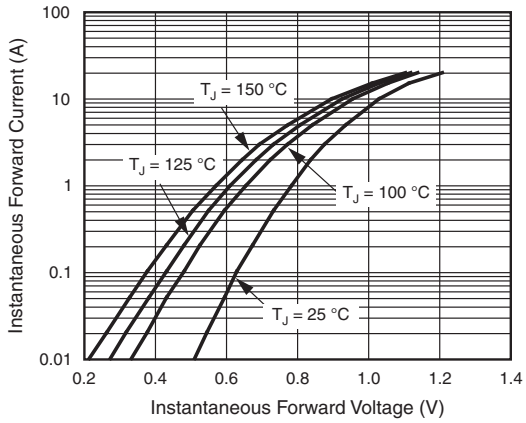



Fig. 3 - Typical Instantaneous Forward Characteristics

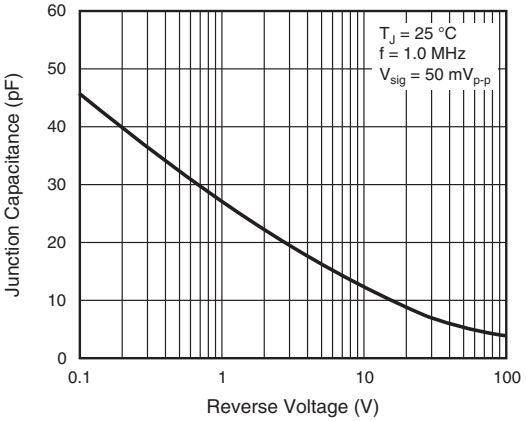



Fig. 5 - Typical Junction Capacitance

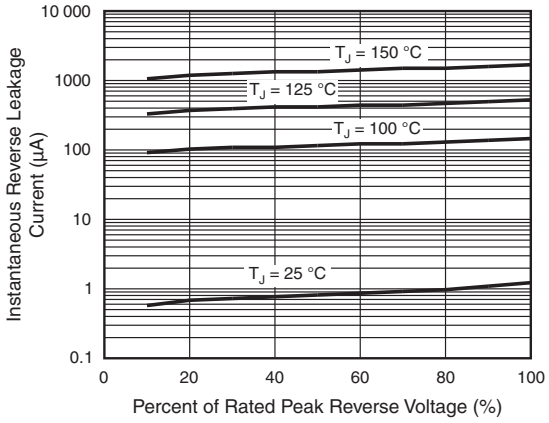
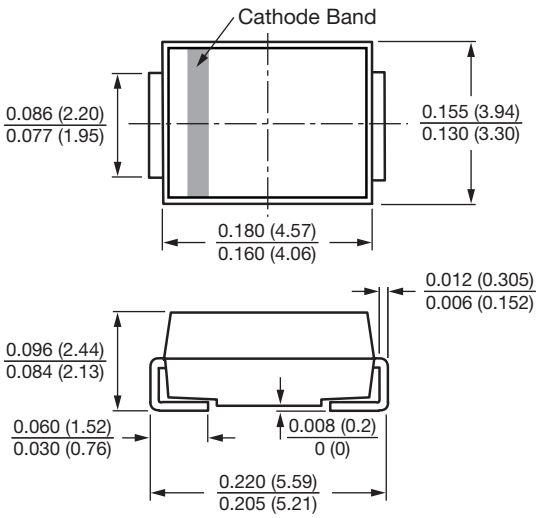


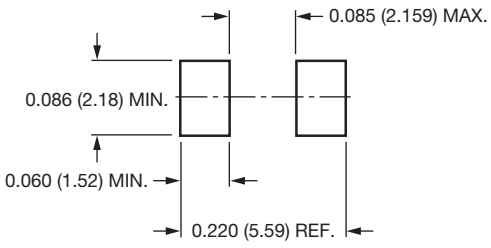

Fig. 4 - Typical Reverse Leakage Characteristics

## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-214AA (SMB)**




**Mounting Pad Layout**



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