

## Surface Mount Ultrafast Plastic Rectifier


**DO-214AB (SMC)**

### FEATURES

- Glass passivated pallet chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power loss
- 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 converter and inverter for both, industrial and automotive.

### MECHANICAL DATA

**Case:** DO-214AB (SMC)

Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-E3 - RoHS-compliant, industrial grade  
 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 2 whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

| PRIMARY CHARACTERISTICS |                     |
|-------------------------|---------------------|
| $I_{F(AV)}$             | 3.0 A               |
| $V_{RRM}$               | 100 V, 150 V, 200 V |
| $t_{rr}$                | 25 ns               |
| $V_F$ at $I_F$          | 0.90 V              |
| $T_J$ max.              | 175 °C              |
| Package                 | DO-214AB (SMC)      |
| Diode variations        | Single die          |

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |                |             |       |       |      |
|------------------------------------------------------------------------------------|----------------|-------------|-------|-------|------|
| PARAMETER                                                                          | SYMBOL         | ESH3B       | ESH3C | ESH3D | UNIT |
| Device marking code                                                                |                | EHB         | EHC   | EHD   |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 100         | 150   | 200   | V    |
| Maximum RMS voltage                                                                | $V_{RMS}$      | 70          | 105   | 140   |      |
| Maximum DC blocking voltage                                                        | $V_{DC}$       | 100         | 150   | 200   |      |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | 3.0         |       |       | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 125         |       |       |      |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -55 to +175 |       |       | °C   |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                                                                                                   |  |                                   |       |               |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--|-----------------------------------|-------|---------------|
| PARAMETER                                                                                    | TEST CONDITIONS                                                                                   |  | SYMBOL                            | VALUE | UNIT          |
| Maximum instantaneous forward voltage                                                        | $I_F = 3\text{ A}$                                                                                |  | $V_F^{(1)}$                       | 0.90  | V             |
| Maximum DC reverse current at rated DC blocking voltage                                      | $T_A = 25\text{ }^\circ\text{C}$                                                                  |  | $I_R$                             | 5.0   | $\mu\text{A}$ |
|                                                                                              | $T_A = 125\text{ }^\circ\text{C}$                                                                 |  |                                   | 150   |               |
| Maximum reverse recovery time                                                                | $I_F = 0.5\text{ A}, I_R = 1\text{ A}, I_{rr} = 0.25\text{ A}$                                    |  | $t_{rr}$                          | 25    | ns            |
| Typical reverse recovery time                                                                | $I_F = 3\text{ A}, V_R = 30\text{ V},$<br>$di/dt = 50\text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$ |  | $T_J = 25\text{ }^\circ\text{C}$  | 40    |               |
|                                                                                              |                                                                                                   |  | $T_J = 100\text{ }^\circ\text{C}$ | 55    |               |
| Typical stored charge                                                                        | $I_F = 3\text{ A}, V_R = 30\text{ V},$<br>$di/dt = 50\text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$ |  | $T_J = 25\text{ }^\circ\text{C}$  | 25    | nC            |
|                                                                                              |                                                                                                   |  | $T_J = 100\text{ }^\circ\text{C}$ | 60    |               |
| Typical junction capacitance                                                                 | 4.0 V, 1 MHz                                                                                      |  | $C_J$                             | 70    | pF            |

**Note**(1) 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                | ESH3B | ESH3C | ESH3D | UNIT                      |
| Typical thermal resistance                                                                | $R_{\theta JA}^{(1)}$ | 50    |       |       | $^\circ\text{C}/\text{W}$ |
|                                                                                           | $R_{\theta JL}^{(1)}$ | 15    |       |       |                           |

**Note**

(1) Units mounted on PCB with 12.0 mm x 12.0 mm land areas

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| ESH3D-E3/57T                          | 0.211           | 57T                    | 850           | 7" diameter plastic tape and reel  |
| ESH3D-E3/9AT                          | 0.211           | 9AT                    | 3500          | 13" diameter plastic tape and reel |
| ESH3DHE3_A/H <sup>(1)</sup>           | 0.211           | H                      | 850           | 7" diameter plastic tape and reel  |
| ESH3DHE3_A/I <sup>(1)</sup>           | 0.211           | I                      | 3500          | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

