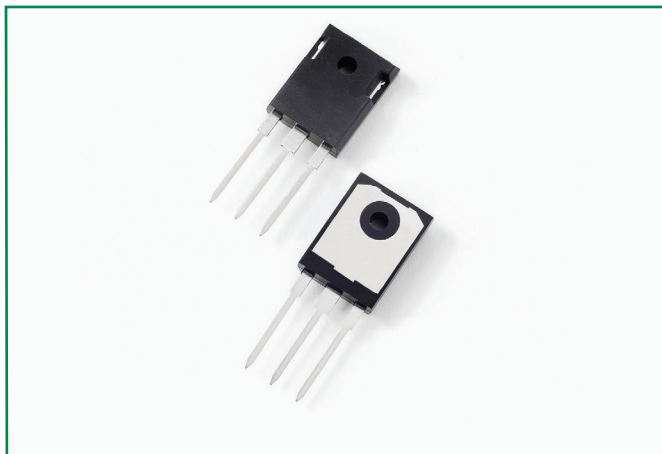


## LFUSCD30120B



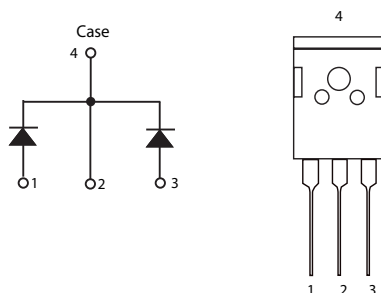
## Description

The LFUSCD series of silicon carbide (SiC) Schottky diodes has near-zero recovery current, high surge capability, and a maximum operating junction temperature of 175 °C. The diode series is ideal for applications where improvements in efficiency, reliability, and thermal management are desired.

## Features

- Positive temperature coefficient for safe operation and ease of paralleling
- 175 °C maximum operating junction temperature
- Enhanced surge capability
- Extremely fast, temperature-independent switching behavior
- Dramatically reduced switching losses compared to Si bipolar diodes

## Circuit Diagram



## Applications

- Boost diodes in power factor correction
- Switch-mode power supplies
- Uninterruptible power supplies
- Solar inverters
- Industrial motor drives

## Maximum Ratings

| Characteristics                                             | Symbol      | Conditions                                                                                          | Max. (Leg / Device) | Unit |
|-------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------|---------------------|------|
| DC Blocking Voltage                                         | $V_R$       | -                                                                                                   | 1200                | V    |
| Repetitive Peak Reverse Voltage, $T_j = 25\text{ °C}$       | $V_{RRM}$   |                                                                                                     | 1200                | V    |
| Maximum DC Forward Current                                  | $I_F$       | $T_C = 138\text{ °C}$                                                                               | 15 / 30             | A    |
| Non-Repetitive Forward Surge Current                        | $I_{FSM}$   | $T_C = 25\text{ °C}$ , 8.3 ms, half sine pulse                                                      | 120 / 240           | A    |
| Non-Repetitive Avalanche Energy                             | $E_{AS}$    | $T_j = 25\text{ °C}$ , $L = 10\text{ mH}$ , $I_{pk} = 5\text{ A per leg}$ , $V_{DD} = 100\text{ V}$ | 132 / 264           | mJ   |
| Power Dissipation                                           | $P_{Tot}$   | $T_C = 25\text{ °C}$                                                                                | 187 / 374           | W    |
|                                                             |             | $T_C = 138\text{ °C}$                                                                               | 46 / 92             |      |
| Maximum Operating Junction Temperature                      | $T_{J,MAX}$ |                                                                                                     | 175                 | °C   |
| Storage Temperature                                         | $T_{STG}$   |                                                                                                     | -55 to 175          | °C   |
| Soldering Temperatures, Wavesoldering Only Allowed at Leads | $T_{sold}$  | 1.6 mm from case for 10s                                                                            | 260                 | °C   |

