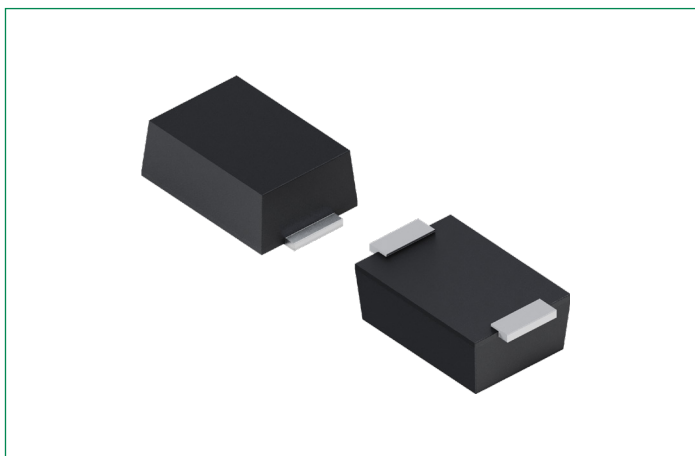


# Dxx02 Series

## 2 A Rectifiers

RoHS

AUTOMOTIVE GRADE



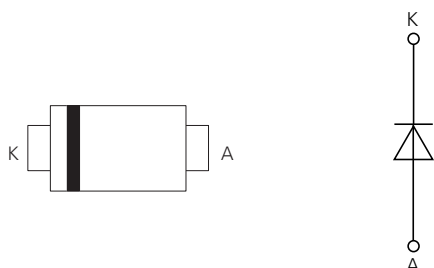
### Description

These silicon rectifiers have glass-passivated junctions, providing stable operation. They are assembled in a small-size SOD-123FL package which is ideal for automated assembly. All devices feature PPAP-3.

### Features

- Reverse leakage current  $I_R \leq 10 \mu A @ 25^\circ C$
- Forward voltage  $V_F \leq 1.1 V @ 25^\circ C$
- SOD-123FL package
- Increased maximum virtual junction temperature from  $125^\circ C$  to  $150^\circ C$
- AEC-Q101 qualified

### Pinout Diagram



**A:** Anode; **K:** Cathode

### Benefits

- Low stand-by losses
- High efficiency
- Reduces the PCB area and ideal for automated assembly
- Higher current in the same package
- Ensures compliance with automotive industry standards

### Applications

- Automotive reverse battery protection
- DC-DC converter
- Switch Mode Power Supplies (SMPS)

### Product Summary

| Characteristic | Value | Unit |
|----------------|-------|------|
| $V_{RRM}$      | 600   | V    |
| $I_{F(AV)}$    | 2     | A    |

## Maximum Ratings

| Symbol      | Characteristics                      | Conditions                                                                                    | Value       | Units                |
|-------------|--------------------------------------|-----------------------------------------------------------------------------------------------|-------------|----------------------|
| $V_{RRM}$   | Repetitive Peak Reverse Voltage      | $T_{vj} = 25\text{ }^{\circ}\text{C}$                                                         | 600         | V                    |
| $I_{F(AV)}$ | Average Forward Current              | $T_c = 107\text{ }^{\circ}\text{C}$                                                           | 2           | A                    |
| $I_{FSM}$   | Non-repetitive Surge Forward Current | Single half cycle; $f = 50\text{ Hz}$ ; $T_{vj}(\text{initial}) = 25\text{ }^{\circ}\text{C}$ | 42          | A                    |
|             |                                      | Single half cycle; $f = 60\text{ Hz}$ ; $T_{vj}(\text{initial}) = 25\text{ }^{\circ}\text{C}$ | 50          | A                    |
| $I^2t$      | $I^2t$ Value                         | $t_p = 8.3\text{ ms}$                                                                         | 10.4        | $\text{A}^2\text{s}$ |
| $T_{vj}$    | Virtual Junction Temperature Range   | –                                                                                             | –55 to +150 | $^{\circ}\text{C}$   |
| $T_{stg}$   | Storage Temperature Range            | –                                                                                             | –55 to +150 | $^{\circ}\text{C}$   |

## Electrical Characteristics – Static ( $T_{vj} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| Symbol | Characteristics | Conditions                                          | Maximum Value                          | Units         |
|--------|-----------------|-----------------------------------------------------|----------------------------------------|---------------|
| $V_F$  | Forward Voltage | $I_F = 2\text{ A}$ , $t_p = 380\text{ }\mu\text{s}$ | 1.1                                    | V             |
| $I_R$  | Reverse Current | $V_R = V_{RRM}$                                     | $T_{vj} = 25\text{ }^{\circ}\text{C}$  | $\mu\text{A}$ |
|        |                 |                                                     | $T_{vj} = 125\text{ }^{\circ}\text{C}$ |               |
|        |                 |                                                     | $T_{vj} = 150\text{ }^{\circ}\text{C}$ |               |

