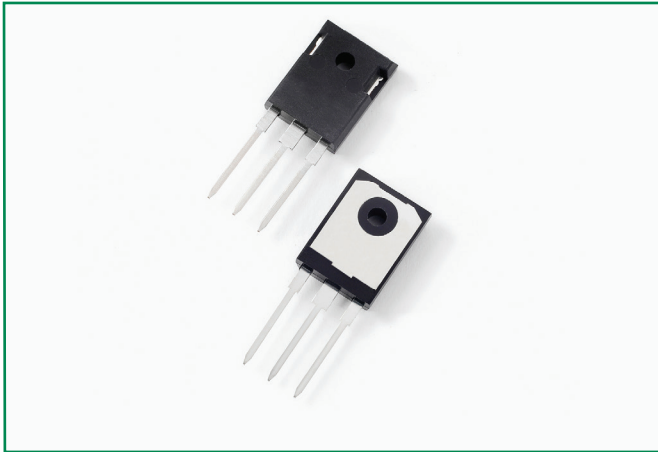


## LFUSCD30120B



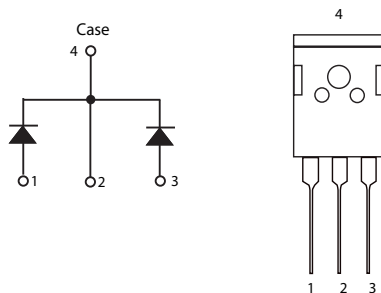
## Description

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, Wave-soldering Only Allowed at Leads	$T_{sold}$	1.6 mm from case for 10s	260	°C

**Electrical Characteristics**

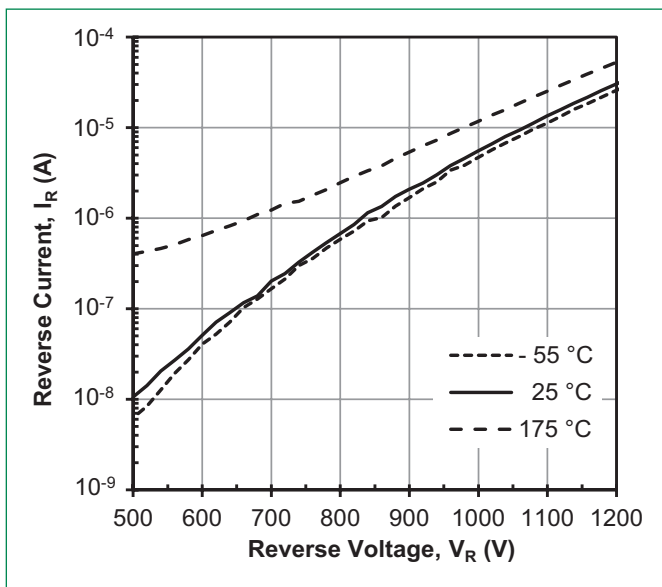
Characteristics	Symbol	Conditions	Value (Leg / Device)			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F = 15 \text{ A}, T_J = 25 \text{ }^\circ\text{C}$	-	1.5	1.7	V
		$I_F = 15 \text{ A}, T_J = 175 \text{ }^\circ\text{C}$	-	2.5	3	
Reverse Current	$I_R$	$V_R = 1200 \text{ V}, T_J = 25 \text{ }^\circ\text{C}$	-	45 / 90	375 / 50	$\mu\text{A}$
		$V_R = 1200 \text{ V}, T_J = 175 \text{ }^\circ\text{C}$	-	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:  $T_J = +25 \text{ }^\circ\text{C}$  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 Forward Characteristics**

