

## Surface Mount Ultrafast Plastic Rectifier


**DO-214AA (SMB)**

### FEATURES

- Glass passivated pellet 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 available  
- Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


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

### PRIMARY CHARACTERISTICS

|                  |                |
|------------------|----------------|
| $I_{F(AV)}$      | 2.0 A          |
| $V_{RRM}$        | 600 V          |
| $I_{FSM}$        | 90 A           |
| $t_{rr}$         | 30 ns          |
| $V_F$ at $I_F$   | 1.0 V          |
| $T_J$ max.       | 150 °C         |
| Package          | DO-214AA (SMB) |
| Diode variations | Single die     |

### 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-M3 - halogen-free, RoHS-compliant

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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

M3 and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

### MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                                                                                              | SYMBOL         | USB260      | UNIT |
|--------------------------------------------------------------------------------------------------------|----------------|-------------|------|
| Device marking code                                                                                    |                | U60         |      |
| Maximum repetitive peak reverse voltage                                                                | $V_{RRM}$      | 600         | V    |
| Maximum RMS voltage                                                                                    | $V_{RMS}$      | 420         | V    |
| Maximum DC blocking voltage                                                                            | $V_{DC}$       | 600         | 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                     | $I_{FSM}$      | 90          | A    |
| Non-repetitive avalanche energy at $I_{AS} = 2.0\text{ A}$ , $L = 10\text{ mH}$ , $T_J = 25\text{ °C}$ | $E_{AS}$       | 20          | mJ   |
| 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                        | TYP.          | MAX. | UNIT |
| Breakdown voltage                                                          | I <sub>R</sub> = 10 μA                                                   | T <sub>J</sub> = 25 °C  | V <sub>BR</sub>               | 600 (minimum) |      | V    |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 1 A                                                     | T <sub>J</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 1.25          | -    | V    |
|                                                                            | I <sub>F</sub> = 2.0 A                                                   | T <sub>J</sub> = 25 °C  |                               | 1.5           | 1.6  |      |
|                                                                            |                                                                          | T <sub>J</sub> = 125 °C |                               | 1.0           | 1.1  |      |
| Maximum reverse current                                                    | V <sub>R</sub> = 600 V                                                   | T <sub>J</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -             | 5.0  | μA   |
|                                                                            |                                                                          | T <sub>J</sub> = 125 °C |                               | 30            | 100  |      |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A |                         | t <sub>rr</sub>               | 30            |      | ns   |
| Typical junction capacitance                                               | 4.0 V, 1 MHz                                                             |                         | C <sub>J</sub>                | 45            |      | 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                | USB260 | UNIT                 |
| Typical thermal resistance                                                           | $R_{\theta JA}^{(1)}$ | 45     | $^{\circ}\text{C/W}$ |
|                                                                                      | $R_{\theta JL}^{(1)}$ | 10     |                      |

**Note**

(1) Units mounted on PCB with 2.0" x 2.0" copper pad areas

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| USB260-M3/52T                  | 0.096           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| USB260-M3/5BT                  | 0.096           | 5BT                    | 3200          | 13" diameter plastic tape and reel |
| USB260HM3/52T                  | 0.096           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| USB260HM3/5BT                  | 0.096           | 5BT                    | 3200          | 13" diameter plastic tape and reel |

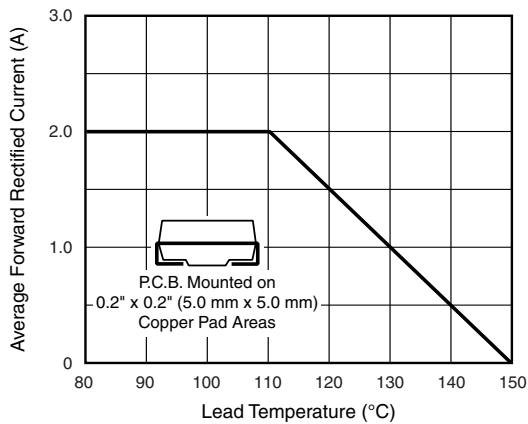
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