## Thermal Specifications

| Symbol        | Characteristics                        | Value |      |      | Unit         |
|---------------|----------------------------------------|-------|------|------|--------------|
|               |                                        | Min.  | Typ. | Max. |              |
| $R_{th(j-c)}$ | Thermal Resistance Junction to Case    | –     | 20   | –    | $\text{K/W}$ |
| $R_{th(j-a)}$ | Thermal Resistance Junction to Ambient | –     | 80   | –    | $\text{K/W}$ |

Characteristic Curves

Figure 1. Typical On-state Current vs. On-state Voltage

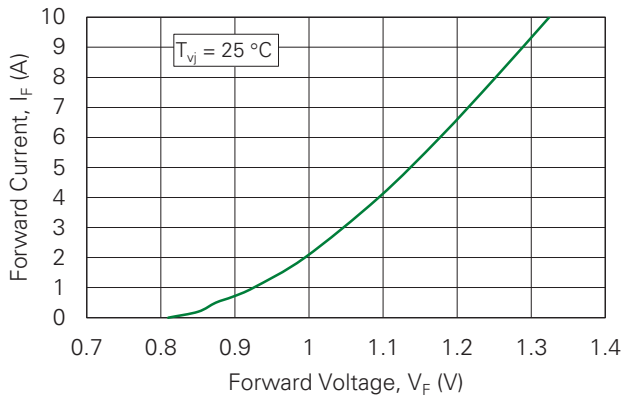


Figure 2. Typical Power Dissipation vs. Average Forward On-state Current

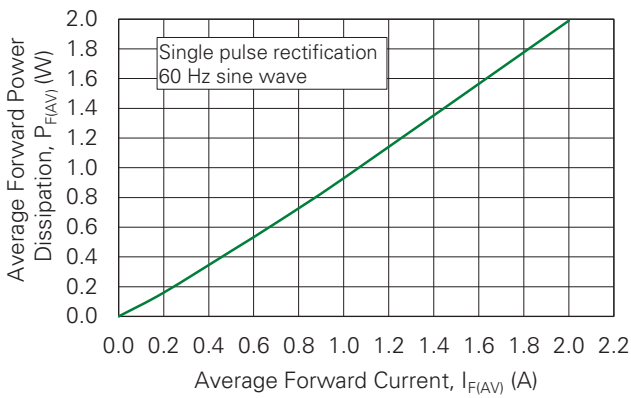


Figure 3. Maximum Allowable Case Temperature vs. Average On-state Current

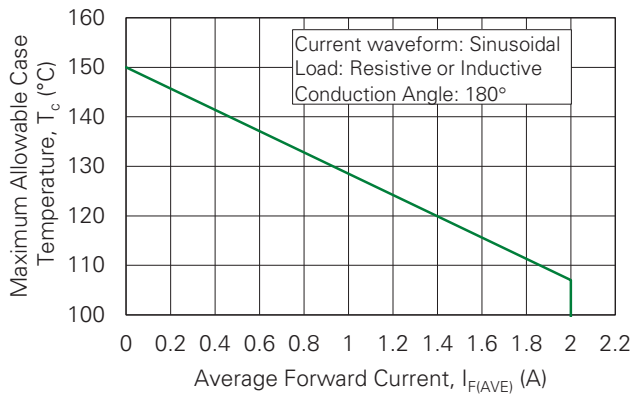
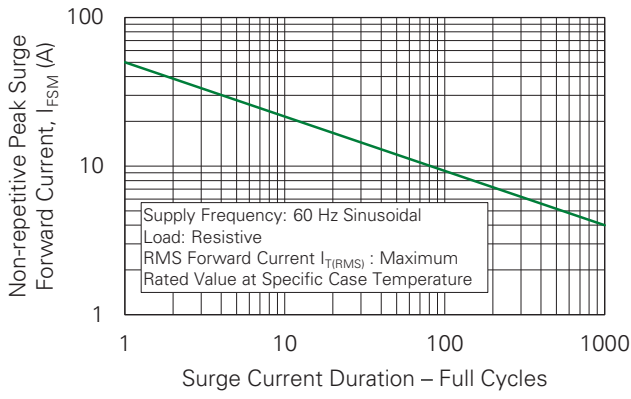


