

## Surface-Mount Ultrafast Plastic Rectifier


**SMB (DO-214AA)**

Cathode  Anode

### FEATURES

- Glass passivated pellet 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 available
  - Automotive ordering code: base P/NHE3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE  
GRADE  
Available

**RoHS**  
COMPLIANT

### LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

### TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converter and inverter for both consumer and automotive.

### MECHANICAL DATA

**Case:** SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/NHE3\_X - RoHS-compliant, 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

### PRIMARY CHARACTERISTICS

|                       |                     |
|-----------------------|---------------------|
| $I_{F(AV)}$           | 2.0 A               |
| $V_{RRM}$             | 100 V, 150 V, 200 V |
| $t_{rr}$              | 25 ns               |
| $V_F$ at $I_F = 2$ A  | 0.93 V              |
| $T_J$ max.            | 175 °C              |
| Package               | SMB (DO-214AA)      |
| Circuit configuration | Single              |

### MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

| PARAMETER                                                                          | SYMBOL         | ESH2B       | ESH2C | ESH2D | 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   | V    |
| Maximum DC blocking voltage                                                        | $V_{DC}$       | 100         | 150   | 200   | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | 2.0         |       |       | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 60          |       |       | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -55 to +175 |       |       | °C   |

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

| PARAMETER                                               | TEST CONDITIONS                                                                                          | SYMBOL                              | VALUE | UNIT          |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|
| Maximum instantaneous forward voltage                   | $I_F = 2\text{ A}$                                                                                       | $V_F^{(1)}$                         | 0.93  | V             |
| Maximum DC reverse current at rated DC blocking voltage | $T_A = 25\text{ }^{\circ}\text{C}$                                                                       | $I_R$                               | 2.0   | $\mu\text{A}$ |
|                                                         | $T_A = 125\text{ }^{\circ}\text{C}$                                                                      |                                     | 50    |               |
| 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                           | $I_F = 2\text{ A}$ , $V_R = 30\text{ V}$ ,<br>$di/dt = 50\text{ A}/\mu\text{s}$ , $I_{rr} = 10\% I_{RM}$ | $T_J = 25\text{ }^{\circ}\text{C}$  | 35    | ns            |
|                                                         |                                                                                                          | $T_J = 100\text{ }^{\circ}\text{C}$ | 55    |               |
| Typical stored charge                                   | $I_F = 2\text{ A}$ , $V_R = 30\text{ V}$ ,<br>$di/dt = 50\text{ A}/\mu\text{s}$ , $I_{rr} = 10\% I_{RM}$ | $T_J = 25\text{ }^{\circ}\text{C}$  | 20    | nC            |
|                                                         |                                                                                                          | $T_J = 100\text{ }^{\circ}\text{C}$ | 35    |               |
| Typical junction capacitance                            | 4.0 V, 1 MHz                                                                                             | $C_J$                               | 30    | pF            |

**Note**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle**THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                  | SYMBOL                | ESH2B | ESH2C | ESH2D | UNIT |
|----------------------------|-----------------------|-------|-------|-------|------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 65    |       |       | °C/W |
|                            | $R_{\theta JL}^{(1)}$ | 20    |       |       |      |

**Note**

(1) Units mounted on PCB with 8.0 mm x 8.0 mm land areas

**ORDERING INFORMATION** (Example)

| PREFERRED P/N               | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|-----------------------------|-----------------|------------------------|---------------|------------------------------------|
| ESH2D-E3/52T                | 0.096           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| ESH2D-E3/5BT                | 0.096           | 5BT                    | 3200          | 13" diameter plastic tape and reel |
| ESH2DHE3_A/H <sup>(1)</sup> | 0.096           | H                      | 750           | 7" diameter plastic tape and reel  |
| ESH2DHE3_A/I <sup>(1)</sup> | 0.096           | I                      | 3200          | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

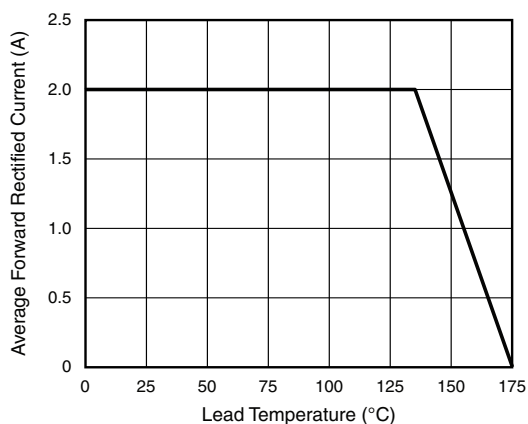
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