### Electrical Characteristics

| Characteristics         | Symbol | Conditions                                                                   | Value (Leg / Device) |            |             | Unit          |
|-------------------------|--------|------------------------------------------------------------------------------|----------------------|------------|-------------|---------------|
|                         |        |                                                                              | Min.                 | Typ.       | Max.        |               |
| Forward Voltage         | $V_F$  | $I_F = 15 \text{ A}, T_J = 25^\circ \text{C}$                                | -                    | 1.5        | 1.7         | V             |
|                         |        | $I_F = 15 \text{ A}, T_J = 175^\circ \text{C}$                               | -                    | 2.5        | 3           |               |
| Reverse Current         | $I_R$  | $V_R = 1200 \text{ V}, T_J = 25^\circ \text{C}$                              | -                    | 45 / 90    | 375 / 50    | $\mu\text{A}$ |
|                         |        | $V_R = 1200 \text{ V}, T_J = 175^\circ \text{C}$                             | -                    | 90 / 180   | 1000 / 2000 |               |
| Total Capacitive Charge | $Q_C$  | $V_R = 600 \text{ V}, I_F = 30 \text{ A}, di/dt = 250 \text{ A}/\mu\text{s}$ | -                    | 60 / 120   | -           | nC            |
| Total Capacitance       | C      | $V_R = 1 \text{ V}, f = 1 \text{ MHz}$                                       | -                    | 750 / 1500 | -           | pF            |
|                         |        | $V_R = 300 \text{ V}, f = 1 \text{ MHz}$                                     | -                    | 75 / 150   | -           |               |
|                         |        | $V_R = 600 \text{ V}, f = 1 \text{ MHz}$                                     | -                    | 54 / 108   | -           |               |

Footnote:  $T_J = +25^\circ \text{C}$  unless otherwise specified

### Thermal Characteristics

| Characteristics    | Symbol          | Conditions | Value ( Leg/ Device ) |      |           | Unit                      |
|--------------------|-----------------|------------|-----------------------|------|-----------|---------------------------|
|                    |                 |            | Min.                  | Typ. | Max.      |                           |
| Thermal Resistance | $R_{\theta JC}$ | -          | -                     | -    | 0.8 / 0.4 | $^\circ\text{C}/\text{W}$ |