Figure 4. Surge Peak On-state Current vs. Number of Cycles

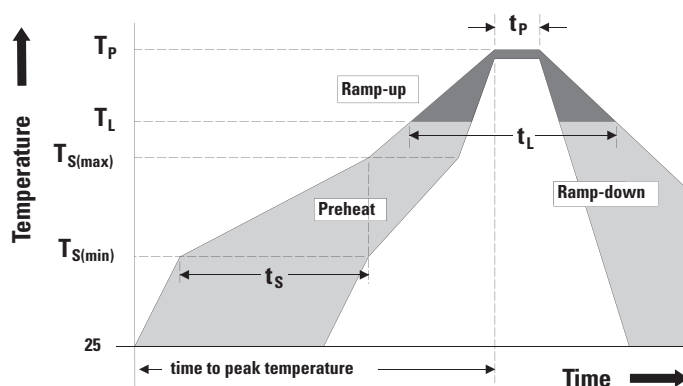


## Soldering Parameters

| Characteristic                                        |                                  | Value                   |
|-------------------------------------------------------|----------------------------------|-------------------------|
| Reflow Condition                                      |                                  | Pb – Free assembly      |
| Pre-heat                                              | Temperature Min ( $T_{s(min)}$ ) | 150 °C                  |
|                                                       | Temperature Max ( $T_{s(max)}$ ) | 200 °C                  |
|                                                       | Time (min to max) ( $t_s$ )      | 60 – 120 secs           |
| Average ramp up rate (Liquidus Temp)( $T_L$ ) to peak |                                  | 3 °C/second max         |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                  | 3 °C/second max         |
| Reflow                                                | Temperature ( $T_L$ ) (Liquidus) | 217 °C                  |
|                                                       | Time ( $t_L$ )                   | 60 – 150 seconds        |
| Peak Temperature ( $T_P$ )                            |                                  | 260 <sup>+0/-5</sup> °C |
| Time within 5 °C of actual peak Temperature ( $t_p$ ) |                                  | 30 seconds              |
| Ramp-down Rate                                        |                                  | 6 °C/second max         |
| Time 25 °C to peak Temperature ( $T_P$ )              |                                  | 8 minutes max           |
| Do Not Exceed                                         |                                  | 260 °C                  |

## Physical Specifications

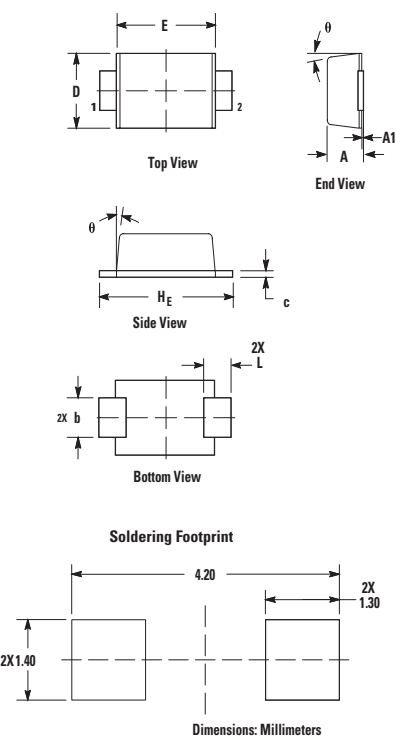
| Characteristic    | Value                                                  |
|-------------------|--------------------------------------------------------|
| Terminal Finish   | 100% Matte Tin-plated                                  |
| Body Material     | UL Recognized compound meeting flammability rating V-0 |
| Terminal Material | Copper Alloy                                           |



## Environmental Specifications

| Test                              | Specifications and Conditions                                                   |
|-----------------------------------|---------------------------------------------------------------------------------|
| High Temperature Voltage Blocking | MIL-STD-750, M-1040, Condition A<br>Rated $V_{RRM}$ , 150 °C, 1008 hours        |
| Temperature/Humidity              | EIA / JEDEC, JESD22-A101, 1008 hours;<br>320 V DC: 85 °C; 85% relative humidity |
| Temperature Cycling               | MIL-STD-750, M-1051, 1000 cycles;<br>-55°C to +150 °C; 15-min dwell-time        |
| Resistance to Solder Heat         | MIL-STD-750: Method 2031, 260 °C, 10 seconds                                    |
| Solderability                     | ANSI/J-STD-002                                                                  |
| High Temperature Storage          | MIL-STD-750, Method 1031, 150 °C, 1008 hours                                    |