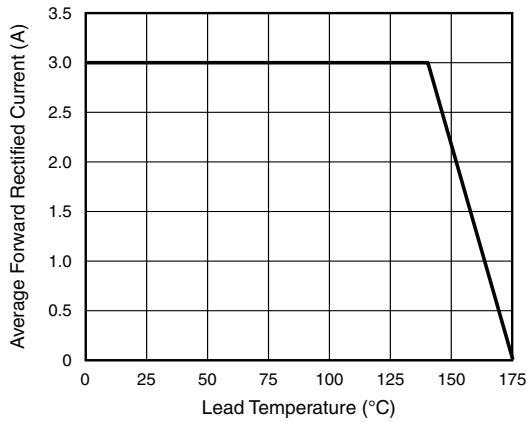


Fig. 1 - Maximum Forward Current Derating Curve

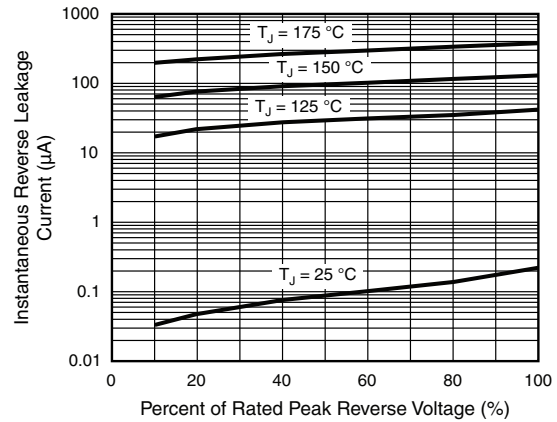


Fig. 4 - Typical Reverse Leakage Characteristics

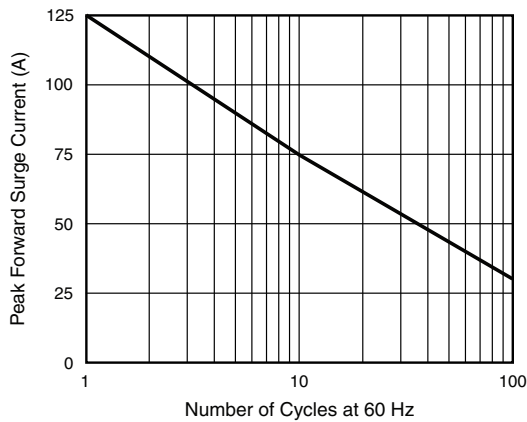


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

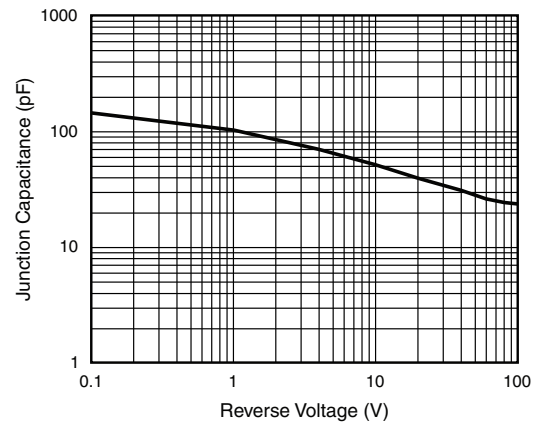


Fig. 5 - Typical Junction Capacitance

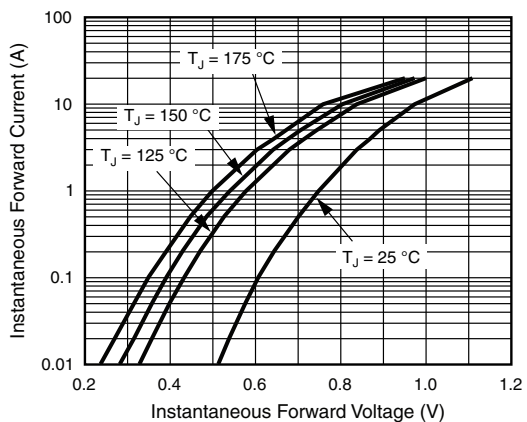


Fig. 3 - Typical Instantaneous Forward Characteristics

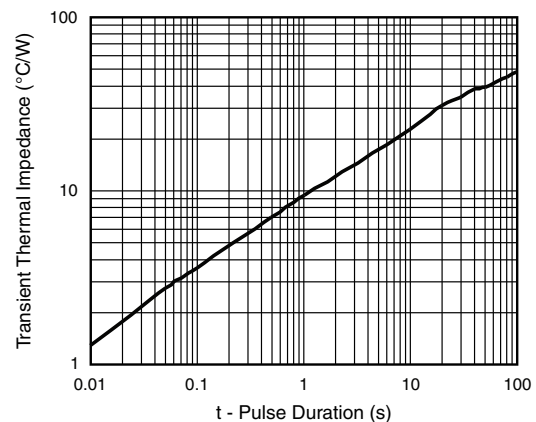
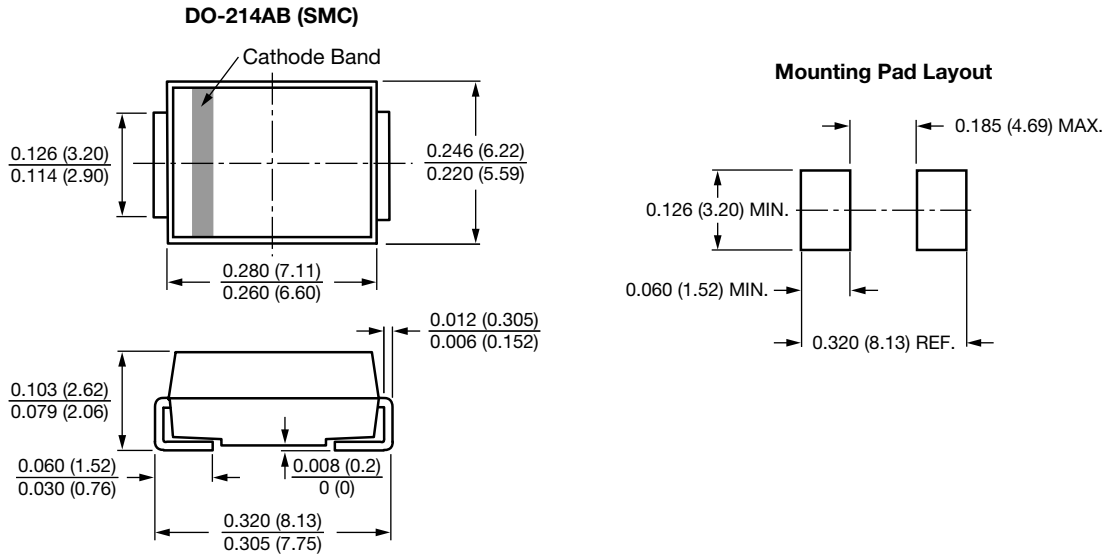


Fig. 6 - Typical Transient Thermal Impedance



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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