

## 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
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://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, and telecommunication.

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

**Polarity:** Color band denotes cathode end

| PRIMARY CHARACTERISTICS |                |
|-------------------------|----------------|
| $I_{F(AV)}$             | 2.0 A          |
| $V_{RRM}$               | 300 V, 400 V   |
| $I_{FSM}$               | 50 A           |
| $t_{rr}$                | 35 ns          |
| $V_F$ at $I_F$          | 1.1 V          |
| $T_J$ max.              | 150 °C         |
| Package                 | DO-214AA (SMB) |
| Diode variations        | Single die     |

| 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 <sub>A</sub> = 25 °C unless otherwise noted) |                                                                                                           |                         |                               |      |      |      |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                                                           |                         | SYMBOL                        | ES2F | ES2G | UNIT |
| Maximum instantaneous forward voltage                                      | 2.0 A                                                                                                     |                         | V <sub>F</sub> <sup>(1)</sup> | 1.1  |      | V    |
| Maximum reverse current at V <sub>RRM</sub>                                |                                                                                                           | T <sub>A</sub> = 25 °C  | I <sub>R</sub>                | 10   |      | μA   |
|                                                                            |                                                                                                           | T <sub>A</sub> = 100 °C |                               | 200  |      |      |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A,<br>I <sub>rr</sub> = 0.25 A                               |                         | t <sub>rr</sub>               | 35   |      | ns   |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 1.0 A, dI/dt = 100 A/μs,<br>V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub> |                         | t <sub>rr</sub>               | 50   |      | ns   |
| Maximum reverse recovery current                                           | I <sub>F</sub> = 1.0 A, dI/dt = 100 A/μs,<br>V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub> |                         | I <sub>RM</sub>               | 3.0  |      | A    |
| Maximum stored charge                                                      | I <sub>F</sub> = 1.0 A, dI/dt = 100 A/μs,<br>V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub> |                         | Q <sub>rr</sub>               | 50   |      | nC   |
| Typical junction capacitance                                               | 4.0 V, 1 MHz                                                                                              |                         | C <sub>J</sub>                | 15   |      | pF   |

**Note**
<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ 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**
<sup>(1)</sup> Units mounted on P.C.B. 5.0 mm x 5.0 mm (0.013 mm thick) land areas

| <b>ORDERING INFORMATION</b> (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 <sup>(1)</sup>            | 0.096           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| ES2GHE3/5BT <sup>(1)</sup>            | 0.096           | 5BT                    | 3200          | 13" diameter plastic tape and reel |

**Note**
<sup>(1)</sup> AEC-Q101 qualified

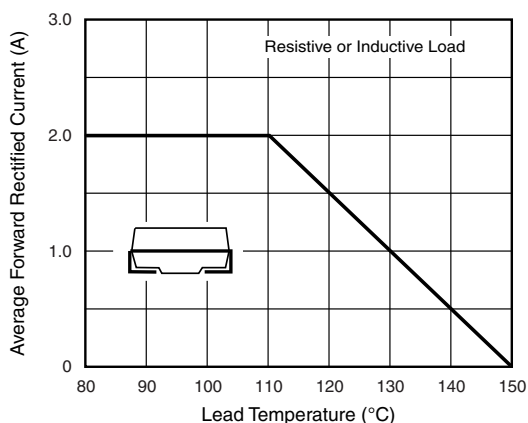
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