Part Outline Drawing SOD-123FL



| Symbol         | Millimeters |      |      | Inches |       |       |
|----------------|-------------|------|------|--------|-------|-------|
|                | Min.        | Typ. | Max. | Min.   | Typ.  | Max   |
| A              | 1.20        | 1.30 | 1.40 | 0.047  | 0.051 | 0.055 |
| A1             | 0.00        | 0.05 | 0.10 | 0      | 0.002 | 0.004 |
| b              | 1.10        | 1.20 | 1.30 | 0.043  | 0.047 | 0.051 |
| c              | 0.10        | 0.17 | 0.25 | 0.004  | 0.007 | 0.01  |
| D              | 2.25        | 2.35 | 2.45 | 0.089  | 0.093 | 0.096 |
| E              | 3.25        | 3.35 | 3.45 | 0.128  | 0.132 | 0.136 |
| L              | 0.35        | 0.47 | 0.60 | 0.014  | 0.019 | 0.024 |
| H <sub>E</sub> | 3.75        | 3.85 | 3.95 | 0.148  | 0.152 | 0.156 |
| $\theta$       | 2°          | —    | 8°   | 2°     | —     | 8°    |

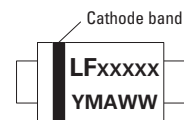
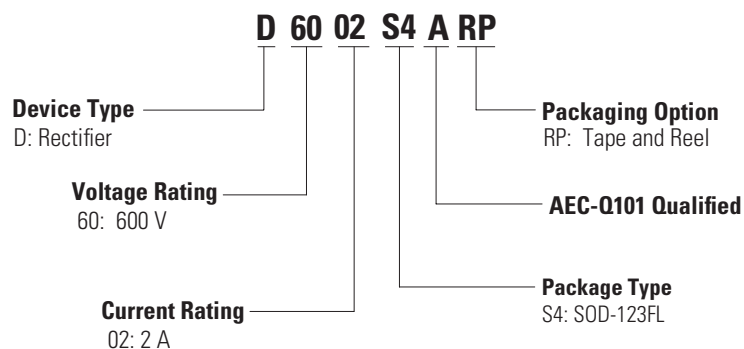
Product Selector

| Part Number | Voltage | Type      | Package   |
|-------------|---------|-----------|-----------|
|             | 600 V   |           |           |
| D6002S4ARP  | X       | Rectifier | SOD-123FL |

Packing Options

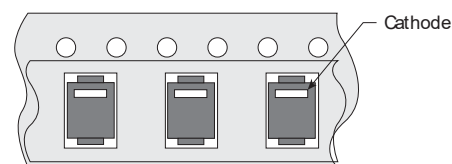
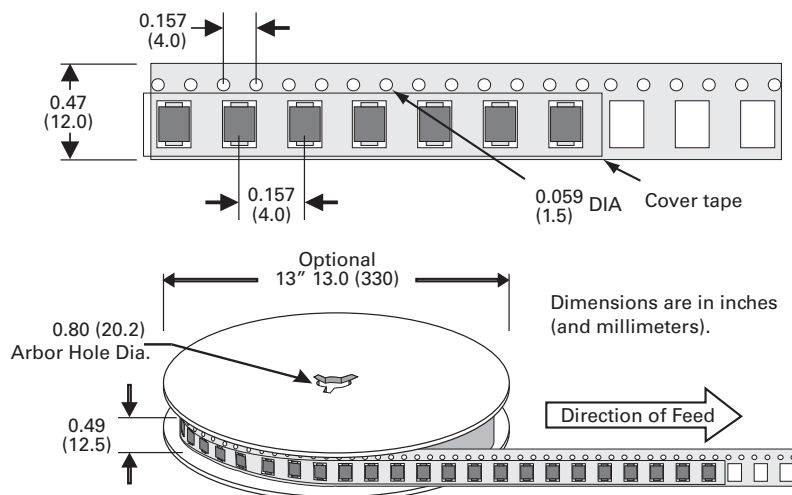
| Part Number | Marking | Weight   | Packing Mode  | Base Quantity |
|-------------|---------|----------|---------------|---------------|
| D6002S4ARP  | D602A   | 0.0268 g | Tape and Reel | 5000          |

## Part Numbering and Marking



**LF** = Littelfuse Logo  
**XXXXX** = Marking Code  
**Y** = Year  
**M** = Month  
**A** = Assembly Location  
**WW** = Lot Code

## Packing Specification



### Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.



Part of:

