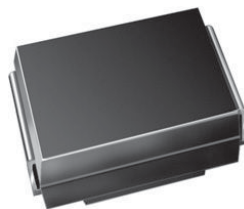


## Surface Mount Ultrafast Plastic Rectifier



SMB (DO-214AA)

### FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, DC/DC converters or polarity protection application.

### 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/N-M3 - halogen-free, RoHS-compliant, and commercial grade

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 and M3 suffix meet 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 |
| $I_{FSM}$               | 50 A                |
| $t_{rr}$                | 20 ns               |
| $V_F$ at $I_F = 2.0$ A  | 0.76 V              |
| $T_J$ max.              | 150 °C              |
| Package                 | SMB (DO-214AA)      |
| Circuit configuration   | Single              |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                            |                |             |     |     |      |
|------------------------------------------------------------------------------------|----------------|-------------|-----|-----|------|
| PARAMETER                                                                          | SYMBOL         | U2B         | U2C | U2D | UNIT |
| Device marking code                                                                |                | U2B         | U2C | U2D |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 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 | $I_{FSM}$      | 50          |     |     | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -55 to +150 |     |     | °C   |

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

| PARAMETER                     | TEST CONDITIONS                                                                                                  | SYMBOL      | TYP. | MAX. | UNIT          |
|-------------------------------|------------------------------------------------------------------------------------------------------------------|-------------|------|------|---------------|
| Instantaneous forward voltage | $I_F = 2\text{ A}$                                                                                               | $V_F^{(1)}$ | 0.86 | 0.90 | V             |
|                               |                                                                                                                  |             | 0.76 | 0.83 |               |
| Reverse current               | Rated $V_R$                                                                                                      | $I_R^{(2)}$ | -    | 10   | $\mu\text{A}$ |
|                               |                                                                                                                  |             | 180  | 350  |               |
| Reverse recovery time         | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ ,<br>$I_{rr} = 0.25\text{ A}$                                        | $t_{rr}$    | -    | 20   | ns            |
|                               |                                                                                                                  |             | 27   | -    |               |
|                               |                                                                                                                  |             | 35   | -    |               |
| Storage charge                | $I_F = 2.0\text{ A}$ , $dI/dt = 50\text{ A}/\mu\text{s}$ ,<br>$V_R = 30\text{ V}$ , $I_{rr} = 0.1\text{ I}_{RM}$ | $Q_{rr}$    | 9    | -    | nC            |
|                               |                                                                                                                  |             | 19   | -    |               |
| Typical junction capacitance  | 4.0 V, 1 MHz                                                                                                     | $C_J$       | 16   | -    | pF            |

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq 40\text{ ms}$

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

| PARAMETER                  | SYMBOL                          | U2B | U2C | U2D | UNIT |
|----------------------------|---------------------------------|-----|-----|-----|------|
| Typical thermal resistance | R <sub>θJA</sub> <sup>(1)</sup> | 105 |     |     | °C/W |
|                            | R <sub>θJM</sub> <sup>(1)</sup> | 18  |     |     |      |

**Note**

(1) Free air, mounted on recommended copper pad area. Thermal resistance  $R_{\theta JA}$  - junction to ambient,  $R_{\theta JM}$  - junction to mount

**ORDERING INFORMATION** (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|---------------|-----------------|------------------------|---------------|------------------------------------|
| U2D-E3/52T    | 0.099           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| U2D-E3/5BT    | 0.099           | 5BT                    | 3200          | 13" diameter plastic tape and reel |
| U2D-M3/52T    | 0.099           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| U2D-M3/5BT    | 0.099           | 5BT                    | 3200          | 13" diameter plastic tape and reel |

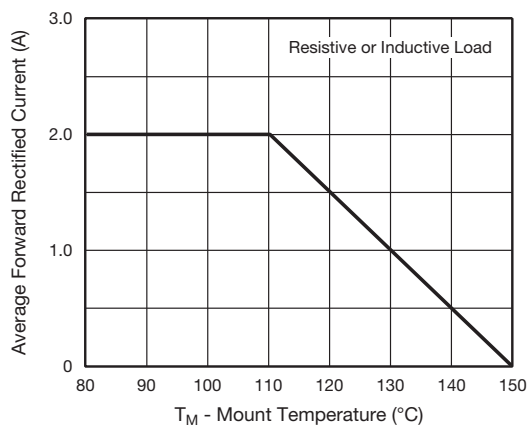
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