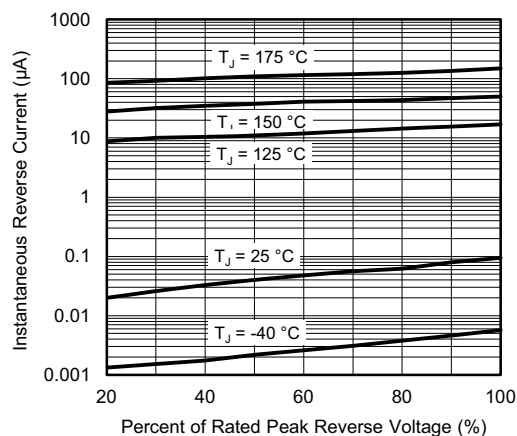


Fig. 4 - Typical Reverse Leakage Characteristics

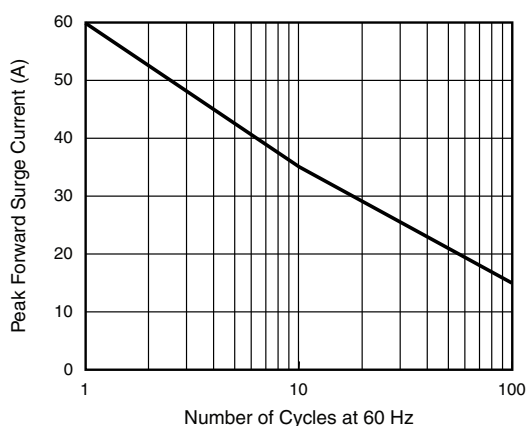


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

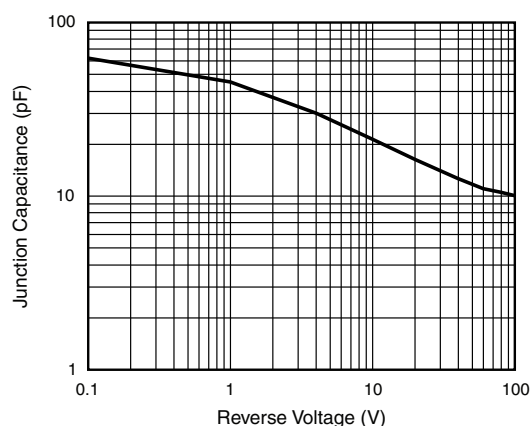


Fig. 5 - Typical Junction Capacitance

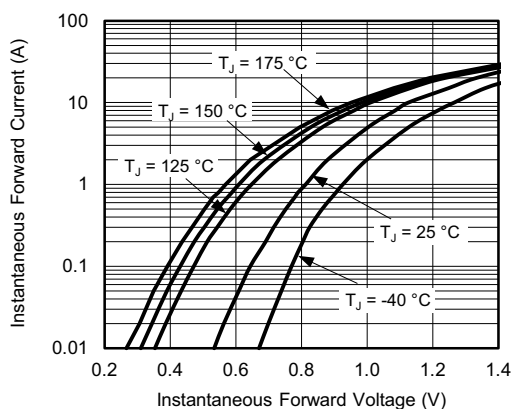


Fig. 3 - Typical Instantaneous Forward Characteristics

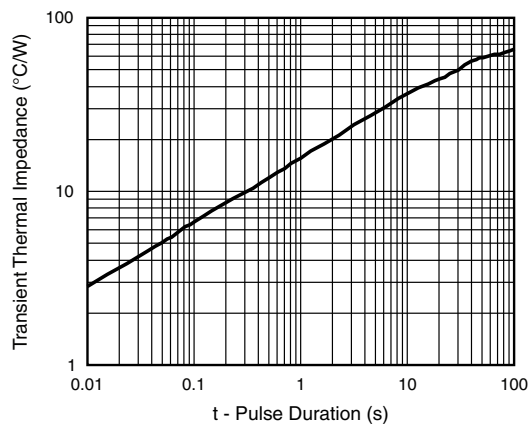
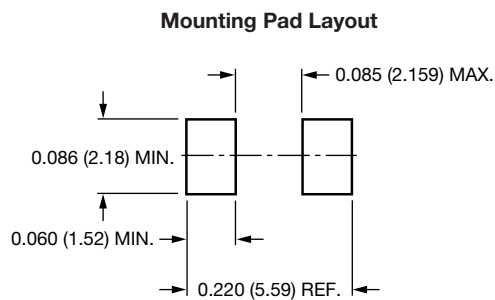
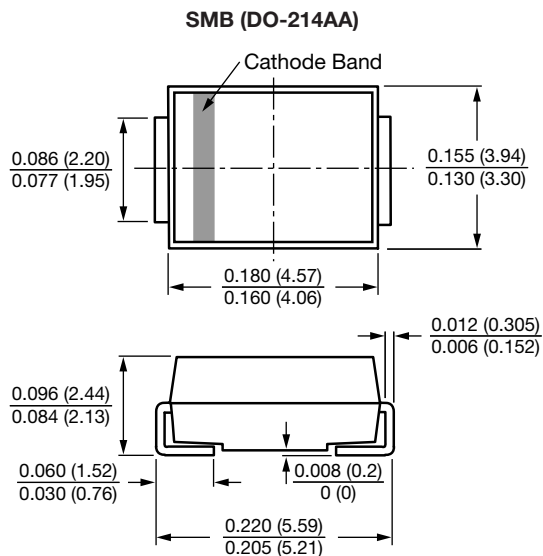


Fig. 6 - Typical Transient Thermal Impedance



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





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