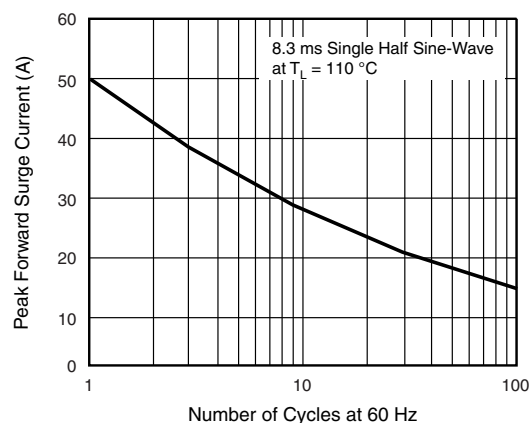


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

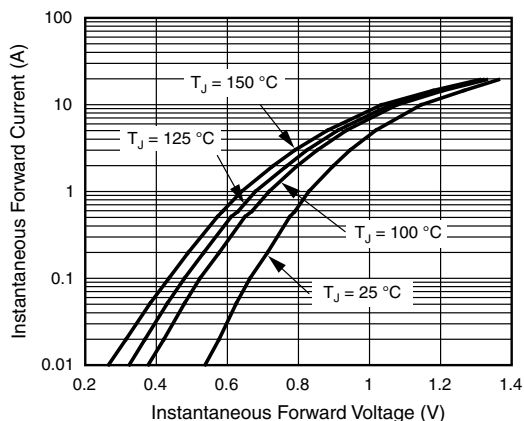


Fig. 3 - Typical Instantaneous Forward Characteristics

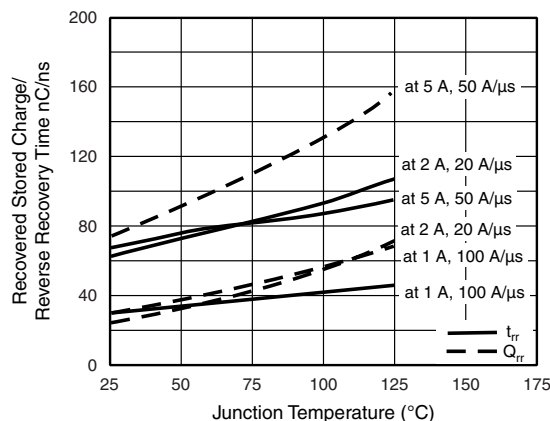


Fig. 5 - Reverse Switching Characteristics

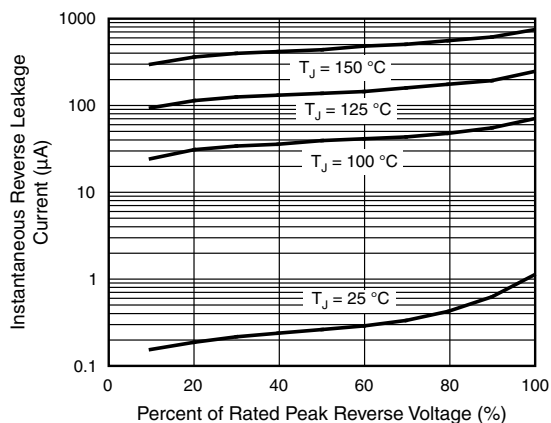


Fig. 4 - Typical Reverse Leakage Characteristics

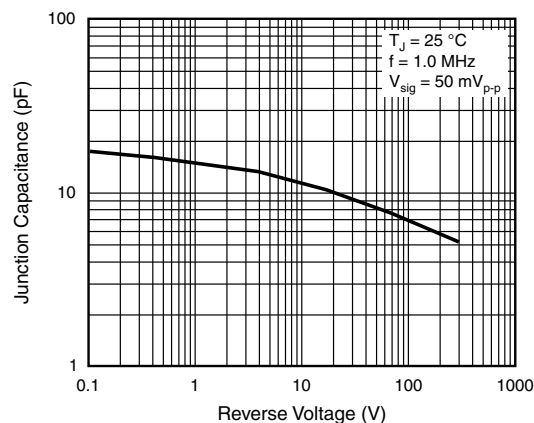
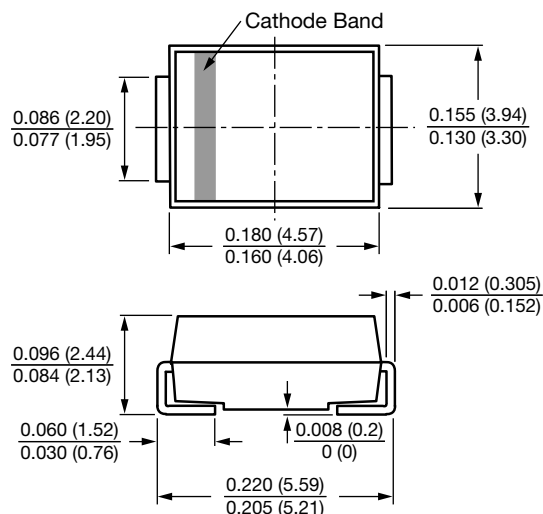


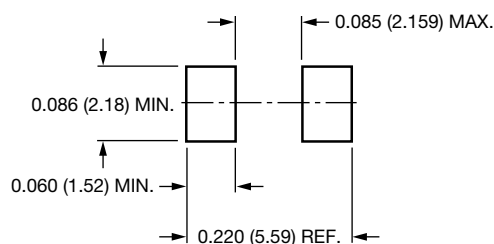
Fig. 6 - Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-214AA (SMB)



### Mounting Pad Layout





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