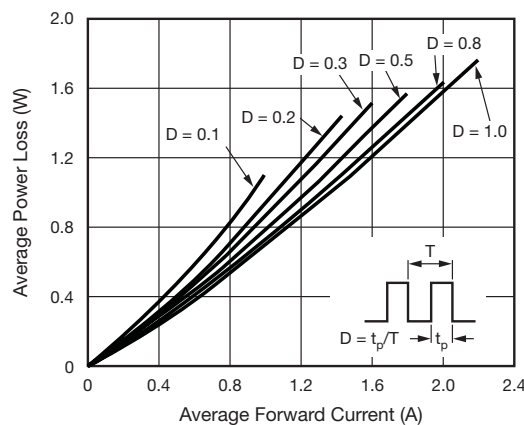


Fig. 2 - Forward Power Loss Characteristics

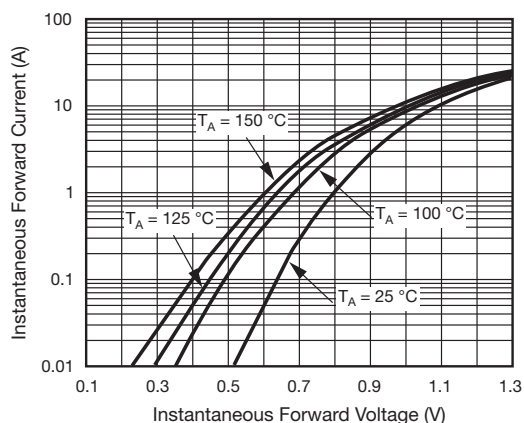


Fig. 3 - Typical Instantaneous Forward Characteristics

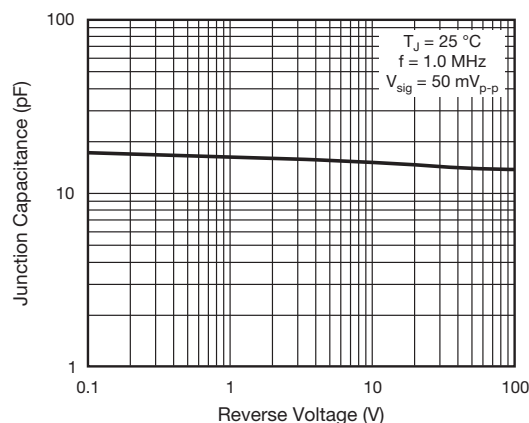


Fig. 5 - Typical Junction Capacitance

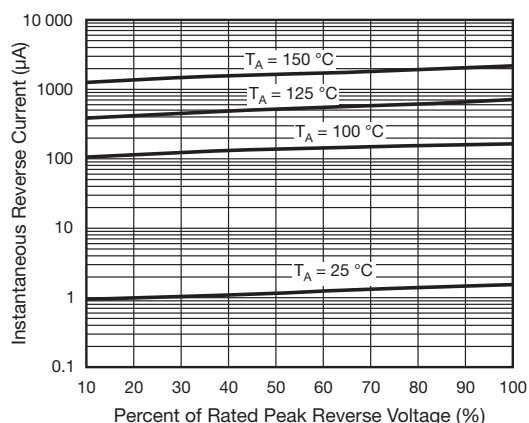


Fig. 4 - Typical Reverse Characteristics

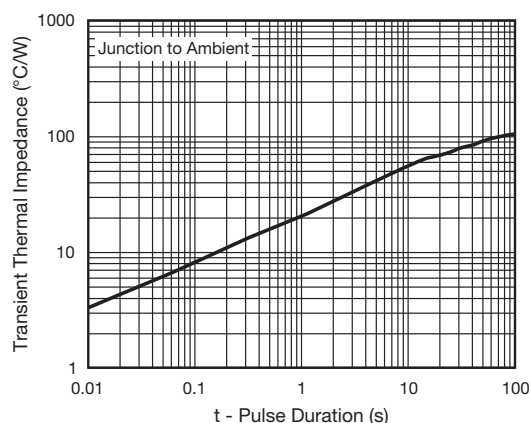
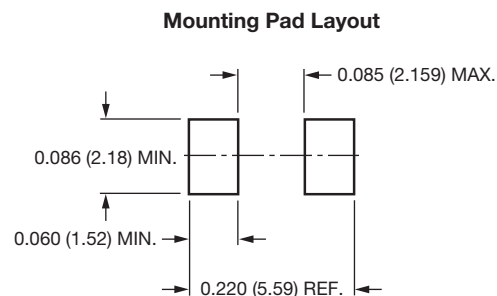
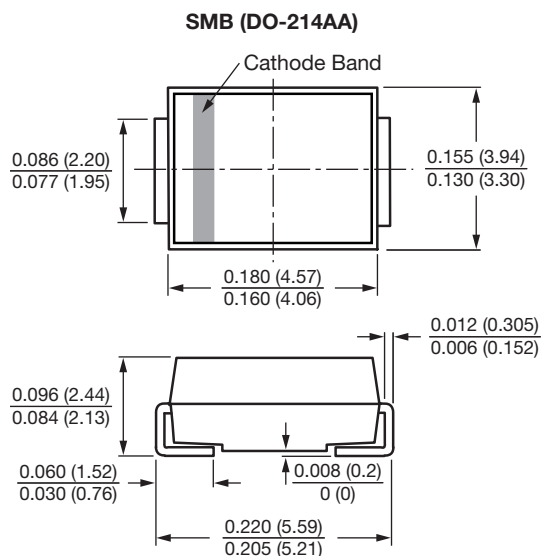


Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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