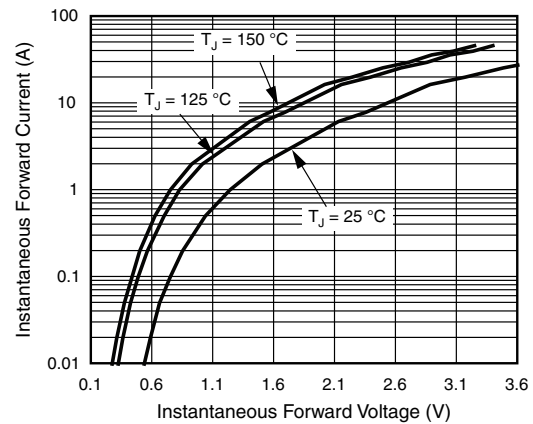


Fig. 4 - Typical Instantaneous Forward Characteristics

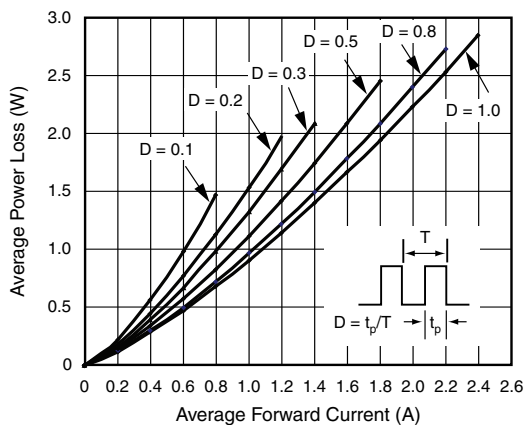


Fig. 2 - Forward Power Loss Characteristics

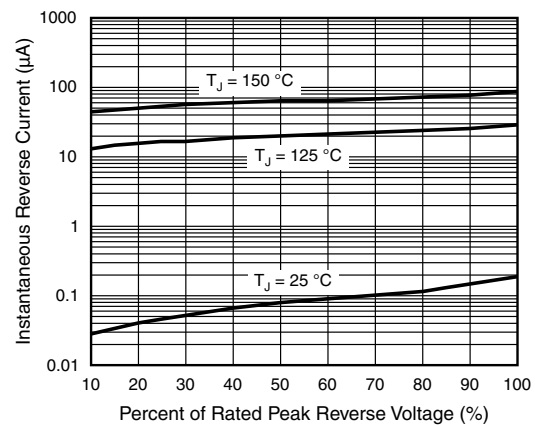


Fig. 5 - Typical Reverse Leakage Characteristics

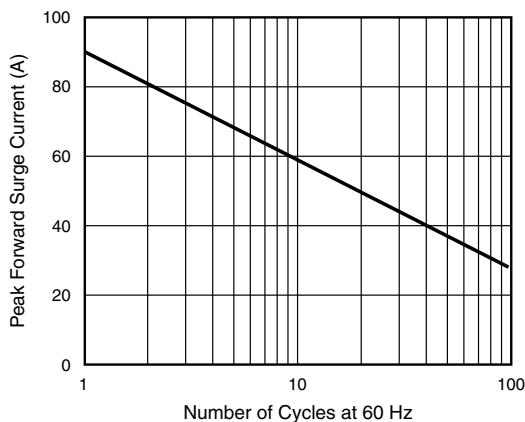


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

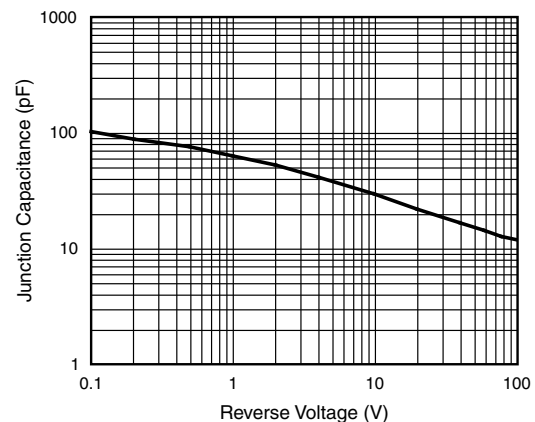


Fig. 6 - Typical Junction Capacitance

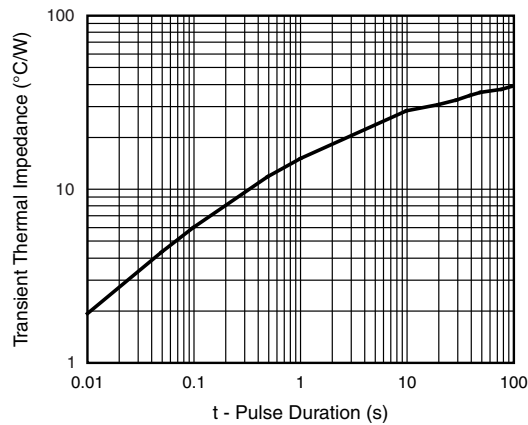
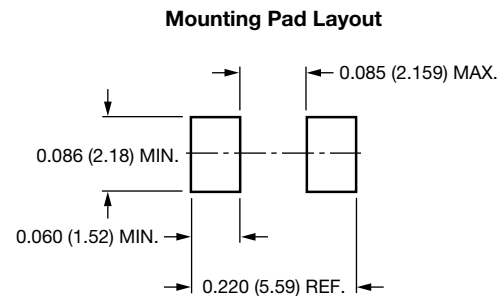
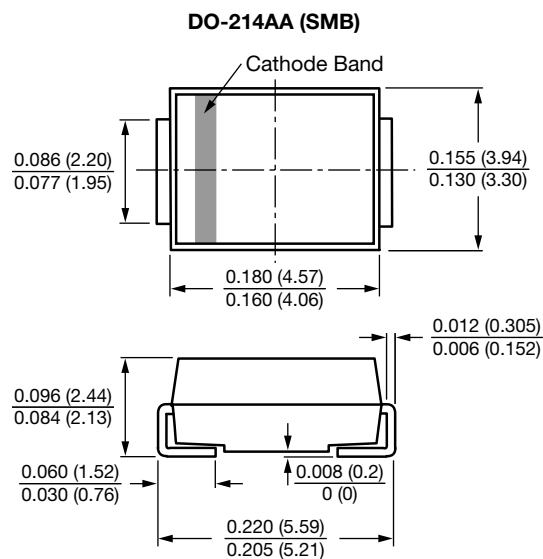


Fig. 7 - Typical Transient Thermal Impedance

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




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