Figure 1: Typical Reverse Characteristics

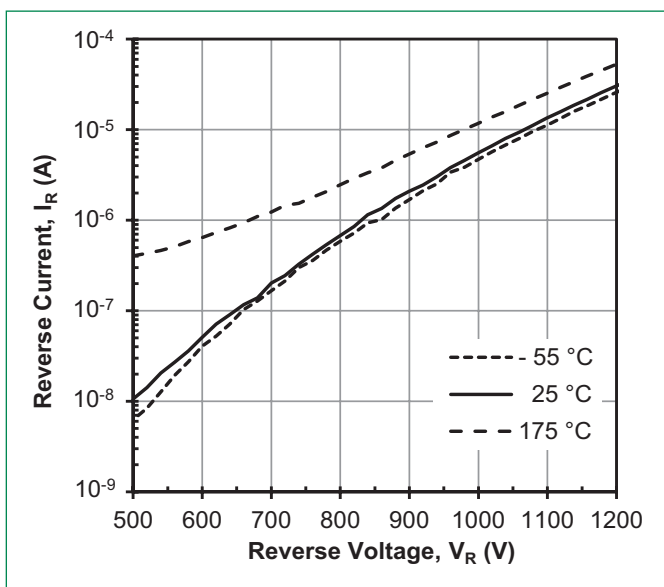


Figure 2: Typical Foward Characteristics

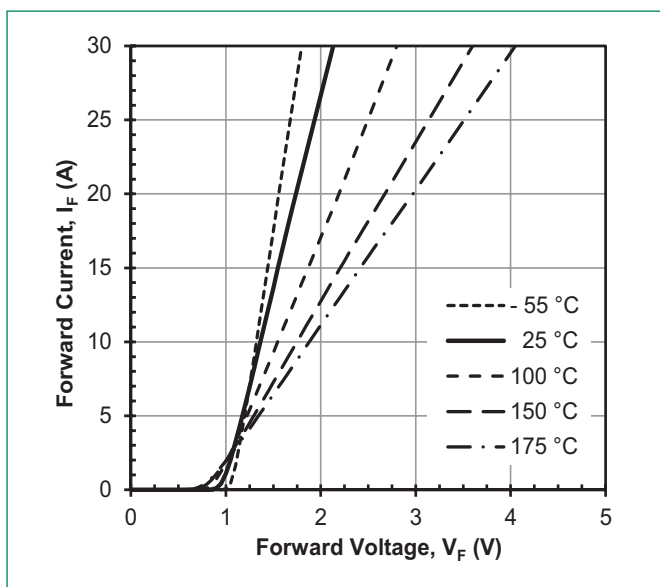


Figure 3: Power Disipation

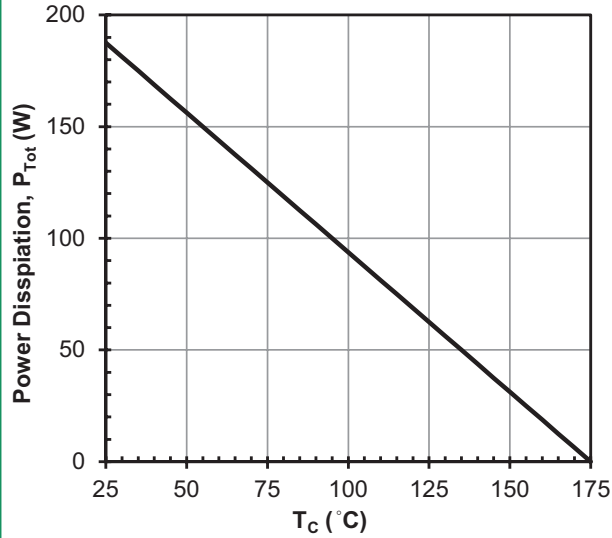


Figure 4: Diode Foward Current

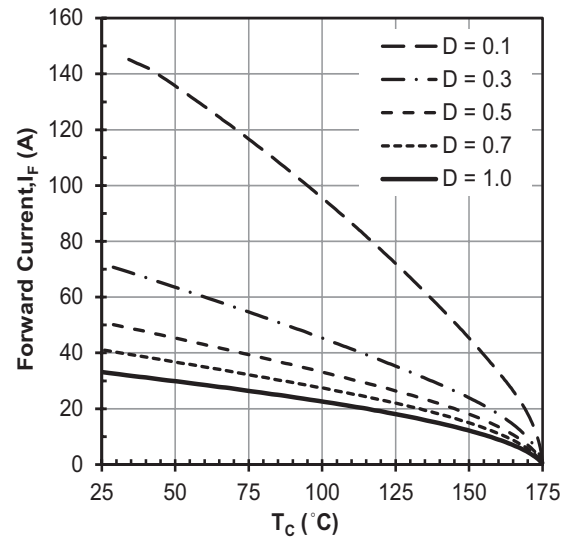


Figure 5: Capacitance vs. Reverse Voltage

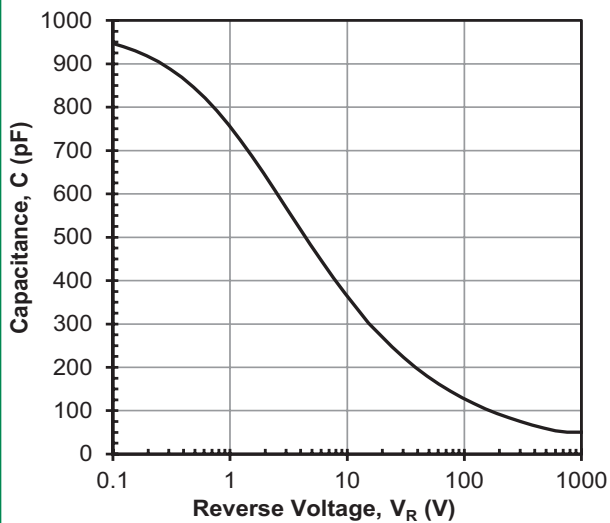
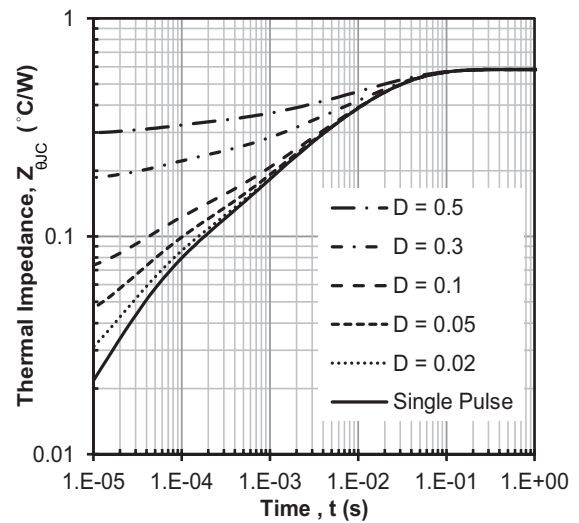
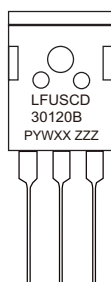


