

# Surface Mount Ultrafast Plastic Rectifier


**DO-214AA (SMB)**

## FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- 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 converters and inverters for consumer, computer and telecommunication.

## PRIMARY CHARACTERISTICS

|                  |                |
|------------------|----------------|
| $I_{F(AV)}$      | 1.0 A          |
| $V_{RRM}$        | 200 V          |
| $I_{FSM}$        | 40 A           |
| $t_{rr}$         | 25 ns          |
| $V_F$            | 0.71 V         |
| $T_J$ max.       | 175 °C         |
| Package          | DO-214AA (SMB) |
| Diode variations | Single die     |

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, commercial grade  
Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

**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

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

| PARAMETER                                                                          | SYMBOL         | VALUE         | UNIT |
|------------------------------------------------------------------------------------|----------------|---------------|------|
| Device marking code                                                                |                | MD            |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 200           | V    |
| Working peak reverse voltage                                                       | $V_{RWM}$      | 200           | V    |
| Maximum DC blocking voltage                                                        | $V_{DC}$       | 200           | V    |
| Maximum average forward rectified current at (fig. 1)                              | $I_{F(AV)}$    | 1.0           | A    |
|                                                                                    |                | 2.0           |      |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 40            | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 65 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                              | $I_F = 1.0\text{ A}$<br>$T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 150\text{ }^{\circ}\text{C}$          | $V_F^{(1)}$ | 0.875<br>0.71 | V             |
| Maximum instantaneous reverse current at rated DC blocking voltage | $T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 150\text{ }^{\circ}\text{C}$                                  | $I_R^{(1)}$ | 2.0<br>50     | $\mu\text{A}$ |
| Maximum reverse recovery time                                      | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$                                     | $t_{rr}$    | 25            | ns            |
| Maximum reverse recovery time                                      | $I_F = 1.0\text{ A}$ , $dI/dt = 50\text{ A}/\mu\text{s}$ ,<br>$V_R = 30\text{ V}$ , $I_{rr} = 10\% I_{RM}$ | $t_{rr}$    | 35            | ns            |
| Maximum forward recovery time                                      | $I_F = 1.0\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$ ,<br>recovery to $1.0\text{ V}$                  | $t_{fr}$    | 25            | ns            |

**Note**
<sup>(1)</sup> Pulse test:  $t_p = 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ 
**THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                                    | SYMBOL          | VALUE | UNIT                        |
|----------------------------------------------|-----------------|-------|-----------------------------|
| Typical thermal resistance, junction to lead | $R_{\theta JL}$ | 13    | $^{\circ}\text{C}/\text{W}$ |

**ORDERING INFORMATION** (Example)

| PREFERRED P/N                 | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|-------------------------------|-----------------|------------------------|---------------|------------------------------------|
| MURS120-E3/52T                | 0.096           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| MURS120-E3/5BT                | 0.096           | 5BT                    | 3200          | 13" diameter plastic tape and reel |
| MURS120HE3/52T <sup>(1)</sup> | 0.096           | 52T                    | 750           | 7" diameter plastic tape and reel  |
| MURS120HE3/5BT <sup>(1)</sup> | 0.096           | 5BT                    | 3200          | 13" diameter plastic tape and reel |

**Note**
<sup>(1)</sup> AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES**

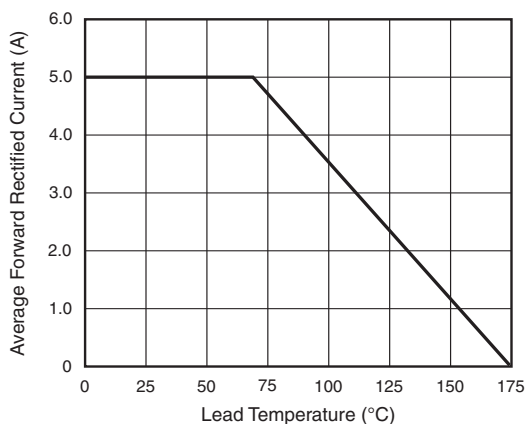
( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

