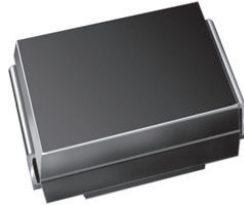


Surface Mount Ultrafast Plastic Rectifier


DO-214AA (SMB)

RoHS
 COMPLIANT
 HALOGEN
FREE

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

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

| 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 |

| 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 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|--|-----------------------------------|-------------|---------------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Breakdown voltage | $I_R = 10\text{ }\mu\text{A}$ | $T_J = 25\text{ }^\circ\text{C}$ | V_{BR} | 600 (minimum) | | V |
| Instantaneous forward voltage | $I_F = 1\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 1.25 | - | V |
| | | $T_J = 25\text{ }^\circ\text{C}$ | | 1.5 | 1.6 | |
| | $I_F = 2.0\text{ A}$ | $T_J = 125\text{ }^\circ\text{C}$ | | 1.0 | 1.1 | |
| Maximum reverse current | $V_R = 600\text{ V}$ | $T_J = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 5.0 | μA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 30 | 100 | |
| Maximum reverse recovery time | $I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$ | | t_{rr} | 30 | | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 45 | | pF |

Notes

- (1) Pulse test: 300 μs 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)

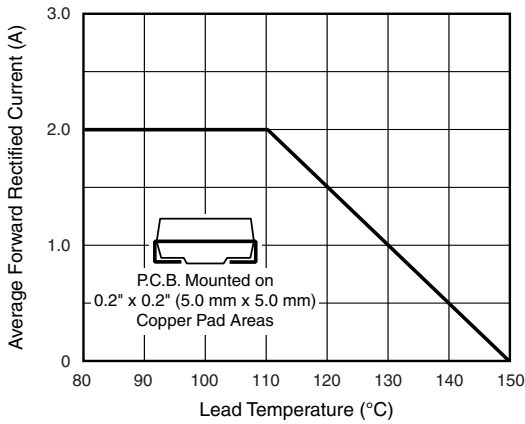


Fig. 1 - Maximum Forward Current Derating Curve

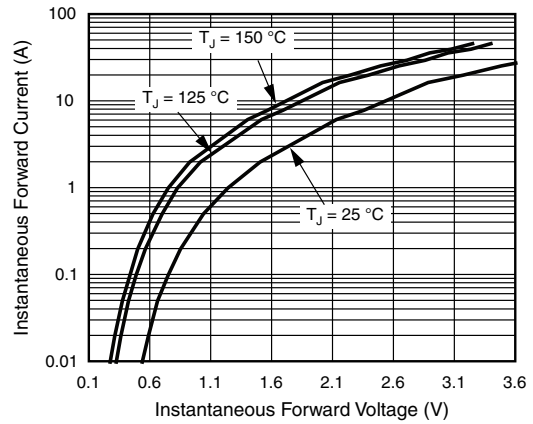


Fig. 4 - Typical Instantaneous Forward Characteristics

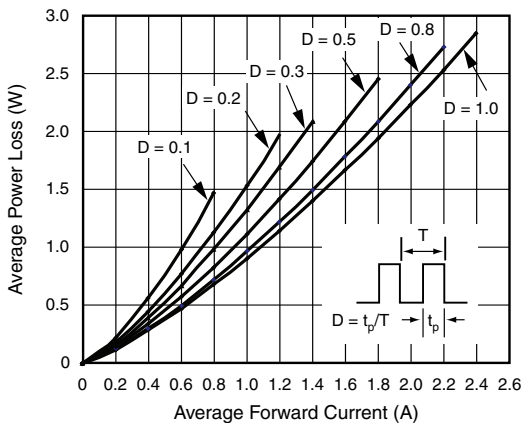


Fig. 2 - Forward Power Loss Characteristics

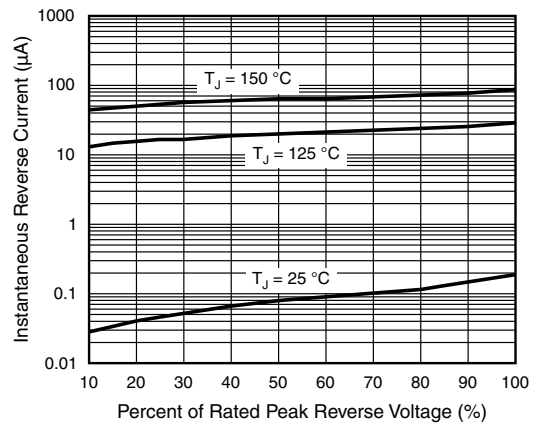


Fig. 5 - Typical Reverse Leakage Characteristics

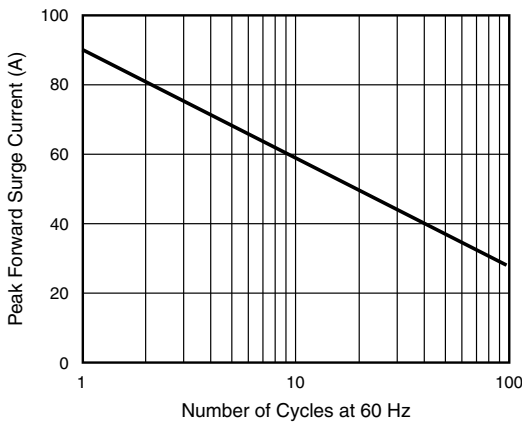


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

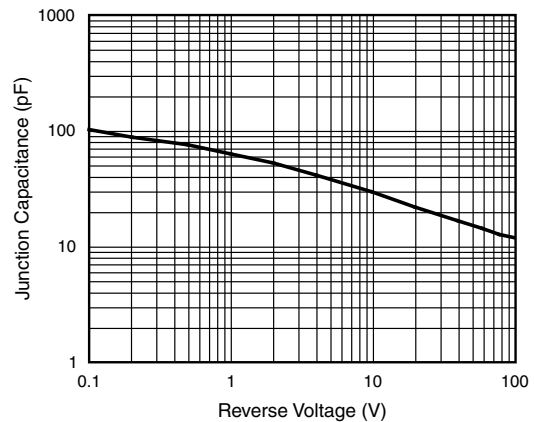


Fig. 6 - Typical Junction Capacitance

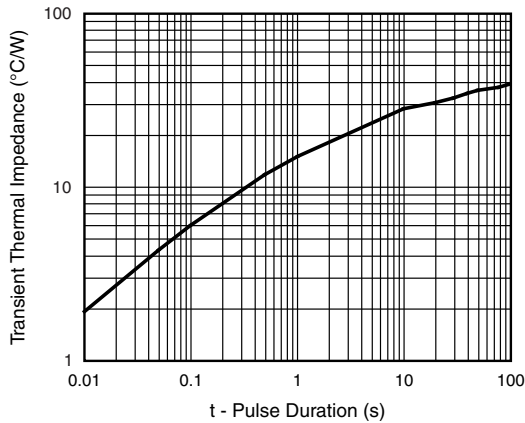
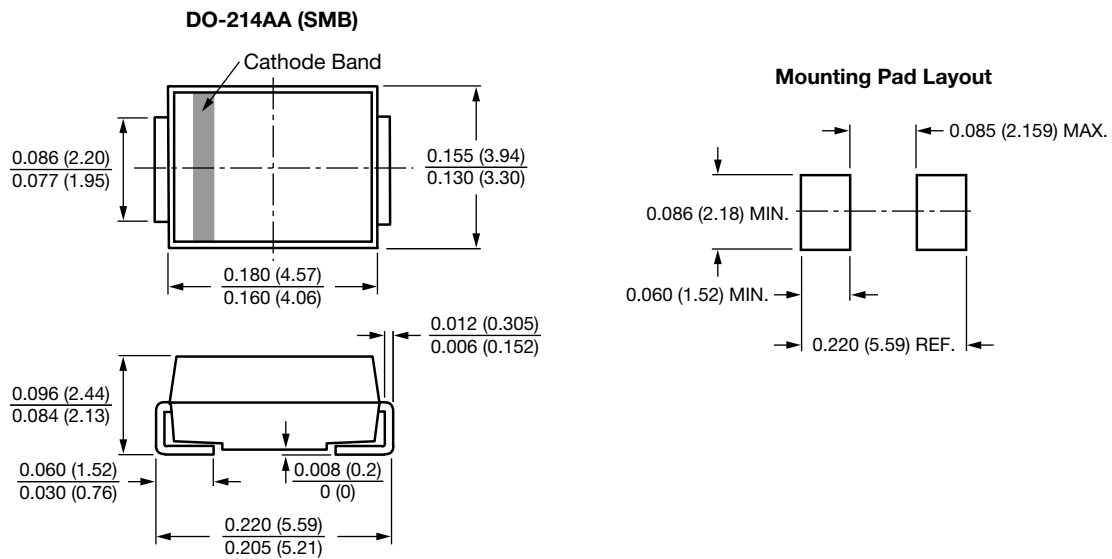


Fig. 7 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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