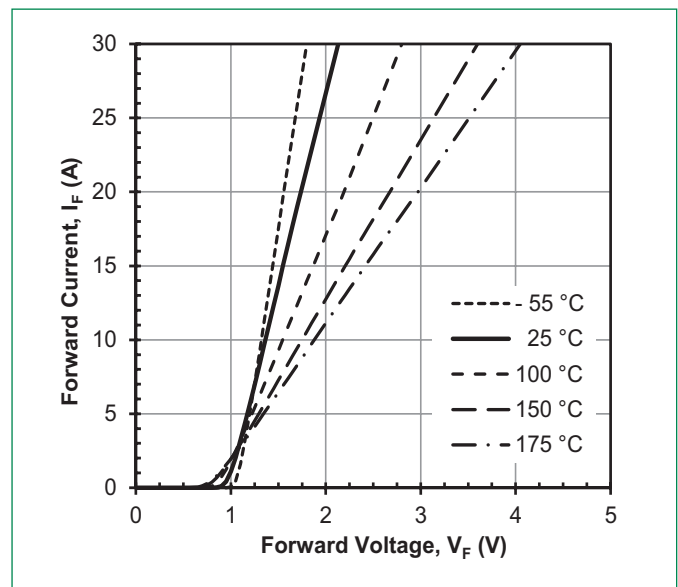


Figure 3: Power Dissipation

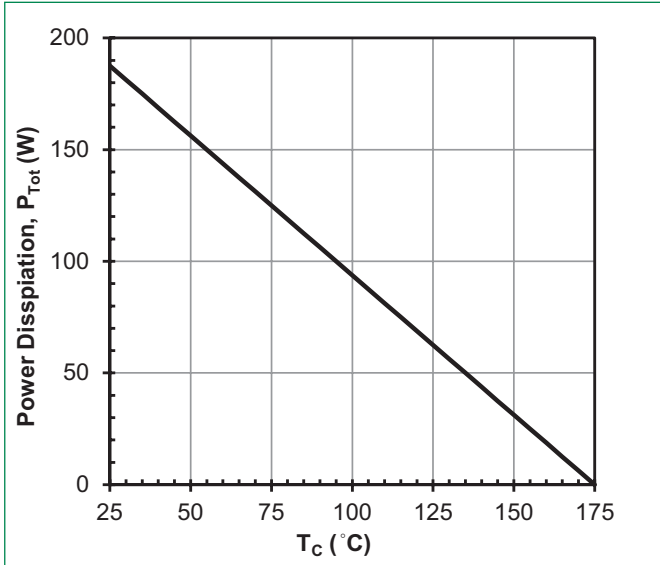


Figure 4: Diode Forward Current

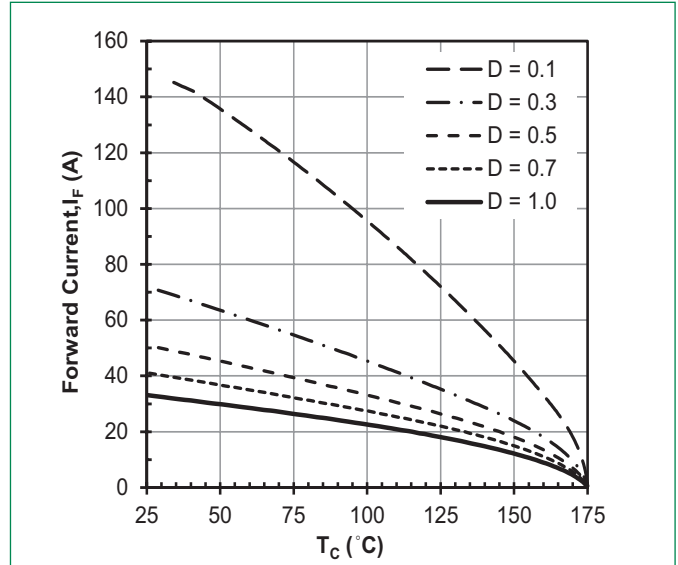


Figure 5: Capacitance vs. Reverse Voltage

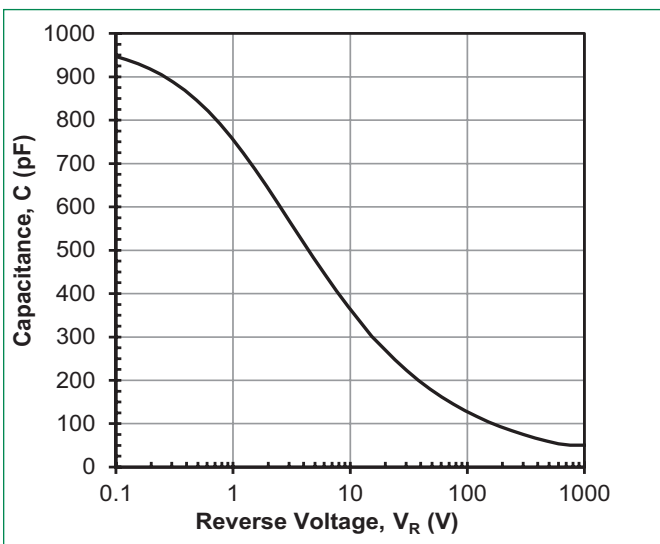
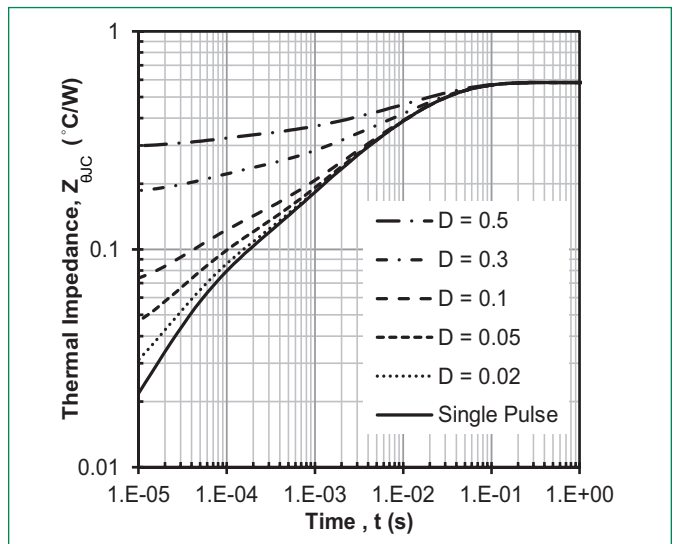
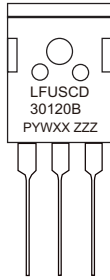


Figure 6: Transient Thermal Impedance



### Part Marking System



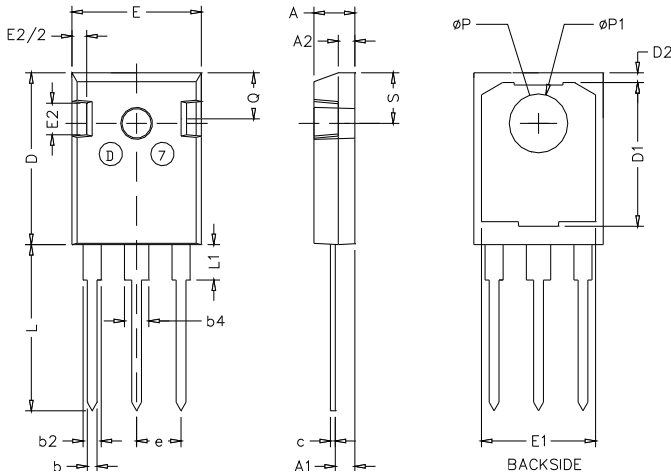