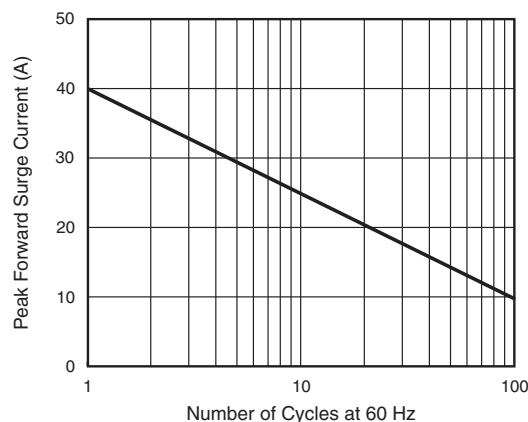


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

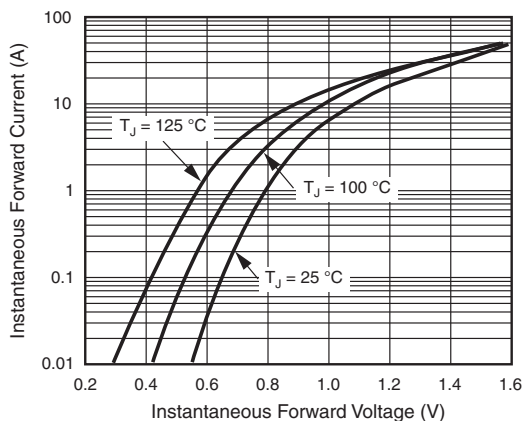


Fig. 3 - Typical Instantaneous Forward Characteristics

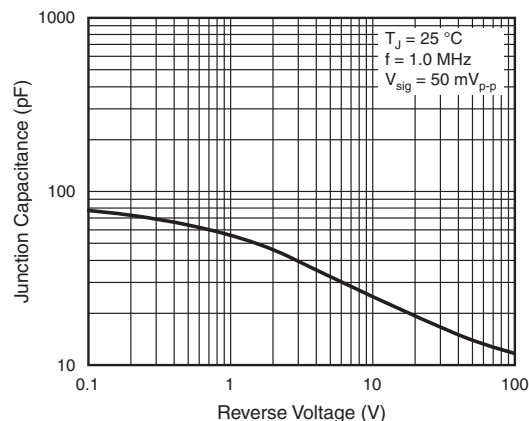


Fig. 5 - Typical Junction Capacitance

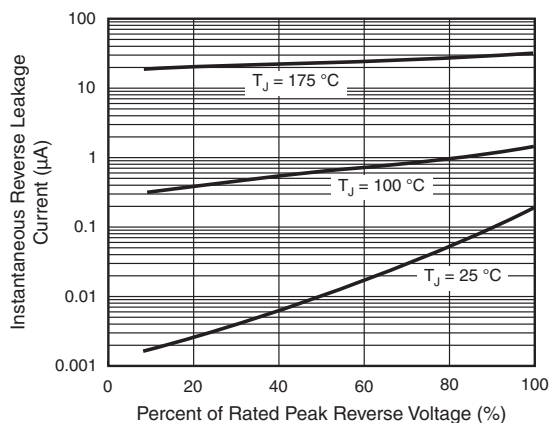
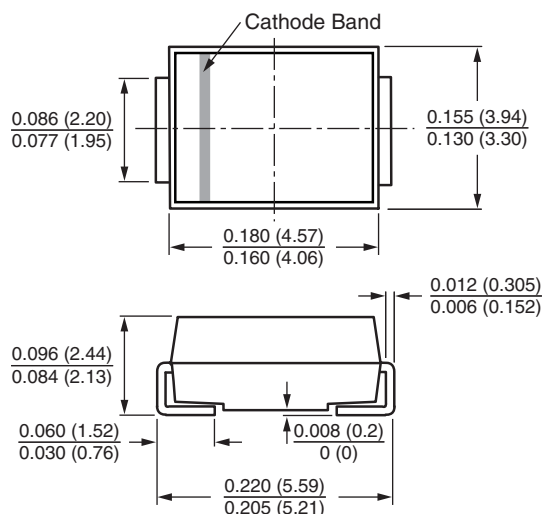


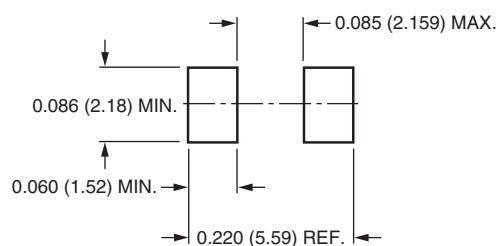
Fig. 4 - Typical Reverse Leakage Characteristics

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-214AA (SMB)



### Mounting Pad Layout





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