Figure 6: Transient Thermal Impedance



### Part Marking System



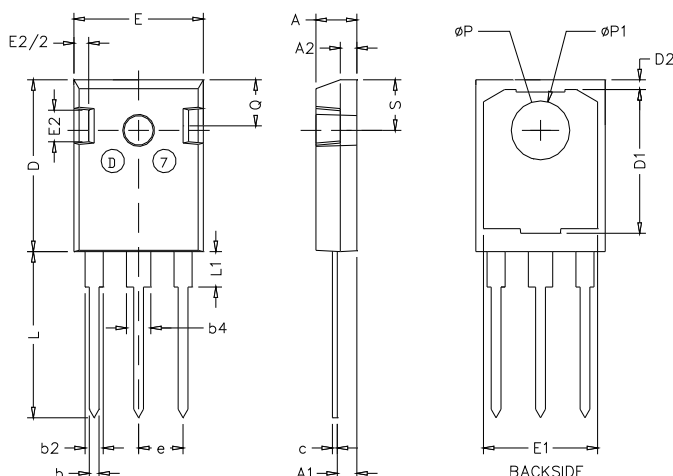
LFU = Littelfuse  
SCD = SiC diode  
30 = Current Rating (30A)  
120 = Voltage Rating (1200V)  
B = TO-247-3 package  
PYWXX ZZZ = Date Code  
ZZZ = Lot Number

Date code notes:  
P = assembly code  
Y = year  
W = week  
XX = sequential build number

### Packing Options

| Part Number  | Marking      | Packing Mode  | M.O.Q |
|--------------|--------------|---------------|-------|
| LFUSCD30120B | LFUSCD30120B | 30 pcs / Tube | 240   |

### Dimensions-Package TO-247 3-lead



| Symbol | Inches    |       |       |
|--------|-----------|-------|-------|
|        | Min       | Nom   | Max   |
| A      | 0.193     | 0.198 | 0.203 |
| A1     | 0.900     | 0.950 | 0.100 |
| A2     | 0.073     | 0.078 | 0.083 |
| b      | 0.042     | 0.047 | 0.052 |
| b2     | 0.075     | 0.080 | 0.094 |
| b4     | 0.113     | 0.118 | 0.133 |
| C      | 0.022     | 0.024 | 0.027 |
| D      | 0.820     | 0.825 | 0.830 |
| D1     | 0.684     | 0.690 | 0.696 |
| D2     | 0.042     | 0.047 | 0.052 |
| E      | 0.621     | 0.626 | 0.631 |
| E1     | 0.547     | 0.552 | 0.557 |
| E2     | 0.135     | 0.146 | 0.157 |
| E2/2   | 0.081     | 0.088 | 0.095 |
| e      | 0.215 BSC |       |       |
| L      | 0.789     | 0.794 | 0.799 |
| L1     | 0.164     | 0.170 | 0.176 |
| øP     | 0.140     | 0.142 | 0.144 |
| øP1    | 0.278     | 0.283 | 0.288 |
| Q      | 0.216     | 0.221 | 0.226 |
| S      | 0.238     | 0.243 | 0.248 |

| Mounting | M3/M3.5 | 1Nm        |
|----------|---------|------------|
| Torque   | Screw   | 8.8 lbf-in |

### Packing Specification ( Tube for TO-247 3-lead )