LFU = Littelfuse  
 SCD = SiC diode  
 30 = Current Rating (30A)  
 120 = Voltage Rating (1200V)  
 B = TO-247-3 package  
 PYWXX = Date Code  
 ZZZ = Lot Number

**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

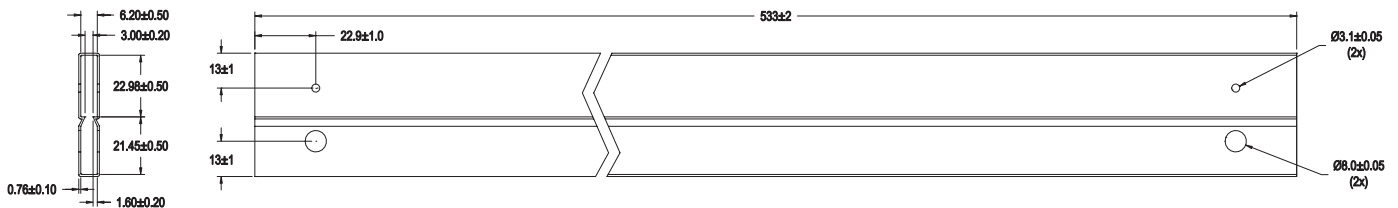
### Dimensions-Package TO-247 3-lead



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)



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